"CUSTOMERS SATISFACTION MEASUREMENT OF INTERNET BANKING"

(AN ANALYTICAL STUDY BASED ON SELECTED CUSTOMERS AND BANKS IN WESTERN INDIA)

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[Commerce and Business Management]

By

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CERTIFICATE

This is to certify that the thesis entitled "Customers Satisfaction Measurement of Internet Banking" (An Analytical study based on selected Customers and Banks in Western India), submitted by Md. Mahtab Alam to the Maharaja Sayajirao University of Baroda, Vadodara for the award of Degree of Doctor of Philosophy in Commerce and Business Management is, to the best of my knowledge, the bonafide work done by Md. Mahtab Alam under my supervision & guidance. The matter presented in this thesis incorporates the results of independent investigations carried out by the candidate himself.

Further certified that, Md. Mahtab Alam, research scholar, has fulfilled/observed the provisions/requirements, regarding attendance contained in O.Ph.D. 3 (i).

Date: 08/05 /2012
Place: Vadodara

Dr. Umesh R. Dangarwala
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DECLARATION

I hereby declare that the entire work embodied in the thesis entitled "Customers Satisfaction Measurement of Internet Banking" (An Analytical study based on selected Customers and Banks in Western India), has been carried out by me under the supervision and guidance of Dr. Umesh R. Dangarwala, Associate Professor Department of Commerce and Business Management, Faculty of Commerce, The Maharaja Sayajirao University of Baroda, Vadodara. The matter presented in this thesis incorporates the results of independent investigations carried out by me. To the best of my knowledge, no part of this thesis has been submitted for any degree or diploma to The Maharaja Sayajirao University of Baroda or any other university/Institution in India or abroad.

I also declare that I have fulfilled/observed the provisions/requirements regarding attendance contained in O.Ph.D. 3 (i).

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Md. Mahtab Alam
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This Thesis

is

Dedicated

To

MD. SULEMAN ALAM

&

ZAHEEDA KHATOON

My

"Beloved Parents"

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ABBREVIATIONS USED IN THE THESIS

CSIB	Customer Satisfaction of Internet Banking
IB	Internet Banking
SDS	Service Delivery System
EC	Expectation of a Customer
SC	Secrecy of a Customer
RC	Reliability of a Customer
ATM	Automated Tailor Machine
MB	Mobile Banking
LIC	Life Insurance Corporation of India
GIC	General Insurance Corporation of India
SCC	Selective Credit Control
DFI	Development Finance Institution
EFT	Electronic Fund Transfer
IAS	Integrated Accounting System
CTS	Cheque Truncation System
CPC	Cheque Processing Centre
CFC	Customer Facilitation Centre
SIPS	Systematically Important Payment Systems
IDRBT	Institute for Development and Research in Banking Technology
MAS	Monetary Authority of Singapore
HKMA	Hong Kong Monetary Authority
TCP	Transmission Control Protocol
IP	Internet Protocol
PPP	Point to Point Protocol
ISP	Internet Service Providers

SSL	Secured Socket Layer
TLS	Transport Layer Security
FTP	File Transfer Protocol
WWW	World Wide Web
HTML	Hyper Text Markup Language
HTTP	Hypertext Transfer Protocol
XML	Extensible Markup Language
WAP	Wireless Application Protocol
WAE	Wireless Application Environment
WTLS	Wireless Transport Layer Security
B2C	Business to Consumer
B2B	Business to Business
PC	Personal Computer
FAQ	Frequently Asked Question
EBPP	Electronic Bill Presentment and Payment
PDA	Personal Digital Assistants
ACH	Automated Clearing House
UCC	Uniform Commercial Code
UETA	Uniform Electronic Transaction Act
OCC	Office of the Comptroller of Currency
URL	Uniform Resource Locators'
RTGS	Real Time Gross Settlement
PIN	Personal Identification Number
NAP	Network Access Point
ROM	Read Only Memory
RAM	Random Access Memory

CHAPTER: 1

INDIAN BANKING: MILESTONE & A ROAD AHEAD

Introduction:

With the Indian economy moving on to a high growth trajectory, consumption levels soaring and investment riding high, the Indian banking sector is at a watershed. Further, as Indian companies globalize and people of Indian origin increase their investment in India, several Indian banks are pursuing global strategies. The industry has been growing faster than the real economy, resulting in the ratio of assets of commercial banks to GDP increasing to 92.5 per cent at end-March 2007[1]. The Indian banks have also been doing exceptionally well in the financial sector with the price-to-book value being second only to china, according to a report by Boston Consultancy Group.

1.1 Pre-Independence Banking Scenario in India [2]:

In India, the ancient Hindu Scriptures refer to the money lending activities in the Vedic period. During the Ramayana and Mahabharata eras, banking had become full-fledged business activity and during the Manu Smriti period which followed the Vedic period and Epic age, the business of banking was carried on by the members of the Vaish Community. Banking is different from money lending but two terms have in practice been taken to convey the same meaning. Banking has two important functions to perform, one of accepting deposits and other of lending money or investment of funds. During the Moguls period, metallic money was issued and the indigenous bankers added one more line of money changing to their already profitable business. They started exchanging money circulating in one part of the country with the money current in another part of the country making good margin for them.

The English traders, who came to India in the 17th century, established some contracts with the indigenous bankers by borrowing funds from them in 1786. The English Agency House had established the Bank of Bengal at Calcutta with the advent of modern banking conducted on western lines, the indigenous bankers lost further importance.

The English House Agency in Calcutta and Bombay were the bankers to the East India Company and the European merchants in India. They had no capital of their own and depend mainly on deposits from the public for finance. These agency houses failed as they combined banking with trading. Among the earliest banks in established in India, were the Bank of Bengal (1806), Bank of Bombay (1840) and Bank of Madras (1843).

These banks were also known as "presidency banks". In 1860 the concept of limited liability was introduced in banking. These banks (presidency banks) were allowed to issue notes to a limited extent, but this right was taken over by the government in 1862. In view of limited liability, several joint stock banks were floated. Some of important banks were established during 1860 to 1900, were:

Table – 1.1: List of Banks established during 1860 – 1900

Sr. No	Bank Name
1	Allahabad Bank Ltd.
2	The Alliance bank of Simla Ltd.
3	The Oudh Bank Ltd.
4	The Punjab national Bank Ltd.

[Source: RBI Report on trend & progress on Banking in India, Several Issues]

Thus by the end of year 1900, there were three classes of banks in India

Table 1.2: Different Classes of Banks in India at the end of year 1900.

Sr. No	Bank Name
1	Presidency Banks, numbering 3
2	Joint Stock Banks, numbering 9
3	Exchange Banks or Foreign Banks, numbering.

[Source: RBI Report on trend & progress on Banking in India, Several Issues]

The swadeshi movement which started in the early 1900s gave stimulus to the growth of indigenous joint Stock Banks. Some of the banks established during the 1900 to 1910 period were,

Table 1.3: List of Banks established during the period of 1900 – 1910

Sr. No	Bank Name
1	The Peoples Bank of India Ltd.
2	The Bank of India Ltd.
3	The Bank of Baroda Ltd.
4	The Central Bank of India Ltd.

[Source: RBI Report on trend & progress on Banking in India, Several Issues]

In 1921, the 3 presidency banks were merged to form the Imperial Bank of India. During 1900 and 1950, the Indian joint stock banks specialized in providing short term credit, for trade in the form of cash-credit and over draft facilities, foreign exchange business, remained the monopoly of foreign banks. Between 1900 and 1925 many banks failed due to various reasons. The Central Banking Enquiry Committee was constituted in 1929; it gave the reasons for the failure of banks such as: refer table 1.4.

On the basis of major recommendations of the central Banking Enquiry Committee the RBI Act was passed in 1934. While in 1949 the Banking Regulation Act was passed for regulation and supervision of banks.

Table 1.4: Various reason for failure of banks during 1900 – 1925

Sr. No.	Particular
1	Insufficient capital.
2	Poor liquidity of assets.
3	Combination of non-banking activities with banking activities.
4	Irrational credit policy.
5	Incompetent and inexperienced directors.

[Source: RBI Report on trend & progress on Banking in India, Several Issues]

It gave wide power to RBI to regulate, supervise and develop the banking systems. During 1950 to 1969 two important developments took place, first, the all India Rural Credit Survey Committee, which examined the issue of credit availability at the rural areas, recommended the creation or a state partnered sponsored bank entrusted with the task of opening branches in the rural areas.

Accepting this recommendation, the State Bank of India Act was passed in 1955 and the Imperial Bank of India was renamed as State Bank of India. Later in 1959 the State Bank of India (Subsidiary Bank) Act was passed enabling SBI, to take over 8 princely state associated banks as the subsidiaries; these banks were,

Table 1.5: List of Subsidiaries bank of SBI in 1959

Sr. No.	Bank
1	State Bank of Bikaner
2	State Bank of Hyderabad
3	State Bank of Indore
4	State Bank of Jaipur
5	State Bank of Mysore
6	State Bank of Patiala
7	State Bank of Saurashtra
8	State Bank of Travancore

[Source: RBI Report on trend & progress on Banking in India, Several Issues]

Secondly the need about wider diffusion of banking facilities and to change the uneven distributive pattern of bank lending was realized. The scheme of social control over banks was announced in the parliament in December 1967. The National Credit Control Council was set up in 1968 to assess the demand for bank credit from various sector of the economy and to determine their respective priorities in allocation.

1.2 Post-Independence Developments in Banking Sector [3]:

On the eve of independence in August 1947, there were 648 commercial banks, comprising 97 scheduled and 551 non scheduled banks. Development in banking sector is divided into two separate groups namely pre-nationalize period and post nationalize period:

1.2.1 Pre-Nationalization Period:

The year 1969 was a landmark in the history of commercial banking in India. In July of that year, the government nationalized 14 major commercial banks of the country. In April 1980, government nationalized 6 more commercial banks.

In 1951, when the First Five Year Plan (1951 – 56) was launched, the development of rural India was accorded the highest priority. The All India Rural Credit Survey Committee recommended. the creation of a State – partnered and State, sponsored bank by taking over the Imperial Bank of India and integrating with it, the former State – owned or State – associated banks. Accordingly, an Act was passed in the Parliament in May 1955 and the. State Bank of India was constituted on July 1, 1955.

Later, the State Bank of India (Subsidiary Banks) Act was passed in 1959 enabling the State Bank of India to take over eight former States – associated banks as its subsidiaries. During the pre-nationalization period, the industrial sector claimed the lion's share in bank credit. Within the industry, the large – scale sector cornered the bulk of credit and the share of small – scale industries was marginal. There were many reasons for the dominance of large industrial companies in the banking sector.

A disturbing feature of the pre-nationalization banking policy was the negligible share of agricultural sector in bank credit. This share hovered around 2 per cent of total commercial bank credit. The privately owned commercial banks were neither interested nor geared to meet the risky and small credit requirements of the farmers. Similarly, the share of other non-industrial sectors in bank credit was also low. Since the commercial banks were under the control of big industrialists, the lendable funds of the banks were sometimes used to finance socially undesirable activities like hoarding of essential commodities.

1.2.2 Post Nationalization Period [4]:

As already noted, leading commercial banks of the country were nationalized in1969 with the following objectives in view:

- To break the ownership and control of banks by a few business families.
- To prevent concentration of wealth and economic power.
- To mobilize savings of the masses from every nook and corner of the country.
- To pay greater attention to the credit needs of the priority sectors like agriculture and small industries.

The post nationalization period witnessed a remarkable expansion in the banking and financial system. The biggest achievement of nationalization was the reallocation of sectoral credit in favour of agriculture, small industries and exports which formed the core of the priority sector. Within agriculture, credit for the procurement of food grains (food credit) was a major item. Other agricultural activities preferred for credit included poultry farming, dairy and piggeries. Certain other sectors of the economy which also received attention for credit allocation were: professionals and self employed persons, artisans and weaker sections of society. Conversely, there was a sharp fall in bank credit to large scale industries. However, the share of small scale industry registered an upward trend.

Nationalization of commercial banks was a mixed blessing: After nationalization there was a shift of emphasis from industry to agriculture. The country witnessed rapid expansion in bank branches, even in rural areas. Branch expansion programme led to mobilization of savings from all parts of the country. Nationalized banks were able to pay attention to the credit needs of weaker sections, artisans and self – employed. However, bank nationalization created its own problems like excessive bureaucratization, red tapism and disruptive tactics of trade unions of bank employees.

1.3 Banking Sector Reforms since 1991[5]:

Until the early 1990s, the banking sector suffered from lack of competition, low capital base, low productivity and high intermediation cost. Commenting on the performance of the nationalized banks, the Reserve Bank of India observed, "After the nationalization of large banks in 1969 and 1980, the Government owned banks have dominated the banking sector. The role of technology was minimal and the quality of service was not given adequate importance. Banks also did not fallow proper risk management systems and the prudential standards were weak. All these resulted in poor asset quality and low profitability." Prior to reforms, the Indian Government determined the quantum, allocation and the price of credit, a situation referred to as financial repression by some experts. It was in this backdrop, that wide – ranging banking sector reforms in India were introduced as an integral part of the economic reforms initiated in the early 1990s. Reforms in the commercial banking sector had two distinct phases.

1.3.1 The First Phase:

The first phase of reforms implemented subsequent to the release of the Report .of the Committee on Financial System (Chairman: M. Narasimham), 1992 (or Narasimham Committee I) focused mainly on enabling strengthening measures. The Committee was guided by the fundamental assumption that the resources of the banks come from the general public and held by the banks in trust. These resources have to be deployed for maximum benefit of their owners, i.e., the depositors. This assumption automatically implies that even the Government has no business to endanger the solvency, health and efficiency of the nationalized banks. According to the Committee, the poor financial shape and low efficiency of public sector banks was due to: (a) extensive degree of central direction of their operations, particularly in terms of investment, credit allocation and branch expansion and (b) excessive political interference, resulting into failure of commercial banks to operate on the basis of their commercial judgment and in the

framework of internal economy. Despite opposition from trade unions and some political parties, the Government accepted all the major recommendations of the Committee some of which have already been implemented.

1.3.2 The Second Phase:

The second phase of reforms, implemented subsequent to the recommendations of the Committee on Banking Sector Reforms (Chairman : M. Narasimham), 1998 (or Narasimham Committee II) placed greater emphasis on structural measures and improvement in standards of disclosure and levels of transparency in order to align the Indian standards with international best practices.

1.3.3 Objectives of Banking Sector Reforms[6]:

The key objective of reforms in the banking sector in India has been to enhance the stability and efficiency of banks. To achieve this objective, various reform measures were initiated that could be categorized broadly into three main groups:

- Enabling measures.
- Strengthening measures and
- Institutional measures.

Enabling measures were designed to create an environment where banks could respond optimally to market signals on the basis of commercial considerations. Salient among these included reduction in statutory pre-emotions so as to release greater funds for commercial lending, interest rate deregulation to enable price discovery, granting of operational autonomy to banks and liberalization of the entry norms for financial intermediaries. The strengthening measures aimed at reducing the vulnerability of banks in the face of fluctuations in the economic environment. These included, inter alia, capital adequacy, income recognition, asset classification and provisioning norms, exposure norms, improved levels of transparency, and disclosure standards. Institutional framework conducive to development of banks

needs to be developed. Salient among these include reforms in the legal framework pertaining to banks and creation of new institutions.

1.3.4 Contents of Banking Sector Reforms [7]:

Banking sector reforms since 1991 have included, among others, the following:

- Granting operational autonomy to banks.
- Liberalization of entry norms for banks.
- Reduction in statutory pre – emption so as to release greater funds for commercial lending.
- Deregulation of interest rates.
- Relaxation in investment norms for banks.
- Easing of restrictions in respect of banks foreign currency investments.
- Withdrawal of reserve requirements on inter – bank borrowings.

Thus, financial repression has eased substantially with the deregulation of interest rates and substantial removal of credit allocation.

Cash Reserve Ratio (CRR):

Scheduled banks in India are required statutorily to hold cash reserves, called cash reserve ratio (CRR), with the RBI. Increase / decrease in CRR is used by the RBI as an instrument of monetary control, particularly to mop up excess increases in the supply of money. This power was given to RBI in 1956.

Narasimham Committee I recommended that RBI should rely on open market operations increasingly and reduce its dependence on CRR. This would reduce the amount of cash balances of the banks with the RBI enabling them to increase their revenues through more investments. It proposed that CRR should be progressively reduced from the then existing level of 15 per cent to 3 to 5 per cent.

CRR was gradually lowered from its peak at 15 per cent during July 1989 to April 1993 to 8.0 per cent in April 2000. It stood at 5 per cent effective October 2, 2004. In this connection, the Ninth Five Year Plan (1997 – 2002) remarked, "the level of the cash reserve ratio (CRR) that is to be maintained by the Indian banks is considerably higher than the international levels which are specified for prudential reasons. Although in recent years there has been significant reduction in the CRR from 15 per cent to 10 per cent and also the interest paid on CRR deposits with the RBI has been raised from 3.5 per cent to 4.5 per cent, there is a view that the CRR should be reduced even further, preferably to 3 per cent."

Statutory Liquidity Ratio (SLR):

Apart from the CRR, banks in India are also subject to statutory liquidity requirement; Under this requirement, commercial banks along with other financial institutions like Life Insurance Corporation of India (LIC), the General Insurance Corporation (GIC) and the Provident Funds are required under law to invest prescribed minimum Proportions of their total assets / liabilities in government securities and other approved securities. The underlying philosophy of this provision is to allocate total bank credit between the government and the rest of the economy. The assurance of a certain minimum share of bank credit to the government affects the borrowings of the government from the RBI and hence serves as a tool of quantitative monetary control. The SLR provision has created a captive market for government securities which increases automatically with the growth in the liabilities of the banks. Moreover, it has kept the cost of the debt to the government low in view of the generally low rate of interest on government securities.

Narasimham Committee I asked the Government to reduce the SLR from the then existing 38.5 per cent to 25 percent over a period of five years. A reduction in the SLR levels would leave more funds with the banks which could allocate them to

promote agriculture, industry and trade. The Committee further recommended that Government borrowing rates should be progressively market related so that higher rates would help banks to increase their income from their SLR investments. SLR was reduced from its peak of 38.5 per cent during September 1990 to 25 per cent in October 1997.

Structure of Interest Rates:

Narasimham Committee I recommended that the level and structure of interest rates in the country should be broadly determined by market forces. All controls and regulations on interest rates on lending should be removed. The country has moved towards liberalized credit allocation mechanism and reduced direct control over interest rates by the monetary authorities. Interest rate slabs have been gradually reduced from 20 to 3. Similarly, interest rates have been deregulated on the high slabs of bank rates. The purpose of deregulation is to promote healthy competition among the banks and encourage their operational efficiency. Scheduled banks have now the freedom to set interest rates on their deposits subject to minimum floor rate (4.5 per cent) and maximum ceiling rate (11 per cent).

Prime lending rates of banks for commercial credit are now entirely within the purview of the banks and are not set by the RBI. The domestic interest rates which are still subject to regulation are the rate of interest on saving accounts and rates of interest on export credit. In line with the decline in inflation rate and also in view of the importance of lower real interest rates in accelerating industrial growth and boosting India's competitiveness abroad, RBI reduced the Bank Rate (3) from 8 per cent to 7 per cent, effective April 2, 2000. Rate of interest on saving deposits of commercial banks was also reduced from 4.5 per cent to 4.0 per cent. Following these measures, the structure of interest rates in India has come closer to ruling international rates.

Organization of Banking Structure:

Narasimham Committee I proposed a substantial reduction in the number of public sector banks through mergers and acquisitions. The broad pattern should consist of:

- 3 or 4 large banks which could become international in character.
- 8 or 10 national banks with a network of branches throughout the country.
- Local banks whose operations would be generally confined to a specific region.
- Rural banks whose operations will be confined to rural areas.

Significantly, Narasimham Committee I recommended that RBI should permit the setting up of new banks in the private sector. It wanted a positive declaration from the Government that there would be no more nationalization of banks. It further recommended that there should not be any difference in treatment between the public sector banks and the private sector banks.

It recommended that RBI should follow a more liberal policy in respect of all owing the foreign banks to open branches in India and they should be subjected to the same requirements as are applicable to the Indian banks.

In January 1993, RBI had issued guidelines for licensing of new banks in the private sector. It had granted licenses to 10 banks which are presently in business. Based on a review of experience gained on the functioning of new private sector banks, revised guidelines were issued in January 2000. Following are the major revised provisions:

- Initial minimum paid-up capital shall be Rs. 200 crore which will be raised to Rs.300 crore within three years of commencement of business.

- Contribution of promoters shall be a minimum of 40 per cent of the paid up capital of the bank at any point of time. This contribution of 40 per cent shall be locked in for five years from the date of licensing of the bank.
- While augmenting capital to Rs. 300 crore within three years, promoters shall bring in at least 40 per cent of the fresh capital which will also be locked in for five years.
- NRI participation in the primary equity of a new bank shall be to the maximum extent of 40 per cent.

Duality of Control:

Narasimham Committee I recommended removal of duality of control over the banking system by the banking department of the Finance Ministry on the one hand, and by the RBI on the other hand. The Committee desired the RBI to assume full responsibility of overseeing the functioning of the banking system.

Abolition of Selective Credit Controls (SCCs):

SCCs, introduced in India in 1956, pertain to regulation of credit for specific purposes. The techniques of SCCs used by the RBI include fixing minimum margins for lending against securities, ceiling on maximum advances to individual borrowers against stocks of certain commodities, and minimum discriminatory rates of interest prescribed for certain kinds of advances. SCCs have been used mainly to prevent the speculative holding of essential commodities like food grains to prevent price rise. Selective credit controls have been abolished in the post liberalization period.

Other Measures:

Credit restrictions for purchase of consumer durables have been removed / relaxed. Similarly, coverage of priority sector has been enlarged by the inclusion of software, agro – processing, industries and venture capital. These measures have given the banks the much – needed flexibility to manage their asset portfolios.

Commenting on the success of banking sector reforms, the Reserve Bank of India observed, "There is evidence to suggest that competition in the banking industry has intensified. Significant improvement was 1ilso discernible in the various parameters of efficiency, especial intermediation costs, which declined significantly. Profitability of commercial banks, on the whole, improved significantly despite a decline in spread and higher provisioning following the introduction and subsequent tightening of prudential norms."

1.4 Current Issues in Indian Banking [8]:

Despite substantial improvements in the banking sector, some issues have to be addressed over time as the reform process is entrenched further. The discussion on banking developments revolves around on a wide range of issues like:

- Overall redrawing of boundaries between the State ownership of financial entities and private sector ones.
- Public sector character of the banking sector and efficiency.
- Dilution of the government stake and its impact on the performance of the banking sector.
- Corporate governance in banks and other segments of the financial system.
- Transparency of policies and practices of monetary and financial agencies and accountability.
- Prudential requirements of market participants together with comprehensive and efficient oversight of the financial system.
- Maintenance of best practices in accounting and auditing, as also collection, processing and dissemination of symmetric and detailed information to meet the market needs.
- Relevance of Development Finance Institutions (DFIs).

The commonality among these concerns has given rise to a wide recognition and acceptance of having a set of international standards and best practices that every systemically important country should strive to foster and implement. Financial sector reforms, introduced in the early 1990s in a gradual and sequenced manner, were directed at the removal of various deficiencies from which the system was suffering. The basic objectives of reforms were to make the system more stable and efficient so that it could contribute in accelerating the growth process.

In response to reforms, the Indian banking sector has undergone radical transformation during the 1990s. Reforms have altered the organizational structure, ownership pattern and domain of operations of institutions and infused competition in the financial sector. The competition has forced the institutions to reposition themselves in order to survive and grow. The extensive progress in technology has enabled markets to graduate from outdated systems to modem market design, thus, bringing about a significant reduction in the speed of execution of trades and transaction costs.

With the increasing integration of various segments of financial markets, the distinctions between banks and other financial intermediaries are also getting increasingly blurred. Another important aspect of reforms in the financial sector has been the increased participation of financial institutions, especially banks, in the capital market. These factors have led to increased inter – linkages across financial institutions and markets. While increased inter – linkages are expected to lead to increased efficiency in the resource allocation process and the effectiveness of monetary policy, they also increase the risk of contagion from one segment to another with implications for overall financial stability. This would call for appropriate policy responses during times of crisis. Increased inter – linkages also raise the issue of appropriate supervisory framework.

Banking sector reforms in India are grounded in the belief that competitive efficiency in the real sectors of the economy will pot realize its full potential unless the banking sector was reformed as well. Thus, the principal objective of banking sector reforms was to improve the allocative efficiency of resources and accelerate the growth process of the real sector by removing structural deficiencies affecting the performance of banks.

In India, while the banking system continues to play a predominant role, it is significant to note that, as a result of various reform measures, the relative significance of financial markets has increased. This augurs well for the overall stability of the financial system. The East Asian crisis has also underlined the need for a balanced financial system wherein financial markets also play an important role in providing necessary liquidity, especially during times of crisis. Banking system also requires liquidity in times of stress, which only deep and liquid financial markets can provide.

1.5 Future of India's Banking Sector [9]:

Banking sector reforms in India are by no means complete. Plans are afoot to modernize the financial system to make it compatible with best international practices.

1.5.1 Vision Document for Payment Systems: 2005 – 08[10]:

In the recent period, the RBI has taken a number of initiatives to strengthen the institutional, technological and procedural framework for the payment and settlement systems. To carry forward these initiatives in an integrated and cohesive manner, a Vision Document for 2005 – 08 has been prepared after taking into consideration the feedback from the various stakeholders such as banks, technology solution providers, members of public and other experts in the field.

The Vision Document sets out the roadmap for implementing the vision for payment and settlement systems within the next three years. The key themes of the action plans identified in the Vision Document are safety, security, soundness and efficiency (Triple-S and E). While safety in payment and settlement systems relates to risk reduction measures, security implies confidence in the integrity of the payment systems. All payment systems are envisaged to be on a sound footing with adequate legal backing for operational procedures and transparency norms. Efficiency enhancements are envisaged by leveraging the benefits of technology for cost effective solutions.

The main action points for payment and settlement systems, 2005 – 08 as set out in the Vision Document are indicated below:

Action Points during 2005 – 06:

- Pursuing with Indian Banks Association and major banks for setting up of a national level entity which will operate all retail payment systems in the country;
- Operationalizing National Settlement System for all clearings at four metro centers by December 2005;
- Finalizing the proposed Electronic Funds Transfer (EFT) regulations;
- Implementing Stage-2 of RTGS System, i.e., Integrated Accounting System (IAS) – RTGS rollout during which all inter – bank transactions at all major centers would be settled on RTGS platform and paper – based inter – bank clearing will be closed;
- Pursuing with RTGS participants to cover all their networked branches under RTGS framework paving way for RTGS based customer related transactions at about ten thousand branches in the country;
- Implementing image – based Cheque Truncation System (CTS) at the National Capital Region (NCR) on a pilot basis;

- Preparing minimum standard of operational efficiency at MICR Cheque Processing Centre (CPC);
- Making available EFT facility at 500 capital market intensive centers as identified by BSE and NSE;
- Setting up Customer Facilitation Centre (CFC) at the RBI for various segments of national payment systems;
- Public disclosure from each payment service provider of its standards, terms and conditions under which the payment will be effected and also compensation policy and procedure for any deficiency in services including the setting up of CFC;
- Drafting the Red Book on Payment Systems in India; and
- Drafting a comprehensive legislation on payment system.

Action Points during 2006 – 07:

It is envisaged to:

- Complete the tasks initiated during 2005 – 06;
- Extend MICR clearing to 20 additional identified centres; ensure that every cheque issued follows MICR format and standards;
- Implement EFT systems at a national level through the new retail payment institution;
- Make all payment systems in India compliant with the Core Principles for Systemically Important Payment Systems (SIPS);
- Increase the reach of payment services by means of tie up and collaboration with other large coverage entities such as the post offices; and
- Facilitate government payments and receipts through electronic mode.

Action Points during 2007 – 08:

- Creating off city back up arrangements for large value national payment systems such as RTGS and G-Sec Clearing;
- Making fully functional the new organization for retail payment systems with all such payment under its umbrella; Regulating various payment systems;
- Ensuring cheque truncation based clearing at Mumbai, Chennai and Kolkata; and
- Covering National Settlement System at all major clearing houses / clearing organizations in the country.

1.5.2 Financial Sector Technology Vision Document [11]:

The RBI released the draft Financial Sector Technology Vision document on May 6, 2005. It provides a broad overview of the thrust areas of the direction provided by the RBI in respect of IT for the financial sector for more than two decades and sets out a roadmap for 2005 – 08. The Vision document focuses on

- IT for regulation and supervision,
- IT for the Financial Sector and
- IT for Government related functions.

The Vision Document envisages emerging challenges in the form of implementation of standardization across a variety of hybrid systems at different financial entities, need for decision support systems and the technology to facilitate risk based off – site supervision. It envisions common inter operable web based structures for transmission of data relating to regulatory functions and the use of a single centralized database for all information, apart from hiving off the operation of non-critical functions by the RBI. The Vision Document also visualizes Institute for Development and Research in Banking Technology (IDRBT) which is to be a premier research institute, concentrating on research and development for the

banking and financial sector, providing educational / training facilities and hiving off business related activities.

Recognizing the requirements of IT for the financial sector, the Vision Document elucidates the thrust areas of the RBI by providing generic information on various standards and approaches, IS Audit and requisite focus on business continuity plans. The Vision Document proposes that specific attention would be devoted to percolation of technology efforts to all types of banks and all sections of the customers in the banks with specific reference to the rural areas and the use of affordable technology products which can be easily used by the target clientele with inter – shareable resources.

The document also details the use of IT in the Government sector transactions (which has the largest potential to grow significantly in the years to come), with specific attention on the need for business process re-engineering, changes in rules and procedures for aligning them with e-governance in a manner so as to achieve implementable objectives.

1.5.3 Road Map for Foreign Banks in India [12]:

At present, foreign banks may operate in India through only one of the three channels, viz.

- Branches;
- A wholly owned subsidiary (WOS); or
- A subsidiary with an aggregate foreign investment up to a maximum of 74 per cent in a private bank.

With a view to delineate the direction and pace of reform process in this area and to operationalize the extant guidelines of March 4, 2004 in a phased manner, the RBI, on February 28, 2005, released the road map for presence of foreign banks in India. The roadmap is divided into two phases.

First Phase: March 2005 to March 2009*:*

During the first phase, between March 2005 and March 2009, foreign banks wishing to establish presence in India for the first time could either choose to operate through branches or set up a 100 per cent was, following the one mode presence criterion. For new and existing foreign banks, it is proposed to go beyond the existing WTO commitment of 12 branches in a year. Foreign banks already operating in India would be permitted to establish presence by way of setting up a WOS or conversion of the existing branches into a WOS. For this purpose, criteria such as ownership pattern, financial soundness, supervisory rating and the international ranking would be considered.

The WOS should have a minimum capital of Rs. 300 crore and would need to ensure sound corporate governance. The was will be treated on par with the existing branches of foreign banks for branch expansion with flexibility to go beyond the existing WTO commitments and preference for branch expansion in under – banked areas. The RBI may also prescribe market access and national treatment limitation consistent with WTO as also other appropriate limitations to the operations of was, consistent with international practices and the country's requirements.

During this phase, permission for acquisition of shareholding in Indian private sector banks by eligible foreign banks will be limited to banks identified by the RBI for restructuring. The RBI may, if it is satisfied that such investment by the foreign bank concerned will be in the long – term interest of all the stakeholders in the investee bank, permit such acquisition. Where such acquisition is by a foreign bank having presence in India, a maximum period of six months would be given for conforming to the "one form of presence" concept.

Second Phase: April 2009 onward:

The second phase will commence in April 2009 after a review of the experience gained and after due consultation with all the stakeholders in the banking sector. In this phase, three interconnected issues would be taken up.

First, the removal of limitations on the operations of the WOS and treating them on par with domestic banks to the extent appropriate would be designed and implemented.

Second, the WOS of foreign banks, on completion of a minimum prescribed period of operation, maybe allowed to list and dilute their stake so that, consistent with March 5, 2004 guidelines, at least 26 per cent of the paid-up capital of the subsidiary is held by resident Indians at all times. The dilution may be either by way of initial public offer or as an offer for sale.

Third, during this phase, foreign banks may be permitted to enter into merger and acquisition transactions with any private sector bank in India subject to the overall investment limit of 74 per cent.

1.6: Concept of E-banking? [13]

Electronic banking (E-banking) is a generic term encompassing internet banking, telephone banking, mobile banking etc. In other words, it is a process of delivery of banking services and products through electronic channels such as telephone, internet, cell phone etc. The concept and scope of E-banking is still evolving.

Several initiatives taken by the Government of India as well as the Reserve Bank of India (RBI) have facilitated the development of E-banking in India. As a regulator and supervisor, the RBI has made considerable progress in consolidating the existing payment and settlement systems, and in upgrading technology with a view

to establishing an efficient, integrated and secure system functioning in a real – time environment, which has further helped the development of E-banking in India. The Government of India enacted the IT Act, 2000 with effect from October 17, 2000, which provides legal recognition to electronic transactions and other means of electronic commerce.

1.6.1 E-banking: Global Experiences: [14]

Finland was the first country in the world to have taken a lead in E-banking. The Scandinavian countries have the largest number of Internet users, with up to one – third of bank customers in Finland and Sweden taking advantage of E-banking. Internet banking is also widespread in Austria, Korea, Singapore, Spain, Switzerland, etc. E-banking facilitates an effective payment and accounting system thereby enhancing the speed of delivery of banking services considerably. While the E-banking has improved efficiency and convenience, it has also posed several challenges to the regulators and supervisors.

In response to the challenges thrown by the Internet banking, regulators and supervisors from various countries have prepared their own mechanism of regulation. There is a matrix of legislation and regulations within the United States that specifically codifies the use of and rights associated with the internet and e-commerce, in general, and electronic banking and internet banking activities, in particular. The concerns of the Federal Reserve are limited to ensuring that Internet banking and other electronic banking services are implemented with proper attention to security, safety and soundness of the bank, and the protection of the banks customers.

In the UK, there is no specific legislation for regulating E-banking activities. The FSA is neutral on regulations of electronic banking. In Sweden, no formal guidance has been given to examiners by the Sveriges Bank on E-banking. General guidelines

apply equally to Internet banking activities. The role of the Bank of Finland has been, as part of general oversight of financial markets in Finland, mainly to monitor the ongoing development of Internet banking without active participation. The Reserve Bank of New Zealand applies the same approach to the regulation of both Internet banking activities and traditional banking activities. There are however, banking regulations that apply only to Internet banking. Supervision is based on public disclosure of information rather than application of detailed prudential rules.

The Monetary Authority of Singapore (MAS) subjects Internet banking to the same prudential standards as traditional banking. The MAS drafted an "Internet Banking Technology Risk Management Guidelines" in September 2002, which calls upon all banks providing internet banking to establish a sound and robust risk management process. The Hong Kong regulatory approach towards E-banking is less specific in nature. The Hong Kong Monetary Authority (HKMA) expects their banks to undertake a rigorous analysis of the security aspects of their system by getting it reviewed by qualified independent experts.

Like many of these countries, India does not have specific regulatory laws for E-banking. The existing regulatory framework over banks has been extended to Internet banking as well. However, certain guidelines have been issued to banks to recognize the risks arising from electronic modes and to devise control mechanisms that are needed to mitigate such risks. Banks offering the E-banking services in India comply with these guidelines.

1.7. E-banking and RBI: [15]

The RBI has been gearing up to upgrading itself as a regulator and supervisor of the technologically dominated financial system. In 1998, it availed the technical assistance project of Department for International Development (DFID), UK for upgrading, its supervisory system and adaptation of its supervisory functions to the

computerized environment. It issued guidelines on "risks and control in computer and telecommunication system" in February 1998 to all the banks advising them to evaluate the risks inherent in the systems and put in place adequate control mechanisms to address these risks, which can be broadly put under three heads, viz., IT environment risks, IT operations risks and product risks.

The existing regulatory framework over banks has also been extended to internet banking. These guidelines cover various issues that would fall within the framework of technology, security standards and legal and regulatory issues. Virtual banks, which have no offices and function only on line are not permitted to offer E-banking services in India and that only banks licensed under the Banking Regulation Act and having a physical presence in India are allowed to offer such services.

Further, banks are required to report to the RBI every breach or failure of security systems and procedures in Internet banking, while the RBI at its discretion may decide to commission special audit / inspection of such banks. As per recent guidelines, banks no longer need any prior approval of the Reserve Bank for offering the internet banking services. Nevertheless, banks must have their internet policy and they need to ensure that it is in line with parameters as set by the Working Group on Internet Banking in India (2001). Main recommendations of the Working Group are set forth below.

1.7.1 Main Recommendations of the Working Group on Internet Banking (Chairman: S. R. Mittal), 2001: [16]

Reserve Bank of India constituted a Working Group to examine different issues relating to internet banking and recommend technology, security, legal standards and operational standards keeping in view the international best practices. The

Group was headed by the Chief General Manager in-Charge of the Department of Information Technology and comprised experts from the fields of banking regulation and supervision, commercial banking, law and technology. The Bank also constituted an Operational Group under its Executive Director comprising officers from different disciplines in the bank, who would guide implementation of the recommendations.

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

1. Risks to the organization and banking system, associated with Internet banking and methods of adopting International best practices for managing such risks.
2. Identifying gaps in supervisory and legal framework with reference to the existing banking and financial regulations, IT regulations, tax laws, depositor protection, consumer protection, criminal laws, money laundering and other cross border issues and suggesting improvements in them.
3. Identifying international best practices on operational and internal control issues, and suggesting suitable ways for adopting the same in India.
4. Recommending minimum technology and security standards, in conformity with international standards and addressing issues like system vulnerability, digital signature information system audit etc.
5. Clearing and settlement arrangement for electronic banking and electronic money transfer; linkages between i-banking and e-commerce.
6. Any other matter, which the Working Group may think as of relevance to Internet banking in India.

Keeping in view the terms of reference, the Group made a number of recommendations. A summary of these recommendations is given below.

1.7.2 Technology and Security Standards: [17]

The role of the network and database administrator is pivotal in securing the information system of any organization. Some of the important functions of the administrator via-a-vis system security are to ensure that only the latest versions of the licensed software with latest patches are installed in the system, proper user groups with access privileges are created and users are assigned to appropriate groups as per their business roles, a proper system of back up of data and software is in place and is strictly adhered to, business continuity plan is in place and frequently tested and there is a robust system of keeping log of all network activity and analyzing the same.

Organizations should make explicit security plan and document it. There should be a separate Security Officer I Group dealing exclusively with information systems security. The Information Technology Division will actually implement the computer systems while the Computer Security Officer will deal with its security. The Information Systems Auditor will audit the information systems.

Access Control:

Logical access controls should be implemented on data, systems, application software, utilities, telecommunication lines, libraries, system software, etc. Logical access control techniques may include user-ids, passwords, smart cards or other biometric technologies.

Firewalls:

At the minimum, banks should use the proxy server type of firewall so that there is no direct connection between the Internet and the bank's system. It facilitates a high level of control and in-depth monitoring using logging and auditing tools. For

sensitive systems, a Stateful inspection firewall is recommended which thoroughly inspects all packets of information, and past and present transactions are compared. These generally include a real-time security alert.

Isolation of Dial up Services:

All the systems supporting dial up services through modem on the same LAN as the application server should be isolated to prevent intrusions into the network as this may bypass the proxy server.

Security Infrastructure:

PKI is the most favored technology for secure Internet banking services. However, it is not yet commonly available. While PKI infrastructure is strongly recommended, during the transition period, until IDRBT or Government puts in place the PKI infrastructure, the following options are recommended:

- Usage of SSL, which ensures server authentication and the use of Client side certificates issued by the banks themselves using a Certificate Server.
- The use of at least 128-bit SSL for securing browser to web server communications and, in addition, encryption of sensitive data like passwords in transit within the enterprise itself.

Isolation of Application Servers:

It is also recommended that all unnecessary services on the application server such as ftp, telnet should be disabled. The application server should be isolated from the e-mail server.

Security Log (audit Trail):

All computer accesses, including messages received, should be logged. All computer access and security violations (suspected or attempted) should be reported and follow up action taken as the organization's escalation policy.

Penetration Testing:

The information security officer and the information system auditor should undertake periodic penetration tests of the system, which should include:

- Attempting to guess passwords using password – cracking tools.
- Search for back door traps in the programs.
- Attempt to overload the system using DdoS (Distributed Denial of Service) and DoS (Denial of Service) attacks.
- Check if commonly known holes in the software, especially the browser and the e-mail software exist.
- The penetration testing may also be carried out by engaging outside experts (often called "Ethical Hackers").

Physical Access Controls:

Though generally overlooked, physical access controls should be strictly enforced. The physical security should cover all the information systems and sites where they are housed both against internal and external threats.

Backup and Recovery:

The bank should have a proper infrastructure and schedules for backing up data. The backed-up data should be periodically tested to ensure recovery without Loss of transactions in a time frame as given out in the bank's security policy. Business continuity should be ensured by having disaster recovery sites, where backed-up data is stored. These facilities should also be tested periodically.

Monitoring against Threats:

The banks should acquire tools for monitoring systems and the networks against intrusions and attacks. These tools should be used regularly to avoid security breaches.

Education and Review:

The banks should review their security infrastructure and security policies regularly and optimize them in the light of their own experiences and changing technologies. They should educate on a continuous basis their security personnel and also the end users.

Log of Messages:

The banking applications run by the bank should have proper record keeping facilities for legal purposes. It may be necessary to keep all received and sent messages both in encrypted and decrypted form. (When stored in encrypted form, it should be possible to decrypt the information for legal purpose by obtaining keys with owners' consent.)

Certified Products:

The banks should use only those security solutions/products which are properly certified for security and for record keeping by independent agencies (such as IDRBT).

Maintenance of Infrastructure:

Security infrastructure should be properly tested before using the systems and applications for normal operations. The bank should upgrade the systems by installing patches released by developers to remove bugs and loopholes, and upgrade to newer versions which give better security and control.

Approval for I-banking:

All banks having operations in India and intending to offer Internet banking services to public must obtain an approval for the same from RBI. The application for approval should clearly cover the systems and products that the bank plans to use as well as the security plans and infrastructure. It should include sufficient details for RBI to evaluate security, reliability, availability, audit ability, recoverability, and other important aspects of the services. RBI may provide model documents for Security Policy, Security Architecture, and Operations Manual.

1.7.3 Legal Issues: [18]

The banks providing Internet banking service, at present are only accepting the request for opening of accounts. The accounts are opened only after proper physical introduction and verification. Considering the legal position prevalent, particularly of Section 131 of the Negotiable Instruments Act, 1881 and different case laws, the Group holds the view that there is an obligation on the banks not only to establish the identity but also to make enquiries about integrity and reputation of the prospective customer. The Group, therefore, endorses the present practice but has suggested that after coming in to force of the Information Technology Act, 2000 and digital certification machinery being in place, it may be possible for the banks to rely on digital signature of the introducer.

The present legal regime does not set out the parameters as to the extent to which a person can be bound in respect of an electronic instruction purported to have been issued by him. Generally authentication is achieved by security procedure, which involves methods and devices like user-id, password, personal identification number (PIN), code numbers and encryption etc., used to establish authenticity of an instruction. However, from a legal perspective a security procedure needs. to be recognized by law as a substitute for signature. In India, the Information Technology Act, 2000, in Section 3(2) provides for a particular technology (viz., the asymmetric crypto system and hash function) as a means of authenticating electronic record. This has raised the doubt whether the law would recognize the existing methods used by banks as valid methods of authentication. The Group holds the view that as in case of other countries, the law should be technology neutral.

In keeping with the view that law should be technology neutral, the Group has recommended that Section 3(2) of the Information Technology Act, 2000 needs to be amended to provide that in addition to the procedure prescribed there in or that

may be prescribed by the Central government, a security procedure mutually agreed to by the concerned parties should be recognized as a valid method of authentication of an electronic document / transaction during the transition period. Banks may be allowed to apply for a license to issue digital signature certificate under Section 21 of the Information Technology Act, 2000 and function as certifying authority for facilitating Internet banking. Reserve Bank of India may recommend to Central Government for notifying the business of certifying authority as an approved activity under clause (0) of Section 6(1) of the Banking Regulations Act, 1949.

Section 40A(3) of the Income Tax Act, 1961 recognizes only payments through a crossed cheque or crossed bank draft, where such payment exceeds Rs. 20,000/-, for the purpose of deductible expenses. Since the primary intention of the above provision, which is to prevent tax evasion by ensuring transfer of funds through identified accounts, is also satisfied in case of electronic transfer of funds between accounts, such transfers should also be recognized under the above provision. The Income Tax Act, 1961 should be amended suitably. Under the present regime there is an obligation on banks to maintain secrecy and confidentiality of customer's account. In the Internet banking scenario, the risk of banks not meeting the above obligation is high on account of several factors like customers not being careful about their passwords, PIN and other personal identification details and divulging the same to others, banks sites being hacked despite all precautions and information accessed by inadvertent finders.

Banks offering Internet banking are taking all reasonable security measures like SSL access, 128 bit encryption, firewalls and other net security devices, etc. The Group is of the view that despite all reasonable precautions, banks will be exposed to enhanced risk of liability to customers on account of breach of secrecy, denial of service etc., because of hacking / other technological failures. The banks should,

therefore, institute adequate risk control measures to manage such risk. In Internet banking scenario there is very little scope for the banks to act on stop – payment instructions from the customers. Hence, banks should clearly notify to the customers the timeframe and the circumstances in which any stop – payment instructions could be accepted.

The banks providing Internet banking service and customers availing of the same are currently entering into agreements defining respective rights and liabilities in respect of Internet banking transactions. A standard format / minimum consent requirement to be adopted by banks may be designed by the Indian Banks Association, which should capture all essential conditions to be fulfilled by the banks, the customers and relative rights and liabilities arising there from. This will help in standardizing documentation as also develop standard practice among bankers offering Internet banking facility.

The concern that Internet banking transactions may become a conduit for money laundering has been addressed by the Group. Such transactions are initiated and concluded between designated accounts. Further, the proposed Prevention of Money Laundering Bill 1999 imposes obligation on every banking company to maintain records of transactions for certain prescribed period. The Banking Companies (Period of Preservation of Records) Rules, 1985 also require banks to preserve certain records for a period ranging between 5 to 8 years. The Group is of the view that these legal provisions which are applicable to all banking transactions, whether Internet banking or traditional banking, will adequately take care of this concern and no specific measures for Internet banking is necessary.[19]

The Consumer Protection Act, 1986 defines the rights of consumers in India and is applicable to banking services as well. Currently, the rights and liabilities of customers availing of Internet banking services are being determined by bilateral

agreements between the banks and customers. It is open to debate whether any bilateral agreement defining customers rights and liabilities, which are adverse to consumers than what is enjoyed by them in the traditional banking scenario will be legally tenable. Considering the banking practice and rights enjoyed by customers in traditional banking, it appears the banks providing I-banking may not absolve themselves from liability to the customers on account of unauthorized transfer through hacking. Similar position may obtain in case of denial of service. Even though, The Information Technology Act, 2000 has provided for penalty for denial of access to a computer system (Section – 43) and hacking (Section – 66), the liability of banks in such situations is not clear. The Group was of the view that the banks providing Internet banking may assess the risk and insure themselves against such risks.

The Information Technology Act, 2000, in Section 72 has provided for penalty for breach of privacy and confidentiality. Further, Section 79 of the Act has also provided for exclusion of liability of a network service provider for data travelling through their network subject to certain conditions. Thus, the liability of banks for breach of privacy when data is travelling through network is not clear. This aspect needs detailed legal examination. The issue of ownership of transactional data stored in banks computer systems also needs further examination.[20]

1.7.4 Regulatory and Supervisory Issues:[21]

All banks, which propose to offer transactional services on the Internet, should obtain approval from RBI prior to commencing these services. Bank's application for such permission should indicate its business plan, analysis of cost and benefit; operational arrangements like technology adopted, business partners and third party service providers and systems and control procedures the bank proposes to adopt for managing risks, etc. The bank should also submit a security policy covering recommendations made in Chapter-6 of this report and a certificate from

an independent auditor that the minimum requirements prescribed there have been met. After the initial approval the banks will be obliged to inform RBI any material changes in the services / products offered by them.

RBI may require banks to periodically obtain certificates from specialist external auditors certifying their security control and procedures. The banks will report to RBI every breach or failure of security systems and procedure and the latter, at its discretion, may decide to commission special audit / inspection of such banks.

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

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

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

With the increasing popularity of e-commerce, i.e., buying and selling over the Internet, it has become imperative to set up "Inter bank Payment Gateways" for settlement of such transactions. The Group have suggested a protocol for transactions between the customer, the bank and the portal and have recommended a framework for setting up of payment gateways. In their capacity as regulator of banks and payment systems of the country, the RBI should formulate norms for eligibility of an institution to set up a payment gateway and the eligible institution should seek RBI's approval for setting up the same.

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

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

Connectivity between the gateway and the computer system of the member bank should be achieved using a leased line network (not through Internet) with appropriate data encryption standard. All transactions must be authenticated using user-id and password. Once, the regulatory framework is in place, the transactions should be digitally certified by any licensed certifying agency. SSL / 128 bit encryption must be used as minimum level of security. Adequate firewalls and related security measures must be taken to ensure privacy to the participating institutions in a payment gateway. Internationally accepted standards such as ISO 8583 must be used for transmitting payment and settlement messages over the network.

The RBI may have a panel of auditors who will be required to certify the security of the entire infrastructure both at the payment gateway end and the participating institutions end prior to making the facility available for customers use. The credit risk associated with each payment transaction will be on the payee bank. The legal basis for such transactions and settlement will be the bilateral contracts between the payee and payee's bank, the participating banks and service provider and the banks themselves. The rights and obligations of each party must be clearly stated in the mandate and should be valid in a court of law.

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

Hyperlinks from banks websites, often raise the issue of reputational risk. Such links should not mislead the customers in to believing that they sponsor any particular product or any business unrelated to banking. Hence, hyperlinks from a bank's websites should be confined to only those portals with which they have a

payment arrangement or sites of their subsidiaries or principals. Hyperlinks to banks website from different portals are normally meant to pass information pertaining to purchases made by banks' customers in the portal. Banks must follow the minimum recommended security precautions while dealing with such request, which includes customer authentication through user-id and password, independent confirmation of transaction by the customer and authorizing payment, use of SSL and 128 bit encryption for all communication both with the portal and customer browser terminal, etc.

On the question of additional capital charge on banks, which undertake Internet banking, the group held the view that standards have not yet been developed for measuring additional capital charge for operational risk. However, this requirement could be covered as the RBI moves towards risk based supervision.

The applicability of various existing laws and banking practices to E-banking is not tested and is still in the process of evolving, both in India and abroad. With rapid changes in technology and innovation in the field of E-banking, there is a need for constant review of different laws relating to banking and commerce. The Group, therefore, recommends that the Reserve Bank of India may constitute a multi disciplinary high level standing committee to review the legal and technological requirements of E-banking on continual basis and recommend appropriate measures as and when necessary.[22]

The regulatory and supervisory framework for E-banking is continuing to evolve and the regulatory authorities all over the world recognize the need for cooperative approach in this area. The Basle Committee for Banking Supervision (BCBS) has constituted an Electronic Banking Group (EBG) to develop guiding principles for the prudent risk management of E-banking activities. This Working Group, therefore, recommends that the Reserve Bank of India should maintain close contact

with regulating / supervisory authorities of different countries as well as with the Electronic Banking Group of BCBS and review its regulatory framework in keeping with developments elsewhere in the world.

The Group submitted its report in June 2001 and the Reserve Bank while accepting the recommendations of the Working Group, issued guidelines on "Internet Banking in India" for implementation by banks. It also stated that the earlier guidelines issued by the Reserve Bank on "Risks and Controls in Computers and Telecommunications" (1998) would equally apply to Internet banking as well. [23]

1.8 E-banking Challenges and Concerns: [24]

E-banking is based on technology that by its very nature is designed to expand the "virtual" geographic reach of banks and customers without necessarily requiring a similar "physical" expansion. Such market expansion can extend beyond national borders which significantly increase cross – border cooperation challenges for bank supervisors due to:

- The potential ease and speed with which banks located anywhere in the world can conduct activities with customers over interconnected electronic networks 4 into countries where a bank is not licensed or supervised.
- The potential ability of a bank or non – bank to use the Internet to cross borders and to seamlessly link banking activities that have typically been subject to supervision with non – banking activities that might be unsupervised by any financial market authority.
- The practical difficulties faced by national authorities wishing to monitor or control local access to E-banking sites originating in other jurisdictions without the cooperation of home country authorities.

Banking organizations have been delivering services to consumers and businesses remotely for years. Electronic funds transfer, including small payments and corporate cash management systems, as well as publicly accessible machines for currency withdrawal and retail account management are global fixtures. However, delivering financial services over public networks such as the Internet is bringing about a fundamental shift in the financial services industry.

The changes created, and some of the technical characteristics of internet technology raise new concerns for both bankers and supervisors. Banking organizations are focusing increasingly on their E-banking activities and are globally expanding Internet banking activities, exploring the use of wireless networks and venturing into some new areas of electronic commerce.

Banks offer E-banking services to defend or expand market share or as a cost saving strategy to reduce paperwork and personnel. The Internet also provides banks with substantial opportunity to extend their customer reach beyond existing boundaries. However, the nature of the open network and the evolution of electronic commerce expose banks to significant competition from banking and non – banking firms. In addition, electronic delivery channels operate in an uncertain legal and regulatory environment that differs by jurisdiction. [25]

All these factors present new challenges for financial institutions in managing security, integrity and availability of services provided while remaining sufficiently profitable. Following are the emerging trends and issues that could impact bank risk profiles:

1. A significant increase in competition in the electronic financial services industry as both, banking and non – banking firms rapidly introduce new financial products and services.

2. Rapid technological improvements in telecommunications and computer hardware and software enabling greater speed in transactions processing.
3. Bank management and staff often lack expertise in technology and E-banking risk issues.
4. Greater reliance on outsourcing to third party service providers, and a proliferation of new alliances and joint ventures with non – financial firms.
5. Greater demand for global infrastructures for technology that are scalable, flexible and interoperable, both within and across enterprises and that can ensure the security, integrity and availability of information and services.
6. Increased potential for fraud, due to the absence of standard business practices for customer verification and authentication on open networks like the Internet.
7. Legal and regulatory ambiguity and uncertainty with respect to the application and jurisdiction of current laws and regulations to evolving E-banking activities.
8. The collection, storage and frequent sharing of significant quantities of customer data can lead to customer privacy issues that potentially create prudential risks for banks (e.g. legal and reputational).
9. Questions regarding the effectiveness and efficiency of online disclosures. Lengthy or complicated online disclosures may cause customers to simply "click through" or even quit a web site; moreover, extensive disclosure reduces the speed at which web sites and pages can be downloaded.

Banks and bank supervisors generally agree that the supervisory principles that apply to traditional banking are applicable to E-banking. However, the combination of rapid changes in technology and the degree of bank dependence on technology vendors and service providers modify and sometimes magnify traditional risks. Hence, there is a need for additional supervisory guidance in selected areas to enhance the overall risk management framework for E-banking activities.

These developments in E-banking to date suggest that:

- ❖ The desire to benefit from the advantages of e-commerce in financial services has become widespread. The financial services industry is increasingly focused on providing technology based financial services solutions directly to customers in order to help build and retain customer bases.
- ❖ Speed to market has become a critical factor for success in E-banking. To reduce time to market, banking institutions are allying with non-banking firms to provide total financial services solutions.
- ❖ The current trends in the formation of strategic alliances and technology outsourcing will grow.

These developments present challenges for both banks and bank supervisors. Bank management needs to re-evaluate the robustness of traditional risk management practices in light of the new risks posed by E-banking activities. Also, bank supervisors need to take a balanced approach to the introduction of new regulation and supervisory policy on E-banking, so as to .ensure safe and sound operations of banks while at the same time not stifling innovation and the competitiveness of the banks relative to non-banks.

1.9 E-banking: Risks and Their Management: [26]

E-banking using the Internet as an added delivery channel may shift bank risk profiles to some degree and create new risk control challenges for banks. Accordingly, bank supervisors need to consider the implications of a bank's use of the E-banking delivery channel on its strategic risk, operational risk, reputational risk, legal risk, credit risk, liquidity risk, market risk and foreign exchange risk.

1.9.1 Strategic and Business Risk: [27]

Strategic risk is one of the most significant risks that E-banking activities present for banking organizations. Strategic risk differs from' other risk categories in that it is more general and broad in nature. Strategic decisions to be taken by a bank's Board of Directors and executive management will have implications for all other risk categories.

Given growing customer acceptance and demand for E-banking, as well as the potential efficiencies afforded, most banks will need to develop a strategy to use the Internet delivery channel to provide informational content and/or transactional service to customers. The rapid changes in technology, the pace of competition with other banks and non bank competitors and the nature of that strategy could expose banks to substantial risk if the planning and implementation of the strategy is flawed or otherwise not well thought through.

Some of the strategic risks involved with E-banking are directly linked with timing issues. There can be significant strategic risk associated with a management decision to be a technology pioneer, particularly if the institution becomes burdened with systems made redundant by rapid technological changes. Likewise, an overly cautious technology follower may find itself unable to adequately position itself in a saturated market or a market that is consolidating rapidly.

Prior to the Internet, banking institutions used proprietary networks within their consolidated enterprise and connected in limited ways to other banks. These proprietary networks helped provide a strategic defence against new entrants and provided individual franchise protection. However, the Internet as an open network with open access allows both banks and non banks freedom to create and leverage existing business without the need for expanded physical presence. Consequently, competition within the financial services industry has been significantly increased and is likely to increase further.

Most bankers believe that the E-banking delivery channel will enable them to reduce operational expenses. However, many bank customers wish to maintain a traditional banking relationship, which makes it difficult for banks to abandon the existing physical infrastructure. This means that banks will at least for the foreseeable future need to run multiple delivery channels for sometime and E-banking will be a net additional expense. Thus, operational expense savings may occur over the long run only.

The challenge the banking industry faces in maintaining market share is complicated by the entry of new firms that ate providing individual financial services via the Internet to existing bank customers. The emergence of aggregation and screen scraping technologies poses both strategic opportunities and threats to banks. Depending on the evolving relationship between the aggregator, the banks affected and the consumer, banks may get further disintermediated as aggregators potentially disrupt the traditional relationship between the customer and the bank and "limit" the direct access that banks will have on – line to retail customers. In addition, aggressive aggregation by both banks and non-banks may lead to greater commoditization of banking products and services, thereby reducing bank profit margins and adding new security and legal risks.

In essence, bank management needs to carefully consider how its Internet strategy will help maintain the competitiveness and profitability of the institution yet not lead to unwarranted increases in its risk profile. Supervisors should expect banking institutions to carefully assess the pros and cons associated with their strategic options.

1.9.2 Operational Risk: [28]

Because of the reliance on technology for all facets of E-banking, operational risk is one of the more significant risks. To limit operational risk, banking organizations may want to consider implementing an integrated enterprise – wide architecture and technology infrastructure that can facilitate inter operability, ensure the security, integrity and availability of data and support the management of relationships with third – party service providers. Further, as technology is also dramatically changing business models and operating processes, banks need to ensure that they have appropriate control procedures (including change control) and audit processes.

Technology Infrastructure:

E-banking has brought the issue of technological systems and applications integration to the forefront. Many large banks are now faced with the task of integrating systems for E-banking activities with their existing legacy systems and with the systems of multiple service providers and partners. These banks are exposed to significant operational risks from errors in transaction processing if the systems for E-banking are not properly integrated.

Accordingly, many large banks are making significant investments in technology infrastructure in order to create improved internal controls and enhanced risk management oversight processes. The banks are also hoping to improve flexibility, scalability and interoperability of their systems and operations both within their enterprises and across outside service providers.

While these general developments by large banks are positive, in general the banking industry has much further to go towards improving its systems and risk management infrastructure to effectively support E-banking. Small to medium-sized banking organizations are particularly challenged because of budget

restrictions for acquiring hardware and software, as well as attracting and keeping technical staff. Many of these banks rely significantly on third party service providers to manage the necessary technological infrastructure to support the bank's E-banking operations. In this situation, the bank still retains ultimate responsibility for ensuring that these operations are well controlled and managed, and the bank supervisor will wish to assess the ongoing ability of bank management to do so adequately.

Security: [29]
The majority of bankers surveyed by EBG members identified security risk as a primary concern relating to E-banking. External threats such as "hacking", "sniffing", "spoofing" and "denial of service" attacks expose banks to new security risks. Open electronic delivery channels create new security issues for banks with respect to confidentiality and integrity of information, non-repudiation of transactions, authentication of users and access control.

Most banks appear to be sensitive to external security threats. Among the issues identified for immediate attention is the development of more robust tools to verify the identity and authenticity of larger value transaction requests. In addition, the banking industry needs to continue to work towards international best practices for encryption requirements, including the legality of electronic signature and records. Moreover, since many banks' internal networks rely on security technology similar to that used to manage their external systems, it is important that bankers also be sensitive to managing the security risk arising from their internal networks. If not managed properly, internal security exposures can also compromise the integrity and confidentiality of bank records and customer data.

Poor security may create reputational or legal risks for banks, as they may be deemed to have provided inappropriate protection for customers' personal data, with consequential legal and / or reputational damage.

At the international level, bank supervisors should encourage the development of a comprehensive approach to managing risk associated with both internal and external security exposures. Given the continuing evolution of industry standards, security risk management may be an area where bank supervisors can work collaboratively with the industry to promote the development of sound practices.

Data Integrity: [30]

Data integrity is an important component of system security. Banking organizations must improve interoperability within and across enterprises to effectively manage relationships with customers, other banks and external service providers. Until industry standards are identified for electronic data management, banking organizations will continue to be challenged to establish effective control processes to ensure the accuracy and integrity of data being transmitted and received. The processes should include, at a minimum, sound policies and practices related to project management, system development life cycle, change control and quality assurance. Bank supervisors should also encourage banks to review the integrity of the data used by their risk management systems.

Given the lower cost and ubiquitous nature of the Internet, organizations are increasingly using TCP / IP as a standard communications protocol to achieve this. While there are significant benefits of communicating via TCP / IP, organizations must ensure that data transmitted between bank legacy systems and systems of other parties are translated and integrated accurately. Moreover, while the introduction of middleware and languages such as XML are helping to facilitate this effort, the development of industry standards to support these new technologies is still in its very early stages.

System Availability: [31]

In addition to ensuring a secure internal network for their E-banking activities, effective capacity planning is critical to ensuring the ongoing availability of E-banking products and services. Transaction volumes may become increasingly volatile due to price sensitivities and greater automation. Also, competitive pressures and increased reliance on having services available 24 hours a day and 7 days a week (24 x 7) have raised customer expectations considerably and in turn reduced the tolerance for error. To compete effectively and avoid potentially significant reputation risk that could arise from systems outages, banks offering E-banking services must deliver the right mix of products and services securely, accurately and consistently. These factors underscore the importance of effective business continuity, recovery and incident response plans. Moreover, trends in outsourcing make it necessary for bankers to ensure that similar plans are in place at their external service providers and are periodically tested for effectiveness.

Denials of service attacks can also reduce or eliminate a bank's ability to serve its customers while under attack. These attacks have become increasingly common against high profile e-commerce providers. An added challenge is posed by banks inability to control the availability of the Internet network itself. Thus, a bank needs to consider, as part of its contingency plans, alternative means to deliver service in the event of a major disruption to the Internet network.

Internal Controls / Audit: [32]

The ability to detect and correct errors is a critical internal control component of any banking operation. Moreover, banking organizations must have sufficient controls in place to prevent fraud from both internal and external sources and safeguard the bank's information and assets.

Much of the efficiency and cost reduction in E-banking services stem from banks ability to implement "straight – through processing". While the benefits of straight – through processing are many, the reality is that E-banking modifies how internal controls, proper segregation of duties and clear audit trails are applied over broad access channels. The challenges presented by these changes are compounded by a critical shortage of skills and expertise in the industry in. both the operations and audit areas. Going forward, banks will be increasingly challenged to ensure that highly automated environments provide effective control and that the controls can be independently audited.

Outsourcing: [33]

Perhaps more than any other industry development relating to E-banking, banks' increased reliance on outsourcing is having a significant impact on the risk profiles of all banking organizations – both large and small. Large banks are outsourcing many activities as they are increasingly focusing on their core businesses and partnering with other organizations for solutions outside of their core competencies. Small banks usually must outsource because they often lack the necessary technical expertise and resources to build an E-banking delivery channel on their own. Additionally, a decline in the cost of "turnkey" solutions has made it more affordable for small banks to purchase E-banking applications from vendors. These developments are positive in that they increase efficiency, they allow smaller institutions to compete more effectively and they promote the introduction of "state of the art" applications within the industry. However, they can also substantially add to banks challenges in managing operational risk.

Preliminary indications from surveys tend to indicate that financial institutions rely upon a relatively small number of third – party providers. This seems to be especially the case for small to medium-sized institutions. In some cases, these third parties happen to be new firms with a relatively short track record. This apparent

reliance on a concentrated number of third parties, which the EBG will investigate further, could have systemic implications if a major problem would arise with one of these service providers.

To properly manage the risks associated with outsourcing, banks must conduct appropriate due diligence and monitoring of the ongoing viability of third party service providers. The adequacy of terms under contract and service level agreements must also be carefully reviewed for legal risk. Operations processing and the management of security, integrity and availability risks are also more complicated. Furthermore, many technology providers and partners are newly established and may lack knowledge of the controls required within a banking environment. Minor disruptions on the part of third party service providers can expose banking organizations to potential financial loss and substantial legal and reputation risk. Complexity is also added by multiple vendor / service provider relationships that often support E-banking operations. Although to date such disruptions seem to have been controlled, in the future their potential impact could be quite considerable and raises significant concerns for supervisors and industry participants.

Outsourcing can lead to additional privacy related risk exposures. Banks may not always be aware of the exact collection and usage of customer data by vendors and other third parties, and / or may not be adequately managing such activities. Moreover, the legal rights and responsibilities of service providers and vendors may not always be clear. Banks should be encouraged to address privacy issues in their contractual and ongoing relations with vendors.

Various bank supervisors around the world have developed specific guidance related to technology outsourcing. The EBG plans to conduct a review of such guidance and to explore ways to coordinate the development of sound practices in this area for both the banking industry and its supervisors.

1.9.3 Reputational Risk: [34]

A bank's reputation can be impacted by any adverse development that precludes the availability of their E-banking delivery channel. Banks have long based their business on a reputation of trust. The ability to provide a trusted network to support E-banking is critical, and a bank's reputation can be damaged by Internet banking services that are poorly executed or otherwise alienate customers and the public.

A bank's reputation can suffer if it fails to deliver secure, accurate and timely E-banking services on a consistent basis. A bank's reputation can also be adversely impacted if it fails to respond to inquiries posted via e-mail, does not provide proper disclosure, or violates customer privacy. Hypertext links from a bank to third party web sites or outsourced service providers may cause customer confusion about the provider of specific products and services offered, and whether they are insured or uninsured. Customers can also be confused about whether the links from the bank reflect an implied endorsement of the third party's products or services and may well look to the bank for recourse if problems are encountered.

Further, major security breaches in a bank or a non – bank competitor's web site could undermine overall consumer or market confidence in banks ability to appropriately manage Internet-based transactions. Any problems that a bank might experience with regard to data and privacy protection could threaten the reputation of that bank as well as the reputation of any other banks perceived to be involved in similar activities.

To protect against adverse situations that may cause damage to their reputation, banking organizations should develop and monitor performance standards for their E-banking activities. Regular review and testing of business continuity, recovery and incident response plans, and communications strategies are also critical to protecting banks reputations.

1.9.4 Legal Risk: [35]

Legal risk arising from E-banking activities represents another area of increased concern. Currently, supervisors in every jurisdiction are examining how existing legal and regulatory frameworks originally designed to address issues affecting the "physical" world of banking interact with the developing E-banking delivery channel as well as examining potential ambiguities.

A bank that develops relationships via the Internet with customers in other jurisdictions may be unfamiliar with the banking and customer protection laws and regulations specific to those countries and may consequently incur heightened legal risks. Even banks that do not intend to solicit business from consumers in foreign jurisdictions may find that their offerings on-line are considered solicitations in. some countries. For example, if a bank makes its web site available in another language, regulators in any country where that language is spoken may determine that the bank is marketing services to its citizens and may find that the bank is therefore subject to its local laws and regulations.

Unauthorized use or misuse of data collected over the Internet is another potential Source of legal risk. Unauthorized individuals can attack and / or try to infiltrate the "data warehouses" maintained about consumers by both banks and third party vendors. For example, hackers or others might break into banks' or vendors' databases or build their own databases and use the consumers' information to perpetrate fraud. Authorized staff may also deliberately misuse data. Surveys of banks and third party vendors conducted by the EBG have showed that such attacks on "data warehouses" have already occurred, although the impact of these attacks has been minimal to date.

The enforceability of certain emerging areas of law is also uncertain. Laws related to the enforceability of electronic contracts and digital signatures are still under

development and vary from jurisdiction to jurisdiction. Effective "know your customer" (KYC) practices are also becoming more critical to bankers in their attempts to prevent fraud.

1.9.5 Other Traditional Banking Risks: [36]

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. The impact of the introduction of E-banking does not necessarily result in an increase or decrease in the risk profile of the institution, but risks can be shifted, sometimes in complex ways.

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 creditworthiness of a potential customer, which are essential elements to sound credit decisions. Further, there has been a tendency for some Internet only banks to pay higher rates on deposits opened over the Internet, which could lead to a higher level of sub-prime credits at these institutions in order to support these higher deposit rates. These factors underscore the importance of sound credit under writing policies, credit monitoring and administration practices regardless of which product delivery channel is used.

Liquidity Risk*:*

The speed with which information and misinformation moves over 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. Also, internet banking can increase deposit volatility to the extent that new customers brought in through this channel maintain accounts solely on the basis of interest rate or terms. Accordingly, increased monitoring of liquidity and changes in deposits and loans may be warranted depending on the volume of activity created through E-banking.

Market Risk:

The impact of recent growth in securities issuance and trading over the internet on banks market risk profiles is complex. From a market standpoint, 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. As with liquidity risk, the effects of increased E-banking activities on market volatility need to be monitored by banks and supervisors.

Foreign Exchange Risk: [37]

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 inexperienced in cross – border banking may not appreciate fully. 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.

As the preceding discussion indicates, the basic types of risks associated with E-banking are not new. However, the specific ways in which these risks arise, as well as the potential magnitude and speed of impact on banks, may be new for bank management and supervisors alike. In addition, while assessing risk should already be dynamic, the rapid pace of technological innovation supporting E-banking, the increased degree of systems outsourcing and the reliance of some products / services on the use of open networks such as the Internet, intensifies the need for a rigorous and ongoing risk management process.

Bank supervisors should expect their banks to have comprehensive risk management processes in place that include the three basic elements of assessing risks, controlling risk exposure, and monitoring risks associated with E-banking. This comprehensive risk management framework should be integrated into the bank's overall risk management framework. [38]

It is also essential that this risk management process is supported by appropriate oversight by the board of directors and senior management and is carried out by staff with the necessary knowledge and skills to deal with the technical complexities of new E-banking developments.

Similarly, bank supervisors must recognize their own critical need for supervisory staff with appropriate technology knowledge and skills to ensure that they understand the risks and challenges arising from the development of the E-banking delivery channel. Enhanced technical training of existing supervisory staff,

complemented by appropriate recruitment of outside expertise, should be a high priority in order to ensure that the supervisor keeps abreast of increasingly complex technology and market developments.

CHAPTER : 2

INTERNET BANKING : A NEW PARADIGM SHIFT

2.1 Internet : Basic Structure and Topology :

Internet is a vast network of individual computers and computer networks connected to and communicate with each other using the same communication protocol – TCP/IP (Transmission Control Protocol / Internet Protocol). When two or more computers are connected a network is created; connecting two or more networks create 'internet work' or Internet. The Internet, as commonly understood, is the largest example of such a system. Internet is often and aptly described as 'Information Superhighway', a means to reach innumerable potential destinations. The destination can be any one of the connected networks and host computers. Internet has evolved to its present state out of a US Department of Defence project ARPA Net (Advanced Research Project Administration Network), developed in the late 1960s and early 1970s as an experiment in wide area networking. A major perceived advantage of ARPA Net was that the network would continue to operate even if a segment of it is lost or destroyed since its operation did not depend on operation of any single computer [1].

Though originally designed as a defence network, over the years it was used predominantly in areas of scientific research and communication. By the 1980s, it moved out of Pentagon's control and more independent networks from US and outside got connected to it. In 1986, the US National Science Foundation (NSF) established a national network based on ARPA protocol using commercial telephone lines for connectivity. The NSF Net was accessible by a much larger scientific community, commercial networks and general users and the number of host computers grew rapidly. Eventually, NSF Net became the framework of today's Internet. ARPA Net was officially decommissioned in 1990.

It has become possible for innumerable computers operating on different platforms to communicate with each other over Internet because they adopt the same communication protocol, viz, TCP/IP. The latter, which stands for 'Transmission Control Protocol / Internet Protocol', is a set of rules which define how computers communicate with each other. In order to access Internet one must have an account in a host computer, set up by any one of the ISPs (Internet Service Providers). The accounts can be SLIP (Serial Line Internet Protocol) or PPP (Point to Point Protocol) account. These accounts allow creating temporary TCP/IP sessions with the host, thereby allowing the computer to join the Internet and directly establish communication with any other computer in the Internet. Through this type of connection, the client computer does not merely act as a remote terminal of the host, but can run whatever programs are available on the web. It can also run several programs simultaneously, subject to limitations of speed and memory of the client computer and modem. TCP/IP protocol uses a unique addressing scheme through which each computer on the network is identified.

TCP / IP protocol is insecure because data packets flowing through TCP / IP networks are not normally encrypted. Thus, any one who interrupts communication between two machines will have a clear view of the data, passwords and the like. This has been addressed through Secured Socket Layer (SSL), a Transport Layer Security (TLS) system which involves an encrypted session between the client browser and the web server.

FTP or File Transfer Protocol is a mechanism for transferring files between computers on the Internet. It is possible to transfer a file to and from a computer (ftp site) without having an account in that machine. Any organization intending to make available to public its documents would normally set up a ftp site from which any one can access the documents for download. Certain ftp sites are available to validated users with an account ID and password. [2]

E-mail:

The most common and basic use of Internet is the exchange of e-mail (electronic mail). It is an extremely powerful and revolutionary result of Internet, which has facilitated almost instantaneous communication with people in any part of the globe. With enhancements like attachment of documents, audio, video and voice mail, this segment of Internet is fast expanding as the most used communication medium for the whole world. Many websites offer e-mail as a free facility to individuals. Many corporate have interfaced their private networks with Internet in order to make their email accessible from outside their corporate network

World Wide Web (WWW):

Internet encompasses any electronic communication between computers using TCP/IP protocol, such as e-mail, file transfers etc. WWW is a segment of Internet, which uses Hyper Text Markup Language (HTML) to link together files containing text, rich text, sound, graphics, video etc. and offers a very convenient means of navigating through the net. It uses hypertext transfer protocol (HTTP) for communication between computers. Web documents, which are referred to as pages, can contain links to other related documents and so on, in a tree like structure. The person browsing one document can access any other linked page. The web documents and the web browsers which are the application programs to access them are designed to be platform independent. [3]

Thus any web document can be accessed irrespective of the platform of the computer accessing the document and that of the host computer. The programming capabilities and platform independence of Java and Java applets have further enriched the web. The 'point and click' method of browsing is extremely simple for any lay user of the net. In fact, the introduction of web since early 1990 has made Internet an extremely popular medium and its use in business has been enhanced dramatically. The next in the HTML genre is the Extensible Markup Language (XML), which allows automated two-way information flow between data stores and

browser screens. XML documents provide both the raw content of data and the data structure and is projected by its proponents as taking the web technology beyond the limits of HTML. [4]

Wireless Application Protocol (WAP):

WAP is the latest industry standard which provides wireless access to Internet through handheld devices like a cellular telephone. This is an open standard promoted by WAP forum and has been adopted by world's all major handset manufacturers. WAP is supplemented by Wireless Application Environment (WAE), which provides industry wise standard for developing applications and services for wireless communication networks. This is based on WWW technology and provides for application for small screens, with interactive capabilities and adequate security.[5] Wireless Transaction Protocol (WTP), which is the equivalent of TCP, sets the communication rules and Wireless Transport Layer Security (WTLS) provides the required security by encrypting all the session data. WAP is set to revolutionize the commercial use of net.

Security:

One of the biggest attractions of Internet as an electronic medium is its openness and freedom. It is a public domain and there is no restriction on who can use it as long as one adheres to its technical parameters. This has also given rise to concerns over the security of data and information transfer and privacy. These concerns are common to any network including closed user group networks. But over the Internet, the dimensions of risk are larger while the control measures are relatively fewer. It will be sufficient to say here that the key components of such concern are, (i) authentication, viz., assurance of identity of the person in a deal, (ii) authorization, viz., a party doing a transaction is authorized to do so, (iii) the privacy or confidentiality of data, information relating to any deal, (iv) data integrity, viz., assurance that the data has not been altered and (v) non repudiation, viz., a party to the deal can not deny that it originated the communication or data.[6]

2.1.1 E-Commerce:

Even though started as network primarily for use by researchers in defence and scientific community, with the introduction of WWW in early 1990s, use of Internet for commerce has grown tremendously. E-commerce involves individuals and business organizations exchanging business information and instructions over electronic media using computers, telephones and other telecommunication equipments. Such form of doing business has been in existence ever since electronic mode of data / information exchange was developed, but its scope was limited only as a medium of exchange of information between entities with a pre-established contractual relationship. However, Internet has changed the approach to e-commerce; it is no longer the same business with an additional channel for information exchange, but one with new strategy and models.

A business model generally focuses on (i) where the business operates, that is, the market, the competitors and the customers, (ii) what it sells, that is, its products and services (iii) the channels of distribution, that is, the medium for sale and distribution of its products and (iv) the sources of revenue and expenditure and how these are affected. Internet has influenced all the four components of business model and thus has come to influence the business strategy in a profound way. The size of the market has grown enormously as technically, one can access the products and services from any part of the world. So does the potential competition. The methods of reaching out to customers, receiving the response and offering services have a new, simpler and efficient alternative, now, that is, Internet. The cost of advertisement, offer and delivery of services through Internet has reduced considerably, forcing most companies to rework their strategies to remain in competition. [7]

A research note by Paul Timmers of European commission had identified eleven business models, which have been commercially implemented. These are e-shop, e-

procurement, e-auction, e-mall, Third-party market place, Virtual communities, Value chain service providers, Value chain integrators, Collaboration platforms and Information brokers. He classified business models along two dimensions, i.e, degree of innovation and extent of integration of functions. The innovation ranged from the electronic version of a traditional way of doing business (e-shop) to more innovative ways by offering functions that did not exist before. The second dimension, i.e, extent of integration ranges from a single function business model (like e-shop) to fully integrated functionality (value chain integrator). In the top end of the graph are models, which cannot be implemented in a traditional way and are critically dependent upon information technology and creating value from information flow. Business models, in between these two limits are a combination of both dimensions in different degrees and have some degree of analogy in traditional firms. [8]

2.1.2 Types of E-Commerce:

There are two types of e-commerce ventures in operation: the old brick and mortar companies, who have adopted electronic medium, particularly Internet, to enhance their existing products and services, and / or to offer new products and services and the pure e-ventures who have no visible physical presence. This difference has wider ramifications than mere visibility when it comes to issues like customer's trust, brand equity, ability to service the customers, adopting new business culture and cost. These aspects of e-commerce will be touched upon in the following discussions.

Another way of classifying the e-commerce is by the targeted counterpart of a business, viz, whether the counterpart is a final consumer or another business in the distribution chain. Accordingly, the two broad categories are: Business-to-Consumer (B2C) and Business-to-Business (B2B).

2.1.3 Business-to-Consumers (B2C): [9]

In the B2C category are included single e-shops, shopping malls, e-broking, e-auction, e-banking, service providers like travel related services, financial services etc., education, entertainment and any other form of business targeted at the final consumer. Some of the features, opportunities and concerns common to this category of business irrespective of the business segment, are the following.

Opportunities:

Internet provides an ever-growing market both in terms of number of potential customers and geographical reach. Technological development has made access to Internet both cheaper and faster. More and more people across the globe are accessing the net either through PCs or other devices. The purchasing power and need for quality service of this segment of consumers are considerable. Anybody accessing Internet is a potential customer irrespective of his or her location. Thus, any business targeting final consumers cannot ignore the business potential of Internet.

Internet offers a unique opportunity to register business presence in a global market. Its effectiveness in disseminating information about one's business at a relatively cost effective manner is tremendous. Time sensitive information can be updated faster than any other media. A properly designed website can convey a more accurate and focused image of a product or service than any other media. Use of multimedia capabilities, i.e., sound, picture, movies etc., has made Internet as an ideal medium for information dissemination. However, help of other media is necessary to draw the potential customers to the web site.

The quality of service is a key feature of any e-commerce venture. The ability to sell one's product at anytime and anywhere to the satisfaction of customers is essential for e-business to succeed. Internet offers such opportunity, since the business presence is not restricted by time zone and geographical limitations. Replying to

customers' queries through e-mail, setting up (Frequently Asked Questions) FAQ pages for anticipated queries, offering interactive help line, accepting customers' complaints online 24 hours a day and attending to the same, etc. are some of the features of e-business which enhance the quality of service to the customers. It is of crucial importance for an e-venture to realize that just as it is easier to approach a customer through Internet; it is equally easy to lose him. The customer has the same facility to move over to another site.

Cost is an important issue in an e-venture. It is generally accepted that the cost of overhead, servicing and distribution, etc. through Internet is less compared to the traditional way of doing business. Although the magnitude of difference varies depending on the type of business and the estimates made, but there is unanimity that Internet provides a substantial cost advantage and this, in fact, is one of the major driving forces for more number of traditional business adapting to e-commerce and pure e-commerce firms to sprout.

Cost of communication through WWW is the least compared to any other medium. Many a time one's presence in the web may bring in international enquiries, which the business might not have targeted. The business should have proper plans to address such opportunities.

Concerns:

There are a number of obstacles, which an e-commerce venture needs to overcome: Trust of customers in a web venture is an important concern. Many customers hesitate to deal with a web venture as they are not sure of the type of products and services they will receive. This is particularly true in a B2C venture like e-shop, e-mall or e-auction site. Traditional business with well established brands and goodwill and having a physical presence face less resistance from customers in this regard than a pure e-venture.

Many B2C ventures have ultimately to deliver a product or service in physical form to the customer for a deal contracted through Internet. This needs proper logistics, an efficient distribution network, and control over quality of product or service delivered. These issues are not technology related and any let off in this area can drive the customer away to the competitor or from e-commerce.

The privacy of information on the customer's preferences, credit card and bank account details etc. and customers' faith in a system where such privacy is stated to be ensured are important issues to be addressed. These are mainly technological issues, but human factor is important both at the business and at the customers' end and also in building the trust in the system.

Security of a transaction, authenticity of a deal, identification of a customer etc. are important technological and systems issues, which are major sources of concern to ecommerce. Equally important are questions of repudiation of a deal, applicability of law, jurisdiction of tax laws etc. These are important to all forms of e-commerce, whether B2C or B2B and all segments of business, i.e., manufacturing, services and finance and are addressed in different chapters of this report.

Accessibility to Internet by the consumers is an important issue in B2C domain. This is particularly so in countries like India where penetration of PCs and other devices to households for access to Internet is minimal. Also important are availability of bandwidth and other infrastructure for faster and easier access. Considering that e-commerce aims at global market, deficiencies of these kinds in the developing world are no longer concerns confined to these areas, but are global e-commerce concerns.

2.1.4 Business to Business (B2B): [10]

As opposed to B2C e-commerce, in B2B domain, the parties to a deal are at different points of the product supply chain. Typically, in a B2B type domain, a company, its suppliers, dealers and bankers to all the parties are networked to finalize and settle all aspects of a deal, online. Perhaps, only the goods in different stages of processing physically move from the supplier to the dealer. This scenario can be extended to include the shipper, providers of different ancillary services, IT service provider and the payment system gateway, etc., depending on the degree of sophistication of the available systems. Another important feature of a B2B domain, as distinct from B2C, is that business information / data is integrated to the back office systems of parties to a deal and the state of straight through processing (STP) or near STP is achieved. This is a very significant aspect of B2B model of e-commerce, which results in improved profits through lowering cost and reducing inventories.

For example, in a B2B environment, typically, the back office system of a company controls inventory requirement with reference to the order book position updated regularly on the basis of orders received from dealers through Internet. At the optimum level of inventory it raises a purchase order with the supplier, whose system in turn, processes the order and confirms supply. Buyer company's system issues debit instructions on its bank account for payment to the supplier. The buyer's bank credits seller's bank with the cost of sale though a payment gateway or through RTGS system.

Similar series of transaction processes are also initiated between the company and its dealers and their respective banks. Once e-commerce relationship is established between the firms, the transactions of the type shown above can be processed with minimal human intervention and on 24 hours a day and 7 day a week basis. New business models are emerging in B2B domain. There are portals which offer a

meeting ground to buyers and sellers of different products in supply chain, more like a buyer-seller meet in international business. This has enabled relatively smaller companies to enter the global market. Banks in the portal offer financial services for deals settled through the portal.

Technology and networking are important constituents of a B2B type of business domain. Earlier, only large firms could have access to such technology and they used private networks with interface to each other for information flow and transaction processing. A major concern used to be compatibility of EDI platforms across different B2B partners. Internet with WWW and other standard technology have offered opportunity to relatively smaller and medium sized firms to integrate their operations in B2B model and take advantage of the benefits it offers. It has also led to standardization of software platforms.

Other new forms of business models in B2B domain are Application Service Providers (ASP) and Service Integrators. ASPs offer application software online to ecommerce companies who pay for the same according to the use without owning it. Often entire back office processing is taken care of by ASPs and other service integrators. However, the utility of such service providers will to a large extent depend on the business strategy of the e-venture.

The concerns of B2B e-commerce are similar to those of B2C, discussed earlier. The security issues are more pronounced because of high value transfers taking place through the net. So also are the issues relating to privacy of information, law, tax repudiation etc. The other issues of importance to a B2B firm are the choice of appropriate technology, the issue of build or out source, maintenance and training of personnel, etc., since they involve large investments and are critical to success.

Several studies have attempted to assess the relative importance of B2B and B2C business domains. There is wide difference in estimates of volume of business transacted over Internet and its components under B2C and B2B. However, most studies agree that volume of transactions in B2B domain far exceeds that in B2C. This is expected result. There is also a growing opinion that the future of e-business lies in B2B domain, as compared to B2C. This has several reasons some of which are already discussed earlier, like low penetration of PCs to households, low bandwidth availability etc., in a large part of the world. The success of B2C ventures depends to a large extent on the shopping habits of people in different parts of the world. A survey sponsored jointly by Confederation of Indian Industries and Infrastructure Leasing and Financial Services on e-commerce in India in 1999 made the following observations. 62% of PC owners and 75% of PC non-owners but who have access to Internet would not buy through the net, as they were not sure of the product offered.

The same study estimated the size of B2B business in India by the year 2001 to be varying between Rs. 250 billion to Rs. 500 billion. In a recent study done by Arthur Anderson, it has been estimated that 84% of total e-business revenue is generated from B2B segment and the growth prospects in this segment are substantial. It has estimated the revenues to be anywhere between US $ 2.7 trillion to over US $ 7 trillion within the next three years (2003). [11]

2.1.5 The Growth of Internet Banking and common products: [12]

Internet Banking is a product of e-commerce in the field of banking and financial services. In what can be described as B2C domain for banking industry, Internet Banking offers different online services like balance enquiry, requests for cheque books, recording stop-payment instructions, balance transfer instructions, account opening and other forms of traditional banking services.

Mostly, these are traditional services offered through Internet as a new delivery channel. Banks are also offering payment services on behalf of their customers who shop in different e-shops, e-malls etc. Further, different banks have different levels of such services offered, starting from level-1 where only information is disseminated through Internet to level-3 where online transactions are put through.

Considering the volume of business e-commerce, particularly in B2B domain, has been generating, it is natural that banking would position itself in an intermediary role in settling the transactions and offering other trade related services. This is true both in respect of B2C and B2B domains. Besides, the traditional role of financial intermediary and settlement agents, banks have also exploited new opportunities offered by Internet in the fields of integrated service providers, payment gateway services, etc. However, the process is still evolving and banks are repositioning themselves based on new emerging e-commerce business models.

In B2B scenario, a new form of e-commerce market place is emerging where various players in the production and distribution chain are positioning themselves and are achieving a kind of integration in business information flow and processing (STP or near STP) leading to efficiencies in the entire supply chain and across industries. Banks are positioning themselves in such a market in order to be a part of the financial settlements arising out of transactions of this market and providing wholesale financial services. This needs integration of business information flow not only across the players in the supply chain, but with the banks as well.

With the integration of business information flow and higher degree of transparency, the banks and other financial services institutions have lost some of the information advantage they used to enjoy and factor in to pricing of their products. However, such institutions have the advantage of long standing relationships, goodwill and brand, which are important sources of assurance in a virtual market. [13]

Banks are in fact, converting this goodwill into a business component in e-commerce scenario in providing settlement and other financial services. Some banks have also moved to providing digital certificates for transactions through e-markets. Banks' strategies in B2B market are responses to different business models emerging in e-commerce.

A recent study by Arthur Andersen shows that banks and financial service institutions generally adopt one of three business models to respond to e-business challenges. In the first place, they treat it as an extension of existing business without any significant changes other than procedural and what technology demands. The second strategy takes the same approach as the first but introduces structural changes to the underlying business. In the third approach banks launch e-business platform as a different business from the existing core business and as a different brand of product.

There is no definite answer as to which approach is appropriate. Perhaps it depends on the type of market the bank is operating, its existing competencies and the legal and regulatory environment. It is, however, sure that e-banking is evolving beyond the traditional limits of banking and many new products / services are likely to emerge as ecommerce matures. [14]

2.2 Internet Banking: International Experience: [15]

Internet banking has presented regulators and supervisors worldwide with new challenges. The Internet, by its very nature, reaches across borders and is, for this reason, engaging the attention of regulatory and supervisory authorities all over the world. The experience of various countries, as far as Internet banking is concerned, is outlined in this chapter. [16}

2.2.1 United State of America [USA]: [17]

In the USA, the number of thrift institutions and commercial banks with transactional web-sites is 1275 or 12% of all banks and thrifts. Approximately 78% of all commercial banks with more than $5 billion in assets, 43% of banks with $500 million to $5 billion in assets, and 10% of banks under $ 500 million in assets have transactional web-sites. Of the 1275-thrifts/commercial banks offering transactional Internet banking, 7 could be considered 'virtual banks'. 10 traditional banks have established Internet branches or divisions that operate under a unique brand name. Several new business process and technological advances such as Electronic Bill Presentment and Payment (EBPP), handheld access devices such as Personal Digital Assistants (PDAs), Internet Telephone and Wireless Communication channels and phones are emerging in the US market. A few banks have become Internet Service Providers (ISPs), and banks may become Internet portal sites and online service providers in the near future. Reliance on third party vendors is a common feature of electronic banking ventures of all sizes and degrees of sophistication in the US.

Currently, payments made over the Internet are almost exclusively conducted through existing payment instruments and networks. For retail e-commerce in the US, most payments made over the Internet are currently completed with credit cards and are cleared and settled through existing credit card clearing and settlement systems. Efforts are under way to make it easier to use debit cards, cheques and the Automated Clearing House (ACH) to make payments over the Internet. Versions of e-money, smart cards, e-cheques and other innovations are being experimented with to support retail payments over the Internet.

There is a matrix of legislation and regulations within the US that specifically codifies the use of and rights associated with the Internet and e-commerce in general, and electronic banking and Internet banking activities in particular. Federal and state laws, regulations, and court decisions, and self-regulation among

industries groups provide the legal and operational framework for Internet commerce and banking in the USA.

The international model laws promulgated by the United Nations Commission on International Trade Law (UNCITRAL) provide the guidance to the member nations on the necessity for revising existing legal structures to accommodate electronic transactions. Some important laws of general application to commercial activity over the Internet within the US are the Uniform Commercial Code (UCC), the Uniform Electronic Transaction Act (UETA) (which provides that electronic documents and contracts should not be disqualified as legal documents particularly because of their electronic form), various state laws and regulations on digital signatures and national encryption standards and export regulations.

Many states already have digital signature and other legislation to enable e-commerce. State laws in this area differ but the trend is towards creating legislation, which is technology neutral. The E-sign Act, a new US law that took effect on October 1, 2000, validates contracts concluded by electronic signatures and equates them to those signed with ink on paper. Under the Act, electronic signatures using touch-tones (on a telephone), retinal scans and voice recognition are also acceptable ways of entering into agreements. The E-sign Act takes a technological neutral approach and does not favor the use of any particular technology to validate an electronic document.

The Act however does not address issues relating to which US state's laws would govern an online transaction and which state's code would have jurisdiction over a dispute. The Gramm - Leach – Bliley (GLB) Act has substantially eased restrictions on the ability of banks to provide other financial services. It has established new rules for the protection of consumer financial information. The Inter-agency Statement on Electronic Financial Services and Consumer Compliance (July 1998) addresses consumer protection laws and describe how they can be met in the

context of electronic delivery. In addition, the Federal Reserve Board has issued a request for comment on revised proposals that would permit electronic delivery of federally mandated disclosures under the five consumer protection regulations of the FRB (Regulations B, DD, E, M & Z).

The Interpretive Ruling of the Office of the Comptroller of Currency (OCC) authorizes a national bank to 'perform, provide or deliver through electronic means and facilities any activity, functions, product or service that it is otherwise authorized to perform, provide or deliver'. The concerns of the Federal Reserve are limited to ensuring that Internet banking and other electronic banking services are implemented with proper attention to security, the safety and soundness of the bank, and the protection of the banks' customers. Currently, all banks, whether they are 'Internet only' or traditional banks must apply for a charter according to existing guidelines.

The five federal agencies - Federal Deposit Insurance Corporation (FDIC), Federal Reserve System (FRS), Office of the Comptroller of Currency (OCC), Office of Thrift Supervision (OTS) and the National Credit Union Association (NCUA) supervise more than 20,000 institutions. In addition, each state has a supervisory agency for the banks that it charters. Most financial institutions in the US face no prerequisite conditions or notification requirements for an existing banking institution to begin electronic banking activities.

For these banks, supervisors gather information on electronic banking during routine annual examination. Newly chartered Internet banks are subject to the standard chartering procedures. For thrift institutions, however, OTS has instituted a 30-day advance notification requirement for thrift institutions that plan to establish a transactional web site. A few State banking departments have instituted a similar notification requirement for transactional Internet banking web sites.

Supervisory policy, licensing, legal requirements and consumer protection are generally similar for electronic banking and traditional banking activities. Internet banks are also subject to the same rules, regulations and policy statement as traditional banks. However, in response to the risks posed by electronic banking, federal banking agencies have begun to issue supervisory guidelines and examination procedures for examiners who review and inspect electronic banking applications. Although specialized banking procedures are used in some areas of Internet banking activities, the existing information technology examination framework that addresses access controls, information security, business recovery and other risk areas generally continues to be applicable. To assist supervisors in monitoring the expansion of Internet banking, state chartered and national banks have been required since June 1999 to report their websites' 'Uniform Resource Locators' (URL) in the Quarterly Reports of Financial Condition that are submitted to supervisors.

In addition, examiners review the potential for reputational risk associated with web-site information or activities, the potential impact of various Internet strategies on an institution's financial condition, and the need to monitor and manage outsourcing relationships. To address these risks, the OCC is developing specific guidance for establishing 'Internet only' banks within the US. The Banking Industry Technology Secretariat recently announced the formation of a security lab to test and validate the security of software and hardware used by banking organizations.

If a bank is relying on a third party provider, it is accepted that it should be able to understand the provided information security programme to effectively evaluate the security system's ability to protect bank and customer data. Examination of service providers' operations, where necessary, is conducted by one or more Federal banking agencies pursuant to the Bank Services Company Act, solely to support supervision of banking organizations.

The Federal Financial Institutions Examination Council (FFIEC) introduced the Information Systems (IS) rating system to be used by federal and state regulators to assess uniformly financial and service provider risks introduced by information technology and to identify those institutions and service providers requiring special supervisor attention. The FFIEC has recently renamed the system as Uniform Rating System for IT (URSIT), which has enhanced the audit function. The importance of risk management procedure has been reinforced under the revised system.

Some characteristics of e-money products such as their relative lack of physical bulk, their potential anonymity and the possibility of effecting fast and remote transfers make them more susceptible than traditional systems to money laundering activities. The OCC guidelines lay down an effective 'know your customer' policy. Federal financial institutions, regulators, Society for Worldwide Inter-bank Financial Telecommunications (SWIFT) and Clearing House Inter-bank Payment System (CHIPS) have issued statements encouraging participants to include information on originators and beneficiaries.[11]

2.2.2 United Kingdom [U.K.]: [18]

Most banks in U.K. are offering transactional services through a wider range of channels including Wireless Application Protocol (WAP), mobile phone and T.V. A number of non-banks have approached the Financial Services Authority (FSA) about charters for virtual banks or 'clicks and mortar' operations. There is a move towards banks establishing portals.

The Financial Services Authority (FSA) is neutral on regulations of electronic banks. The current legislation, viz. the Banking Act 1987 and the Building Societies Act, provides it with the necessary powers and the current range of supervisory tools. A new legislation, the Financial Services and Market Bill, offers a significant addition

in the form of an objective requiring the FSA to promote public understanding of the financial system. There is, therefore, no special regime for electronic banks. A draft Electronic Banking Guidance for supervisors has, however, been developed.

A guide to Bank Policy has also been published by the FSA which is technology neutral, but specifically covers outsourcing and fraud. The FSA also maintains bilateral discussions with other national supervisors and monitors developments in the European Union (EU) including discussions by the Banking Advisory Committee and Group de Contract. New legislation on money laundering has been proposed and both the British Bankers Association and the FSA have issued guidance papers in this regard.

The FSA is actively involved in the Basle Committee e-banking group which has identified authorization, prudential standards, transparency, privacy, money laundering and cross border provision as issues where there is need for further work. The FSA has also been supporting the efforts of the G7 Financial Stability Forum, which is exploring common standards for financial market, which is particularly relevant to the Internet, which reaches across all borders.

The Financial Services and Markets Bill will replace current powers under the 1987 Banking Act giving the FSA statutory authority for consumer protection and promotion of consumer awareness. Consumer compliance is required to be ensured via desk based and on site supervision. The FSA has an Authorization and Enforcement Division, which sees if web sites referred to them are in violation of U.K. laws.

The FSA has issued guidelines on advertising in U.K. by banks for deposits, investments and other securities, which apply to Internet banking also. The guidelines include an Appendix on Internet banking. The FSA's supervisory policy

and powers in relation to breaches in the advertising code (viz. invitation by any authorized person to take a deposit within U.K., fraudulent inducements to make a deposit, illegal use of banking names and descriptions, etc.) are the same for Internet banking as they are for conventional banking. The FSA does not regard a bank authorized overseas, which is targeting potential depositors in its home market or in third countries as falling within U.K. regulatory requirements solely by reason of its web site being accessible to Internet users within the U.K., as the advertisements are not aimed at potential U.K. depositors. [12]

2.2.3 Scandinavia: [19]

Swedish and Finnish markets lead the world in terms of Internet penetration and the range and quality of their online services. Merita Nordbanken (MRB) (now Nordic Bank Holding, a merger between Finland's Merita and Nord banker of Sweden) leads in "log-ins per month" with 1.2 million Internet customers, and its penetration rate in Finland (around 45%) is among the highest in the world for a bank of 'brick and mortar' origin. Standinaviska Easkilda Banken (SEB) was Sweden's first Internet bank, having gone on-line in December 1996. It has 1,000 corporate clients for its Trading Station – an Internet based trading mechanism for forex dealing, stock-index futures and Swedish treasury bills and government bonds. Swed bank, is another large sized Internet bank. Almost all of the approximately 150 banks operating in Norway had established "net banks".

In Denmark, the Internet banking service of Den Danske offers funds transfers, bill payments, etc. The basic on-line activity is paying bills. Swed bank was the first bank in the world to introduce Electronic Bill Presentment and Payment (EBPP) and now handles 2 million bill payment a month. E-shopping is another major Internet banking service. MNB has an on-line "mall" of, more than 900 shops, which accepts its "Solo" payment system. Swed bank has a similar system called "Direct".

Besides using advanced encryption technology, the Scandenavian banks have adopted a basic but effective system known as "challenge response logic", which involves a list of code numbers sent to every online client and used in sequence, in combination with their password or PIN. This gives each transaction a unique code, and has so far proved safe. Some banks use even more sophisticated versions of the same technique. It is not a common practice to use third party vendors for services.

In Sweden, no formal guidance has been given to examiners by the Sveriges bank on e-banking. General guidelines apply equally to Internet banking activities. Contractual regularization between customers and the bank is a concern for regulators and is being looked into by the authorities.

The role of the Bank of Finland (Suomen Parkki) has been, as part of general oversight of financial markets in Finland, mainly to monitor the ongoing development of Internet banking without active participation. Numerous issues concerning Internet banking have, however, been examined by the Bank of Finland.

All Internet banking operating from a Norwegian platform are subject to all regular banking regulations, just as any other bank. As part of the standard regulation, there is also a specific regulation on the banks' use of IT. This regulation dates from 1992 when Internet banking was not the main issue, but it covers all IT systems, including Internet banking. The regulation secures that banks' purchase, development, use and phase out of IT systems is conducted in a safe and controlled manner.

An Act relating to Payment systems defines payment systems as those which are based on standardized terms for transfer of funds from or between customer accounts in banks/financial undertakings when the transfer is based on use of payment cards, numeric codes or any other form of independent user identification.

Internet banking is covered by this regulation. The Banking, Insurance and Securities Commission may order for implementation of measures to remedy the situation if there is a violation of provisions.

In addition to their national laws, countries in Europe are also expected to implement European Union (EU) directives. In 1995, the EU passed a Europe-wide Data Protection Directive aimed at granting individuals greater protection from abuses of their personal information. It also passed the Telecommunications Directive that prescribes special protection in relation to telephones, digital TVs, mobile communications, etc. Every EU country is to have a privacy commissioner to enforce the regulations as they apply within the EU. The EU directive on electronic signature is also required to be implemented in national laws.[13]

2.2.4 Australia: [20]

Internet Banking in Australia is offered in two forms: web-based and through the provision of proprietary software. Initial web-based products have focused on personal banking whereas the provision of proprietary software has been targeted at the business/corporate sector. Most Australian-owned banks and some foreign subsidiaries of banks have transactional or interactive web-sites. Online banking services range from FIs' websites providing information on financial products to enabling account management and financial transactions.

Customer services offered online include account monitoring (electronic statements, real-time account balances), account management (bill payments, funds transfers, applying for products on-line) and financial transactions (securities trading, foreign currency transactions).

Electronic Bill Presentment and Payment (EBPP) is at an early stage. Features offered in proprietary software products (enabling business and corporation

customers to connect to the financial institutions (via dial-up/leased line/extranet) include account reporting, improved reconciliation, direct payments, payroll functionality and funds transfer between accounts held at their own or other banks.

Apart from closed payment systems (involving a single payment-provider), Internet banking and e-commerce transactions in Australia are conducted using long-standing payment instruments and are cleared and settled through existing clearing and settlement system. Banks rely on third party vendors or are involved with outside providers for a range of products and services including e-banking. Generally, there are no 'virtual' banks licensed to operate in Australia.

The Electronic Transactions Act, 1999 provides certainty about the legal status of electronic transactions and allows for Australians to use the Internet to provide Commonwealth Departments and agencies with documents which have the same legal status as traditional paperwork.

The Australian Securities and Investments Commission (ASIC) is the Australian regulator with responsibility for consumer aspects of banking, insurance and superannuation and as such, it is responsible for developing policy on consumer protection issues relating to the Internet and e-commerce.

ASIC currently has a draft proposal to expand the existing Electronic Funds Transfer Code of Conduct (a voluntary code that deals with transactions initiated using a card and a PIN) to cover all forms of consumer technologies, including stored value cards and other new electronic payment products. Australia's anti-money laundering regulator is the Australian Transaction Reports and Analysis Centre (AUSTRAC).

Responsibility for prudential supervisory matters lies with the Australian Prudential Regulation Authority (APRA). APRA does not have any Internet specific legislation, regulations or policy, and banks are expected to comply with the established legislation and prudential standards.

APRA's approach to the supervision of e-commerce activities, like the products and services themselves, is at an early stage and is still evolving. APRA's approach is to visit institutions to discuss their Internet banking initiatives. However, APRA is undertaking a survey of e-commerce activities of all regulated financial institutions. The growing reliance on third party or outside providers of e-banking is an area on which APRA is increasingly focusing. [14]

2.2.5 New Zealand: [21]

Major Banks offer Internet banking service to customers; operate as a division of the bank rather than as a separate legal entity. Reserve Bank of New Zealand applies the same approach to the regulation of both Internet banking activities and traditional banking activities. There are however, banking supervision regulations that apply only to Internet banking. Supervision is based on public disclosure of information rather than application of detailed prudential rules. These disclosure rules apply to Internet banking activity also. [15]

2.2.6 Singapore: [22]

The Monetary Authority of Singapore (MAS) has reviewed its current framework for licensing, and for prudential regulation and supervision of banks, to ensure its relevance in the light of developments in Internet banking, either as an additional channel or in the form of a specialized division, or as stand-alone entities (Internet Only Banks), owned either by existing banks or by new players entering the banking industry. The existing policy of MAS already allows all banks licensed in Singapore to use the Internet to provide banking services.

MAS are subjecting Internet banking, including IOBs, to the same prudential standards as traditional banking. It will be granting new licenses to banking groups incorporated in Singapore to set up bank subsidiaries if they wish to pursue new business models and give them flexibility to decide whether to engage in Internet banking through a subsidiary or within the bank (where no additional license is required). MAS also will be admitting branches of foreign incorporated IOBs within the existing framework of admission of foreign banks.

As certain types of risk are accentuated in Internet banking, a risk – based supervisory approach, tailored to individual banks' circumstances and strategies, is considered more appropriate by MAS than "one-size-fits-all" regulation. MAS requires public disclosures of such undertakings, as part of its requirement for all banks and enhance disclosure of their risk management systems. It is issuing a consultative document on Internet banking security and technology risk management. In their risk management initiatives for Internet banking relating to security and technology related risks, banks should:

a) Implement appropriate workflow, authenticated process and control procedures surrounding physical and system access.
b) Develop, test, implement and maintain disaster recovery and business contingency plans.
c) Appoint an independent third party specialist to assess its security and operations.
d) Clearly communicate to customers their policies with reference to rights and responsibilities of the bank and customer, particularly issues arising from errors in security systems and related procedures.

For liquidity risk, banks, especially IOBs, should establish robust liquidity contingency plans and appropriate Asset-Liability Management systems. As

regards operational risk, banks should carefully manage outsourcing of operations, and maintain comprehensive audit trails of all such operations. As far as business risk is concerned, IOBs should maintain and continually update a detailed system of performance measurement.

MAS encourages financial institutions and industry associations such as the Associations of Banks in Singapore (ABS) to play a proactive role in educating consumers on benefits and risks on new financial products and services offered by banks, including Internet banking service.[16]

2.2.7 Hong Kong: [23]

There has been a spate of activity in Internet banking in Hong Kong. Two virtual banks are being planned. It is estimated that almost 15% of transactions are processed on the Internet. During the first quarter of 2000, seven banks have begun Internet services. Banks are participating in strategic alliances for e-commerce ventures and are forming alliances for Internet banking services delivered through Jetco (a bank consortium operating an ATM network in Hong Kong). A few banks have launched transactional mobile phone banking earlier for retail customers.

The Hong Kong Monetary Authority (HKMA) requires that banks must discuss their business plans and risk management measures before launching a transactional website. HKMA has the right to carry out inspections of security controls and obtain reports from the home supervisor, external auditors or experts commissioned to produce reports. HKMA is developing specific guidance on information security with the guiding principle that security should be "fit for purpose".

HKMA requires that risks in Internet banking system should be properly controlled. The onus of maintaining adequate systems of control including those in

respect of Internet banking ultimately lies with the institution itself. Under the Seventh Schedule to the Banking ordinance, one of the authorization criteria is the requirement to maintain adequate accounting system and adequate systems control. Banks should continue to acquire state-of-the art technologies and to keep pace with developments in security measures.

The HKMA's supervisory approach is to hold discussions with individual institutions who wish to embark on Internet banking to allow them to demonstrate how they have properly addressed the security systems before starting to provide such services, particularly in respect of the following – (i) encryption by industry proven techniques of data accessible by outsiders, (ii) preventive measures for unauthorized access to the bank's internal computer systems, (iii) set of comprehensive security policies and procedures, (iv) reporting to HKMA all security incidents and adequacy of security measures on a timely basis.

At present, it has not been considered necessary to codify security objectives and requirements into a guideline. The general security objectives for institutions intending to offer Internet banking services should have been considered and addressed by such institutions.

HKMA has issued guidelines on 'Authorization of Virtual Banks' under Section 16(10) of the Banking Ordinance under which (i) the HKMA will not object to the establishment of virtual banks in Hong Kong provided they can satisfy the same prudential criteria that apply to conventional banks, (ii) a virtual bank which wishes to carry on banking business in Hong Kong must maintain a physical presence in Hong Kong; (iii) a virtual bank must maintain a level of security which is appropriate to the type of business which it intends to carry out. A copy of report on security of computer hardware, systems, procedures, controls etc. from a qualified independent expert should be provided to the HKMA at the time of

application, (iv) a virtual bank must put in place appropriate policies, procedures and controls to meet the risks involved in the business; (v) the virtual bank must set out clearly in the terms and conditions for its service what are the rights and obligations of its customers (vi) Outsourcing by virtual banks to a third party service provider is allowed, provided HKMA's guidelines on outsourcing are complied with. There are principles applicable to locally incorporated virtual banks and those applicable to overseas-incorporated virtual banks.

Consumer protection laws in Hong Kong do not apply specifically to e-banking but banks are expected to ensure that their e-services comply with the relevant laws. The Code of Banking Practice is being reviewed to incorporate safeguards for customers of e-banking.

Advertising for taking deposits to a location outside Hong Kong is a violation unless disclosure requirements are met. Consideration is being given as to whether this is not too onerous in the context of the global nature of the Internet.

Recognizing the relevance of Public Key Infrastructure (PKI) in Hong Kong to the development of Internet banking and other forms of e-commerce, the government of Hong Kong has invited the Hong Kong Postal Authority to serve as public Certificate Authority (CA) and to establish the necessary PKI infrastructure.

There is no bar, however, on the private sector setting up CAs to serve the specific needs of individual networks. There should be cross-references and mutual recognition of digital signatures among CAs. The Government is also considering whether and, if so, how the legal framework should be strengthened to provide firm legal basis for electronic transactions (particularly for digital signatures to ensure non-repudiation of electronic messages and transactions). [17]

2.2.8 Japan: [24]

Banks in Japan are increasingly focusing on e-banking transactions with customers. Internet banking is an important part of their strategy. While some banks provide services such as inquiry, settlement, purchase of financial products and loan application, others are looking at setting up finance portals with non-finance business corporations. Most banks use outside vendors in addition to in-house services.

The current regulations of the Bank of Japan on physical presence of bank branches are undergoing modifications to take care of licensing of banks and their branches with no physical presence. The Report of the Electronic Financial Services Study Group (EFSSG) has made recommendations regarding the supervision and regulation of electronic financial services. Financial institutions are required to take sufficient measures for risk management of service providers and the authorities are required to verify that such measures have been taken. Providing information about non-financial businesses on a bank web site is not a violation as long as it does not constitute a business itself.

With respect to consumer protection it is felt that guidance and not regulations should encourage voluntary efforts of individual institutions in this area. Protection of private information, however, is becoming a burning issue in Japan both within and outside the field of e-banking. Japanese banks are currently requested to place disclosure publications in their offices (branches) by the law. However, 'Internet Only banks' are finding it difficult to satisfy this requirement. The Report of the EFSSG recommends that financial service providers that operate transactional website should practice online disclosure through electronic means at the same timing and of equivalent contents as paper based disclosure. They should also explain the risks and give customers a fair chance to ask queries. The Government of Japan intends to introduce comprehensive Data Protection Legislation in the near

future. There are no restrictions or requirements on the use of cryptography. The Ministry of International Trade and Industry (MITI)'s approval is required to report encryption technology.

World over, electronic banking is making rapid strides due to evolving communication technology. Penetration of Internet banking is increasing in most countries. Wireless Application Protocol (WAP) is an emerging service which banks worldwide are also offering. The stiff competition in this area exposes banks to substantial risks. The need is being felt overseas that transparency and disclosure requirements should be met by the e-banking community. While existing regulations and legislations applicable to traditional banking are being extended to banks' Internet banking and electronic banking services, it is recognized that Internet security, customer authentication and other issues such as technology outsourcing pose unique risks.

Central Banks worldwide are addressing such issues with focused attention. Special legislations and regulations are being framed by the regulators and supervisors for proper management of the different types of risks posed by these services. The reliance on outsourcing is an area where overseas regulators and supervisors are focusing their attention, with banks having to regularly review and test business continuity, recovery and incidence response plans in order to maintain their reputation of trust. Consumer protection and data privacy are areas which assume great significance when banking transactions are carried over a medium as insecure as the Internet.

Many countries are looking at special consumer protection/data privacy legislation for an e-commerce environment. The presence of 'virtual banks' or 'Internet only banks' and the licensing requirements required for such entities are also areas which are being looked into by overseas authorities.

There has also been co-operation among the regulators and supervisors to meet the challenges of 'virtual' cross border e-banking, particularly in the light of the possibility of increased money laundering activities through the medium of Internet. Internet banking is universally seen as a welcome development, and efforts are being made to put in place systems to manage and control the risks involved without restricting this service. [18]

2.3 Internet Banking: The Indian Scenario:

"Use of the Internet for banking has seen a massive rise in the 2010-11 survey, taking the overall number of bank consumers who use the Net to close 7% of the total bank account holders -- a seven-fold jump since 2007 -- even as for the first time in the past 13 years, branch banking has come down by a full 15 percentage points during the same period

2.3.1 The entry of Indian banks into Net Banking: [25]

Internet banking, both as a medium of delivery of banking services and as a strategic tool for business development, has gained wide acceptance internationally and is fast catching up in India with more and more banks entering the fray. India can be said to be on the threshold of a major banking revolution with net banking having already been unveiled. A recent questionnaire to which 46 banks responded, has revealed that at present, 11 banks in India are providing Internet banking services at different levels, banks propose to offer Internet banking in near future while the remaining 13 banks have no immediate plans to offer such facility.

At present, the total Internet users in the country are estimated at 9 lakh. However, this is expected to grow exponentially to 90 lakh by 2003. Only about 1% of Internet users did banking online in 1998. This increased to 16.7% in March 2000. The growth potential is, therefore, immense. Further incentives provided by banks would dissuade customers from visiting physical branches, and thus get 'hooked'

to the convenience of arm-chair banking. The facility of accessing their accounts from anywhere in the world by using a home computer with Internet connection, is particularly fascinating to Non-Resident Indians and High Net worth Individuals having multiple bank accounts.

Costs of banking service through the Internet form a fraction of costs through conventional methods. Rough estimates assume teller cost at Re.1 per transaction, ATM transaction cost at 45 paise, phone banking at 35 paise, debit cards at 20 paise and Internet banking at 10 paise per transaction. The cost-conscious banks in the country have therefore actively considered use of the Internet as a channel for providing services. Fully computerized banks, with better management of their customer base are in a stronger position to cross-sell their products through this channel. [19]

2.3.2 Products and services offered: [26]

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

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

transaction details and status of instructions given by him. These web sites still do not allow online transactions for their customers.

Some of the banks permit customers to interact with them and transact electronically with them. Such services include request for opening of accounts, requisition for cheque books, stop payment of cheques, viewing and printing statements of accounts, movement of funds between accounts within the same bank, querying on status of requests, instructions for opening of Letters of Credit and Bank Guarantees etc.

These services are being initiated by banks like ICICI Bank Ltd., HDFC Bank Ltd. Citibank, Global Trust Bank Ltd., UTI Bank Ltd., Bank of Madura Ltd., Federal Bank Ltd. etc. Recent entrants in Internet banking are Allahabad Bank (for its corporate customers through its 'Allnet' service) and Bank of Punjab Ltd. State Bank of India has announced that it will be providing such services soon. Certain banks like ICICI Bank Ltd., have gone a step further within the transactional stage of Internet banking by allowing transfer of funds by an account holder to any other account holder of the bank.

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

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

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

The race for market supremacy is compelling banks in India to adopt the latest technology on the Internet in a bid to capture new markets and customers. HDFC Bank Ltd. with its 'Freedom- the e-Age Saving Account' Service, Citibank with Suvidha and ICICI Bank Ltd. with its Mobile Commerce service have tied up with cellphone operators to offer Mobile Banking to their customers. Global Trust Bank Ltd. has also announced that it has tied up with cellular operators to launch mobile

banking services. Under Mobile Banking services, customers can scan their accounts to seek balance and payments status or instruct banks to issue cheques, pay bills or deliver statements of accounts. It is estimated that by 2003, cellular phones will have become the premier Internet access device, outselling personal computers. Mobile banking will further minimize the need to visit a bank branch. [20]

2.3.3 The Future Scenario: Internet Banking in India: [27]

Compared to banks abroad, Indian banks offering online services still have a long way to go. For online banking to reach a critical mass, there has to be sufficient number of users and the sufficient infrastructure in place. The 'Infinity' product of ICICI Bank Ltd. gets only about 30,000 hits per month, with around 3,000 transactions taking place on the Net per month through this service.

Though various security options like line encryption, branch connection encryption, firewalls, digital certificates, automatic signoffs, random pop-ups and disaster recovery sites are in place or are being looked at, there is as yet no Certification Authority in India offering Public Key Infrastructure which is absolutely necessary for online banking. The customer can only be assured of a secured conduit for its online activities if an authority certifying digital signatures is in place. The communication bandwidth available today in India is also not enough to meet the needs of high priority services like online banking and trading.

Banks offering online facilities need to have an effective disaster recovery plan along with comprehensive risk management measures. Banks offering online facilities also need to calculate their downtime losses, because even a few minutes of downtime in a week could mean substantial losses. Some banks even today do not have uninterrupted power supply unit or systems to take care of prolonged power breakdown. Proper encryption of data and effective use of passwords are also matters that leave a lot to be desired. Systems and processes have to be put in place to ensure that errors do not take place.

Users of Internet Banking Services are required to fill up the application forms online and send a copy of the same by mail or fax to the bank. A contractual agreement is entered into by the customer with the bank for using the Internet banking services. In this way, personal data in the applications forms is being held by the bank providing the service. The contract details are often one-sided, with the bank having the absolute discretion to amend or supplement any of the terms at any time.

For these reasons domestic customers for whom other access points such as ATMs, tele-banking, personal contact, etc. are available, are often hesitant to use the Internet banking services offered by Indian banks. Internet Banking, as an additional delivery channel, may, therefore, be attractive / appealing as a value added service to domestic customers. Non-resident Indians for whom it is expensive and time consuming to access their bank accounts maintained in India find net banking very convenient and useful.

The Internet is in the public domain whereby geographical boundaries are eliminated. Cyber crimes are therefore difficult to be identified and controlled. In order to promote Internet banking services, it is necessary that the proper legal infrastructure is in place. Government has introduced the Information Technology Bill, which has already been notified in October 2000. Section 72 of the Information Technology Act, 2000 casts an obligation of confidentiality against disclosure of any electronic record, register, correspondence and information, except for certain purposes and violation of this provision is a criminal offence.

Notification for appointment of Authorities to certify digital signatures, ensuring confidentiality of data, is likely to be issued in the coming months. Comprehensive enactments like the Electronic Funds Transfer Act in U.K. and data protection rules and regulations in the developed countries are in place abroad to prevent

unauthorized access to data, malafide or otherwise, and to protect the individual's rights of privacy. The legal issues are, however, being debated in our country and it is expected that some headway will be made in this respect in the near future.

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

The proposed setting up of a Credit Information Bureau for collecting and sharing credit information on borrowers of lending institutions online would give a fillip to electronic banking. The deadline set by the Chief Vigilance Commissioner for computerization of not less than 70 percent of the bank's business by end of January 2001 has also given a greater thrust to development of banking technology. The recommendations of the Vasudevan Committee on Technological Upgradation of Banks in India have also been circulated to banks for implementation. In this background, banks are moving in for technological Upgradation on a large scale. Internet banking is expected to get a boost from such developments.

Reserve Bank of India has taken the initiative for facilitating real time funds transfer through the Real Time Gross Settlement (RTGS) System. Under the RTGS system, transmission, processing and settlements of the instructions will be done on a continuous basis. Gross settlement in a real time mode eliminates credit and liquidity risks. Any member of the system will be able to access it through only one specified gateway in order to ensure rigorous access control measures at the user level. The system will have various levels of security, viz., Access security, 128 bit

cryptography, firewall, certification etc. Further, Generic Architecture (**see fig. 2**), both domestic and cross border, aimed at providing inter-connectivity across banks has been accepted for implementation by RBI. Following a reference made this year, in the Monetary and Credit Policy statement of the Governor, banks have been advised to develop domestic generic model in their computerization plans to ensure seamless integration. The abovementioned efforts would enable online banking to become more secure and efficient.

With the process of dematerialization of shares having gained considerable ground in recent years, banks have assumed the role of depository participants. In addition to customers' deposit accounts, they also maintain demat accounts of their clients. Online trading in equities is being allowed by SEBI. This is another area which banks are keen to get into. HDFC Bank Ltd., has tied up with about 25 equity brokerages for enabling third party transfer of funds and securities through its business-to-business (B2B) portal, 'e-Net'. Demat account holders with the bank can receive securities directly from the brokers' accounts. The bank has extended its web interface to the software vendors of National Stock Exchange through a tie-up with NSE.IT – the infotech arm of the exchange. The bank functions as the payment bank for enabling funds transfer from its customers' account to brokers' accounts. The bank is also setting up a net broking arm, HDFC Securities, for enabling trading in stocks through the web. The focus on capital market operations through the web is based on the bank's strategy on tapping customers interested in trading in equities through the Internet. Internet banking thus promises to become a popular delivery channel not only for retail banking products but also for online securities trading.

An upcoming payment gateway is being developed by ICICI and Global Tele System, which will enable customers to transfer funds to banks which are part of the project. Transfer of funds can be made through credit/debit/ smart cards and

cheques, with the central payment switch enabling the transactions. Banks are showing interest in this new concept, which will facilitate inter-bank funds transfers and other e-commerce transactions, thus highlighting the role of banks in e-commerce as intermediaries between buyers and sellers in the whole payment process.

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

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

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

2.4 Internet Banking and its various types: [28]

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

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.

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.

2.4.1 Types of Services Available: [29]

Net banking is a web-based service that enables the banks authorized customers to access their account information. It allows the customers to log on to the banks website with the help of bank's issued identification and personal identification number (PIN).

The banking system verifies the user and provides access to the requested services, the range of products and service offered by each bank on the internet differs widely in their content. Most banks offer net banking as a value-added service. Net banking has also led to the emergent of new banks, which operate only through the internet and do not exists physically, Such banks are called "virtual" banks or "Internet Only" banks. A couple of years ago, there was a belief even among bankers that customers opening new accounts wanted the online banking facility, just to 'feel good' and very few of them actually used that services.

Today, bankers believe that the trend from 'nice to have' is changing to 'need to have' .after all it depends on how busy a person is. Services provided through Internet Banking 1) account information 2) E-cheques (Online Fund Transfer) 3) Bill Payment Service 4) Requests and Intimations 5) Demat Account share trading. Through Internet banking, customers can not only get account balance and see statements of account online but they can also transfer funds, order demand drafts, pay utility bills etc. Following types of main transactions or operations can be performed through. Internet banking:

Account Information:
Provides summary of all bank accounts. Allow transaction tracking which enables retrieval of transaction details based on cheque number, transaction amount, and date. Provide account statement and transaction reports used on user-defined criteria. Customers can even download and print the statement of accounts.

Funds Transfer (E-Cheque):
Customer can transfer funds: Transfer funds between accounts, even if they are in different branches' cities Customer can also transfer funds to any person having an account with the same bank anytime, anywhere, using third party funds transfer option.

Bill Presentment and Payment:
Banks Bill Payments is the easiest way to manage bills. A/c holder can pay their regular monthly bills i.e. telephone, electricity, mobile phone, insurance etc. at anytime, anywhere for free. Saves time and effort. Make bill payments at customer's convenience form their home or office. Lets a/c holders check their hill amount before it is debited form their account. No debits to account without their knowledge. No more missed deadlines, no more loss of interest – a/c holder can schedule their bills in advance, avoid missing the bill deadlines as well as earn extra

interest on their money. Track payment history – all payments to a biller are stored automatically for future reference. No queuing up at collection centers or writing cheque anymore! Just a few clicks and customers account will be debited for the exact amount they ask.

Premium:

- Online Payment for Shopping done on Internet.
- Loan Applications.
- Standing Instructions.
- Request and Intimations.
- Financial Advice.
- Credit and Debit Cards.
- Investment Transactions.
- Customer Correspondence.
- Opening Accounts.
- Insurance.
- Other Value Added / Premium Services etc.

2.4.2 Mediums of E-banking: [Various products and services:] [30]

Electronic banking, also known electronic fund transfer (EFT), uses computer and electronic technology as a substitute for checks and other paper transactions. EFTs is initiated through devices like cards or codes that let you, or those you authorize, access your account.

Many financial institutions use ATM or debit cards and Personal Identification Numbers (PINs) for this purpose. Some use other forms of debit cards and personal Identification Numbers (PINs) for this purpose. Some use other forms of debit cards such as those that require, at the most, your signature or a scan. The federal Electronic Fund Transfer Act (EFT Act) covers some electronic consumer transactions.

Following are the electronic medium by which services are generally provided by the banks as a part of e-banking services.

1. Internet Banking
2. ATM (Automatic Teller Machine)
3. Phone Banking
4. Mobile Banking
5. Payment Cards (Debits/Credit Card)

All the above mediums provide services, which can be, also know as "any time any where banking". This facilitates the customer of the bank to operate their account from any corner of the world, without visiting local or any subsidiary branch of their banks. Efforts are made by the bank not only to provide the facility to the customer, but also to reduce the operational cost of the bank by providing e-banking services. So with this, banks have to employ less staff and still would be able to deliver service to the customer, round the corner.

2.4.3 Factors Responsible for Growth of Internet Banking: [31]

Numerous factors including competitive cost, customer service, and demographic considerations are motivating banks to evaluate their technology and assess their Internet banking strategies. The challenge for national banks is to make sure the savings from Internet banking technology more than offset the costs and risks associated with conducting business in cyberspace. Marketing strategies will vary as national banks seek to expand their markets and employ lower cost delivery channels. Examiners will need to understand the strategies used and technologies employed on a bank-by-bank basis to assess the risk. Evaluating a bank's data on the use of their Web sites, may help examiners determine the bank's strategic objectives, how well the bank is meeting its Internet banking product plan, and whether the business is expected to be profitable.

Competition:

Studies show that competitive pressure is the chief driving force behind increasing use of Internet banking technology, ranking ahead of cost reduction and revenue enhancement, in second and third place respectively. Banks see Internet banking as a way to keep existing customers and attract new ones to the bank.

Cost Efficiencies:

Banks can deliver banking services on the Internet at transaction costs far lower than traditional brick and mortar branches. The actual costs to execute a transaction will vary depending on the delivery channel used. The frequently quoted Booz – Allen and Hamilton study showed that the cost of a customer walking into the branch and using a teller is US$1.01, where as the cost of conducting the same transaction on the Internet is only a tenth of the cost. No doubt the ATM is considerably cheaper than a teller, but even so, the Internet is nearly 3 times cheaper than the ATM usage. In short, replacing a teller with an Internet channel should in theory, show a 10 fold increase in the distribution revenue for the bank. This reason alone should be sufficient for banks to encourage this form of distribution channel. However, banks should use care in making product decisions. Management should include in their decision making the development and ongoing costs associated with a new product or service, including the technology, marketing, maintenance, and customer support functions. This will help management exercise due diligence, make more informed decisions, and measure the Success of their business venture.

Geographical Reach:

Internet banking allows expanded customer contact through increased geographical reach and lower cost delivery channels. In fact some banks are doing business exclusively via the Internet. They do not have traditional banking offices and only reach their customers online. Other financial institutions are using the Internet as an alternative delivery channel to reach existing customers adds attract new customers.

Branding:

Relationship building is a strategic priority for many national banks. Internet banking technology and products can provide a means for national banks to develop and maintain an ongoing relationship with their customers by offering easy access to a broad array of products and services. By capitalizing on brand identification and by providing a broad array of financial services, banks hope to build customer loyalty, cross sell, and enhance repeat business.

Customer Demographics:

Internet banking allows national banks to offer a wide array of options to their banking customers. Some customers will rely on traditional branches to conduct their banking business. For many, this is the most comfortable way for them to transact their banking business. Those customers place a premium on person to person contact other customers are early adopters of new technologies that arrive in the marketplace. These customers were the first to obtain PCs and the first to employ them in conducting their banking business. The demographics of banking customers will continue to change.

Round the Clock Access:

Internet banking services are available on 24 x 7 basis to the customers without charging any extra cost from the customers. And one can access the bank from anywhere in the world at one's own convenience without owning your own PC.

2.5 Types of risks associated with Internet banking: [32]

A major driving force behind the rapid spread of i-banking all over the world is its acceptance as an extremely cost effective delivery channel of banking services as compared to other existing channels. However, Internet is not an unmixed blessing to the banking sector. Along with reduction in cost of transactions, it has also brought about a new orientation to risks and even new forms of risks to which banks conducting i-banking expose themselves.

Regulators and supervisors all over the world are concerned that while banks should remain efficient and cost effective, they must be conscious of different types of risks this form of banking entails and have systems in place to manage the same. An important and distinctive feature is that technology plays a significant part both as source and tool for control of risks. Because of rapid changes in information technology, there is no finality either in the types of risks or their control measures. Both evolve continuously. The thrust of regulatory action in risk control has been to identify risks in broad terms and to ensure that banks have minimum systems in place to address the same and that such systems are reviewed on a continuous basis in keeping with changes in technology. In the following paragraphs a generic set of risks are discussed as the basis for formulating general risk control guidelines, which this Group will address.

2.5.1 Operational Risk: [33]

Operational risk, also referred to as transactional risk is the most common form of risk associated with i-banking. It takes the form of inaccurate processing of transactions, non enforceability of contracts, compromises in data integrity, data privacy and confidentiality, unauthorized access / intrusion to bank's systems and transactions etc. Such risks can arise out of weaknesses in design, implementation and monitoring of banks' information system. Besides inadequacies in technology, human factors like negligence by customers and employees, fraudulent activity of employees and crackers hackers etc. can become potential source of operational risk. Often there is thin line of difference between operational risk and security risk and both terminologies are used interchangeably.

2.5.2 Security Risk: [34]

Internet is a public network of computers which facilitates flow of data / information and to which there is unrestricted access. Banks using this medium for

financial transactions must, therefore, have proper technology and systems in place to build a secured environment for such transactions.

Security risk arises on account of unauthorized access to a bank's critical information stores like accounting system, risk management system, portfolio management system, etc. A breach of security could result in direct financial loss to the bank. For example, hackers operating via the Internet, could access, retrieve and use confidential customer information and also can implant virus. This may result in loss of data, theft of or tampering with customer information, disabling of a significant portion of bank's internal computer system thus denying service, cost of repairing these etc. Other related risks are loss of reputation, infringing customers' privacy and its legal implications etc.

Thus, access control is of paramount importance. Controlling access to banks' system has become more complex in the Internet environment which is a public domain and attempts at unauthorized access could emanate from any source and from anywhere in the world with or without criminal intent. Attackers could be hackers, unscrupulous vendors, disgruntled employees or even pure thrill seekers. Also, in a networked environment the security is limited to its weakest link. It is therefore, necessary that banks critically assess all interrelated systems and have access control measures in place in each of them.

In addition to external attacks banks are exposed to security risk from internal sources e.g. employee fraud. Employees being familiar with different systems and their weaknesses become potential security threats in a loosely controlled environment. They can manage to acquire the authentication data in order to access the customer accounts causing losses to the bank.

Unless specifically protected, all data / information transfer over the Internet can be monitored or read by unauthorized persons. There are programs such as 'sniffers' which can be set up at web servers or other critical locations to collect data like account numbers, passwords, account and credit card numbers. Data privacy and confidentiality issues are relevant even when data is not being transferred over the net. Data residing in web servers or even banks' internal systems are susceptible to corruption if not properly isolated through firewalls from Internet.

The risk of data alteration, intentionally or unintentionally, but unauthorized is real in a networked environment, both when data is being transmitted or stored. Proper access control and technological tools to ensure data integrity is of utmost importance to banks. Another important aspect is whether the systems are in place to quickly detect any such alteration and set the alert.

Identity of the person making a request for a service or a transaction as a customer is crucial to legal validity of a transaction and is a source of risk to a bank. A computer connected to Internet is identified by its IP (Internet Protocol) address. There are methods available to masquerade one computer as another, commonly known as 'IP Spoofing'. Likewise user identity can be misrepresented. Hence, authentication control is an essential security step in any e-banking system. Non-repudiation involves creating a proof of communication between two parties, say the bank and its customer, which neither can deny later. Banks' system must be technologically equipped to handle these aspects which are potential sources of risk.

2.5.3 System Architecture and Design: [35]

Appropriate system architecture and control is an important factor in managing various kinds of operational and security risks. Banks face the risk of wrong choice of technology, improper system design and inadequate control processes. For example, if access to a system is based on only an IP address, any user can gain access by masquerading as a legitimate user by spoofing IP address of a genuine user. Numerous protocols are used for communication across Internet. Each protocol is designed for specific types of data transfer. A system allowing communication with all protocols, say HTTP (Hyper Text Transfer Protocol), FTP (File Transfer Protocol), telnet etc. is more prone to attack than one designed to permit say, only HTTP.

Choice of appropriate technology is a potential risk banks face. Technology which is outdated, not scalable or not proven could land the bank in investment loss, a vulnerable system and inefficient service with attendant operational and security risks and also risk of loss of business.

Many banks rely on outside service providers to implement, operate and maintain their e-banking systems. Although this may be necessary when banks do not have the requisite expertise, it adds to the operational risk. The service provider gains access to all critical business information and technical systems of the bank, thus making the system vulnerable. In such a scenario, the choice of vendor, the contractual arrangement for providing the service etc., become critical components of banks' security. Bank should educate its own staff and over dependencies on these vendors should be avoided as far as possible.

Not updating bank's system in keeping with the rapidly changing technology, increases operational risk because it leaves holes in the security system of the bank. Also, staff may fail to understand fully the nature of new technology employed.

Further, if updating is left entirely at customers' end, it may not be updated as required by the bank. Thus education of the staff as well as users plays an important role to avoid operational risk.

2.5.4 Reputational Risk: [36]

Reputational risk is the risk of getting significant negative public opinion, which may result in a critical loss of funding or customers. Such risks arise from actions which cause major loss of the public confidence in the banks' ability to perform critical functions or impair bank-customer relationship. It may be due to banks' own action or due to third party action.

The main reasons for this risk may be system or product not working to the expectations of the customers, significant system deficiencies, significant security breach (both due to internal and external attack), inadequate information to customers about product use and problem resolution procedures, significant problems with communication networks that impair customers' access to their funds or account information especially if there are no alternative means of account access. Such situation may cause customer-discontinuing use of product or the service. Directly affected customers may leave the bank and others may follow if the problem is publicized.

Other reasons include losses to similar institution offering same type of services causing customer to view other banks also with suspicion, targeted attacks on a bank like hacker spreading inaccurate information about bank products, a virus disturbing bank's system causing system and data integrity problems etc.

Possible measures to avoid this risk are to test the system before implementation, backup facilities, contingency plans including plans to address customer problems during system disruptions, deploying virus checking, deployment of ethical hackers for plugging the loopholes and other security measures.

It is significant not only for a single bank but also for the system as a whole. Under extreme circumstances, such a situation might lead to systemic disruptions in the banking system as a whole. Thus the role of the regulator becomes even more important as not even a single bank can be allowed to fail.

2.5.5 Legal Risk: [37]

Legal risk arises from violation of, or non-conformance with laws, rules, regulations, or prescribed practices, or when the legal rights and obligations of parties to a transaction are not well established. Given the relatively new nature of Internet banking, rights and obligations in some cases are uncertain and applicability of laws and rules is uncertain or ambiguous, thus causing legal risk.

Other reasons for legal risks are uncertainty about the validity of some agreements formed via electronic media and law regarding customer disclosures and privacy protection. A customer, inadequately informed about his rights and obligations, may not take proper precautions in using Internet banking products or services, leading to disputed transactions, unwanted suits against the bank or other regulatory sanctions.

In the enthusiasm of enhancing customer service, bank may link their Internet site to other sites also. This may cause legal risk. Further, a hacker may use the linked site to defraud a bank customer.

If banks are allowed to play a role in authentication of systems such as acting as a Certification Authority, it will bring additional risks. A digital certificate is intended to ensure that a given signature is, in fact, generated by a given signer. Because of this, the certifying bank may become liable for the financial losses incurred by the party relying on the digital certificate.

2.5.6 Money Laundering Risk:

As Internet banking transactions are conducted remotely banks may find it difficult to apply traditional method for detecting and preventing undesirable criminal activities. Application of money laundering rules may also be inappropriate for some forms of electronic payments. Thus banks expose themselves to the money laundering risk. This may result in legal sanctions for non-compliance with "know your customer" laws.

To avoid this, banks need to design proper customer identification and screening techniques, develop audit trails, conduct periodic compliance reviews, frame policies and procedures to spot and report suspicious activities in Internet transactions.

2.5.7 Cross Border Risks:

Internet banking is based on technology that, by its very nature, is designed to extend the geographic reach of banks and customers. Such market expansion can extend beyond national borders. This causes various risks.

It includes legal and regulatory risks, as there may be uncertainty about legal requirements in some countries and jurisdiction ambiguities with respect to the responsibilities of different national authorities. Such considerations may expose banks to legal risks associated with non-compliance of different national laws and regulations, including consumer protection laws, record-keeping and reporting requirements, privacy rules and money laundering laws.

If a bank uses a service provider located in another country, it will be more difficult to monitor it thus, causing operational risk. Also, the foreign-based service provider or foreign participants in Internet banking are sources of country risk to the extent that foreign parties become unable to fulfill their obligations due to economic, social or political factors.

Cross border transaction accentuates credit risk, since it is difficult to appraise an application for a loan from a customer in another country compared to a customer from a familiar customer base. Banks accepting foreign currencies in payment for electronic money may be subjected to market risk because of movements in foreign exchange rates.

2.5.8 Strategic Risk:

This risk is associated with the introduction of a new product or service. Degree of this risk depends upon how well the institution has addressed the various issues related to development of a business plan, availability of sufficient resources to support this plan, credibility of the vendor (if outsourced) and level of the technology used in comparison to the available technology etc. For reducing such risk, banks need to conduct proper survey, consult experts from various fields, establish achievable goals and monitor performance. Also they need to analyze the availability and cost of additional resources, provision of adequate supporting staff, proper training of staff and adequate insurance coverage. Due diligence needs to be observed in selection of vendors, audit of their performance and establishing alternative arrangements for possible inability of a vendor to fulfill its obligation . Besides this, periodic evaluations of new technologies and appropriate consideration for the costs of technological Upgradation are required.

2.5.9 Other Risks: [38]

Traditional banking risks such as credit risk, liquidity risk, interest rate risk and market risk are also present in Internet banking. These risks get intensified due to the very nature of Internet banking on account of use of electronic channels as well as absence of geographical limits. However, their practical consequences may be of a different magnitude for banks and supervisors than operational, reputational and legal risks. This may be particularly true for banks that engage in a variety of banking activities, as compared to banks or bank subsidiaries that specialize in Internet banking.

Credit risk is the risk that a counter party will not settle an obligation for full value, either when due or at any time thereafter. Banks may not be able to properly evaluate the credit worthiness of the customer while extending credit through remote banking procedures, which could enhance the credit risk. Presently, banks generally deal with more familiar customer base. Facility of electronic bill payment in Internet banking may cause credit risk if a third party intermediary fails to carry out its obligations with respect to payment. Proper evaluation of the creditworthiness of a customer and audit of lending process are a must to avoid such risk. Another facility of Internet banking is electronic money. It brings various types of risks associated with it. If a bank purchases e-money from an issuer in order to resell it to a customer, it exposes itself to credit risk in the event of the issuer defaulting on its obligation to redeem electronic money.

Liquidity Risk arises out of a bank's inability to meet its obligations when they become due without incurring unacceptable losses, even though the bank may ultimately be able to meet its obligations. It is important for a bank engaged in electronic money transfer activities that it ensures that funds are adequate to cover redemption and settlement demands at any particular time. Failure to do so, besides exposing the bank to liquidity risk, may even give rise to legal action and reputational risk. Similarly banks dealing in electronic money face interest rate risk because of adverse movements in interest rates causing decrease in the value of assets relative to outstanding electronic money liabilities. Banks also face market risk because of losses in on-and-off balance sheet positions arising out of movements in market prices including foreign exchange rates. Banks accepting foreign currency in payment for electronic money are subject to this type of risk.

Risk of unfair competition: Internet banking is going to intensify the competition among various banks. The open nature of Internet may induce a few banks to use

unfair practices to take advantage over rivals. Any leaks at network connection or operating system etc., may allow them to interfere in a rival bank's system.

Thus one can find that along with the benefits, Internet banking carries various risks for bank itself as well as banking system as a whole. The rapid pace of technological innovation is likely to keep changing the nature and scope of risks banks face. These risks must be balanced against the benefits. Supervisory and regulatory authorities are required to develop methods for identifying new risks, assessing risks, managing risks and controlling risk exposure. But authorities need to keep in consideration that the development and use of Internet banking are still in their early stages, and policies that hamper useful innovation and experimentation should be avoided. Thus authorities need to encourage banks to develop a risk management process rigorous and comprehensive enough to deal with known risks and flexible enough to accommodate changes in the type and intensity of the risks.

2.6 Technology and Security Standards for Internet Banking: [39]

The Internet has provided a new and inexpensive channel for banks to reach out to their customers. It allows customers to access banks' facilities round the clock and 7 days a week. It also allows customers to access these facilities from remote sites/home etc. However, all these capabilities come with a price. The highly unregulated Internet provides a less than secure environment for the banks to interface. The diversity in computer, communication and software technologies used by the banks vastly increases the challenges facing the online bankers. In this chapter, an effort has been made to give an overview of the technologies commonly used in Internet banking. An attempt has been made to describe concepts, techniques and technologies related to privacy and security including the physical security. The banks planning to offer Internet banking should have explicit policies

on security. An outline for a possible framework for security policy and planning has also been given. Finally, recommendations have been made for ensuring security in Internet banking.

2.6.1 Technologies: Computer Networking & Internet:

The purpose of computer networking is sharing of computing resources and data across the whole organization and the outside world. Computer Networks can be primarily divided into two categories based on speed of data transfers and geographical reach. A Local area network (LAN) connects many servers and workstations within a small geographical area, such as a floor or a building. Some of the common LAN technologies are 10 MB Ethernet, 100 MB Ethernet, 1GB Ethernet, Fiber Distributed Data Interface (FDDI) and Asynchronous Transfer Mode (ATM). The data transfer rates here are very high. They commonly use broadcast mode of data transfer.

The Wide Area Network (WAN), on the other hand, is designed to carry data over great distances and are generally point-to-point. Connectivity in WAN set-up is provided by using dial-up modems on the Public Switched Telephone Network (PSTN) or leased lines, VSAT networks, an Integrated Services Digital Network (ISDN) or T1 lines, Frame Relay/X.25 (Permanent Virtual Circuits), Synchronous Optical Network (SONET), or by using Virtual Private Networks (VPN) which are software-defined dedicated and customized services used to carry traffic over the Internet. The different topologies, technologies and data communication protocols have different implications on safety and security of services.

To standardize on communications between systems, the International Organization of Standards developed the OSI model (the Open System Interconnection Reference Model) in 1977. The OSI breaks up the communication process into 7 layers and describe the functions and interfaces of each layer. The

important services provided by some of the layers are mentioned below. It is necessary to have a good understanding of these layers for developing applications and for deploying firewalls (described later).

- **Application Layer:** Network Management, File Transfer Protocol, Information validation, Application-level access security checking.
- **Session Layer:** establishing, managing and terminating connections (sessions) between applications.
- **Transport Layer:** Reliable transparent transfer of data between end points, end to end recovery & flow control.
- **Network Layer:** Routing, switching, traffic monitoring and congestion control, control of network connections, logical channels and data flow.
- **Data Link Layer:** Reliable transfer of data across physical link and control of flow of data from one machine to another.

Protocols:

The data transmission protocol suite used for the Internet is known as the Transmission Control Protocol/Internet Protocol (TCP/IP). The Internet is primarily a network of networks. The networks in a particular geographical area are connected into a large regional network. The regional networks are connected via a high speed "back bone". The data sent from one region to another is first transmitted to a Network Access Point (NAP) and are then routed over the backbone. Each computer connected to the Internet is given a unique IP address (such as 142.16.111.84) and a hierarchical domain name(such as cse.iitb.ernet.in).The Internet can be accessed using various application-level protocols such as FTP (File Transfer Protocol), Telnet (Remote Terminal Control Protocol), Simple Mail Transport Protocol (SMTP), Hypertext Transfer Protocol (HTTP). These protocols run on top of TCP/IP. The most innovative part of the Internet is the World Wide Web (WWW). The web uses hyperlinks, which allow users to move from any place

on the web to any other place. The web consists of web pages, which are multimedia pages composed of text, graphics, sound and video. The web pages are made using Hypertext Markup Language (HTML). The web works on a client-server model in which the client software, known as the browser, runs on the local machine and the server software, called the web server, runs on a possibly remote machine. Some of the popular browsers are Microsoft Internet Explorer and Netscape Navigator. With the popularity of web, organizations find it beneficial to provide access to their services through the Internet to its employees and the public. In a typical situation, a component of the application runs (as an 'applet') within the browser on user's workstation. The applet connects to the application (directly using TCP/IP or through web server using HTTP protocols) on the organization's application and database servers. These servers may be on different computer systems. The web-based applications provide flexible access from anywhere using the familiar browsers that support graphics and multimedia. The solutions are also scalable and easy to extend.

Banking Products:

Internet Banking applications run on diverse platforms, operating systems and use different architectures. The product may support centralized (bankwide) operations or branch level automation. It may have a distributed, client server or three tier architecture based on a file system or a DBMS package. Moreover, the product may run on computer systems of various types ranging from PCs, open (Unix based) systems, to proprietary main frames. These products allow different levels of access to the customers and different range of facilities. The products accessible through Internet can be classified into three types based on the levels of access granted:

Information only systems:

General-purpose information like interest rates, branch locations, product features, FAQs, loan and deposit calculators are provided on the bank's web (WWW) site.

The sites also allow downloading of application forms. Interactivity is limited to a simple form of 'e-mail'. No identification or authentication of customers is done and there is no interaction between the bank's production system (where current data of accounts are kept and transactions are processed) and the customer.

Electronic Information Transfer System*:*
These systems provide customer specific information in the form of account balances, transaction details, statement of account etc. The information is still largely 'read only'. Identification and authentication of customer takes place using relatively simple techniques (like passwords). Information is fetched from the Bank's production system in either the batch mode or offline. Thus, the bank's main application system is not directly accessed.

Fully Transactional System:
These systems provide bi-directional transaction capabilities. The bank allows customers to submit transactions on its systems and these directly update customer accounts. Therefore, security & control system need to be strongest here.

2.6.2 Application Architecture:

A computer-based application may be built as a monolithic software, or may be structured to run on a client–server environment, or even have three or multi-tiered architecture. A computer application typically separates its 3 main tasks: interactions with the user, processing of transactions as per the business rules, and the storage of business data. The three tasks can be viewed as three layers, which may run on the same system (possibly a large, proprietary computer system), or may be separated on to multiple computers (across the Internet), leading to three-tier or multi-tier architecture. These layers can be briefly described as follows:

Presentation Layer :
This layer is responsible for managing the front-end devices, which include browsers on personal computers, Personal Digital Assistants (PDAs), mobile phones, Internet kiosks, Web TV etc. The presentation layer takes care of user interface related issues like display details, colour, layout, image etc. It also has important responsibilities in user authentication and session management activity.

Application layer :
It contains the business logic (for processing of data and transactions) and necessary interfaces to the data layer. It processes requests from the presentation layer, connects to the data layer, receives and processes the information and passes results back to the presentation layer. It is responsible for ensuring that all the business rules are incorporated in the software. The issues of scalability, reliability and performance of the services to a great extent depend upon the application layer architecture.

Data Layer :
The data layer uses a database package to store, retrieve and update application data. The database may be maintained on one or multiple servers. A database package also supports back-up and recovery of data, as well as logging of all transactions.

2.6.3 Issues in Administration of Systems and Applications: [40]

The role of the network and the database administrator is pivotal in securing the information systems of any organization. The role extends across various job functions and any laxity in any of the functions leaves the system open for malicious purposes. A few important functions of the administrator and how they relate to or impinge on system security are discussed below:

Installation of Software:

A software (whether system or application) needs to be carefully installed as per the developer's instructions. The software system may contain bugs and security holes, which over a period are fixed through appropriate patches. It is necessary to know the latest and correct configuration of all software packages. Hackers and intruders are often aware of these bugs and may exploit known weaknesses in the software; hence, care should be taken to install only the latest versions of software with the latest patches. Further, improper installation may lead to degradation of services. Installation of pirated software is not only illegal and unethical, but may also contain trojans and viruses, which may compromise system security. In the case of installation of outsourced software, care should be taken to compare the source code and the executable code using appropriate tools as unscrupulous developers may leave backdoor traps in the software and for illegal access and update to the data. In addition, while installing software care should be taken that only necessary services are enabled on a need to use basis.

Access Controls and User Maintenance :

An administrator has to create user accounts on different computer systems, and give various access permissions to the users. Setting access controls to files, objects and devices reduces intentional and unintentional security breaches. A bank's system policy should specify access privileges and controls for the information stored on the computers. The administrators create needed user groups and assign users to the appropriate groups. The execution privilege of most system–related utilities should be limited to system administrators so that users may be prevented from making system level changes. The write / modify access permissions for all executables and binary files should be disabled. If possible, all log files should be made "append only". All sensitive data should be made more secure by using encryption. The system and database administrators are also responsible for the maintenance of users and the deletion of inactive users. Proper logs should be

maintained of dates of user creation and validity period of users. There should be a frequent review to identify unnecessary users and privileges, especially of temporary users such as system maintenance personnel and system auditors.

Backup, Recovery & Business Continuity :

Back-up of data, documentation and software is an important function of the administrators. Both data and software should be backed up periodically. The frequency of back up should depend on the recovery needs of the application. Online / real time systems require frequent backups within a day. The back-up may be incremental or complete. Automating the back up procedures is preferred to obviate operator errors and missed back-ups. Recovery and business continuity measures, based on criticality of the systems, should be in place and a documented plan with the organization and assignment of responsibilities of the key decision making personnel should exist. An off-site back up is necessary for recovery from major failures / disasters to ensure business continuity. Depending on criticality, different technologies based on back up, hot sites, warm sites or cold sites should be available for business continuity. The business continuity plan should be frequently tested.

System & Network Logging :

Operating systems, database packages and even business applications produce a 'log' of various tasks performed by them. Most operating systems keep a log of all user actions. Log files are the primary record of suspicious behavior. Log files alert the administrator to carry out further investigation in case of suspicious activity and help in determining the extent of intrusion. Log files can also provide evidence in case of legal proceedings. The administrator has to select types of information to be logged, the mechanisms for logging, locations for logging, and locations where the log files are stored. The information required to be logged should include Login/Logout information, location and time of failed attempts, changes in status,

status of any resource, changes in system status such as shutdowns, initializations and restart; file accesses, change to file access control lists, mail logs, modem logs, network access logs, web server logs, etc. The log files must be protected and archived regularly and securely.

2.6.4 Security and Privacy Issues: Terminology: [41]

Security:
Security in Internet banking comprises both the computer and communication security. The aim of computer security is to preserve computing resources against abuse and unauthorized use, and to protect data from accidental and deliberate damage, disclosure and modification. The communication security aims to protect data during the transmission in computer network and distributed system.

Authentication:
It is a process of verifying claimed identity of an individual user, machine, software component or any other entity. For example, an IP Address identifies a computer system on the Internet, much like a phone number identifies a telephone. It may be to ensure that unauthorized users do not enter, or for verifying the sources from where the data are received. It is important because it ensures authorization and accountability. Authorization means control over the activity of user, whereas accountability allows us to trace uniquely the action to a specific user. Authentication can be based on password or network address or on cryptographic techniques.

Access Control:
It is a mechanism to control the access to the system and its facilities by a given user up to the extent necessary to perform his job function. It provides for the protection of the system resources against unauthorized access. An access control mechanism uses the authenticated identities of principals and the information about these

principals to determine and enforce access rights. It goes hand in hand with authentication. In establishing a link between a bank's internal network and the Internet, we may create a number of additional access points into the internal operational system. In this situation, unauthorized access attempts might be initiated from anywhere. Unauthorized access causes destruction, alterations, theft of data or funds, compromising data confidentiality, denial of service etc. Access control may be of discretionary and mandatory types.

Data Confidentiality:

The concept of providing for protection of data from unauthorized disclosure is called data confidentiality. Due to the open nature of Internet, unless otherwise protected, all data transfer can be monitored or read by others. Although it is difficult to monitor a transmission at random, because of numerous paths available, special programs such as "Sniffers", set up at an opportune location like Web server, can collect vital information. This may include credit card number, deposits, loans or password etc. Confidentiality extends beyond data transfer and include any connected data storage system including network storage systems. Password and other access control methods help in ensuring data confidentiality.

Data Integrity:

It ensures that information cannot be modified in unexpected way. Loss of data integrity could result from human error, intentional tampering, or even catastrophic events. Failure to protect the correctness of data may render data useless, or worse, dangerous. Efforts must be made to ensure the accuracy and soundness of data at all times. Access control, encryption and digital signatures are the methods to ensure data integrity.

Non-Repudiation:

Non-Repudiation involves creating proof of the origin or delivery of data to protect the sender against false denial by the recipient that data has been received or to protect the recipient against false denial by the sender that the data has been sent. To ensure that a transaction is enforceable, steps must be taken to prohibit parties from disputing the validity of, or refusing to acknowledge, legitimate communication or transaction.

Security Audit Trail:

A security audit refers to an independent review and examination of system's records and activities, in order to test for adequacy of system controls. It ensures compliance with established policy and operational procedures, to detect breaches in security, and to recommend any indicated changes in the control, policy and procedures. Audit Trail refers to data generated by the system, which facilitates a security audit at a future date.

2.6.5 Attacks and Compromises: [42]

When a bank's system is connected to the Internet, an attack could originate at any time from anywhere. Some acceptable level of security must be established before business on the Internet can be reliably conducted. An attack could be any form like:

- The intruder may gain unauthorized access and nothing more.
- The intruder gains access and destroys, corrupt or otherwise alters data
- The intruder gains access and seizes control partly or wholly, perhaps denying access to privileged users
- The intruder does not gain access, but instead forges messages from your system
- The intruder does not gain access, but instead implements malicious procedures that cause the network to fail, reboot, and hang.

Modern security techniques have made cracking very difficult but not impossible. Further more, if the system is not configured properly or the updated patches are not installed then hackers may crack the system using security hole. A wide range of information regarding security hole and their fixes is freely available on the Internet. System administrator should keep himself updated with this information. Common cracking attacks include:

- E-mail bomb and List linking
- Denial-of-Service
- Sniffer attack
- Utilizing security hole in the system software
- *E-mail bomb:* This is a harassment tool. A traditional e-mail bomb is simply a series of message (perhaps thousands) sent to your mailbox. The attacker's object is to fill the mailbox with junk.
- *Denial-of-Service (DoS) attacks:* DoS attacks can temporarily incapacitate the entire network(or at least those hosts that rely on TCP/IP). DoS attacks strike at the heart of IP implementations. Hence they can crop up at any platform, a single DoS attack may well work on several target operating systems. Many DoS attacks are well known and well documented. Available fixes must be applied.
- *Sniffer Attack***:** Sniffers are devices that capture network packets. They are a combination of hardware and software. Sniffers work by placing the network interface into promiscuous mode. Under normal circumstances, all machines on the network can "hear" the traffic passing through, but will only respond to data addressed specifically to it. Nevertheless, if the machine is in promiscuous mode then it can capture all packets and frames on the network. Sniffers can capture passwords and other confidential information. Sniffers are extremely difficult to detect because they are passive

programs. Encrypted session provides a good solution for this. If an attacker sniffs encrypted data, it will be useless to him. However, not all applications have integrated encryption support.

- *Holes:* A hole is any defect in hardware, software or policy that allows attackers to gain unauthorized access to your system. The network tools that can have holes are Routers, Client and Server software, Operating Systems and Firewalls.

2.6.6 Authentication Techniques: [43]

As mentioned earlier, authentication is a process to verify the claimed identity. There are various techniques available for authentication. Password is the most extensively used method. Most of the financial institutions use passwords along with PIN (Personal Identification Number) for authentication. Technologies such as tokens, smart cards and biometrics can be used to strengthen the security structure by requiring the user to possess something physical.

Token technology relies on a separate physical device, which is retained by an individual, to verify the user's identity. The token resembles a small hand-held card or calculator and is used to generate passwords. The device is usually synchronized with security software in the host computer such as an internal clock or an identical time based mathematical algorithm. Tokens are well suited for one-time password generation and access control. A separate PIN is typically required to activate the token.

Smart cards resemble credit cards or other traditional magnetic stripe cards, but contain an embedded computer chip. The chip includes a processor, operating system, and both Read Only Memory (ROM) and Random Access Memory (RAM). They can be used to generate one-time passwords when prompted by a host computer, or to carry cryptographic keys. A smart card reader is required for their use.

Biometrics involves identification and verification of an individual based on some physical characteristic, such as fingerprint analysis, hand geometry, or retina scanning. This technology is advancing rapidly, and offers an alternative means to authenticate a user.

2.6.7 Firewalls: [44]

The connection between internal networks and the outside world must be watched and monitored carefully by a gatekeeper of sorts. Firewalls do this job. Otherwise, there is a risk of exposing the internal network and systems, often leaving them vulnerable and compromising the integrity and privacy of data. Firewalls are a component or set of components that restrict access between a protected network and the outside world (i.e., the Internet). They control traffic between outside and inside a network, providing a single entry point where access control and auditing can be imposed. All firewalls examine the pieces or packets of data flowing into and out of a network and determine whether a particular person should be given access inside the network. As a result, unauthorized computers outside the firewall are prevented from directly accessing the computers inside the internal network. Broadly, there are three types of firewalls i.e. Packet filtering firewalls, Proxy servers and tasteful inspection firewall. Packet filtering routers are the simplest form of firewalls.

The bastion host directs message accepted by the router to the appropriate application servers in the protected network. Their function is to route data of a network and to allow only certain types of data into the network by checking the type of data and its source and destination address. If the router determines that the data is sourced from an Internet address which is not on its acceptable or trusted sources list, the connection would be simply refused. The advantage of this type of firewall is that it is simple and cheaper to implement and also fast and transparent to the users. The disadvantage is that if the security of the router were

compromised, computers on the internal network would be open to external network for attacks. Also, the filtering rules can be difficult to configure, and a poorly configured firewall could result in security loopholes by unintentionally allowing access to an internal network. Proxy servers control incoming and outgoing traffic for a network by executing specific proxy program for each requested connection. If any computer outside the internal network wants to access some application running on a computer inside the internal network, then it would actually communicate with the proxy server, and proxy server in turn will pass the request to the internal computer and get the response which will be given to the recipient (outside user). That is, there is no direct connection between the internal network and Internet. This approach allows a high level of control and in-depth monitoring using logging and auditing tools. However, since it doubles the amount of processing, this approach may lead to some degradation in performance. Fig. 3 shows a typical firewall organization consisting of 'militarized zone' that separates the protected network from the Internet.

Stateful Inspection firewall:

This type of firewalls thoroughly inspects all packets of information at the network level as in the case of proxy servers. Specifications of each packet of data, such as the user and the transportation method, the application used are all queried and verified in the inspection process. The information collected is maintained so that all future transmissions are inspected and compared to past transmission. If both the "state" of the transmission and the "context" in which it is used deviate from normal patterns, the connection would be refused. This type of firewalls are very powerful but performance would also decline due to the intensive inspection and verification performed.

Cryptography: [45]

The process of disguising a message in such a way as to hide its substance is called encryption. An encrypted message is called cipher text. The process of turning a cipher text back into plain text is called decryption. Cryptography is the art and science of keeping messages secure. It uses a 'key' for encrypting or decrypting a message. Both the method of encryption and the size of key are important to ensure confidentiality of a message. There are two types of encryption: Symmetric key and Asymmetric key encryption. In the symmetric key cryptography scheme, the same key is used to encrypt and decrypt the message. Common symmetric algorithms include One-time pad encryption, Data Encryption Standard (DES), Triple DES, LOKI, Twofish, Blowfish, International Data Encryption Algorithm (IDEA). DES and Triple DES are the commonly used techniques. Asymmetric key cryptography scheme is also known as Public key crypto-system. Here two keys are used. One key is kept secret and therefore it is referred as "private key". The other key is made widely available to anyone who wants it, and is referred as "Public key". The Public key and Private key are mathematically related so that information encrypted using the public key can only be decrypted by the corresponding private key and vice-versa. Importantly, it is near to impossible to find out the private key from the public key. Common and more popular public key cryptosystem algorithms are Diffie-Hellman, RSA, Elliptic Curve etc. In all these, the confidentiality is directly related to the key size. Larger the key size, the longer it takes to break the encrypted message.

- *Diffie-Hellman*: This is the first public key algorithm invented. It gets its security from the difficulty of calculating discrete logarithms in a finite field. Diffie-Hellman method can be used for distribution of keys to be used for symmetric encryption.
- *RSA:* Named after its three inventors, Ron Rivest, Adi Shamir and Leonard Adleman, who first introduced the algorithm in 1978, RSA gets its security from the difficulty of factoring large numbers.

The public and private keys are function of a pair of large (100 or 200 digits or even larger) prime numbers. The pair is used for asymmetric encryption.

2.6.8 Digital Signature and Certification: [46]

Digital signatures authenticate the identity of a sender, through the private, cryptographic key. In addition, every digital signature is different because it is derived from the content of the message itself. The combination of identity authentication and singularly unique signatures results in a transmission that can not be repudiated.

Digital signature can be applied to any data transmission, including e-mail. To generate digital signature, the original, unencrypted message is processed through mathematical algorithms that generate a 'message digest' (a unique character representation of data). This process is known as "hashing". The message digest is then encrypted with the private key and sent along with the message (could be encrypted also). The recipient receives both the message and encrypted message digest. The recipient decrypts the message digest using the sender's public key, and then runs the message through the hash function again. If the resulting message digest matches the one sent with the message, the message has not been altered and data integrity is verified. Because the message digest was encrypted using the private key, the sender can be identified and bound to the specific message.

2.6.9 Certification Authorities and Digital Certificates: [47]

Certificate Authorities and Digital Certificates are emerging to further address the issues of authentication, non-repudiation, data privacy and cryptographic key management. A Certificate Authority (CA) is a trusted third party that verifies the identity of a party to a transaction. To do this, the CA vouches for the identity of a party by attaching the CA's digital signature to any messages, public keys, etc.,

which are transmitted. The CA must be trusted by the parties involved, and identities must have been proven to the CA beforehand. Digital certificates are messages that are signed with the CA's private key. They identify the CA, the represented party, and even include the represented party's public key.

Secure Socket Layer (SSL): [48]

SSL is designed to make use of TCP to provide a reliable end-to-end secure service. The SSL servers have digital certificates issued by Certifying Authorities so that the clients can authenticate the service provider (a bank in our case). The servers use a password /PIN/digital certificate to authenticate clients. Once the clients and server have authenticated each other, they establish a session key for encryption of messages. The diagram above shows flow of messages in SSL. The flow of authentication messages in SSL is shown in Fig.6.4.

Public Key Infrastructure (PKI): [49]

Public key cryptography can play an important role in providing needed security services including confidentiality, authentication, digital signatures and integrity. Public key cryptography uses two electronic keys: a public key and a private key. The public key can be known by anyone while the private key is kept secret by its owner. As long as there is strong binding between the owner and the owner's public key, the identity of the originator of a message can be traced to the owner of the private key. A Public Key Infrastructure (PKI) provides the means to bind public keys to their owners and helps in the distribution of reliable public keys in large heterogeneous networks. Public keys are bound to their owners by public key certificates. These certificates contain information such as the owner's name and the associated public key and are issued by a reliable Certification Authority (CA).

PKI consists of the following components:[50]

- *Key Certificate* - An electronic record that binds a public key to the identity of the owner of a public-private key pair and is signed by a trusted entity.
- *Certification Authority (CA)* - A trusted entity that issues and revokes public key certificates
- *Registration Authority (RA)* - An entity that is trusted by the CA to register or vouch for the identity of users to the CA.
- *Certificate Repository* - An electronic site that holds certificates and CRLs. CAs post certificates and CRLs to repositories.
- *Certificate Revocation List (CRL)* - A list of certificates that have been revoked. The list is usually signed by the same entity that issued the certificates. Certificates can be revoked for several reasons. For example, a certificate can be revoked if the owner's private key has been lost or if the owner's name changes**.**
- *Certificate User* - An entity that uses certificates to know, with certainty, the public key of another entity.

The widespread use of PKI technology to support digital signatures can help increase confidence of electronic transactions. For example, the use of a digital signature allows a seller to prove that goods or services were requested by a buyer and therefore demand payment. The use of a PKI allows parties without prior knowledge of each other to engage in verifiable transactions.

Confidentiality and PKI: A PKI could also support confidentiality services using a public-private key pair that is different from the one used for signing. In this case, users need to obtain a separate certificate for the confidentiality public key. To send an encrypted message, a user could obtain the recipient's confidentiality certificate

from a certificate repository and verify that it is valid. Then the sender can encrypt the message using the public key. Only the recipient, in possession of the private key, will be able to decrypt the message.

Certificates: Although there have been several proposed formats for public key certificates, most certificates available today are based on an international standard (ITU-T X.509 version 3). This standard defines a certificate structure that includes several optional extensions. The use of X.509v3 certificates is important because it provides interoperability between PKI components. Also, the standard's defined extensions offer flexibility to support specific business needs.

PKI Architectures:

A PKI is often composed of many CAs linked by trust paths. The CAs may be linked in several ways. They may be arranged hierarchically under a "root CA" that issues certificates to subordinate CAs. The CAs can also be arranged independently in a network. Recipients of a signed message with no relationship with the CA that issued the certificate for the sender of the message can still validate the sender's certificate by finding a path between their CA and the one that issued the sender's certificate. The National Institute of Standards and Technology (NIST) has developed a hybrid architecture specification based on both a hierarchical and a network architecture model in the document, Public Key Infrastructure (PKI) Technical Specifications (Version2.3): Part C - Concept of Operations.

2.6.10 Physical Security: [51]

Physical security is a vital part of any security plan and is fundamental to all security efforts--without it, information security, software security, user access security, and network security are considerably more difficult, if not impossible, to initiate. Physical security is achieved predominantly by controlled and restricted physical access to the systems resources. *Access control* broadly provides the ability

to grant selective access to certain people at certain times and deny access to all others at all times. Physical security involves the protection of building sites and equipment (and all information and software contained therein) from theft, vandalism, natural disaster, manmade catastrophes and accidental damage (e.g., from electrical surges, extreme temperatures and spilled coffee). It requires solid building construction, suitable emergency preparedness, reliable power supplies, adequate climate control, and appropriate protection from intruders. Thus, in broad terms, the focus is on restricting access to the computer area, controlling access to all vulnerable and sensitive areas of the department, and monitoring of all staff and visitors.

Physical Access can be secured through the following means: Bolting Door locks and Combination Locks, Electronic Door Locks, Biometric Door Locks, Manual Logging, Electronic Logging, Photo Identification Badges, Video Cameras stationed at strategic points, Controlled Visitor Access. A bank should also have in place environmental controls to manage exposures from fire, natural disasters, power failure, air-conditioning failure, water damage, bomb threat / attack etc. A few means of obtaining control over environmental exposure are:

- The server room and any other unattended equipment room should have water detector. Fire extinguishers should be placed at all strategic points, supplementing fire suppression systems with smoke detectors, use of fire resistant materials in office materials including furniture, redundant power supply from two substations, electrical wiring placed in fire resistant panels and conduits and documented and tested evacuation plans.
- It is important to educate all 'stake-holders' (users, employees, etc) about the importance of physical security. This education should be carried out as part of 'social engineering'.

Security Policy:

The information security policy is the systemization of approaches and policies related to the formulation of information security measures to be employed within the organization to assure security of information and information systems owned by it. The security policy should address the following items:

- Basic approach to information security measures.
- The information and information systems that must be protected, and the reasons for such protection.
- Priorities of information and information systems that must be protected.
- Involvement and responsibility of management and establishment of an information security coordination division.
- Checks by legal department and compliance with laws / regulations.
- The use of outside consultants.
- Identification of information security risks and their management.
- Impact of security policies on quality of service to the customers (for example, disabling an account after three unsuccessful logins may result in denial of service when it is done by somebody else mischievously or when restoration takes unduly long time).
- Decision making process of carrying out information security measures.
- Procedures for revising information security measures.
- Responsibilities of each officer and employee and the rules (disciplinary action etc) to be applied in each case.
- Auditing of the compliance to the security policy.
- User awareness and training regarding information security.
- Business continuity Plans.
- Procedures for periodic review of the policy and security measures.

The top management of the bank must express a commitment to security by manifestly approving and supporting formal security awareness and training. This may require special management level training. Security awareness will teach people not to disclose sensitive information such as password file names. Security guidelines, policies and procedures affect the entire organization and as such, should have the support and suggestions of end users, executive management, security administration, IS personnel and legal counsel.

CHAPTER: 3

LITERATURE REVIEW

Introduction:

Generally, a researcher conducts and surveys the related literature in order to review the present status of a particular research topic. From the survey of literature, a researcher is able to know the quantum of work already done on his research topic so far not touched, or yet to be undertaken. The overview of literature at the national or an international level is to be researched with the help of research reports, articles, books and other materials. The major benefits of literature reviews are: firstly, helps the researcher in avoiding duplication of efforts on the same research topic. Secondly, helps the researcher in adopting methodologies used successfully by other researchers, writers and policy makers. Thirdly, suggests new approaches in planning, organizing the investigation of research topic. Fourthly, helps to narrow down the research problem more clearly and sixthly, assists investigators to develop firm understandings of theoretical implications of proposed inquiries.

This study contributes to literature by focusing on the measurement of Customer Satisfaction of Internet Banking in Western India. The aim of literature reviews is to justify, rationale of an ensuring research study, provides an overview of historical perspectives and to bring to the light the research trends and problems.

The present study identifies an ample number of research works at global level in general but at domestic level very few studies have been reviewed and found most appropriate on measuring customer satisfaction of Internet Banking in Western India. The contribution of various researchers, policy-makers and writers to this area has focused on explaining the process of the internet banking and satisfaction of the customer with the service, their challenges, advantages, disadvantages,

herewith, the study, in brief summary and present some of them in a descending order as year of publication.

Siddiqui K.O., (2011) found that the positive relationship between all the service quality attributes and customer satisfaction. This study also suggests that SERVQUAL is a suitable instrument for measuring the bank service quality in the Bangladeshi context. Therefore, bank managers can use this instrument to assess the bank service quality in Bangladesh. Moreover, because all the dimensions of service quality attributes are positively correlated with customer satisfaction, Bangladeshi bank managers should emphasize all the service quality dimensions in maintaining and improving the service quality that they provide.

Empathy shows the highest positive correlation with customer satisfaction in the current study. The core concept of empathy is employee-customer interactions. Therefore, Bangladeshi bank managers would be well advised to emphasize the employee training programmes so that they can offer personalized service. The main aim should be to develop a long-term relationship with the customers. The current study demonstrates that there is a large positive correlation between customer satisfaction and customer loyalty. That means that if the customers are satisfied then they will become loyal. Jones and Sasser (1995) pointed out that there is a huge difference between merely satisfied and completely satisfied customers. Therefore bank managers should pay attention on the complete customer satisfaction. [1]

Ishaq M.I., (2011) found that four dimensions of service quality have impact on behavioral responses of the banking clients. Convenience, physical evidence and product innovation put positive impact on behavioral response means these dimensions create positive word-of-mouth communication through the customers and customer's loyalty and intention to stay with the current bank will increases

and pricing will put negative impact on behavioral response. These study findings are consistent with the findings of Blodgett & Li (2007) and Fernandes & dos Santos (2007). Overall, the findings impart very strong support the direct effects of customer satisfaction on the customers' behavioral responses. More specifically, research findings indicated that when the customer's satisfaction is high they will stay with their current service providers, engage in positive word-of-mouth communications and subdue negative behavioral intentions. [2]

Srivastava & Chatterjee, (2011) Found that the overall satisfaction or dissatisfaction of customers with regards to expected and actual services quality have been analyzed in this research paper and expressed dissatisfaction with the services offered by the bank. The dissatisfied customers attributed responsiveness dimension of services quality as the major lacuna with the transacting bank. Among the satisfied customers too there existed a disparity between the expected and actual service quality experienced at the transacting bank. These customers suggested that the bank is yet to instill confidence among the customers that it has the ability to provide excellent services dependably and accurately.

While making an assessment of customer's response with regards to his/her overall satisfaction or dissatisfaction with the transacting bank's services, it was found that most of the customers 78.78% were dissatisfied, while only 27.21% customers were satisfied. The interpretation was based on the services quality assessment made by both dissatisfied and satisfied customers. Customers who were dissatisfied considered the responsiveness dimension of services quality to the more important than other dimension. However, on all the dimension of the services quality the transacting bank was perceived to be poor than the corresponding service offered by the bank. [3]

Ahangar R.G., (2011), found that the website is an important element in a bank's marketing communications activities and giving better customer experience. It is therefore important to use it in an appropriate way and to provide rich content and to keep it updated to attract and maintain customers. Bank should consider that it is beneficial to spend time on the design because this can help the company attract visitors, which in turn can become customer. Banks should conduct surveys and self assessment tests which should be actually related to the product and service line, which would in turn customers more educated about the companies offerings and this could be done just by starting a blog or chat for the customers. Banks should create platforms wherein customer can be free to express their opinion or give the feedback to the banks. Automated e-mail and instant message should be used more extensively than it is at present. It is essential to assess the effectiveness of a website. By doing this bank can improve their site and that help to provide positive web experience to the customers. [4]

Rahmath Safeena *et al* (2011) found that banks need to highlight the benefits of IB, make IB easy to use, and enhance IB security to improve consumers' trust. They also need to make the consumers aware about the system by providing them about the details of the benefits associated with it and also ensuring security of the system. Banks can highlight benefits such as IB conveniences in their promotional and advertising activities. The IB interface could be made simple.

Banks also need to engage in security enhancement activities such as encryption, firewall, and user protection and authenticity. Trust is one of the more influential factors, implying that controlling the risk of online banking is more important than providing benefits. This finding is particularly important for managers as they decide how to allocate resources to retain and expand their current customer base. However, building a risk-free online transaction environment is much more difficult than providing benefits to customers.

Therefore, online banking companies need to search for risk-reducing strategies that might assist in inspiring high confidence in potential customers. This study suggests that they should consider focusing on the prevention of intrusion, fraud and identity theft. In addition, this study suggests that online banking companies could develop trust-building mechanisms to attract customers, such as statements of guarantee, increased familiarity through advertising, and long-term customer service. The proposed model makes an important contribution to the emerging literature on e-commerce, especially with regard to online banking. [5]

Devi & Malarvizhi, (2010) found that customers are satisfied with the quality of e-banking services. But the study shows that among the varied e-banking services, only ATM is more popular which is most cost effective. While using e-banking services the customers faced problems such as technical hurdles, more formalities, less social relation with banks, skill up gradation, lack of knowledge and insufficient number of ATM centers. To popularize the e-banking services, it was felt that more training programs must be conducted for bank customers through demo fair at the centers.

The analysis of the study revealed that in the global competitive world, to promote e-banking services it is of paramount importance that the banks must ensure quality in customer service. Quality in work and satisfaction of the customers are the two key words which must be given sternest attention to promote products. [6]

Alhemoud (2010), suggested that in general customers in Kuwait, Kuwaiti and non-Kuwaiti customers are satisfied with services provided by retail banks. The ANOVA test shows slight differences between Kuwaiti and non-Kuwaiti customers in their degree of satisfaction. Kuwaiti customers are mostly satisfied with: availability of ATMs in several locations, safety of funds, easy-to-use ATMs, and the quality of services provided. While non-Kuwaiti customers are mostly satisfied

with: availability of ATMs in several locations, phone account access, safety of funds, ease of opening a current account, and bank image and reputation.

The least factors that Kuwaiti customers are satisfied with are: service prices, interest rates on saving accounts, interest rates on loans, and ease of obtaining loans. While non-Kuwaitis have ranked their dissatisfaction with: interest rates on loans, bank monetary transactions, interest rates on saving account, and ease of obtaining loans (the acceptability of loans terms).

The research findings clearly suggest that the drive towards the ease of banking and convenience are favored by customer and, therefore, banks should find alternative strategic routes designed to improve service delivery (either human or technology based). Bank customers' attitudes towards the human provision of services and subsequent levels of satisfaction will impact on bank switching more than when the same service delivery is made through automation.

Bank managers can use this information to better serve their customers and increase satisfaction in areas that need some attention. The link between service delivery and customer satisfaction is visible in the study results, and financial institutions and bank managers, as a whole, should continue to find effective ways to systematically measure and manage customer sustainable satisfaction and retention. [7]

Sadeghi & Hanzaee, (2010) their finding of the study showed that those who use electronic banking services in Iran have a higher educational background. In other words, better educated people use banks electronic services more frequently than others. Moreover, according to the findings governmental banks (Melli Bank and Mellat Bank) have the largest number of electronic services users with saman bank, which is a private bank, being the third. This could be due to customers having more confidence in governmental banks in Iran.

After calculating the variance average between factors (AVE), we found that the accuracy, reliability, image, impression of the bank and management, and web site design are the main grounds for satisfaction. The factors of security and privacy had the least correlation with satisfaction. This might also be due to the confidence customers have in electronic banking services, especially in governmental banks. [8]

Ravichandran K., Mani B.T., Kumar S.A. and Parbhakaran S., (2010) their study suggested that recognizing responsiveness as another form of responsibility is essential to every member of the health care system in order to increase customers' overall satisfaction with banking service. So the study affirms that the service quality level in the proposed study on private banks was at adequate level and the regression on overall service quality lists out the various servqual items which has a spread in all the dimensions of the servqual model.

This result is similar to that of the study by O'Connor et al. (2000). The extent of the quality disconfirmation in five dimensions is based on the order from the lowest mean to the highest mean, as follows: tangibles (.684), empathy (.619), responsiveness (.378), reliability (.243), and assurance (.336). Since all quality disconfirmation scores were positive, the subjects' perceptions (actual) were greater than expectations and the subjects were satisfied with banks service quality in varying degrees. The findings also showed that only responsiveness was found to be significant in predicting overall satisfaction with the banking service (b = 0.143, p = .0003), although the R-square is .102. Being responsive means being attentive to the needs of customer's in a timely manner. Though prompt service has both an objective and subjective component for both the provider and consumer of a service (Sower. et al., 2001). [9]

Zhu J.D. et al (2010) in their study, they found that Banks are interested in understanding the roles of perceived value, trust, and satisfaction in influencing

customers' loyalty to e-SQ (Harris & Goode, 2004). Our results were consistent with studies of offline exchange, showing that service quality exerts an indirect influence on loyalty, while perceived value exhibits both direct and indirect associations with online loyalty.

This study extends research carried out by DeLone and McLean (1992) on consumer evaluation of service quality because we included information, system quality, and trust as antecedents in this model. The results indicate that perceived e-SQ is composed of three key constructs and four dimensions. The three constructs – information, system quality, and trust – play important roles as antecedents influencing e-SQ. Moreover, our results reveal that different dimensions are influenced by different antecedents. For instance, in addition to informativeness, customers' perceived security regarding receiving promised services at all times, has an impact on information quality.

In terms of practice, the results of the study also have implications. In order to ensure service consistency, online claims and promises need to be matched with physical delivery of these to develop trust and, therefore, loyalty. However, a firm's e-services delivery is constituted by its online presence, and the most easily controllable means of influencing the customer. Thus, firms should continuously maintain, manage, and improve their online mechanisms, to best meet the needs, wants, and demands of both current and potential customers. In this regard, creating and developing websites that users perceive to be providing value and satisfaction, and maintaining appropriate service quality were identified by our respondents as fruitful avenues for those firms interested in enhancing factors linked with customer loyalty. It would appear that the requirements of online customers are similar to those of offline customers.

Further, results suggest that trustworthiness is of significant importance, so that firms should recognize customers' concerns and develop strategies, systems, and websites that further build and maintain trust. [10]

Dixit N. & Datta S.K., (2010) in their study, they found that country like India, there is need for providing better and customized services to the customers. Banks must be concerned the attitudes of adult customers with regard to acceptance of online banking. It is shows that adult customers are more reluctant to join new technologies or methods that might contain little risk. It's also important to note that some adult customers are interested in online banking; however, they do not posses the necessary computer literacy to conduct it. In addition banks should design the website to concern security and privacy issues.

The recommendations to the banks are that they have to increase the level of trust between banks' website and customers. Because customer perception on security and privacy aspect have been seen in the literature. The importance of security and privacy for the acceptance of internet banking has been noted in many banks study and found that people have weak understanding of internet banking, although they are aware about risk. Banks noted that although consumer confidence in their bank was strong yet their confidence in the technology was weak through many studies. It is clear those adult customers are ready to adopt online banking if banks take necessary action. There are following strategies should be applied by banks.

Banks should ensure that online banking is safe and secure for financial transaction like as traditional banking, Banks should organize seminar and conference to educate the customer regarding uses of online banking as well as security and privacy of their accounts, Some elder customers are hindered by lack of computer skills. They need to be educated on basic skills required to conduct online banking, Banks must emphasize the convenience that online banking can provide to elder

people, such as avoiding long queue, in order to motivate them to use it, Banks must emphasize the cost saving that online can provide to the elder people, such as reduce transaction cost by use of online banking.

Adult customer always prefers advanced technology but sometimes lack of knowledge they are unable to access such technologies. The fact that people have positive perceptions about online banking should be treated with great value. This is because one bad experience can result in customer discontinuation of the E-banking service (Jun & Cai, 2001). [11]

Nupur J.M., (2010) found that E-banking is a much talked issue for last few years in Bangladesh and currently gaining patronization for the country by the Bangladesh Bank which is a central bank. However, it is still in the growing stage. Many enthusiastic merchants started e-commerce activities in Bangladesh but due to lack of support from the banking industries.

E-bank fund transfer in Bangladesh is allowed only through clearing house which requires at least two working days to be settled the transaction. E-banking payment will also facilitate the customers to pay their utility bills through ATM, Online banking or SMS banking systems from anywhere anytime even from office / residence at mid-night or holidays. Tomiuk and Pinsoneaults (2001) e-banking environment observation is supported by the study. Gradual process for implementing e-banking, new policies, rules and regulations are being enacted by the Bangladesh Bank. Wise and Ali (2009) observation regarding customer relationship management through automated banking system should be considered by the policy makers.

By stepping into new and aggressive strategy of e-banking, it can make a difference in Bangladesh banking sector. By constantly reviewing its e-banking systems,

policies, process, and prices of its products and services, ensuring various facilities, use of modern technology and establishing a bond with the customers, it could reach in leading position. On the basis of the literature review we go for quantitative test. Empirical results and analysis of the findings proves that the null hypothesis is accepted and the alternative hypothesis is rejected which was stated earlier. [12]

Mishra Uma Shankar *et al* (2010), found that good premises and suitable location of the branch are essential for bank branches for smooth operation of banking business. When the private banks are compared with public sector banks, all the private banks have excellent locations from business point of view compared to public banks. Getting high-value customers or more business from the existing customers is being adapted as the major strategies by the public sector banks, which is not true in case of private sector banks. For providing better service to customers proper training should be given to the staff by the banks. The rate of vanishing customers is higher in case of urban large-sized public sector banks.

The more attractive private banks are able to attract new customers. Public sector banks invest and concentrate more on staff development where as private sector gives more priority on infrastructural aspects. Rigid policy of public banks creates more dissatisfaction among the customers while for private banks mostly the value of service is the key factor of dissatisfaction.

The major reasons for dissatisfaction with public sector banks is the rigid policy, while for the private banks it is mostly service related factors like service charges, interest rates on loans & term deposit and matching to customer's attitude. Again for variables like Attitude of Staff, Speed of Transactions, Decor of the Bank, Physical Facilities, Computerization and Introduction of new & innovative products; the Private Banks are far ahead of their counterparts.

But one variable i.e. Knowledge level of Staff for public sector banks is higher than the private banks. This trend may be evident, as the Private Banks spends heavily on developing infrastructure, but the investment on staff is more in public sector ones, indicated by better knowledge about banking products / services. [13]

Munusamy *et al* (2010) found that Customer value is an asset to the organization. Hence, in order to maintain the customer, the organization needs to ensure that the right products and services, supported by the right promotion and making it available at the right time for the customers. While quality service and merchandise are essential in today's competitive market, it is equally important that a customer experiences the "Wow Effect" that only superior customer service can deliver. A business that caters to their customers` needs will inevitably gain the loyalty of their customers, thus resulting in repeat business as well as potential referrals.

Consequently, it is imperative that businesses get to know their customers. Establishing a professional relationship with customers empowers us with the knowledge of what our customers need. When a business focuses on delivering what is of value to their customers, this will generate the potential for repeat business as well. The feedbacks from the survey is a testament to the customer satisfaction hypothesis most definitely, there exists a positive relationship between reliability with customer satisfaction.

Similarly, the other attributes, such as; assurances, tangibles, empathy and responsiveness all have positive relationship with customer satisfaction. It is far more difficult to measure the level of performance and satisfaction when it comes to the intangible expectations. One of the ways to help obtain loyal customers is by having products and services that are so good that there is very little chance that the customer requirements will not be met. Of course, one of the difficulties in understanding the true customer requirements is that the customer can and will

change them without notice or excuse. Having a good recovery process for a dissatisfy customer is a very important and necessary process for any service organization. [14]

Chung N. & Kwon S.J., (2009) their findings are as follows: First, in this study customer trust has been considered a moderating factor in system and information quality relationship to customer satisfaction. We confirmed Fishbeinand Ajzen's (1975) theory of reasoned action, which suggests that cognitive variables (e.g. perceived value and system quality/information quality) are moderated by affective ones (e.g. customer trust) to result in cognitive outcomes (e.g. customer satisfaction). Our findings indicate that trust can play a crucial intervening role in the relationship between perceived value (system and information quality) and customer satisfaction. To truly understand customer repurchase behaviors, multidimensional models, which consider both cognitive and affective variables, are needed. Thus, the concepts of system quality, information quality and customer satisfaction do not substitute for, but rather complement, each other.

Second, the customers in the high trust group show a larger path coefficient from system quality to customer satisfaction than those in the low trust group. This is because low trust customers have less experience enjoying their mobile banking services quality and value, and show more customer satisfaction as a result, than the high trust customers. Meanwhile, the customers in the high trust group, who are accustomed to and familiar with the systems quality, are less affected by it than are the low trust customers. These results indicate that mobile banking service providers should continue to keep their customers trust in order to retain them.

Third, system and information quality were found to significantly influence customer satisfaction. From a managerial perspective, one way to increase

customers' re-use of the system is to encourage them to use the system. Some barriers may exist when customers face a new system; this means that replacing an old system may be difficult because the customers' assessment that the new system is highly valuable is not always enough to make them switch. Thus, mobile banking service practitioners can attract new customers through special promotions, sales and coupons related to information quality. Once customers begin using a mobile banking service and become familiar with it, they may be inclined to continue, especially when the mobile banking services offer good quality information.

Fourth, the information presentation of mobile banking does not significantly affect customer satisfaction. This represents are cent trend in the mobile service market, where most customers regard mobile service use as customary or a daily necessity. This result is understandable when we consider that the commercialization of mobile services began more than 10 years ago. Since then, customers have experienced a variety of changing mobile service functions that affect information presentation value.

Fifth, our empirical results also emphasize the importance of assuming a simultaneous, multivariate analytical approach using PLS. We hope to encourage customer loyalty managers to include e-measures of system quality, information quality, trust and customer satisfaction in their current customer loyalty valuation techniques. The study has provided reliable and valid measures of these constructs. These concise, customer satisfaction related measures, with good reliability and validity may be periodically administered to a representative set of consumers, allowing mobile banking services marketers to enhance their understanding of customer trust levels and take the necessary corrective actions to improve them. [15]

Riquelme H.E. *et al* (2009), Their results showed that despite the level of satisfaction with internet banking, customers are still using multiple channels to conduct their banking transactions. This finding is consistent with other studies by Joseph and Stone (2003), Patricio et al (2003), Kam and Riquelme (2007). This is a challenging aspect for banks that aim at migrating heavy-cost clients to transact via low-cost outlets (e.g. online). Satisfaction may not guarantee that clients will not use other channels.

Customers report to use the online banking facilities for information purposes e.g. check balances (100%), to transfer funds between own accounts (88.1%), check for standing orders (70.8%), to pay bills (68.1%), to transfer funds to others (62.7%), to buy/sell shares (48.6%), request cheques (46.5%), and to stop ATM/ credit cards (42.2%). Most of the customers in our sample use internet banking facilities quite frequently; daily and sometimes two or three times per day. Cross tabulations between satisfaction (satisfied –not satisfied) and number of online banking facilities used were not statistically significant thus not supporting a relationship.

Our findings provide support to the conclusions elsewhere that not all customer service and online systems attributes influence satisfaction equally and more online features drives satisfaction (ForeSeeResults.com, 2005). However, our study's findings defer from Fore Sees's results that found navigation and tasks and transactions the most important features to improve satisfaction. The difference may be due to the observable variables used to measure navigation. In the current study the item perhaps reflecting navigation is ''accessibility'. In both cases, customers using internet banking reported the highest level of satisfaction with the attribute 'accessibility'. On the other hand, the present study supports the importance of content and functionality found in the Fore See's study assuming that functionality can be interpreted by the variable 'ease of use' in the present study. From the managerial point of view, this stresses the importance of accessibility and

number of features offered to customers as a strategic objective to move clients from transacting at branches to online.

To investigate if more satisfied customers of online banking tend to use more services, more frequently (H3), more of a specific channel of distribution, or differ in their demographics than less satisfied customers, the sample was divided in two groups. An alternative discriminant analysis was conducted on those who had put a complaint online. Only 37 respondents rated the handling of the complaint as unsatisfactory or indifferent. The second group was comprised of 144 respondents who rated the handling of the complaint satisfactory or more than satisfactory.

Overall, contrary to results from an e-service provider in the UK (Transversal) that concludes banks in the UK are failing to take online service seriously (Annonymous, 2006), our results signal that customers are satisfied or very satisfied (86%) with the bank's responsiveness online suggesting that the bank in Kuwait does take Internet banking seriously. Clients of the bank in Kuwait seem to be satisfied with the level of services. The level of satisfaction on average is as high as that found in other studies on Internet banking elsewhere.

It appears from the results that to increase satisfaction of online customers, a company must make sure that clients are treated with courtesy and in a timely manner. Clients also expect to have access to updated information on the bank services, and most importantly, they expect a range of products and services online. The findings suggest less satisfied customers are less technologically ready. Overall, it is encouraging to see that the investment made in implementing web operations in the bank is paying off at least from the point of view of customer satisfaction. [16]

Al-Eisa A.S. ***et al*** **(2009),** their study showed that the vast majority of the customers of retail banks in Kuwait (nearly 81 percent) are generally satisfied with the services

that their banks deliver. Such a findings could mean that retail banks in Kuwait perform reasonably well in terms of satisfying their customers. However, if it is true that satisfaction and dissatisfaction represent the two sides of the same coin, then that findings should not be viewed as pleasing.

The results indicate that the expectations of about one fifth of the retail banks' customers have not been satisfied. That is, the actual performance of retail banks in Kuwait has not been perceived as satisfactory by nearly 20 percent of their customers. Thus, if ensuring a 100 percent satisfactory performance from the customers' viewpoint (Tanta kasem and Lee, 2007) or providing "zero defect" service is a strategic goal for Kuwaiti retail banks, then one could rightly conclude that retail banks in Kuwait have not been impressively successful. Taken into consideration the fierce competition in the retail banking market, the percentage of dissatisfied customers should not be viewed as trivial and thus the expectations of these customers merit special attention by the managers of retail banks in Kuwait.

The results of this study also showed that speed in service delivery, courtesy and helpfulness of bank staff and self-banking services are the most critical attributes that influence customer satisfaction with Kuwaiti retail banks and thus together form the best predictors of overall customer satisfaction. These significant and relatively high associations signify that the customers of retail banks in Kuwait expect services that they require to be delivered to them in a short period of time by helpful employees in a courteous manner.

The satisfaction of the customers with the promptness in service delivery as reported here indicates that Kuwaiti retail banks have positioned their offer on time advantage for customers. Prompt service delivery and helpfulness of personnel are characterized as major indicators of the responsiveness dimension of service quality whereas friendly courtesy of staff can be regarded as a surrogate variable of the

assurance dimension of service quality. In addition to empathy, tangibility and reliability, responsiveness and assurance have been identified as interrelated dimensions that customers value when they evaluate service quality in a service industry (Parasuraman et al., 1988).

Empirical studies that have used the widely-known SERVQUAL instrument to measure service quality in different industries and cultures, however, have shown inconsistencies in regard to which of these five dimensions are more important in determining service quality. For retail banks in Kuwait, the present study found that their customers pay more attention to the responsiveness and assurance dimensions of the quality of offered services, and those two dimensions appeared to play a crucial role in predicting customer satisfaction.

The results of this study disclosed that self-banking services are highly important for the customers of retail banks in Kuwait, and this attribute comprises another salient predictor of customer satisfaction. Self-banking services are technology-based encounters and belong to the tangible dimension of service quality. They refer to technological interfaces that allow customers to produce a service independent of direct service staff involvement (Chen, 2005). Examples of such interfaces include ATMs, phone and the internet.

Self-banking services are technology-dependent whereas fast service and courtesy and helpfulness of employees are major elements of the service encounter which is a social encounter. Due to competition and to preserve their market shares, Kuwaiti retail banks have invested enormously in state-of-the-art technology to allow their customers to obtain routine transactions without having to visit their branch outlets. The customers of these banks appeared to value technology-dependent services, but the challenge that the managers of these banks continuously face is that technology changes rapidly and dramatically. To maintain a competitive edge

in the market, these managers need to be updated about technological advances and to invest in those that satisfactorily enhance technology-based encounters with their customers.

In the result section, a significant difference was found between the weighted satisfaction scores of those respondents who are 55 or older and those who are younger than 35 years of age. Though the former group accounts for nearly 8 percent of the sample size, this difference is worth further discussion. To reach a plausible interpretation of this difference, the mean scores of the expectations of the older group and those of the younger group for the 12 attributes identified for this study were tested for differences using the non-parametric Mann-Whitney test.

This finding implies that older customers prefer to transact with their banks in a traditional fashion that involves visiting the bank's premise and have interpersonal interactions with the employees. Younger customers are more inclined to depend on available technological interfaces, and thus they are more of a preference for technology-based encounters. The significance of the results of this extended analysis of the data is that they provide the managers of retail banks in Kuwait with invaluable information about the differences in the expectations of two major segments of their customers. [17]

Trivellas et al (2009), Stated that the analysis of the research data showed that all six quality dimensions have a significant positive effect on overall customer satisfaction. This is something that was largely expected, since the relevant immaturity of the Greek internet banking sector increases the importance of all the quality related customer satisfaction drivers. Among the dimensions, reliability was the one having the strongest impact. This finding, combined with the fact that customers ranked the performance of banks regarding reliability as the lowest amid the quality dimensions, poses a major threat to the wider embracing of internet

banking in Greece. Therefore, bank managers must closely look at how they will ensure that the internet sites of their institutions will provide the service they promise. Reliability of internet services was also found to be a very significant predictor of customer satisfaction in the work of Jun et al. (2004), Lee and Lin (2005) and Yang et al. (2004).

Web assistance, empathy, responsiveness and assurance were proved to have a significant effect on customer satisfaction at similar levels. This means that at this early stage of internet banking use in Greece, managers cannot afford to underestimate the importance of any of the aforementioned dimensions and continuously aim to improve the associated facilities and functionality. The high significance of the impact these internet service quality dimensions have on customer satisfaction has also been illustrated in internet retail settings by the results of other researchers, such as Devaraj et al. (2002) (assurance and empathy), Jun et al. (2004) (empathy), Kuo et al. (2005) (empathy), Lee and Lin (2005) (assurance and responsiveness) and Yang et al. (2004) (responsiveness).

The analysis showed that among the internet service quality dimensions, information quality has the least significant impact on overall customer satisfaction. This is rather unexpected since national statistics (National Statistical Service of Greece, 2004) show that account and credit card information retrieval is cited by customers in Greece as one of the most important facilities of internet banking services. It can be argued that this peculiarity is 'corrected' by the very high significance of the effect of information quality on customer future use intentions. Therefore, bank managers in their aim to keep and expand their internet clientele have to strive for the provision of timely and accurate information, regarding both existing (e.g. accounts, cards) and new (e.g. global market overviews, stock exchange feeds) products. It must also be noted that responsiveness was also proved as a significant antecedent of customer future use intentions.

Finally, web assistance and empathy were the two internet service quality dimensions that strongly affect customers' willingness to recommend internet banking use to other people. This is in contrast with the results reported by Long and Mc Mellon (2004), who found that the core SERVQUAL dimensions of assurance, reliability and responsiveness are major antecedents of internet retail site recommendation to friends. However, their research was conducted in an internet retail mature environment such as that of the USA. On the contrary, the work reported here took place in an internet retail emerging country, where familiarizing facilities such as site personalization and online assistance play a very important role in the introduction of the internet as a new market channel to a population, the majority of which consists of late adopters. [18]

Bravo et al, (2009), the finding of the study indicates that the intention to use new services largely depends on the satisfaction they have obtained before. It is not a secret that financial institutions have been trying for years to obtain customers' satisfaction with the aim of increasing their loyalty and reducing their sensitivity to the competitors' actions (Angelis et. al., 2005).

Furthermore, bad experiences that produce dissatisfaction tend to have a psychological impact on consumers and are more long-lasting than good experiences (Howcroft, 1991). The results obtained in the present work justify the importance given to satisfaction, since it explains to a great extent the individual's intention to use again the services of a bank or savings bank.

Nevertheless, results indicate that intention of use, for both present and new customers, also depends on corporate associations. Thus, the effect of global image on intention of use will be both direct and indirect through satisfaction. On the other hand, accessibility to the services and personnel directly influence the intention to use the services of an organization again, and its effect is not mediated by satisfaction. Settling an open debate, it is shown that the mediating effect that

satisfaction exerts on the relationship between corporate associations and purchase behavior will depend on the type of associations under exam. [19]

Chakraborty et al (2009), their finding of the research explored the influence of three drivers on the dimensions of true loyalty (Day, 1969; Dick and Basu, 1994; Rowley, 2005). Of the three, two new drivers were tested on the dimensions of true loyalty – Stake and Value of Switching. These two concepts along with overall Satisfaction were tested in a model to determine the relative effect of the three independent variables on the Behavioral Response dimension of loyalty as well as the attitudinal dimensions – the affective dimension of Commitment to the People providing the service and the rational dimension of Commitment to the Institution providing the service (Fullerton, 2003; Hansen et al., 2003). It was hypothesized that there would be differential influence by the drivers on the dependent variables. The hypotheses were supported. To our knowledge, this is first time the concepts of Stake and Value of Switching have been tested to determine their effect on true loyalty.

Behavioral Response dimension, which is the basis for spurious loyalty, was positively influenced not only by Satisfaction but also by the Stake in the relationship and inversely influenced by the perceived Value of Switching. The attitudinal dimensions of loyalty as measured by Commitment to the Institution with whom the customer has a relationship and Commitment to the People providing the service are not only positively influenced by Satisfaction but also by one additional driver. The perceived Value of Switching inversely influenced the Commitment to the Institution. Stake in the relationship positively influenced Commitment to the People providing the service as well as Satisfaction. All three independent variables – Stake, Satisfaction and Value of Switching – had a significant impact on the Behavioral Response and the Commitment to the Institution dimensions of loyalty. [20]

Kumar M. *et al* (2009), their study used the technique of factor analysis to develop the SERVQUAL model for Malaysian banking sector. Further, it examines the relative importance of each extracted service quality dimension in narrowing down the gap between customers' expectation and their perception by using the dominance analysis technique. All the four service quality dimensions tested recorded negative gaps indicating the level of service quality the customers' receive are significantly lower than their initial expectation. Among the four dimensions extracted from the factor analysis, tangibility has a lowest gap implying that the customers are rather "satisfied" with the banks' infrastructures but with room for better improvement especially on the "neat appearance of staff" which has the largest negative gap among the four statements in tangibility dimension.

The next smallest service quality gap is reliability, indicating that the respondents perceive the banks' ability to perform the promised services dependably and accurately close to what they expect. In other words, the banks are reliable especially on their staff keeping promises. The dimensions that recorded the largest significant gap are competence and convenience. These dimensions are very much related with human factor such as the ability for banks to understand and give individualized attention, willingness to help customers and provide prompt services. For example, majority of the respondents felt that banks are not having convenience operating hours as they operate only from Monday to Friday between 9.30 a.m. to 4 p.m. Another concerning issue is that banks are not sensitive enough in providing special services or having special counters for elderly or disabled customers. [21]

Rod Michel *et al* (2009), Their outcome presented a model to explain how three dimensions of internet banking service quality influence perceptions of overall internet banking service quality, and how these overall perceptions of internet service quality influence customers' satisfaction. All hypotheses were confirmed

albeit with H3 marginally. Our results suggest that online information system quality is a significantly stronger predictor of overall internet banking service quality than both online customer service quality and banking service product quality individually and when combined.

The significant relationship between online customer service quality and overall internet banking service quality indicates that the quality of customer service is important for banks in the context of internet banking. Even in the absence of face-to-face interactions, reliability, responsiveness, tangibles and empathy are still important to customers. These dimensions directly affect customer perceptions of overall internet banking service quality which influences overall customer satisfaction with the bank.

Online information system quality is also significantly related to overall internet banking service quality perceptions. A high-performance information system enables customers to conduct banking transactions on their own through the computer system. Without direct interaction with bank staff, ease of use, accuracy, security, timeliness, contents and aesthetics are critical to enhancing customer perception of overall internet banking service quality. The strong positive association between overall internet banking service quality and customer satisfaction suggests that when overall internet banking service quality is perceived to be high, customers are more likely to be satisfied with their online service and consequently will be more satisfied with their bank. Overall, the contribution that this research makes is in examining five relevant and important constructs in one model.

The research findings suggest a number of implications for online banking services management. This includes the need for managers to acknowledge that the provision of online service quality is an expectation of bank customers.[22]

Khan M.S. & Mahapatra S.S., (2009), explored the service quality of i-banking operative in India from customer's perspective. It is observed that customers are satisfied with the reliability of the services provided by the banks but are not very much satisfied with the dimension 'User friendliness'. A seven-dimension model using regression analysis is developed for measuring the overall service quality of i-banking. The result indicates that the two dimensions, viz. 'Privacy/Security' and 'Fulfillment' are not contributing significantly towards the overall service quality.

This is an implication that the customers feel that bankers fail in providing the services on these two dimensions satisfactorily. It is also observed that the opinion of male and female of business class differs from the other classes. The i-banking is going to be very crucial for India, having increasing percentage of younger generation population with computer literacy. Since research on service quality in i-banking is still in its infancy and the relevant literature is scarce, therefore the insight gained in this study may offer a foundation for future research on self-service technology and provide useful recommendations to the bankers for improving the i-banking services.

The limitation of this study is that the result should not be generalized, as the service quality of i-banking has been tested in urban India. Furthermore, a small sample may not be the representative of the whole population and hence, in future, the research can be conduced by taking a large sample to facilitate a robust examination of the service quality of the i-banking. The future study can also be conducted to identify the relative importance of each dimension.

The extension of this study can also include the providers (bankers) perspective to have a better understanding of the problem domain. Validation of model and extension of the results to other industries and also to different cultures are some of

the future directions in which the academics and the practitioners can work with to enrich the service quality literature in i-banking.[23]

Lio Z. & Cheung M.T., (2008), the study conclude that Internet banking to become significantly more important in the increasingly technology and information-based global economy. Financial institutions must therefore deliver ever-better service quality in their online operations and products. Given that a large number of service-quality attributes can potentially affect consumer attitudes toward Internet banking, the theory of bounded rationality suggests that the high decision cost entailed in the pursuit of service-quality enhancement in each and every direction would be reduced if the opportunity set is rationally made smaller. To this end, we have proposed a framework under which service-quality attributes are reduced to a core subset on the basis of both analytical and empirical considerations. The resulting core framework can then be applied to decision- cost-effective and empirically prioritized management in Internet banking, especially with regard to market development.

Significant analytical and statistical grounds exist to justify the introduction of perceived usefulness, ease of use, reliability, responsiveness, security, and continuous improvement into the core subset. The idea of empirically testing bounded-rational model construction can also be extended to evaluate re-specification of the core subset in response to shifts in the business and/or technological environment. If bank-user perceptions and preferences are found to change with regard to certain core attributes, empirical results obtained in this exercise can be exploited by marketing managers to attract more customers to online banking. [24]

Chau et al (2008), their results were consistent with the opinion of Crisp et al. (1997) that older individuals have to exert more cognitive and emotional effort to learn

new behaviors and dissociate themselves from their daily routines. These also support Katz and Aspden's (1997) findings that the internet banking segments consist mostly of younger customers. Although people aged 30-39 years have a less positive attitude and intention towards using IBS than the younger group, they have a more positive attitude and intention than the other two age groups (aged 40-49 and 50 years). Those aged 30-39 years have been in their careers for some years, and have higher levels of income than those of the younger group, who are typically highly mobile in their early careers. This inevitably leads to a variety of financial service requirements of the people aged 30-39 years. This supports the assumption of Lewis and Bingham (1991) that attracting young customers should be profitable for financial institutions in the future.

The younger customers' disposable incomes are seen to be low (relative to non-younger customers), but their discretionary incomes and purchasing power are high. We suggest that IBS marketers see the longer term gains by attracting young customers as "future revenues" which can be generated from loyal customers. With the growth of the IBS younger customers segment, IBS marketers must focus on comprehending this target customer base and deliver consistently to their specific demands. In the case of our sample (university students), the offer of student and graduate account benefits (e.g. interest-free overdrafts, offer of credit cards, and discounted loans and mortgages, etc.) is strongly encouraged. The exact composition of such account benefits may be the result of further market research into what exactly graduate students require.

Moreover finding of the study stated that the significant difference in the perceptions, attitude and behavior of young customers (aged 16-29) towards IBS than any other age group in the study. We therefore argue that there is value in focusing marketing effort on this segment of the financial services industry, particularly as they provide the greatest promise of future profitability. As we find

that customers are more likely to be retained once they use IBS, so similarly marketing effort should also be asserted to retain existing customers as well as attract new ones. The research has confirmed prior expectations about service quality and loyalty, and we continue to advocate such a need for the continued development of IBS website quality for the long-term benefits of the bank and retention of young customers. [25]

Krauter *et al,* (2008), they concluded that the results of this study provide strong support for the proposed influence of internet trust on risk perception and consumer attitudes toward internet banking. We conceptualized internet trust as trusting beliefs in the reliability and predictability of the internet and the willingness of the consumer to depend on the internet with regard to economic transactions and thus did not include any characteristics of the bank or the bank's web site in our definition. In the original survey, the variable bank trust also was included, as we expected it to influence the adoption of internet banking as well.

In a rival structural model (the results are not reported in this paper) trust in the bank was included as another antecedent of the attitude toward internet banking. Bank trust did not show any impact on the attitude toward internet banking and there only was a small inter correlation between bank trust and internet trust.

Thus it can be concluded that trust toward the bank or the internet vendor in a broader sense and trust toward the internet must not be confounded or treated as different dimensions of the same construct "online trust", but have to be regarded as two distinct constructs that influence online consumer behavior in different ways. Another contribution of this study to the trust literature is the confirmation of the hypothesized impact of propensity to trust on internet trust as a specific form of technology trust. The question if the psychological concept of dispositional trust or propensity to trust is extendable towards technical systems is controversially

discussed in the literature (Kaluscha, 2004; McKnight et al., 2002; McKnight and Acceptance of internet banking Chervany, 2002).

Our findings assert that not only people may be the object of dispositional trust, but trust propensity might be a generalized tendency both across different situations and different objects of trust. In addition, this study has shown that the adoption process of internet banking is not a mere question of web design, or actions dedicated to diminish perceived internet risk, but that it is a complex psychological process in which predispositions in the personality structure of potential internet users play a significant role.

Thus, even if bank managers might devote valuable efforts to design web site interfaces with improved usability and security in order to enhance internet trust and reduce the perceived risk, these steps are likely to have diverging success among internet bank customers, depending on their personal predisposition. In practice however it is quite difficult for bank managers to assess the personality scores on the trust facet of their customer base as a whole.

Therefore, in the long run in order to enhance trust in internet banking and to reduce the perceived risk there might be no other means than actions in communicating the reliability and predictability of the internet banking system. This contains detailed information about the use of security features already in the instruction phase for the internet banking user, furthermore regular information up-dates for customers about security improvements, and also high-publicity events such as public lectures, research grants, etc.

Negative headlines concerning internet banking, as lately happened in Austria, where phishing-attacks with misuse intentions have caused high uncertainty

among internet banking users, have to be counterbalanced by overt efforts to improve security and to re-gain customer trust. [26]

Polasik M. & Misniewski P.T., (2008), the study sought to identify empirically the factors underlying the decision to adopt online banking in Poland. The analysis presented here is based on a large sample of respondents and considers the impact of numerous variables, such as internet experience and connection mode, perceived security, exposure to marketing campaigns, experience with other banking products, and socio-demographic characteristics. A binomial logistic regression has been employed to econometrically pinpoint the determinants of the adoption status. Not only does our inquiry concur with the conclusions of earlier studies conducted in developed economies, but also uncovers statistically significant factors that were rarely investigated in the prior literature.

It has been documented that a high level of perceived security in cyberspace is necessary to foster further acceptance of online banking. Furthermore, customers who are familiar with other electronic distribution channels, such as mobile banking or payment cards, show greater proclivity to open an internet account. Promotional campaigns appear to be essential to the process of gaining widespread acceptance, and internet users have been shown to be receptive to banks' marketing efforts. The more technology-savvy they are, the higher the probability of them conducting banking operations via the medium of internet. In particular, the usage of internet for work and shopping, the duration of use, and number of years of schooling were important predictors of the adoption status.

Demographic characteristics also seem to exert an influence on the phenomenon under investigation. The likelihood of banking online is correlated with the urbanization of the area of residence, educational attainment and the age of the respondent. In general, minors and mature individuals over the age of 65 were less

positively disposed to an internet account. Last but not least, the findings indicate that respondent's gender has a statistically significant impact on the decision to conduct banking operations on the internet.

Although the Polish consumers exhibit similar preferences to those observed in more developed countries, certain problems pertinent to further advancement in online banking do exist. Presence of infrastructural barriers coupled with lower income per capita and lower saturation with basic banking services may be viewed as a hindrance.

The process of overcoming these obstacles may take several years and is closely linked to future economic growth and educational efforts in the field of information and communication technologies. It would be reasonable to assume that the diffusion of internet banking services in Poland will track the historical record of the European Union old member states. [27]

Al – Hashash K., (2008), The research results proved that there is some factors influence customer in Kuwait is not satisfied. Marketing manager should seek to improve the area where customer is not satisfied to improve customer retention. The research findings clearly suggest that the drive towards ease of banking and convenience is favored by the customer and, therefore, banks should find alternative strategic routes designed to improve service delivery (either human-based or technology-based). Bank customers' attitudes towards the human provision of services and subsequent level of satisfaction will impact on bank switching more than when the same service delivery is made through automation. The link between service delivery and customer satisfaction is patently visible in the study results and financial institutions should continue to find effective ways to systematically measure and manage customer sustainable satisfaction and retention.

Customer care and customer retention programms should take into consideration that the increased "push" towards the provision of convenient, easy and fast banking services is closely associated with the human and technology based delivery processes. More importantly, they are greatly linked with the customers' perceptions of how these bank services are delivered to them. These perceptual outcomes will, in turn, affect the level of bank customer satisfaction ratings, retention and switching rates. In summary, the current study suggests that in general customers in Kuwait (Muslim and Non-Muslim) are satisfied with services provided by retail banks. The ANOVA test show slightly differences between Muslim and non-Muslim customer in their degree of satisfaction.

Muslim customers are mostly satisfied with: Availability of ATM in several locations, Safety of funds, Easy to use ATM and The quality of services provided. while Non-Muslim customers are mostly satisfied with: Availability of ATM in several locations, Phone account access, Safety of funds, Ease of opening a current account and Bank image and reputation.

The lest factor that Muslim customers are satisfied with squinty are: Services prices, Interest rate on saving account, Interest rate on loans and Ease of obtaining loans. while Non-Muslim lest ranking of their satisfied with squinty are; Interest rate on loans, Bank monetary transactions, Interest rate on saving account and Ease of obtaining loans (the acceptability of loans terms). [28]

Acharya *et al*, (2008), this study utilized two different statistical procedures (a structural equation modeling and an econometric procedure) in constructing online banking and profit efficiency indices. Since online banking is an evolving concept, it is defined as a latent construct and estimated using web application data collected from community bank websites. A parametric approach, initially proposed by Jondrow et al. (1982), is employed to determine bank level efficiency measures from

an alternative profit efficiency frontier estimated using financial data. The relationship between online banking intensity and overall bank performance is evaluated by regressing profit efficiency measure against a number of variables including online banking intensity index. Consistent with the prior studies, model estimates show that community banks with a wider range of online banking services are more proficient than those with limited web presence (DeYoung et al., 2007).

These results indicate that online banking is an important strategic option for competitive positioning of community banks. The implementation of a wide array of web-based products by community banks allows these financial institutions to compete for customers that may traditionally be outside the "local" market. As the level of customer affinity to web-based banking services increases, along with a demand for services of this type, the community bank should design a product mix that improves profit efficiency while engendering enhanced customer service quality. This type of strategic direction will expand the customer base of the firm in general and the market segment that is demanding robust online services in particular. [29]

Wong *et al*, (2008), the Outcome of the Study showed that banks are performing relatively well in terms of their appearances (tangibles), and in building trust and confidence with their customers (assurance), while relatively poorer in providing prompt service (responsiveness), individualized attention (empathy), and dependability and accuracy (reliability). Measuring the size of the service quality gaps is important in determining how satisfied or dissatisfied customers are with the bank's service. The question now arises on the bank's resource allocation in dealing with these levels of satisfaction.

Quadrant analysis of service quality dimensions Traditional service quality dissatisfaction – which of these gaps need to be given attention first, and how much attention. The simple notion is to prioritize resources according to the size of each service quality gap. That is, that the dimensions with the largest service quality gaps should gain the most attention of resources in order to close the gap, while the dimensions with the smallest gaps should be given a lower priority and allocation of resources.

This however is a fallacy as it neglects to analyze the most important aspect of service quality – how important that gap is to the customer. It may be that a large gap exists for a service dimension, but if the overall magnitude of the customer's expectations is relatively low, that dimension should not receive more attention than another dimension with the same gap but has a higher customer expectation. The latter case should be dealt with more fervently by the bank than the former case.

To account for the differences in magnitude of expectations for the five dimensions of service quality, it is necessary to first calculate the mean ratings for expectations and perceptions across the five service quality dimensions and re plot the quadrant analysis matrix with these means as the dividing lines between quadrants in the matrix.

The resulting quadrant analysis shows each service quality dimension plotted using its difference from the mean expectations and perceptions across all five dimensions. Points in quadrant one would indicate a higher than average expectation of the service and a lower than average perception of the same service. Points in Q1 should receive the most attention in closing or minimizing the service quality gap.

The second priority would be the points that lie within quadrant two (Q2). Points in this quadrant have a higher than average expectation, but also have a higher than average perception. These points should receive second priority in resource allocations needed to further minimize or close the gap and to maintain or improve service quality. Quadrant three (Q3) indicates a lower than average expectation with also a lower than average perception, while quadrant four (Q4) indicate a lower than average expectation but higher than average perception. They should receive third and fourth priorities respectively. In this analysis, we note that there are no points within Q1, but two points within Q2.

These two dimensions of service quality – namely Reliability and Assurance, should receive the highest priority and most attention from the banks. Despite Assurance having a relatively small service quality gap (as found in the first analysis from Figure 2), the high expectation by customers for the bank to perform well in this dimension makes it an important gap to close. Reliability of the banking service also holds a high expectation from customers, and its relatively larger service quality gap further accentuates its needed attention.

Responsiveness and Empathy are the next dimensions to be dealt with that fall in Q3. These dimensions should receive lower priority in resource allocation than the dimensions in Q2 described earlier. They have moderately large service quality gaps, but lower than average expectations.

Tangibles should receive the lowest priority in resource allocation as it falls within Q4, where despite still having a small service quality gap, this dimension is characterized by lower than average customer expectations, while being perceived as performing higher than average. [30]

Benamati *et al*, (2007), the primary recommendation of this study suggested that banks should build trust but not ignore the powerful synergy of consumer distrust. Distrust must be acknowledged and embraced. Means for allowing customers to have a healthy level of distrust should be developed and included in banking offerings. Ultimately, banks must accept that the Internet is simply another channel that customers can use to handle their finances. The reality is that some customers will readily adopt online banking, some will take longer, and some will never accept it. In the spirit of trust and distrust, customers will accept those channels with which they are comfortable and reject those that instill fear and concern. Effective banks will determine how to nurture relationships with their customers within each of these channels, while taking advantage of selling customers added services that they want or need. [31]

McDonald *et al*, (2007), they Concluded that the customer satisfaction is not a prime motivation for instituting CSR programs, research linking CSR strategies with positive customer outcomes, such as loyalty, has led to the expectation that these strategies generally have positive flow-on effects for customers. Yet researchers have failed to consider whether these strategies do indeed impact customer satisfaction levels. Banking industry surveys have led to the identification of a mismatch between consumer satisfaction levels and massive spending on CSR programs (e.g. MUFG in Japan). Given both the increasing investment in CSR strategies, and the fact that customer satisfaction mediates firm market value, further research is warranted. In view of research suggesting that retail banking customers prefer initiatives that create direct customer benefits compared to those that have broader social impacts, this paper has contended that funding directed towards customer-centric initiatives may create better customer satisfaction outcomes than CSR initiatives. A reduction in the proportion of dissatisfied customers would enable banks to reduce customer churn (Manrai and Manrai, 2007), thus increasing share and profits (Sweeney and Swait, 2007).

As well as identifying that research has yet to consider the impact of CSR strategies on customer satisfaction levels, we have also identified the omission of research on the differential impact of CSR initiatives on consumer effects, including satisfaction. This is surprising in view of the dominant model of CSR dimensions used, that discussed by Bhattacharya and Sen (2004). Identification of a hierarchy of customer-preferred CSR initiatives will enable banks suffering from low customer satisfaction levels to fine-tune their CSR programs, directing efforts to those initiatives likely to not only benefit the broader community, but also customer satisfaction levels.

This paper puts forward a series of propositions for testing in future research. We first predict, congruent with Soderlund (2006), that banks' increasing investment in CSR programs may not represent the best investment in terms of increasing satisfaction. Instead, we propose that customer-centric initiatives, those that more directly benefit customers, may achieve better customer outcomes than CSR initiatives. Second, as research (Chakrabarty, 2006; Manrai and Manrai, 2007) has identified a number of customer-focused initiatives that determine overall customer satisfaction, a hierarchy of customer-centric initiatives, congruent with Manrai and Manrai (2007), has been proposed to differentially impact customer satisfaction. Third, from the examination of Auger et al.'s (2006) hierarchy of consumer preferences for social and ethical issues, and using Bhattacharya and Sen's (2004) CSR dimensions, it was contended that a hierarchy of CSR initiatives exist, with some having better outcomes for retail banking customer satisfaction than other initiatives. [32]

Malhotra *et al* (2007), they found that the rate at which innovations are adopted by firms constitutes an important part of the process of technological change. Investigation of firm-specific and market-specific characteristics, which influence decision to adopt innovations, has long been recognized as an important area of study. An understanding of the factors affecting this choice is essential both for

economists studying the determinants of growth and for the creators and producers of such technologies. There are a number of studies on adoption of new technology, but only a handful of studies look specifically at the financial services industry.

Using data on Internet banking adoption by banks in India, the present study is an attempt to examine the factors affecting the probability of adoption of Internet banking in India. The results indicate that larger banks, banks with younger age and banks which have large amounts of deposits are found to exhibit a higher probability to adopt Internet banking. On the other hand, banks with lower market shares and branching intensity and higher expenses for fixed assets and premises also tend to adopt Internet banking. Thus, the banks have used Internet banking as a complementary channel to the existing branch network with an intention to increase the market share and lower the expenses. The category of the bank is quite important in affecting the probability of adoption of Internet banking. In particular, it has been found that private banks (both domestic and foreign) tend to adopt Internet banking quicker than public sector banks.

The adoption of this innovation by other banks increases the probability that a decision to adopt will be made. The least important variable is profitability. The results reported are consistent with the theoretical predictions, thus validate the underlying model. [33]

Srivastava, (2007), reveals that the perception of the consumers can be changed by awareness program, friendly usage, less charges, proper security, and the best response to the services offered. The study also provides the kind of correlation between different factors. As per our basic assumptions we consider only those consumers who know how to use Internet and have an access to Internet, and our study considered only the situation wherein banks provide Internet banking

services. By grouping the variables less than one relevant question may result in proper implication for the bankers.

This research pointed out that there is a significant difference between educated users and educated non users. Academic people use more internet banking. This factor was not studied by earlier researchers. This becomes important in a country where the level of education is not very high. Gender also does play an important role in acceptance of internet banking. This study revealed that males are more internet banking users compared to females. Again small research was done on the internet banking usage and the role of gender. Similarly, this study also revealed that people of higher income group are more Internet banking users.

However, religion and choices of internet banking by user are independent of each other. This study corroborates earlier finding of Back et al. (2001) concerning those people who do not use Internet banking and believe that manual banking is more convenient. This age old habit has become so strong that even such quick and efficient mode as Internet banking has not been able to change it. The reasons are that manual banking offers human interaction and more flexibility. There is no motivation which would push them to use Internet banking services as they have a strong belief that manual banking is easy and convenient to use.

In case of the consumers who don't use Internet banking services, having all facilities at their disposal, technology was not the biggest issue. The first thing that all bankers should concern about is the requirement of awareness. Even though these people are inclined towards the manual banking, these can be turned to potential customers, it is well proven thing, which says the surrounding influences the individual's behavior or in India only environment that surrounds the public determines the behavior and decisions of the individuals. So if consumer sees most

of their colleagues or friends who surround him using Internet banking then it may influence his decision to follow Internet banking option. [34]

Sohail *et al* (2007), the results of the factor analysis in the present study produced three dimensions. While this result reveals that "efficiency and security" is the most influencing factor in users' evaluation of service quality, the factor group produces a combination of diverse measures which may be due to the highly correlated nature of service quality dimensions. Efficiency in internet banking mainly involves download speed, which in turn involves users in completing a transaction quickly. Findings of the present study support the results of research by Hoffman and Novak (1996), which a significant correlation between web site download speed and perception of superior service quality. While speed is of concern to users, other important factors are the ease of acquiring needed information and the organization of the information on the site itself. Banks should strike a balance between attractiveness and speed, ensuring that there is no usage of extensive high-resolution graphics. The role of host server is also important as this significantly affects efficiency. Technological developments in recent times have greatly assisted banks, as the speed of downloading has increased in Saudi Arabia.

Security, which involves protecting users from the risk of fraud and financial loss, has been another important issue in safe use of the internet when conducting financial transactions in Saudi Arabia. A number of studies have pointed this out as a key evaluative criterion in online services (for example Culnan and Armstrong, 1999; Hoffman et al., 1999; Quelch and Klein, 1996). Banks in Saudi Arabia have used numerous features to boost the confidence of online user, such as advanced encryption technology, employing a method whereby five minutes of inactivity automatically logs users off the account or requires users to provide a combination of different unique identifiers.

The second important factor in internet banking users' evaluation of service quality as identified in this study is labeled "fulfillment". In an online context we include the dimensions of technical reliability under this factor. This finds support in the work of (Zeithaml et al., 2002). The findings of this study are supported by Wolfinbarger and Gilly (2003), who found that reliability/fulfillment ratings were the strongest predictor of customer satisfaction and quality and the second strongest predictor of loyalty/intentions to repurchase at a site. Reliability has also been cited as an important factor in electronic service quality (Palmer et al., 2000).

Finally, the third factor identified in this study is that of responsiveness, which is deemed important in evaluating internet service quality. Measurement of service quality generally for service delivery through web sites and particularly for online banking services is in its early stages; published scholarly literature is minimal, and hence it is difficult to make comparisons. However, in other literature responsiveness is regarded as having a significant relationship with online service quality (Mulvenna et al., 2000). Another study examining the usage of online retailers found responsiveness as a key indicator of service quality (Griffith and Krampf, 1998). [35]

Sayar *et al* (2007), their findings stated that differences between the two countries regarding their banking sectors and technological infrastructures are not reflected in the two countries provision of internet banking services. Despite the clear leadership of the UK in these areas, internet branches of Turkish banks offer services as developed as their British counterparts; furthermore it can be said that Turkish banks are more advanced in terms of service diversity. Analysis of the internet branches of British and Turkish banks in the sample reveal that the service range of British banks is concentrated mainly around information (statements and balances) and money transfer (from the account of the user to make bill payments) services followed by credit card services. On the other hand, in addition to these,

Turkish internet branches have a large portfolio of investment transactions and other convenience services like payments of insurance premiums, traffic fines, university fees and online top ups for mobile phones.

The differences in the banking cultures between the two countries may be claimed as one of the main reason for this. For example, since UK customers allocate a large proportion of their incomes to mortgage payments and/or ISAs, banks have fewer incentives to offer investment services like mutual funds, equity or foreign exchange type transactions. One other aspect arising from the banking culture differences is the availability of traditional branches. In Turkey, bank branches operate only on business days and within business hours, when the majority of customers are in their offices and do not have the opportunity to visit a bank branch. Those branches that are open during lunch breaks and weekends constitute only a minority and are not geographically widespread. In the UK, on the other hand, branches are open during lunch breaks and this decreases the necessity for internet branches to offer every type of transaction that is done through the traditional branches.

Another reason for differences may be the strong appetite of Turkish banks for technology, which has been clearly evident since the time when ATMs were introduced in the late 1980s. Once having the necessary infrastructure for internet banking in place, the variety of services offered in the internet branches have been presented by banks as an important aspect for differentiation, competitive advantage and superior service quality. Consequently, Turkish banks are continuously adding new transactions to their internet branches without proper consideration of a cost-benefit analysis or demand from customers. In other words, functional variety is the result of "push factors" created by the banks, rather than pull factors (i.e. created to meet the needs and demands of customers).

The final main difference is the approach taken to security. Faced with the same problems about the privacy of customers' financial information, Turkish banks choose a technology oriented approach like one-time-passwords, special software and SMS alerts, whereas, British banks choose to discourage malignant third parties by making it difficult for them to learn the necessary information (passwords, memorable data, etc) to access the accounts of customers. This difference may also be attributed to the "technology-bias" of Turkish banks. [36]

Mahdi *et al* (2007), highlighted the import of social-political context in shaping the uptake and introduction of new technology in the Sudanese banking industry (SBI). Policy initiatives can set an agenda for change, but the actual implementation and consequences of change for local operating practice is enabled and constrained by a range of contextual elements – for example economic sanctions imposed by powerful industrialized economies; limitations to the infrastructure, such as in the supply of electricity; recruitment and retention of skilled banking employees; bank ownership and the influence of family business concerns, such as unwillingness to invest appropriate funding or the appointment of relatives to senior positions; decision-making responsibilities within Sudanese banks, and the differing vested interests of senior management and IT managers – all shape the process and outcomes of technological change in the development of the SBI.

Many of these socio-political and cultural issues are linked to the nature of developing economies, which do not have the political stability, supporting infrastructure, financial support and economic power of more "advanced" industrialized nations. There are a different set of circumstances that have to be accommodated in the development of policy and the implementation of change in the pursuit of upgrading financial banking services in the Sudan. For example, a number of internal and external contextual factors including bank ownership, international sanctions and telecommunications infrastructure have in various ways

constrained the process of technological change in the Sudanese banking sector. In terms of management issues, nepotistic or politically motivated appointments emerged as an important factor shaping change.

Other concerns centered on lack of technology awareness, lack of quality management, fear about security, small technology budgets or funds, and a failure to retain qualified and experienced staff. In addition, there are also a number of constraints on staffing and in particular, on the poor levels of training for new recruits and the lack of staff development programmes for more experienced and able banking staff. Other staff issues included: lack of qualified and experienced IT employees; staff turnover; and resistance from older employees to IT change initiatives.

The historical legacy of Sudanese banking, current systems and infrastructure, and banking management, have all had major implications for the development of a sound banking industry in Sudan. This highlights the need for bank GMs and IT managers to collaborate in establishing IT strategies and to ensure that they commit sufficient staff and budget resources to managing the change from more traditional manual banking methods to more advanced computer-based banking systems. As such, managing technological change is not simply a technical problem, but also a complex socio-political process that requires management to carefully consider contextual barriers to change.

These findings draw attention to the importance of formulating and implementing policies that go beyond a "technical-fix" type approach, to policies that are contextually aware in seeking to accommodate social and political issues whilst also being sensitive to practical economic constraints. It is through this broader understanding of technological change in the development of policy and implementation strategies, that an environment in which the Sudanese banking

industry (SBI) can move forward and compete in international financial markets is more likely to be achieved.

Finally, we would argue that the paucity of literature in the area of technology and change in developing countries makes it important for academics to conduct further research in this field. The bulk of the studies on information technology and change are based in mature industrial countries with a well-developed infrastructure, extensive education system, and relatively stable political economy. Additional studies in developing countries that investigate this area of technology and change is considered to be vital; for example, the impact of culture on both the uptake and development of new technology is an area in need of further investigation. In the context of the Sudan, researchers are also urged to assess and evaluate the continuing process of change towards the full implementation of IT in Sudanese banks. [37]

Ndubisi et al, (2006), the findings of this study showed that attitudinal disposition and webpage features can predict internet banking adoption. Four attitudinal factors have strong influences on adoption namely importance to banking needs, compatibility, complexity, and trial ability, whereas risks has a weak influence. Importance of the internet to banking needs significantly predicts internet banking adoption. Individuals who deem internet banking useful in fulfilling their banking needs such as, the need to have better control of their own financial accounts, and those seeking for the most convenient channel to have close monitoring of these accounts, etc. are more promising prospects.

Compatibility is another determinant of adoption. Given that individuals have already established personal banking norms, lifestyle, finance management system, and account monitoring mechanism prior to the advent of internet banking, their acceptance or rejection of this new mode will rely greatly on the extent this new

mode accommodates or rejects all or some of the past values. Prior research has also shown that some people have phobia for change, and will avoid change if they can. This plausibly explains why more compatible IB systems will be adopted, and vice versa. Complexity also has significant relationship with intention to adopt internet banking. This result corroborates the findings of Cheung et al. (2000).

This study suggested that easy to use technologies should be put in place in order to enhance adoption. Another component of attitude supported in this study is trial ability. Thus, potential adopters will be more inclined to adopt internet banking if they can try it out first. Surprisingly, risk has no significant influence on adoption. A plausible reason for this outcome could be the tight security impression the banks in Malaysia have managed to sell to customers, which may have resulted in perceived risk not being a top issue when considering adoption. Some of the banks boast of the latest 128-bit encryption technology to allay fears of security among consumers (Suganthi and Balachandran, 2001).

Lastly, internet banking adoption is anchored to utilitarian outcome rather than hedonistic outcome. Thus banks should minimize the hedonistic content of their internet banking sites as hedonism is not a salient usage factor. Since customers attach greater importance to the transaction related features of the IB website rather than the entertainment features, a good strategy to enhance adoption would be to emphasize the former and minimize investment in the latter. Since the process of downloading the entertainment features in a website takes time and slows down the transaction circle time, cyber banks will increase efficiency by reducing or even eliminating unimportant hedonic features.

Marketing experts had long advised that businesses should provide services and features that add value to customers. Therefore, since the internet banking users as shown in this study do not see much value in the entertainment features of the

system, it will benefit both the customer and the firm to minimize them, and in their places improve on the transaction-related features. It is important to jog the mind of cyber bankers that creating value that are not needed or appreciated by customers is worse than not creating value that customers need, because the former will not only leave in its wake dissatisfied customers just like the latter, but also make a waste of the firm's resources that have been channeled towards creating such value.

In conclusion, this research argues that customer attitude and the features of the internet banking site can help in creating internet banking acceptance among Malaysian bank customers. Specifically, the following strategies would assist in consummating greater diffusion of internet banking in Malaysia: enhanced salience of internet banking to customers' banking needs, greater compatibility of internet banking to customers banking norms and lifestyle, less complex and easy to use system that does not require a lot of mental and physical efforts to accomplish banking task, and opportunity for adopters to experiment with the system before making any long-term commitment.

Besides the above attitudinal factors, system's design factors to be considered in developing strategies for enhancing internet banking adoption in Malaysia should be transaction related. For example, easy to read, comprehensive information or instructions on the site, prompt processing of transactions, fast downloading/uploading of materials, interactivity, customization, and website semblance with the actual bank are important. On the flip side, de-emphasizing hedonic features such as background music, animation, cartoon, advertisements, promotional jingles, and so on, that could potentially distract the user are also effective strategies for promoting internet banking adoption. [38]

Pikkarainen *et al*, (2006), they tested the end-user computing satisfaction (EUCS) model in an online banking context. With a survey sample of 268 respondents the

EUCS model was tested and modified to suit the data. The main findings reveal that from the original EUCS Mean S.d. Overall, how satisfied are you with the use of online banking?

Furthermore, our results showed that users were satisfied with online banking services. However, users were less satisfied with the information and reports available from online banking services. In light of the results it can be argued that although overall satisfaction with online banking is high, certain areas such as the presentation of information on sites should be developed. When looking at the effect of background variables on computing satisfaction, it was found that women are more satisfied with online banking than men are. In addition, income level also had an impact on satisfaction. The higher the income the less satisfied users seem to be. Finally, older users seemed to hold more positive views about online banking services than younger ones. [39]

Gerrard *et al*, (2006), the study has identified the various factors which explain why certain consumers are not using internet banking. The two most frequently mentioned factors were perceptions about the risks associated with internet banking and the lack of perceived need. Other less frequently mentioned factors were lack of knowledge of the service, inertia, inaccessibility, lacking the human touch, pricing and IT fatigue.

The findings suggest that marketing campaigns which aim to encourage consumers to become internet bank users are likely to attract more males, the higher income groups, the better educated, those who have already used the internet to buy services and/ or goods and those who are knowledgeable about internet banking.

These findings provide a base for bank marketers to consider ways of expanding the number of consumers who use internet banking. While some 50 percent of the

respondents in this study may not require much "persuading", no doubt, the other 50 percent probably will. All the factors, identified as reasons for consumers not being internet banking users are capable of being "influenced" by the banks. High on the agenda ought to be how to address perceptions about risk.

Bank management and marketers may be very disappointed to see how many respondents indicated that they perceived no need to use internet banking and, to a lesser extent, to see how many non-users lacked an awareness of the procedures necessary to become an internet banking user and the range of services available over the internet. This may illustrate a mismatch between what banks expect customers should do and what customers expect banks should do. There appears to be much for banks to do before the number of internet banking users begins to plateau off.

The main limitation of this study arises through the sampling procedure which was used. To have a completely random sample, it would be necessary to have a list of the names and addresses of everyone who is a non-internet bank user and to randomly select from that list. Such a list, though, does not exist. Some of the steps taken to minimize the impact of biasness were to seek responses at several community centers and to sample at a variety of times. The extent to which our sampling procedure has a negative impact on the study depends on the representativeness of the respondents. The respondents' characteristics, as we showed earlier, are not unrepresentative of the sample they aim to represent. A second limitation arises through using content analysis. The analytical process and the labeling are judgmental and require the sorters to show an element of flexibility in arriving at a final classification.

In respect of further studies, the model needs to be tested in a quantitative way through the development of scale items for each factor. This would assist in

establishing the extent to which each factor impacts decisions not to use internet banking. The results would provide bank marketers with a better understanding of which factors are more influential in the decision-making process and better enable marketing campaigns to be designed which aim to address the various concerns, especially the most influential concerns.

It is widely recognized that two models of internet banking exist (Furst et al. 2002; United Nations Conference on Trade and Development, 2001). One model arises where "conventional" banks begin to offer services over the internet and these banks have become popularly known as "clicks-and-mortar banks". The other type of internet bank is a stand-alone bank. This may be a subsidiary of a well established bank, a subsidiary of a non-bank financial institution, or one not associated with a financial services' provider. Of interest here would be how respondents viewed our model's components in respect of each of these internet bank models.

A study of this nature may or may not indicate that the inhibitors are viewed as being less of a hurdle in respect of a bricks-and-mortar bank which has become a clicks-and-mortar bank in comparison with, say, a stand-alone bank which has no well-established track record of providing financial services. Concern about risk was mentioned by all respondents. How can banks best address this problem? Sampling both users and non-users of internet banking and asking them to indicate what banks could do to alleviate or eliminate the incidental fear might provide both a useful addition to the literature and offer practitioners guidance on how they could usefully address this concern. The factors which were developed were created in an internet banking context and the issue of generalizability naturally arises. The extent to which the eight factors are generalizable is best addressed in a broad based study which seeks to create measures that relate to each of the eight

factors we developed. In considering this matter, there appear no factors which lack wider applicability. [40]

Siu et al, (2005), the findings from this study provide initial direction in determining the optimum service quality attributes to focus on in evaluating Internet banking service quality. The conceptual framework for this research is based on the dimensions proposed by Zeithaml et al. (2000, 2002). Four dimensions were generated in the current study, namely credibility, efficiency, security and problem handling. Only one dimension, efficiency, was found to have remained the same as the original construct. New factors labeled credibility, security and problem handling were formed.

The credibility factor had the highest mean score, and this indicates that Internet banking users are most impressed by technically functioning web sites and quick confirmations. Bank managers need to emphasize the credibility aspect of their services. On the other hand, the problem handling factor showed the lowest mean score, indicating that most of the respondents disagreed that the bank would compensate them for problems their service had created. Problem handling is related to what Zeithaml et al. (2002) describe as a recovery dimension. In routine interactions with sites, consumers seem not to be concerned about the availability of online customer service representatives or the compensation policy of Internet banks.

However, when customers confront problems and questions, such dimensions would be used in evaluating electronic service quality. Therefore, it is necessary for practitioners to investigate present problem handling policies to identify perception gaps between customers and management. This will help to inspire customers' confidence in using Internet banking services. Credibility, problem handling and efficiency have been shown to be moderately good predictors of overall service

quality. The most significant correlation was found in the efficiency factor. The ease and speed of accessing and using a web site is a vital factor in evaluating overall service quality. These results are consistent with those of previous studies (Zeithaml, Parasuraman and Malhotra 2001) that efficiency is the core dimension in electronic service quality.

This may be explained by the fact that too much information and graphics can be confusing and would slow down transaction speed. In the case of a pure service such as Internet banking, service quality is generally believed to be the most important determinant of customer satisfaction.

However, the results indicate that service quality dimensions have only weak predictive power in terms of the relationship between the overall service quality and customer satisfaction. The strongest association is with the credibility dimension. This shows that technically functioning web sites and quick confirmations are the essential elements in satisfying customer needs. Meeting customer expectations alone is no longer enough. Bank managers should delight their customers by exceeding their expectations to enhance customer satisfaction. Such a principle could be applied to technology-based service encounters such as those in Internet banking.

Moreover, the findings indicate that the variance in future consumption intentions explained by the four dimensions is low. Other factors, such as service variety, brand or corporate image, may play a more significant role in determining future intent to continue using their current supplier. Of the four dimensions, security had the strongest association with future consumption behavior. Security has long been considered one of the most crucial issues for Internet banking users (Liao 1996; Rust, Kannan and Peng 2002; Feldman 2000, Black et al. 2001). Findings from the focus groups and the interviews indicated that Internet banking at its present stage

is considered relatively secure. This has been attributed to Hong Kong's Electronic Transaction Ordinance and the establishment of a public key infrastructure to enhance public confidence in the legality and enforceability of e-transactions (Hong Kong Trade Development Council 2004). Consequently, users are more likely to adopt Internet banking and to recommend their banks to others.

According to the demographic data, customer perceptions of credibility, security and efficiency are significantly correlated with the education level. This may be due to the fact that professionals or those with tertiary education are more knowledgeable about and more receptive to self-service technology such as Internet banking. In addition, customers' perceptions of the credibility, efficiency, security and problem handling of a bank are significantly correlated with their usage rate of Internet banking. This may be explained by the fact that customers tend to use more Internet banking if they feel that Internet banks are trustworthy and can fulfill their needs. Previous studies have indicated that customers' feelings of trust or confidence were the most essential issue (Gwinner, Gremler and Bitner 1998; Zeithaml and Bitner 2003). The more transactions the customers conduct online, the more they trust or have confidence in their banks.

Nowadays, banks are more aware of the need to enhance future usage and to build long lasting relationships with customers. They seek to exceed customer expectations and, by doing so, keep them away from their competitors. Customers are encouraged to practice convenient one-stop shopping at the banks' web site. Banks could sell more products and services to their existing customers by further expanding their non-core online businesses such as insurance, stock brokerage and fund marketing. Banks could continuously improve and enhance their electronic customer relationship management (e-CRM) program so as to strengthen their relationships with customers. Practitioners could continuously conduct electronic service quality research using the four dimensions–credibility, efficiency, problem

handling and security–as a framework, and attempt to monitor the perceived gaps between customers′ and managers′ perceptions of online service. The four dimensions could be integrated into marketing strategies in order to develop unique and superior Internet banking experiences for customers. The insight gained in this study may offer a foundation for future research on self-service technology, and provide useful recommendations for improving Internet-banking service. [41]

CHAPTER: 4
THEORETICAL FRAME WORK

Introduction:

This part will provide the conceptual frame work based on literature review. This chapter will explain the key factors, variables and the relationships among theories or models and provide a theoretical overview. The conceptualization will help in answering the research questions and also will guide in the data collection process for this study.

The main purpose of the study is to gain better understanding of the customer satisfaction measurement of Internet Banking service facilities users. Because satisfaction is the key factor which leads to the Loyalty, loyalty leads to the attracting more customer, expansion of business and increase in net profit.

4.1. Theoretical Frame Work:

The importance of customer satisfaction in the internet services context has been highlighted by recent statistics cited in the work of Cheung and Lee (2005), which showed that 80% of highly satisfied online consumers would shop again within two months, while 90% would recommend the internet shops they use to others. Furthermore, 87% of dissatisfied customers stop using the services of online shops without any complaints.

Customer satisfaction is a complicated mix of 'hard wares' (technology, product, price, quality, etc.) and 'soft wares' (attitude, responsiveness, deliverance, communication, etc.). On one hand, it is a curious mix of facts, and on the other, the perception of customers (Ravichandran & Thyagarajan, 1998).

Thus, customer satisfaction means not only giving the customer a good product, but also ensuring customers feel that he can get a genuine product. Therefore,

customer satisfaction is a guide; and product and technology are the focus to achieve business objectives. As the customer expectations keep on changing with changing environment, customer satisfaction becomes a dynamic issue and a determined effort is to be continuously made to accesses it (Ravichandran et al, 1998). In a competitive environment, identification of customer needs these are not being addressed properly, will give a wide scope for development.

In recent years, consumer satisfaction / dissatisfaction (CS / D) has begun to emerge as a major topic in the field of consumer research (Keith Hunt, 1977). In a rapidly expanding competitive environment, banks are no longer confined to their traditional activities, but are venturing into unknown financial territories (Mishra & Sarangi, 2000).

The fierce competition has compelled all the banks to analyze themselves and to devise suitable strategies based on the concept of customer satisfaction – providing the customer with what he wants, when he wants, and where he wants (Lewis & Smith, 1989; Aurora & Malhotra, 1997; Mishra & Sarangi, 2000). The level of customer satisfaction has becoming one of the major targets in the hands of bankers to increase their future business.

Quality has been recognized as a strategic tool for attaining operational efficiency and improved business performance, and is one of the most important parameter of customer satisfaction (Anderson and Zeithaml, 1984; Babakus and Boller, 1992; Garvin, 1983; etc.).

Several authors have discussed the unique importance of quality of service firms (Norman, 1984; Shaw, 1978; etc.) and have 140 International Research Journal of Finance and Economics - Issue 59 (2010) demonstrated its positive relationship with customer satisfaction and repeat purchases (Anderson et al, 1994; Boulding et al,

1993; Rust & Oliver, 1994; etc.). One of the obvious conclusions is that firms with superior quality products outperform these marketing inferior quality products (Jain & Gupta, 2004).

As stated above, there is an abundance of material that examines service quality and related aspects. In spite of the volume of research, it is fair to state that opinions differ, with regard to the conceptualization, definition and method of measurement.

Academic literature on service quality is divided on how service quality should be conceptualized. Early work (Gronroos 1982 and 1984; Lewis and Booms 1983; Parasuraman et al. 1985 and 1988) on service quality conceptualized it as a disconfirmation process. The rationale of the disconfirmation model is that service quality can be measured by measuring both expectations and perceptions and equating the difference scores from the two measures to service quality.

However, various studies have found a poor fit for the disconfirmation model. In particular, Teas (1993) asserts that the model has conceptual, theoretical and measurement problems, Spreng and Olshavsky (1992) contend that the model suffers from problems with regard to the measurement of expectations. Due to these problems with the disconfirmation model, researchers are increasingly ignoring expectations completely and measuring perceptions as indicators of service quality.

Andaleeb and Basu (1994), Mittal and Lassar (1996) report that this approach results in good predictive power of service quality. Babakus and Boiler (1992), Cronin and Taylor (1992) compared the computed difference scores with perceptions and found that perceptions are a superior predicator of service quality than disconfirmation. There is another significant advantage in measuring perceptions only, data collection is much easier since there are only half the number of items in a questionnaire.

Disconfirmation is also the major issue related to another debate on the measurement of service quality. When expectations and perceptions are measured separately, the computed difference scores for disconfirmation have problems of reliability, discriminate validity, and variance restriction (Brown et al. 1993; Peter et al. 1993). These authors contend that a direct measurement of difference between expectations and perceptions is superior to a computed difference in overcoming measurement problems. It is a position supported by more recent research (Dabholkar et al. 2001).

Early service quality models (Gronroos 1978; LeBlanc and Nguyen 1988; Parasuraman et al. 1988) have tended to conceptualise factors related to service quality as components of service quality. For example, the SERVQUAL instrument is a 22-item scale for measuring service quality along five diniensions: reliability, responsiveness, assurance, empathy and tangibles (these five dimensions were recast from the 10 dimensions, comprising of tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding / knowing the consumer and access).

This instrument (developed with data collected across five separate service categories, namely, appliance repair and maintenance, retail banking, long-distance telephone, securities and brokerage, and credit cards) was initially proposed by Parasuraman et al. (1988) and later refined by Parasuraman et al. (1991,1993 and 1994a). The underlying rationale in the SERVQUAL model, and many of its contemporary models, is that service quality is not viewed as a separate construct, but composed of components, and that the measurement in combination of these components (also referred to as factors and/or dimensions) will result in an estimate of service quality.

A large number of studies that have been carried out since have espoused this conceptualization (for example, Babakus and Boiler 1992; Boulding et al. 1993; Cronin and Taylor 1992; Zeithamal et al. 1996). A considerable drawback of this single item approach is that it is impossible to ascertain the reliability of the construct. The concern here is that, when service quality is conceptualized as being composed of factors, it fails to capture the effect of the relevant factors as antecedents of service quality and also fails to capture customers' overall evaluations of service quality as a separate, multi-item construct.

Table 4.1: Selected Literature of online service quality and customer satisfaction

Authors	Reliability	Responsive-ness	Security	Ease of Use	Access
Parasuraman et al (1985)	Y	Y	Y	-	Y
Parasuraman et al (1988)	Y	Y	-	-	-
Johnston (1995)	Y	Y	Y	-	Y
Johnston (1997)	Y	Y	Y	-	Y
Doll & Torkzadeh (1998)	-	-	-	Y	-
Joseph et al (1999)	-	-	Y	-	Y
Netal (2000)	Y	-	Y	-	-
Zeithaml et al (2000)	Y	Y	Y	-	Y
Liu & Arnett (2000)	Y	Y	-	-	-
Jun & Cai (2001)	Y	Y	Y	Y	Y
Yang & Huang (2001)	Y	-	-	Y	-
Madu & Madhu (2002)	Y	Y	Y	-	-
Wolfinbarger & Gilly (2002)	Y	-	Y	-	-
Santos (2003)	Y	-	Y	Y	-
Jun (2004)	Y	Y	Y	-	-
Yang & Fang (2004)	Y	Y	Y	-	-
Yang (2004)	Y	Y	Y	Y	Y

Table 4.2: Research Measurement Criteria used for customer satisfaction

Dimensions	Measurement Criteria	Supportive Articles
Reliability	The ability of the Internet Bank to keep service promises accurately, consistently and also perform the service right the first time.	Parasuraman's et al (1985) Jun & Cai (2001) Santos (2003)
Responsiveness	The ability of Internet bank to provide prompt service, quick problem solving and convenience services.	Jun & Cai (2001)
Security	Low risk associated with online transaction, personal information safety and online transaction safety.	Yang et al (2004) Jun & Cai (2001)
Ease of Use	Convenience for the customers to interact with the bank through the internet.	Doll & Torkzadeh (1998)
Access	Approachability and ease of contact of service	Jun & Cai (2001)
Service Loyalty	Considers using only same service provider when a need of this service exits	Gremler & Brown (1996)
Recommendations	Customer keep loyal energetically recommend other customers the product and service of the enterprise.	Barnes & Glosenese (1887)
Expected Repurchase	The intension of a customer to repurchase product/ services through a particular e-service vendor.	Beatty et al (1998)
Customer Satisfaction	Evaluation between the customers' expectations and what they would receive from the product and services.	Oliver (1980) TSE & Wilton (1998)

In order to address this issue, a few studies (Dabholkar et al. 1996; Taylor and Baker 1994) have examined overall service quality as composed of multi items. More recently, Dabholkar et al. (2001) have concluded that factors related to service quality should be viewed as antecedents of service quality and not as components.

In view of the problems outlined with the disconfirmation model of service Quality, this research conceptualizes and measures service quality as perceived by consumers. Additionally, it treats dimensions related to service quality as antecedents of service quality.

4.2. Service Quality Model (Servqual Model):

Parasuraman *et al* (1985) undertook a Qualitative Research to investigate the concept of Service Quality. They arranged an in-depth interview with the executives and Focus Group interviews with customers to develop a model of Service Quality. They proposed the following Service Quality model according to their research:

Parasuraman *et al* (1985) identified ten key determinants of Service Quality. They are: Reliability, Responsiveness, Competence, Access, Courtesy, Communication, Credibility, Security, Understanding, Tangibles.

In 1988, Parasuraman *et al* arranged a quantitative Research. They revealed an instrument for measuring consumers' perception of Service Quality, after that it became known as SERVQUAL. They collapsed their dimensions from ten to five. The dimensions were:

- Tangibles – physical facilities, appearance of personnel and equipment.
- Reliability – ability to perform the promised service dependably and accurately.
- Responsiveness – willingness to help customers and provide prompt service.
- Assurance - Assurance (combination of items designed originally to assess. Competence, Courtesy, Credibility, and Security) –

ability of the organization's employees to inspire trust and confidence in the organization through their knowledge and courtesy.

- Empathy - Empathy (combination of items designed originally to assess Access, Communication, and Understanding the customer) – personalized attention given to customer.

Organizations can use SERVQUAL in various ways. Parasuraman *et al* (1988) mentioned that SERVQUAL can help the Service and Retailing Organizations in assessing the expectations of customers and Service Quality perceptions. It can focus on the core areas where managers need to take attention and action to improve Service Quality.

4.2.1. Criticism of SERVQUAL

Much criticism emerged against the SERVQUAL. Some of the reviewed criticism of SERVQUAL is as follows:

Carman (1990) suggested that the five service quality dimensions are inconsistent in cross sectional analysis. He found that some of the items loaded different components when compared to different service providers. As mentioned earlier, Parasuraman *et al* (1988) converted Understanding and Access component into Empathy. Carman did not find it appropriate combinations in his research. Carman also noted that the difference between expectations and perceptions concept is operationally difficult to follow. He suggested that future researchers should analyse the expectation and perception at the individual level.

Babakus and Boller (1992) supported Carman's (1990) idea about the dimensions of Service Quality. He found that the Service Quality dimensions are under investigation depending on the type of service. He identified that there are some operational problems in the expectations and perceptions gap analysis.

Brown *et al* (1993) argued that the "difference score" (perception minus expectation) has some operational problems. Therefore, they suggested that a "non-difference score" measure is superior to "difference score" measure.

After the criticism of Brown *et al* (1993), Parasuraman *et al* wrote an article in the same year where they proved that non-difference score measure is debatable. Brown *et al* (1993) mentioned that SERVQUAL mean was 0.82 and non-difference score measure mean was 4.51. Parasuraman *et al* (1993) argued that 0.82 is the ideal standard of expectations because it implies that the average respondents' perceptions fell short of their expectations. In contrast, the mean of 4.51 draws the opposite conclusion. It raises the validity question of non-difference score measure.

In 1992, Cronin and Taylor criticised Parasuraman *et al* (1988) conceptualization of service quality. Parasuraman *et al* (1988) described service quality as ".....similar in many ways to an attitude." So, managers and researchers could get more information if the construct measurement was conformed to an attitude-based conceptualization. Therefore, they suggested nullifying the expectation portion from the SERVQUAL. They argued that only performance dimensions could predict behavioural intensions and they termed it as SERVPERF.

Gilmore (2003) summarised the criticism of SERVQUAL is as follows:

- The gaps model – some researchers mention that there is a little evidence that customers assess service quality in terms of performance and expectation gaps.
- Dimensionality – SERVQUAL's five dimensions are not universal. The number of dimensions comprising SERVQUAL is contextualized and there is a high degree of intercorrelation between the five dimensions.
- Expectations – some researchers argue that measuring

expectations is unnecessary. If they are to be measured, expectations and perceptions should be measured on a single scale.

- Item Composition – four or five items cannot capture the variability within each SERVQUAL dimension.
- Scale Points – the seven-point likert scale is flawed. The mid-range numbers can only be vaguely related to varying degrees of opinions and many respondents may rate these differently.
- Polarity – the reversed polarity of items on the scale causes respondent error. In the SERVQUAL instrument some items are reversed to ensure that respondents do not fall into the habit of marking the same scale point for each question; however this can cause confusion.

4.2.2. Service Quality in Banking

Service quality is important in the retail banking sector. Some of the reviewed literatures are presented below:

Bahia and Nantel (2000) conducted a research to develop a valid measurement of perceived service quality in the Retail Banking sector in Canada. They argued that the SERVQUAL approach has not except from critics; therefore, they developed a new measurement for perceived service quality in Retail Banking. They proposed a scale that was called Bank Service Quality (BSQ). It comprises 31 items classified across six dimensions as: effectiveness and assurance, access, price, tangibles, range of services offered and accuracy and reliability. They proved that the dimensions of BSQ are more reliable than the dimensions of SERVQUAL.

Glaveli *et al.* (2006) stated that BSQ is more reliable than SERVQUAL. Stafford (1996) conducted research to identify the core elements of BSQ and identified seven attributes in assessing BSQ. They are as follows:

- Bank atmosphere - environment of the bank including the attitude of the staffs.
- Relationship -it indicates the personal relationship with the bank employees.
- Rates and charges - an individual's perception of BSQ is affected by the low cost and high interest rates.
- Available and convenient services - it indicates the full range of available services, convenient and easily accessible.
- ATMs - it indicates the availability of the automatic teller machines.
- Reliability/honesty - it emphasises on the solid bank ratings and reliable, honest staff.
- Tellers - enough and accessible tellers.

Angur *et al* (1999) examined the applicability of alternative service quality measure in the Retail Banking industry in India. They conducted their research on the consumers of two major banks in India. They use SERVQUAL model to measure the overall service quality. They found that all the dimensions are not equally important in explaining variance in overall service quality. The result indicated that responsiveness and reliability seem to be the most important dimensions followed by the empathy and tangible dimensions; whereas, assurance appears to be the least important dimension. Finally, they concluded that SERVQUAL is the best measure of service quality in banking industry.

The applicability of the SERVQUAL measure is well established in the retail banking industry. As mentioned earlier, Angur *et al* (1999) stated that SERVQUAL is the best measure of service quality in the retail banking industry in the developing country. Most of the researchers use the SERVQUAL measure or the modified SERVQUAL measure in the retail banking industry.

From the above discussion it can be concluded that SERVQUAL is still suitable as an assessment tool to measure the service quality perceptions in the retail banking industry, whether it is based on difference score, gap score or performance only.

4.3. Benefits of Internet Banking:

Customers:

Consumers are embracing the many benefits of Internet banking. The following are a few advantages that e-banking gives to customers:

- Consumers can use their computers and a telephone modem to dial in from home or any site where they have access to a computer.
- The services are available seven days a week, 24 hours a day. Transactions are executed and confirmed quickly, although not instantaneously. Processing time is comparable to that of an ATM transaction.
- In general, the customer will find lower fees and higher interest rates for deposits due to the reduced cost of operating online and not needing numerous physical bank branches.
- And the range of transactions available is fairly broad. Customers can do everything from simply checking on an account balance to applying for a mortgage.

- The interface is very user-friendly and often intuitive. Additionally, business customers will most likely use the Internet for more than cash management, and they will be accustomed to a similar "look and feel" among all applications that they use.

Banks:

Why should a bank 'bank online'? Advantages previously held by large financial institutions have shrunk considerably. The Internet has leveled the playing field and afforded open access to customers in the global marketplace. Internet banking is a cost-effective delivery channel for financial institutions. The bank has an opportunity to generate revenue, decrease operational and transactional costs, increase productivity, and attract new customers.

Ability to increase Revenue:

Financially, the bank can benefit a great deal from providing their customers with an online banking service. The bank has the ability to increase revenue by generating user and transaction fees for the use of a bill payment product and has the option of charging an account access fee for the use of the online system. Online banking provides an excellent promotional opportunity to generate revenue by helping the bank to cross-sell products such as credit cards, loans, certificate of deposits, and other financial services.

Save Money:

In addition to making money, the bank can save money with an Internet banking system. Online banking can actually decrease operating costs by reducing the daily reproduction and distribution of paper-drawn transactions and delivering and processing statements for accounts, credit cards, and bills. Performing transactions via the Internet also provides cost savings, as indicated by a study done by Booz, Allen & Hamilton that shows a transaction over the phone costs $.54, at an ATM it

costs $.27 and via the Internet the cost is $.01. Using the Internet to perform transactions greatly reduces the cost to the bank.

Improves Productivity:

Internet banking improves productivity as well. Bank representatives are able to process data more quickly and efficiently; track account activity with automated reports, help customers achieve daily tasks via the Internet, and reduce time spent handling service problems. There can be a dramatic reduction in the number of customer service calls, as some banks that are providing this service has proven.

Marketing & Competitive Tool:

Internet banking also offers the bank an exceptional marketing and competitive tool. Large banks such as Nations Bank and Wells Fargo, in the United States, have already capitalized on the Internet as a mechanism to attract new customers. The majority of people using the Internet are middle to high income and polls indicate that 50% of the people online are either in professional or managerial positions. These people are also the ones who want to have the convenience of online banking for home or business use. This is an excellent opportunity for the community bank to keep their hometown customers from looking to national institutions for an online product.

Innumerable services are available via the Internet today. Internet banking provides a higher level of convenience that both commercial and retail customers desire to have. With this service, the bank not only has the opportunity to manage their business better, but can also help their customers achieve a much more efficient process of managing their finances.

4.4. Research Question:

Despite so many additional and quick service facilities available on internet banking the acceptance/adoption of internet banking was not up to the mark in Indian context. If we see the international adoption rate it was quite satisfactory.

1. Measuring the customer satisfaction of net banking users because it leads to make customer more loyal and hence loyalty leads to the attracting more customer, expansion of business and increase in net profit.
2. Is there any relationship between adoption of internet banking service facilities and customers satisfaction?
3. What are the other reasons behind the low adoption rate of Internet banking service facilities provided by the banks?
4. Are customers afraid about the misuse of their account information when they are operating their account using internet?
5. How much customers rely on their banks towards maintenance of their account and the privacy issues?
6. Security provided by the bank to their Internet Banking account users is known to all?

This study also attempts to contribute to the literature on Factor determinant of the satisfaction level of consumers/customers by applying various statistical tools and techniques.

Which factor influences the most to the customer to adopt Internet banking service facilities? It's not only high light the Positive factor but also try to high light the negative factor of the internet banking adoption by the customers and the satisfaction level of customers by using the net banking services. Are customer fared about their account with the use of internet banking? What is the level of security and how customer feels about secrecy etc?

Recently many banks in India are offering the internet banking to provide their customers 24 hours a day and 7 days a week online choice. The customers are allowed to purchase e-service anytime and anywhere they want (Hoffman and Bateson, 2002).

With the high competition in internet banking industry in India, it is obvious that banks need to set up web sites to provide quality information and services to customers, so as to satisfy customer's needs.

Many researches show that service quality is one of the key factors in determining the success of e-commerce (Yang, 2004). Moreover, delivery of superior service has become one of the most important ways to gain superior profitability (Kotler, 2000).

Service quality has to be found to be an important input to customer satisfaction (Caruana & Malta 2002). Yand & Fang (2004) identified online service quality dimension and their relationship with satisfaction. These service quality dimensions are reliability, responsiveness, ease of use and competence.

Oppewal and Veriens (2000) developed an application for measuring retail banking service quality, which consists of 28 attributes including four service quality dimensions such as; Accessibility, Competence, Accuracy and Friendliness & Tangibles.

A number of Academicians such as Parasuraman et al. (1985, 1988); Gaonroos (1990); Johnston (1995) and others have tried to identified key determinants by which a customer assesses service quality and consequently results in satisfaction or not.

The increasing number of the internet uses worldwide, including India, led to the higher competition in internet banking industry than ever before. In such a competitive market place, understanding a customer's needs has become one of the most important factors in determining the company's success.

As a result, companies have moved from a product centric to a customer centric position (Hanson, 2000). Apparently, Banks need to provide customers with high quality services to satisfy the customer. Hence, they can gain more market shares in the online marketing paradigm. The main purpose of this study is:

To measure the satisfaction level of internet banking users with a selected banks and customers in western India because it leads to make more loyal customer and hence loyalty leads to the attracting more customer, expansion of business and increase in net profit.

4.5. Research Gap:

From the Review of Related Literature it has been concluded that very few studies had been conducted in India on the topic of measurement of customer satisfaction of internet banking while at global level a number of studies had been conducted on the same topic. So there is a major gap in between International and Indian Scenario.

Most of the study had been conducted on the basis of 5 point of Servqual Model. But this study includes the Expectation of a customer which is not a part of Servqual Model. So this study will be an improvement on Servqual Model developed by Parasuraman in 1985.

In western India no any studies had been conducted in the past on the topic of measurement of customer satisfaction of internet banking users in a selected city of

western Indian states. This study fills the gap regarding the absence of any study on the same topic in the region.

On banking sector there is a lot of work in western Indian region had been conducted by a number of researchers but measurement of customer satisfaction of internet banking users has not been covered by any researcher yet in this region. This study fills the gap between Domestic and international level, improvement on Servqual Model and pioneering study on the same topic in western Indian region. This paper makes an attempt to measure customer satisfaction of internet banking users in a selected city of Western Indian states for the first time.

CHAPTER: 5
RESEARCH METHODOLOGY

Introduction:

Research methodology is to be considered as a path maker, torch viewer and provide concrete guidelines to the researchers in any field and any kind of research. Without research methodology a research work is look like a building without pillar, an effort without planning and a running train on track without any signal. It may be noted, in the context of planning and development, that the significance of research lies in its quality and not in quantity. The need, therefore, is for those concerned with research to pay due attention to designing and adhering to the appropriate methodology throughout for improving the quality of research. The methodology may differ from problem to problem, yet the basic approach towards research remains the same. Keeping in mind all these things this chapter deals in details the research methodology and its various components to be used in this research.

5.1 Objectives of the Study:

The objectives of this study can be divided into two category namely main objective and the sub objectives.

5.1.1 Main Objective of the study:

i. To identify the factor affecting of customer satisfaction level of internet banking users in a selected city of western Indian state, which leads to make more loyal customer and hence loyalty leads to the attracting more customer, expansion of business and increase in net profit.

ii. To measure the satisfaction level of internet banking users in a selected city of western Indian state, which leads to make more loyal customer and hence loyalty leads to the attracting more customer, expansion of business and increase in net profit.

5.1.2 Sub-objectives of the study:

i. The purpose of this study is to find out which of the factors (Identified Variables) play an important role to determine the over all satisfaction of internet banking users in the selected city of western Indian State.

ii. To establish the relationship among several attributes and the over all customer satisfaction of internet banking in a selected city of western Indian states.

iii. To find out the Geographical & Cultural impact on over all satisfaction of internet banking users among the selected city of western Indian states.

iv. To know that how much customers rely on their banks towards maintenance of their account and privacy issues.

v. To establish relationship among Gender, Age, Income and the level of education with the satisfaction level of internet banking service facilities provided by the banks.

vi. To create awareness of internet banking which provides a higher level of convenience that both commercial and retail customers desire to have. With this service, the bank not only has the opportunity to manage their business better, but also help their customers to achieve efficient process of managing their finances.

vii. To recommend banks regarding the improvement which is to be needed if any for successful adoption and operations of internet banking service facilities.

5.2 Benefits of the Study:

This study will be beneficial for both, the customer of a bank and the banks itself.

The major benefits of this study are as follows:

i. Bank should be able to identify area of improvements which is to be needed to increase the level of customer satisfaction towards internet banking services in western Indian states.

ii. This study also tries to increase adoption level through increase in customer satisfaction which leads to internet banking improves productivity. Bank representatives are able to process data more quickly and efficiently; track account activity with automated reports, help customers achieve daily tasks via the Internet, and reduce time spent handling service problems.

iii. This study tries to improve the satisfaction level of customer directly or indirectly with the help of suggestions and recommendations which leads to the customer to use internet banking service facilities.

iv. When satisfaction level is up to the expectation of the customers, they can use the internet service facilities more frequently which can lead to the time and cost saving of customers.

v. This study also provides a strategy not only to manage their business better, but can also help their customers achieve more efficient process of managing their finances.

vi. The recommendation and suggestion will be beneficial for the banks to increase the satisfaction level of internet banking services and manage their business more efficiently and strategically which leads to attract more customer and hence the profit.

vii. Finally this study will not only provide a sound literature in the field of banking industry for an academic purpose and the research scholars to pursue a further future research but also provide a scope of future research.

5.3 Research Design:

Research design for this study was combination of Descriptive and Analytical in nature. Descriptive is due to the fact finding characteristics and to describe the Customer satisfaction level of Internet Banking users across the western India in a multiple dimension and broad perspectives. An open ended structured questionnaire has been framed to collect the data related with the satisfaction level of customer who are using internet banking service facilities. Questionnaire has been divided into seven sub category as follows:

Initial part are containing the information related with respondents Demographic in which 15 questions were asked from the respondent about his/her personal information like income, age, educational qualification, area of residence, types of bank account, number of bank account, purpose of bank account etc.

Second important part of Questionnaire contains the information related with the Efficiency of a Banks in which seven questions were asked from the respondent like; Log in speed of the account, find out the important information from the bank website, user friendliness of bank website, Instructions & Notice statements for customers on bank's website, Hang out during transaction process and speed of logout etc.

Third important part of a questionnaire contains the information related with the reliability of a customer on a bank in which 13 questions were asked from the respondent like; how much web page of a bank is reliable, The bank site is up (24 x 7) and running all the time, The bank's site page don't freeze after you have put in all your information, Links are problem-free, accurate and the pages download quickly, Information that is provided is accurate, Information contents and texts are easy to understand, Easiness of transferring money to any branch, Account statement through SMS/ E-mail services and Reputation of bank etc.

Fourth important part of a questionnaire contains the information related with the service delivery system to customer by bank in which 12 questions were asked from the respondents like; The banks take care of problems promptly, The bank is willing to help customer and provide prompt services, The bank's website has online customer service representatives, Able to talk a customer service representatives on telephone number, Informing customers when services will be performed and Behavior & Attitude of Employee/Customer service representative etc.

Fifth component of questionnaire acquiring the information related with the customer's expectations from the bank in which 4 questions were asked from the respondents like; the bank's website provides a confirmation of the service ordered, the bank's site perform the service right for the first time and the bank site perform task as per the customer instructions etc.

Sixth important part of a questionnaire contains the information related with the privacy issues of customer account information by the banks in which 6 questions were asked from the respondents like; The bank's site does not use cookies to collect information, The bank's site is secure for your credit card information, You can rely on the information that you have given not being misused/shared and You can rely on the information remaining in the register.

Last and seventh part of a questionnaire contains the information related with the tangible in which 6 questions were asked from the respondents like; Modern looking equipment, visually appealing physical facilities, Smart employees, visually appealing materials associated with service and Bank modify their home page occasionally.

The study is Analytical due to the characteristic of its Analysis. It involves a sound and scientific analysis of data with the help of hypothesis testing and the coefficient of regression.

5.4 Methods of Data Collection:

Primary methods of data collection with the help of structured close ended questionnaire have been used for this study. Initially questionnaire was drafted on the basis of past references used by prominent scholars in that field. In initial draft questionnaire was having 75 questions. Entire questionnaire were divided into 6 parts namely, Efficiency, Reliability, Service Delivery, Expectations, Privacy and Tangible. In past many of the researcher have used 5 part and they ignored the last one i.e. Tangible. But in recent Modernized, Globalized and an Innovative era tangible also play an important role to attract customers in a number of ways. Initial draft consists of five point Likert scale which is to be more common in present and past.

After completion of initial draft, printed version of questionnaire were distributed among our colleagues in the Department of Management, Sumandeep Vidyapeeth. After a healthy discussion we come to a conclusion that Expectation should be removed from the questionnaire because both are running in opposite directions some time. Expectation some time cannot be fulfilled or if do so there may be a high charge for that. Another discussion from the first draft includes the Likert scale. Some of our colleagues argued that satisfaction is a qualitative in nature and hence can't be measured numerically. They had suggested that put 9 point Likert scale and the qualitative aspect of customer satisfaction measurement.

As per the improvement suggested by the colleagues some questions were deleted from the initial questionnaire at the time of second draft of questionnaire. Nine point Likert scale were framed to measure the customer qualitative satisfaction. Some new and innovative questions were added in the second draft of questionnaire as per the suggestion and feedback of our colleagues.

Both the draft handed over to the three experts [IIMA, IMNU, MSU] one from each in the same area to check the content validity of the questionnaire. All of them suggest some inclusion and some deletion from the questionnaire. Unanimously all the three experts suggested that five point Likert scale will be best fitted into this kind of study due to various reasons. In the past, majority of the researcher have used only 5 point Likert scale so keeping in mind, they have suggested that consider only five point Likert scale.

Another changes suggested by the expert panel was inclusion of customer expectations in the questionnaire. They argued that without expectation there is no satisfaction. According to them satisfaction is dependent on expectation so include the expectation part in the questionnaire.

Another important suggestion came out from the expert was that inclusion of demographical part in the questionnaire. Initial and second draft of questionnaire does not having a demographical section. Unanimously

5.5 Target Population:

It is very difficult to define the exact target population for this study because there is no any availability of such kind of data at any level in India. I have tried my level best to find out the number of customer who is currently having a bank account with internet banking service facilities but unable to get it or find it. For that purpose I have approached to the various banks branch to get the information regarding the number of internet banking, through my guide but banks has ignored the proposal with a comment that due to privacy maintenance of a customer we are unable to provide such kind of data.

In the past most of the researcher on the related topic or same have used either qualitative measurement or in a few cases they have estimated the target

population on the basis of preliminary survey. Most of them just defining the target population for their study as all the bank account holder with internet banking service facilities in their concerned geographical area.

For this study the target population may be defined in a qualitative term as all the bank account holders with internet banking service facilities in the concerned geographical area of this study. Because there is no alternative options available either to get it from primary and secondary sources or to calculate it.

5.6 Sampling Techniques:

Non-probability snow ball sampling is to be used for this study due to unavailability of proper information and identification which is to be needed about internet banking users. No other sampling techniques are found to be more appropriate than the snow ball sampling. Because the researcher has not aware about the internet banking users so it becomes very difficult to identify them.

The only way to identify the internet banking user not only with the help of personal contact but the contact of friends, relatives and more importantly the contact of internet banking users.

Initially, researcher needs to identify a few internet banking users in their concerned area and for further identification of respondents their previously identified respondent becomes the source of information and will be helpful to identify the further respondents.

This is the only way to get the appropriate number of respondents which is considered as a sample for this study.

5.7 Sample Size:

Calculation of Sample size for this study is very difficult due to the ill defined target population (Numerically). But still with the consultation of experts across Gujarat (IIMA, IMNU and MSU) in this area, I have just tried to find out the reasonable number which is considered as true representative of that particular city in given state. As per the direction of Dr. Uma Sekaran in his book "Social Statistics" published by Wiley India, total respondent has been decided.

Hence keeping in mind the difficulty level the total number of sample size for this study would be taken 1200. The above figure shows the city wise distribution of sample size for this study.

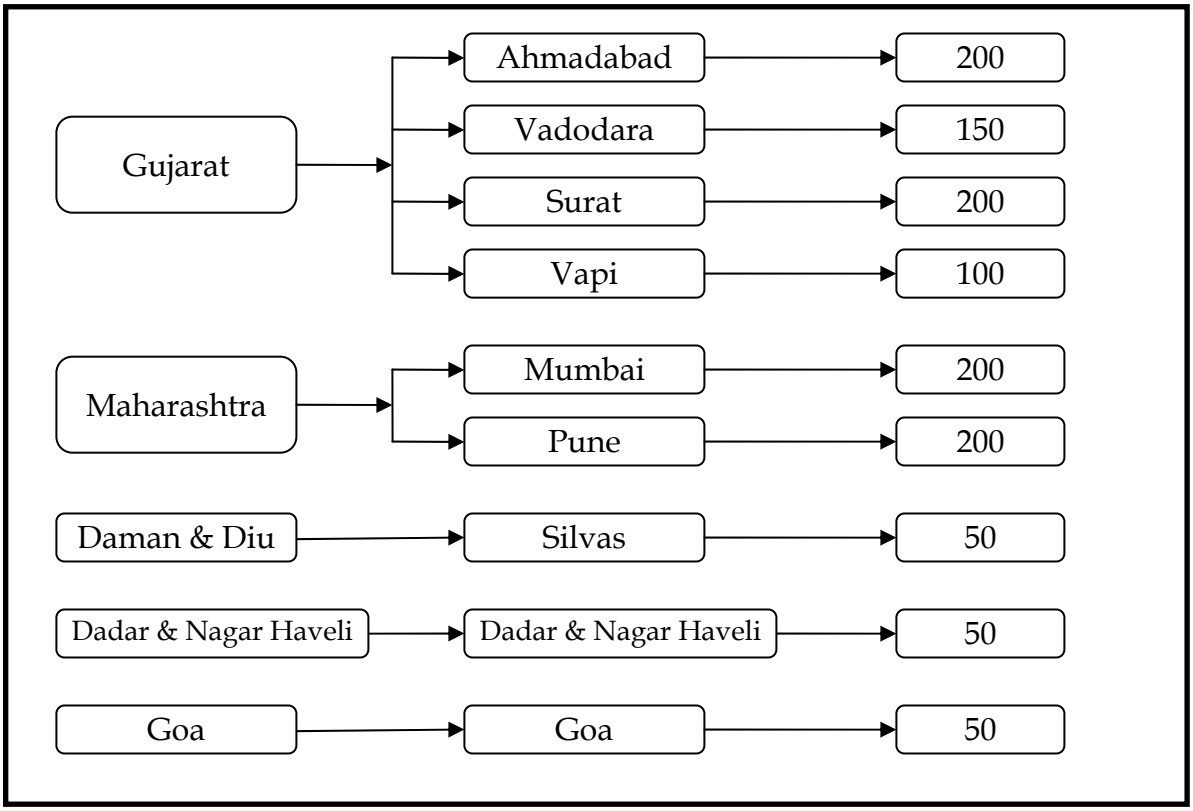
Furthermore, in Gujarat, Ahmadabad and Surat is having a sample of 200 each. Because the former is considered as the financial capital of Gujarat while the later is known as the diamond city of Gujarat. In both the city number of bank account holder with internet banking is more in comparison to the other city in the state that's why I have kept sample size 200 each for both the city.

Vadodara and Vapi are having a sample size of 150 each due to that they have less bank branches and account holders in comparison to Ahmadabad and Surat.

In Maharashtra two major cities i.e. Mumbai and Pune has been considered for this particular study and each having a sample of 200. The logic behind that Mumbai is also known as financial capital and Pune is well known for Business Purpose in every aspect.

Daman & Diu, Dadar and Nagar Haweli and Goa, the three union territories are having a sample representative of 50 each. The logic behind that they have very few numbers of banks branches and hence accounts holders with internet banking

service facilities. Their geographical areas are also small in comparison to the other cities and states have been taken in this study.



5.8 Reliability and Validity of the Study:

The study is valid if its measures actually measure what they claim to and if there are no logical errors in drawing conclusions from the data (Garson, 2002). Therefore different steps were taken to ensure the validity of the study. The theories that have been selected for the study was clearly described and research question has been formulated based on the previous theories. To check the content validity of the questionnaire various expert in the field of academics and banking from the different organization were contacted and the components of questionnaire were modified as per their instructions.

According to Garson (2002), reliability is a measure if the extent to which an item, scale or instrument will yield the same score when administered in different times, location or population, when the two administrations do not differ in relevant variables. The objective is to make sure that if another investigator will follow the same procedures and used the same case study objects, the same conclusion would me made.

Table 5.1: Reliability & Validity of the Study (SPSS output)				
Sr. No.	**Item**	**No. of Items**	**Cronbach's Alpha**	**Remark**
1	Efficiency	7	0.793	Desired Level of Alpha is 0.700
2	Reliability	14	0.688	Desired Level of Alpha is 0.700
3	Service Delivery System	9	0.752	Desired Level of Alpha is 0.700
4	Expectation	4	0.891	Desired Level of Alpha is 0.700
5	Privacy	5	0.725	Desired Level of Alpha is 0.700
6	Tangibles	6	0.863	Desired Level of Alpha is 0.700
7	Satisfaction	60	0.927	Desired Level of Alpha is 0.700

Cronbach's Alpha Reliability Index was used to evaluate internal consistency of each construct. Hair et al. (1998) suggests that that acceptable level of reliability index should be maintained at a minimum of 0.5 in order to satisfy for the early stages of research; and over 0.7 is considered to be a good level.

5.9 Hypothesis of the study:

Table 5.2: Hypothesis of the Study			
Sr. No.	**Hypothesis**	**Variables**	
		Independent	**Dependent**
$H0_1$	Bank treats the customer as individual and provides comparative advantage to the customers [Efficiency of a Bank]	Efficiency of a bank	Satisfaction level of Internet Banking Users
$H0_{1a}$	There is no significant relationship between the speed of login of account and the satisfaction level of Internet banking users.	Speed of log in of Account	Satisfaction level of Internet Banking Users
$H0_{1b}$	There is no significant relationship between the user friendly bank's website and the satisfaction level of Internet banking users.	User friendly bank's website	Satisfaction level of Internet Banking Users
$H0_2$	Bank has the ability to deliver on the promise [Reliability]	Reliability of a Bank	Satisfaction level of Internet Banking Users
$H0_{2a}$	There is no correlation between bank website running time and the satisfaction level of Internet banking users.	Bank's website running time	Satisfaction level of Internet Banking Users
$H0_{2b}$	Service Charge and the satisfaction level of internet banking users are independent from each other.	Service Charge	Satisfaction level of Internet Banking Users
$H0_{2c}$	There is no significant relationship between Account statement through SMS/ E-mail services and the satisfaction level of Internet banking users.	Account statement through SMS/ E-mail	Satisfaction level of Internet Banking Users
$H0_3$	Bank has the willingness to help the clients [Service Delivery System].	Service Delivery System	Satisfaction level of Internet Banking Users

Sr. No.	Hypothesis	Variables	
		Independent	Dependent
$H0_{3a}$	There is no significant relationship between the banks provides appropriate information to customers when a problem occurs and the customer satisfaction of Internet banking.	Banks provides appropriate information to customers when a problem occurs	Satisfaction level of Internet Banking Users
$H0_{3b}$	There is no significant relationship between Banks is Educating Customers time to time and the customer satisfaction of Internet banking.	Banks is Educating Customers	Satisfaction level of Internet Banking Users
$H0_{3c}$	There is no significant relationship between informing customers when services will be performed and the customer satisfaction of Internet banking.	Informing customers after services performed	Satisfaction level of Internet Banking Users
$H0_4$	Bank has ready to fulfill its customer expectation [Expectation of a Customer]	Customer Expectation	Satisfaction level of Internet Banking Users
$H0_{4a}$	Online purchase facilities and Satisfaction level of Internet Banking Users are independent from each other	Online purchase facilities	Satisfaction level of Internet Banking Users
$H0_5$	Bank has the ability to inspire trust and confidence in the clients [Privacy]	Secrecy of a Bank	Satisfaction level of Internet Banking Users
$H0_{5b}$	There is no significant relationship between the bank's website is secure for credit card information and the customer satisfaction of Internet banking.	Bank's website security for credit card information	Satisfaction level of Internet Banking Users

Sr. No.	Hypothesis	Variables	
		Independent	Dependent
$H0_6$	Bank has the ability to represent the service physically {Tangibles}	Tangibles	Satisfaction level of Internet Banking Users
$H0_7$	There is no significant relationship between age and customer satisfaction of internet banking users	Age of a Respondents	Satisfaction level of Internet Banking Users
$H0_8$	There is no significant relation between profession of customer and customer satisfaction of internet banking users.	Profession of a Respondents	Satisfaction level of Internet Banking Users
$H0_9$	Factor determining the satisfaction level of respondents are independent from duration of uses (in year) of internet banking services.	Duration of Internet Banking Uses	Satisfaction level of Internet Banking Users
$H0_{10}$	Satisfaction levels of respondents are independent from the geographic location of the respondents.	Geographic Location (Selected City of western India)	Satisfaction level of Internet Banking Users
$H0_{11}$	There is no association between qualification of a respondents and the customer satisfaction of internet banking users.	Qualification of the Respondents	Satisfaction level of Internet Banking Users
$H0_{12}$	There is no association between number of earning members in a family of a respondents and the satisfaction level of internet banking users.	Number of earning members in a family of the respondents	Satisfaction level of Internet Banking Users
$H0_{13}$	There is no association between income of a respondents and the satisfaction level of internet banking users.	Income of a respondents	Satisfaction level of Internet Banking Users

5.10 Unit of Analysis:

Unit of Analysis for this study would be an individual and a group. Customers who are having a bank account with internet banking are to be considered as an individual. On the other hand a group is formed by the adding a group of individual having a same characteristics i.e. on the base of age, sex, education, income, number of bank account, area of residence, purpose of bank account etc.

5.11 Appropriate Tools for Data Analysis:

This study includes the following tools and techniques for the purpose of data analysis at various stages.

i. Measure of central tendency:
ii. Measure of variability:
iii. Factor Analysis
iv. Cross Tabulation:
v. Regression Analysis:
vi. Hypothesis testing:
vii. Cronbach's alpha (Reliability Test):

5.12 Limitations of the Study:

Major limitation of this study includes the following points:

i. Appropriate identification of target population: Without proper identification of target population it becomes very difficult for a researcher to calculate the sample size. For this study also there is no way to identify the target population and hence scientifically calculate the sample size. It becomes the major limitation of this study.
ii. Second major limitation of this study is that the suggestions and recommendations cannot be generalized. It will only applicable to the concern city of different states and union territories of western India.

5.13 Delimitation of the Study:

The major delimitation for this study is the geographical area and cities across western India. Western India consists of two states i.e. Gujarat and Maharashtra and three union territories i.e. Daman & Diu, Dadar and Nagar Haweli and Goa. All states and union territories across the western India have been considered for this study.

But this study is delimited to the four cities in Gujarat, i.e. Ahmadabad, Vadodara, Surat, Vapi. All these four cities have their own identity. Ahmadabad is known as business capital of Gujarat while Vadodara is known as the cultural capital of Gujarat, Surat is a diamond city not only for Gujarat but at national level. Vapi is considered as fast growing and developing business centre in Gujarat due to the attachment of Mumbai city. In Maharashtra the study is delimited to only two cities i.e. Mumbai and Pune. These two cities are very important not only for the business point of view but for the so many reasons. Daman & Diu, Dadar and Nagar Haweli, Goa there is no option for delimitation due to its geographical expansion. They are very small, having a low population, bank branches and hence bank account holders with internet banking service facilities.

CHAPTER: 6
DATA ANALYSIS AND INTERPRETATION

Introduction:

The result of the survey conducted as a part of the research study has been presented and analyzed in this chapter. Descriptive statistics of the survey respondents has been presented first which includes demographic profile of the respondents and the cross tabulation of the various demographic profile of the respondents. In the second part of this chapter measure of central tendency and measure of variation has been found for each attributes. Third part of this chapter contained the factor analysis of 6 different factors with its attributes. Fourth part of this chapter represents the regression analysis between dependent and independent variables. Fifth and last part of this chapter includes the hypothesis testing and concluded with the summary of this chapter.

Table – 6.1 explain the Demographic Profile of the respondents. The first component of Demographic Profile is Gender. Out of total 1200 respondents, 936 are Male while 264 are Female. Percentage of male respondents is 78 while the percentage of female is 22 only. The respondents belong to the selected city of Western Indian state as per the detail given in the sample size break up.

Second component of the demographic profile as shown in table – 6.1 is the age of the respondents. Total 1200 respondents are divided into four categories as far as their age is concern. The first category of age is 15 years to 30 years, which is the most dominant category among the four. Total 672 respondents belong to this category and their percentage is 56. The second category of age is 30 years to 45 years. Total 264 respondents are belonging to this category and their percentage is 22 out of 1200 respondents. This category has the second highest number of

respondents as far as their age is concern. The third category of age is 45 years to 60 years. Total 168 respondents (22%) out of 1200 belong to this category. The last category of age is 60 years and above. Total 96 respondent out of 1200 belongs to this category while the percentage weightage of this category is 8% only.

Table – 6.1: Demographic Profile of the Respondents			
		Frequency	**Percent**
Gender	Male	936	78.0
	Female	264	22.0
	Total	**1200**	**100.0**
Age (in Years)	15 - 30	672	56.0
	30 – 45	264	22.0
	45 – 60	168	14.0
	60 – Above	96	8.0
	Total	**1200**	**100.0**
Qualification	HSC	72	6.0
	Graduate	672	56.0
	Post Graduate	336	28.0
	Professional	120	10.0
	Total	**1200**	**100.0**
Profession	Job in Public Sector	264	22.0
	Job in Private Sector	840	70.0
	Business Entrepreneur	96	8.0
	Total	**1200**	**100.0**
Gross Monthly Income	0 – 20000	192	16.0
	20001 – 40000	792	66.0
	40001 – 60000	192	16.0
	60001 – Above	24	2.0
	Total	**1200**	**100.0**
Residential Area	Urban	624	52.0
	Semi Urban	96	8.0
	Rural	480	40.0
	Total	**1200**	**100.0**
Family type	Joint Family	192	16.0
	Single Family	1008	84.0
	Total	**1200**	**100.0**
Number of other earning	One	456	38.0

member in a family	Two	552	46.0
	Three – More	192	16.0
	Total	**1200**	**100.0**
How long have you been using bank services	0 – 5	264	22.0
	5 – 10	840	70.0
	10 – above	96	8.0
	Total	**1200**	**100.0**
How long have you been using internet banking	1 – 2	336	28.0
	2 – 3	648	54.0
	3 – Above	216	18.0
	Total	**1200**	**100.0**
Tick the type of a bank in which you have bank account	Private	600	50.0
	Public	312	26.0
	Foreign	240	20.0
	Cooperative	48	4.0
	Total	**1200**	**100.0**

The third component of demographic profile is educational qualification of the respondents. Total respondents are divided into four categories of qualification i.e. up to higher secondary, graduate, Post Graduate and professional. 672 (56%) respondents are graduates while 336 (28%) respondents are Post Graduate. 120 respondents (10%) stand in professional category and the last, which have the lowest number of respondents stands in the category of higher secondary i.e. 72 (6%) respondents only.

The fourth component of demographic profile is the profession of the respondents. There are four categories of profession i.e. Unemployed, Public Sector job, Private Sector job and Business Entrepreneur. Majority of the respondents (70%) are working in the Private sector as shown in the table 6.1 while only (8%) respondents have their own business set up and (22%) respondents are working in the public sector. No any respondents belong to the unemployed category as shown in table – 6.1 above.

The fifth component of the demographic profile of respondents is gross monthly income. The majority (66%) respondents earn 20,000 – 40,000 per month while only 2% respondents earn 60,000 and above monthly. The percentage of respondents who earn zero to 20,000 and 40,000 to 60,000 monthly are same i.e. 16% of the total respondents.

The sixth component of the demographic profile of respondents is their residential area. This component consists of four categories i.e. Urban, Semi Urban, Rural and Slum area. The Urban area has the highest number of respondents i.e. 624 (52%) of the total respondents. While on the other hand there are no respondents belonging to the slum area. Percentage of rural respondents are (40%) while the Semi Urban percentage is only (8%) of the total respondents.

The seventh component of the demographic profile of respondents is their family type. Respondents belong to the two types of family i.e. joint family and single family. 84% respondents belong to the single family background while 16% respondents belong to the joint family background as shown in the table above.

The eighth component of the demographic profile of the respondents is the number of other earning members in a family. This component of demographic profile is divided into four categories i.e. Zero, One, Two and Three or more. 38% respondents have only one more earning member excluding the respondent in their family while 46% respondents have two other earning members in their family. Only 16% respondents told that they have three or more other earning members in their family as shown in above table.

The ninth components of the demographic profile of the respondents are, they have a bank account or not. This study only considered those customers who have bank account and using internet banking. So ultimately 100% respondents have their bank account and using internet banking services provided by their respective bank branches.

The tenth component of the demographic profile of the respondents is types of their bank account i.e. saving account or current account. 100% respondents told that they have saving bank account.

The eleventh component of the demographic profile of the respondents is purpose of their bank account operation. This component is further divided into two categories i.e. personal purpose and business purpose. 100% respondents opted having bank account which is being for their personal purposes not for any business. Table – 6.1 excludes the ninth, tenth and eleventh components of the demographic profile of the respondents because all the three components have 100% respondents in a single category.

The twelve component of the demographic profile of the respondents is; how long they have been using banking services? This component of the demographic profile further classified into four groups i.e. less than five year, five to ten year, ten to fifteen year and fifteen year or above. Majority (70%) of the respondents have been using their banking services from 5 to ten year, while 22% respondents have been using their banking services from zero to five years. Only (8%) respondents have opted that they have been using their banking services since last ten to fifteen years category. None of the customers/respondents are belonging to the category of fifteen years or more.

The thirteenth component of the demographic profile of the respondents is that; how long they have been using internet banking services. This component consist of four categories i.e. less than one year, one to two year, two to three year and three and above year. 54% respondents have been using their internet banking services since last two to three years, while 28% respondents have been using their internet banking services since one year or less. 18% respondents are using their internet banking services since last three years or more as shown in the above table.

Finally, the last and fourteenth component of the demographic profile of the respondents is which types of bank respondents have their bank account. This component is divided into four categories i.e. private bank, nationalized bank, foreign bank and cooperative bank. Half (50%) of the respondents are having their bank account in private bank, while 26% respondents have their bank account in public bank. 20% respondents are having their bank account in foreign bank and only 4% respondents having their bank account in cooperative bank. (*As shown in the above table number – 6.1*).

Table – 6.2 : Cross Tabulation Age Versus How long have you been using internet banking							
			Age				Total
			< - 30	30 - 45	45 - 60	60 - >	
How long have you been using internet banking	1 -2 (Year)	Count	216	96	24	0	336
		% within How long have you been using internet banking	64.3%	28.6%	7.1%	0.0%	100.0%
		% within Age	32.1%	36.4%	14.3%	0.0%	28.0%
		% of Total	18.0%	8.0%	2.0%	0.0%	28.0%
	2 – 3 (Year)	Count	288	144	120	96	648
		% within How long have you been using internet banking	44.4%	22.2%	18.5%	14.8%	100.0%
		% within Age	42.9%	54.5%	71.4%	100.0%	54.0%
		% of Total	24.0%	12.0%	10.0%	8.0%	54.0%
	3 – Above (Year)	Count	168	24	24	0	216
		% within How long have you been using internet banking	77.8%	11.1%	11.1%	0.0%	100.0%
		% within Age	25.0%	9.1%	14.3%	0.0%	18.0%
		% of Total	14.0%	2.0%	2.0%	0.0%	18.0%
Total		Count	672	264	168	96	1200
		% within How long have you been using internet banking	56.0%	22.0%	14.0%	8.0%	100.0%
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	56.0%	22.0%	14.0%	8.0%	100.0%

Table – 6.2 shows the cross tabulation output between age group and since how long respondents have been using internet banking services. Total 336 respondents

have been using internet banking services since two year or less but more than one year out of which (64.3%) 216 respondents are below 30 year of age while (28.6%) 96 respondents are in 30 – 45 year age category and (7.1%) 24 respondents are in the age group of 45 – 60 year. Not any respondent belongs to 60 and above years of age and use internet banking services since last two year or less.

Total 672 respondents are below the age of 30 years out of which 216 (32.1%) respondents have been using internet banking services since last two years or less but more than one year. While 18% of total 1200 respondents are those who are below 30 years of age and use internet banking services since last two years or less but more than one year.

Total 264 respondents are within the age group of 30 – 45 years out of which 96 (36.4%) respondents have been using internet banking services since last two years or less but more than one year. only 8% of total (1200) respondents are in the age group of 30 - 45 years and have been using internet banking services since last two years or less but more than one year.

Total 168 respondents are within the age group of 45 – 60 years out of which 24 (14.3%) respondents have been using internet banking services since last two years or less but more than one year. Only 2% of total (1200) respondents are in the age group of 45 - 60 years and have been using internet banking services since last two years or less but more than one year.

Total 96 respondents are in the age group of 60 and above years out of which not any (0%) respondent have been using internet banking services since last two years or less but more than one year.

Total 648 respondents have been using internet banking services since less than three years but not less than two years out of which (44.44%) 288 respondents are below 30 year of age while (22.2%) 144 respondents are in 30 – 45 year age category and (18.5%) 120 respondents are in the age group of 45 – 60 year. 96 (14.8%) respondents belongs to 60 and above years of age and have been using internet banking services since less than three years but not less than two years.

Total 672 respondents are below the age of 30 years out of which 288 (42.9%) respondents have been using internet banking services since last two years or less but more than one year. Only 24% of total (1200) respondents are those who are below 30 years of age and have been using internet banking services since last two years or less but more than one year.

Total 264 respondents are within the age group of 30 – 45 years out of which 144 (54.5%) respondents have been using internet banking services since last two years or less but more than one year. While 12% of total (1200) respondents are those who are within the age group of 30 - 45 years of age and using internet banking services since last two years or less but more than one year.

Total 168 respondents are within the age group of 45 – 60 years out of which 120 (71.4%) respondents have been using internet banking services since last two years or less but more than one year. Only 10% of total (1200) respondents are those who are within the age group of 45 - 60 years of age and have been using internet banking services since last two years or less but more than one year.

Total 96 respondents are within the age group of 60 – above years out of which 96 (100%) respondents have been using internet banking services since last two years or less but more than one year. 100% of total (1200) respondents are those who are within the age group of 45 - 60 years of age and have been using internet banking services since last two years or less but more than one year.

Total 216 respondents have been using internet banking services since last three years or more out of which (77.8%) 168 respondents are below 30 year of age while (11.1%) 24 respondents are in 30 – 45 year of age category and (11.1%) 24 respondents are in the age group of 45 – 60 year. Zero (0%) respondents belongs to 60 and above years of age and have been using internet banking services since last three years or more.

Total 672 respondents are below the age of 30 years out of which 168 (25%) respondents have been using internet banking services since last three years or more. Only 14% of total (1200) respondents are those who are below 30 years of age and have been using internet banking services since last three years or more.

Total 264 respondents are within the age group of 30 – 45 years out of which 24 (9.1%) respondents have been using internet banking services since last three years or more. Only 2% of total (1200) respondents are those who are within the age group of 30 - 45 years of age and have been using internet banking services since last three years or more.

Total 168 respondents are within the age group of 45 – 60 years out of which 24 (14.3%) respondents have been using internet banking services since last three tears or more. Only 2% of total (1200) respondents are those who are within the age group of 45 - 60 years of age and have been using internet banking services since last three years or more. Total 96 respondents are within the age group of 60 – above years out of which Zero (0%) respondents have been using internet banking services since last three years or more.

Table – 6.3 : Cross Tabulation
City Versus How long have you been using internet banking

			City									Total
			1	2	3	4	5	6	7	8	9	
How long have you been using internet banking	1 – 2 (Year)	Count	55	44	56	28	55	57	14	12	15	336
		% within How long have you been using internet banking	16.4 %	13.1 %	16.7 %	8.3 %	16.4 %	17.0 %	4.2 %	3.6 %	4.5 %	100.0%
		% within City	27.5 %	29.3 %	28.0 %	28.0 %	27.5 %	28.5 %	28.0 %	24.0 %	30.0 %	28.0%
		% of Total	4.6%	3.7 %	4.7 %	2.3 %	4.6 %	4.8 %	1.2 %	1.0 %	1.3 %	28.0%
	2 – 3 (Year)	Count	111	82	110	54	112	104	25	26	24	648
		% within How long have you been using internet banking	17.1 %	12.7 %	17.0 %	8.3 %	17.3 %	16.0 %	3.9 %	4.0 %	3.7 %	100.0%
		% within City	55.5 %	54.7 %	55.0 %	54.0 %	56.0 %	52.0 %	50.0 %	52.0 %	48.0 %	54.0%
		% of Total	9.3%	6.8 %	9.2 %	4.5 %	9.3 %	8.7 %	2.1 %	2.2 %	2.0 %	54.0%
	3 – Above (Year)	Count	34	24	34	18	33	39	11	12	11	216
		% within How long have you been using internet banking	15.7 %	11.1 %	15.7 %	8.3 %	15.3 %	18.1 %	5.1 %	5.6 %	5.1 %	100.0%
		% within City	17.0 %	16.0 %	17.0 %	18.0 %	16.5 %	19.5 %	22.0 %	24.0 %	22.0 %	18.0%
		% of Total	2.8%	2.0 %	2.8 %	1.5 %	2.8 %	3.3 %	.9%	1.0 %	.9%	18.0%
Total		Count	200	150	200	100	200	200	50	50	50	1200
		% within How long have you been using internet banking	16.7 %	12.5 %	16.7 %	8.3 %	16.7 %	16.7 %	4.2 %	4.2 %	4.2 %	100.0%
		% within City	100.0 %	100. 0%	100. 0%	100. 0%	100. 0%	100. 0%	100. 0%	100. 0%	100. 0%	100.0%
		% of Total	16.7 %	12.5 %	16.7 %	8.3 %	16.7 %	16.7 %	4.2 %	4.2 %	4.2 %	100.0%

1 = Ahmadabad, 2 = Vadodara, 3 = Surat, 4 = Vapi, 5 = Mumbai, 6 = Pune, 7 = Silwas, 8 = Dadar & Nagar Haweli, 9 = Goa

Table – 6.3 shows the cross tabulation output between selected city of western Indian state and since how long respondents have been using internet banking services. Total 336 respondents have been using internet banking services since two year or less but more than one year. Among the selected city of Gujarat state, Surat

has the highest number of respondents (16.7)% who have been using internet banking service since two year or less but more than one year while Vapi has the least number of respondents 28 (8.3%) of total respondents. In Maharashtra, Pune has the highest number 57 (17%) of respondents in the same category. In comparison to the states, Union Territories have a less number of respondents as in Silwas, only 14 (4.2%), Dadar & Nagar Haweli, 12 (3.6%) and Goa, 15 (4.5%) in the same category.

Among 9 selected cities of western Indian states, Pune has the highest number of respondents 57 (4.8%) of total respondents in the category of 1 – 2 years of Internet banking use while Dadar & Nagar Haweli has the least 12 (1%) respondents out of total respondents in this category.

In 2 – 3 years duration of internet banking users Ahmadabad and Mumbai have the highest number of respondents (9.3%) of total while Goa has the least number of respondents in this category 24 (2%) only.

Table also depicts that under the category of 3 – 4 years of internet banking users Pune has the highest number of respondents 39 (3.3%) of total respondents while Goa and Silwas has the least number of respondents 11 (0.9%) only in this category.

On the basis of above interpretation it can be concluded that there is no consistency as far as the length of use is concern. There is a huge variation among the users in different period and city. Pune is in the top as far as length of use is concern in the first i.e. 1-2 year and 3-Above years category. While in the bottom there is no consistency in first and third category, Goa has placed in first category while third category occupied by Dadar and Nagar Haweli.

Table – 6.4 : Cross Tabulation Gender Versus How long have you been using internet banking					
			Gender		Total
			Male	Female	
How long have you been using internet banking	1 – 2 (Year)	Count	288	48	336
		% within How long have you been using internet banking	85.7%	14.3%	100.0%
		% within Gender	30.8%	18.2%	28.0%
		% of Total	24.0%	4.0%	28.0%
	2 – 3 (Year)	Count	528	120	648
		% within How long have you been using internet banking	81.5%	18.5%	100.0%
		% within Gender	56.4%	45.5%	54.0%
		% of Total	44.0%	10.0%	54.0%
	3 – Above (Year)	Count	120	96	216
		% within How long have you been using internet banking	55.6%	44.4%	100.0%
		% within Gender	12.8%	36.4%	18.0%
		% of Total	10.0%	8.0%	18.0%
Total		Count	936	264	1200
		% within How long have you been using internet banking	78.0%	22.0%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	78.0%	22.0%	100.0%

Table 6.4 depicts the cross tabulation between Gender versus How long have you been using internet banking services. There is a huge variation in using internet banking service in 1 – 2 years category. Among the total respondents, 336 (28%) respondents belong to this category. Percentage of male users are very high, 288 (24%) of total respondents in comparison to female 48 (4%) only in this category. Within this period approximately 86% respondents are male while female respondents are 14% only.

Among the total respondents, 648 ((54%) belong to the second category i.e. 2 – 3 years of internet banking service uses. The duration of this period has same trend as the one in previous duration. Male plays a dominant role as far as the number of users is concern. There are 528 (44%) of male users in this category while female are 120 (10%) only.

In the third category of internet banking service users i.e. 3 year and above, table depicts the continuation of trend. 216 (18%) respondents belong to this category in which 120 (10%) are male and 96 (8%) are female out of the total respondents.

Over all more than one third, 936 (78%) respondents are male while on the other side 96 (22%) respondents are female only. On the basis of above interpretation more focus should be given to the male users in comparison to the female.

Table – 6.5 : Cross Tabulation Qualification Versus How long have you been using internet banking							
			Qualification				Total
			HSC	Graduate	PG	Prof.	
How long have you been using internet banking	1 – 2 (Year)	Count	48	168	120	0	336
		% within How long have you been using internet banking	14.3%	50.0%	35.7%	0.0%	100.0%
		% within Qualification	66.7%	25.0%	35.7%	0.0%	28.0%
		% of Total	4.0%	14.0%	10.0%	0.0%	28.0%
	2 – 3 (Year)	Count	24	336	192	96	648
		% within How long have you been using internet banking	3.7%	51.9%	29.6%	14.8%	100.0%
		% within Qualification	33.3%	50.0%	57.1%	80.0%	54.0%
		% of Total	2.0%	28.0%	16.0%	8.0%	54.0%
	3 – Above (Year)	Count	0	168	24	24	216
		% within How long have you been using internet banking	0.0%	77.8%	11.1%	11.1%	100.0%
		% within Qualification	0.0%	25.0%	7.1%	20.0%	18.0%
		% of Total	0.0%	14.0%	2.0%	2.0%	18.0%
Total		Count	72	672	336	120	1200
		% within How long have you been using internet banking	6.0%	56.0%	28.0%	10.0%	100.0%
		% within Qualification	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	6.0%	56.0%	28.0%	10.0%	100.0%

Qualification and the duration of using Internet Banking services varied significantly as shown in table – 6.5. Graduates are more in numbers than post graduates, professionals and under graduate. 336 (28%) respondents belong to this category i.e. 1 - 2 year of using internet banking, out of which 168 (14%) are graduates, 120 (10%) post graduates and 48 (4%) under graduates. Not any respondent belong to professional category in this duration of services use among

the total respondents. Among the total respondents, 648 (54%) who have been using internet banking since last 2-3 year, 336 (28%) are graduates, 192 (16%) are post graduates, 96 (8%) are professionals and 24 (2%) are under graduates out of the total respondents.

216 (18%) respondents belong to the third category that have been using internet banking services since last three years or more. Within this category, 168 (78%) respondents are graduates while post graduates and professionals are only 24 (11%) and 24 (11%) respectively. There are no any respondents belonging from the under graduate category who have been using internet banking since last three years and above.

The respondents whose qualification is Professionals or undergraduates contributed very less and still less adopted the internet banking in comparison to graduates and post graduate. So there is a need to take initiative to create awareness among professionals or undergraduates respondents about various types of internet banking services available through internet, Cost and time saving with the use of internet banking and other benefits related to internet banking services.

Table – 6.6 : Cross Tabulation Profession versus How long have you been using internet banking						
			Profession			Total
			Pub Sec	Pvt Sec	BE	
How long have you been using internet banking	1 – 2 (Year)	Count	72	264	0	336
		% within How long have you been using internet banking	21.4%	78.6%	0.0%	100.0%
		% within Profession	27.3%	31.4%	0.0%	28.0%
		% of Total	6.0%	22.0%	0.0%	28.0%
	2 – 3 (Year)	Count	192	384	72	648
		% within How long have you been using internet banking	29.6%	59.3%	11.1%	100.0%
		% within Profession	72.7%	45.7%	75.0%	54.0%
		% of Total	16.0%	32.0%	6.0%	54.0%
	3 – Above (Year)	Count	0	192	24	216
		% within How long have you been using internet banking	0.0%	88.9%	11.1%	100.0%
		% within Profession	0.0%	22.9%	25.0%	18.0%
		% of Total	0.0%	16.0%	2.0%	18.0%
Total		Count	264	840	96	1200
		% within How long have you been using internet banking	22.0%	70.0%	8.0%	100.0%
		% within Profession	100.0%	100.0%	100.0%	100.0%
		% of Total	22.0%	70.0%	8.0%	100.0%

Profession and the duration of using internet banking differ as the period become longer. In 1 – 2 year category, there are 336 (28%) respondents. In this time frame the respondents who are working in private sector lead among others. Within this category, private sector job holders are 264 (79%) in number while public sector job holder are 72 (21%). But when we look as a total, the respondents who belongs to private sector category are (22%) of total respondents while the public sector respondents are (6%) only. A major issue of concern for the purpose of research is that in this time frame not a single business entrepreneur is using internet banking services.

The 2-3 year period which is having 648 (54%) respondents, out of which 192 (16%) belongs to public sector category while 384 (32%) respondents belong to private sector category. Only 72 (6%) respondents belong to the business entrepreneur category.

In the third category i.e. three year and above of internet banking use 216 (18%) respondents belongs to this category out of which 192 (16%) respondents are working in a private sector while only 24 (2%) respondents are business entrepreneur. There are no respondents belonging to the public sector category who have been using internet banking services since last three year and above.

The respondents from public sector and business entrepreneur are less in number in the three categories as far as the duration of internet banking services is concerned in comparison to the private sector. So there is a need to check the reasons why they are not using the internet banking services.

Table – 6.7 : Cross Tabulation Income Versus How long have you been using internet banking							
			Gross Monthly Income				Total
			Below - 20000	20001 - 40000	40001 – 60000	60001 – Above	
How long have you been using internet banking	1 – 2 (Year)	Count	48	264	24	0	336
		% within How long have you been using internet banking	14.3%	78.6%	7.1%	0.0%	100.0%
		% within Gross Monthly Income	25.0%	33.3%	12.5%	0.0%	28.0%
		% of Total	4.0%	22.0%	2.0%	0.0%	28.0%
	2 – 3 (Year)	Count	120	336	168	24	648
		% within How long have you been using internet banking	18.5%	51.9%	25.9%	3.7%	100.0%
		% within Gross Monthly Income	62.5%	42.4%	87.5%	100.0%	54.0%
		% of Total	10.0%	28.0%	14.0%	2.0%	54.0%
	3 – Above (Year)	Count	24	192	0	0	216
		% within How long have you been using internet banking	11.1%	88.9%	0.0%	0.0%	100.0%
		% within Gross Monthly Income	12.5%	24.2%	0.0%	0.0%	18.0%
		% of Total	2.0%	16.0%	0.0%	0.0%	18.0%
Total		Count	192	792	192	24	1200
		% within How long have you been using internet banking	16.0%	66.0%	16.0%	2.0%	100.0%
		% within Gross Monthly Income	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	16.0%	66.0%	16.0%	2.0%	100.0%

Table – 6.7 shows the cross tabulation output between income and since how long respondents have been using internet banking services. Total 336 respondents have been using internet banking services since two year or less but more than one year, out of which 48 (14.3%) respondents earn 20,000 or less monthly 264 (78.6%)

respondents earn 20001 to 40000 monthly and 24 (7.1%) respondents earn 40001 to 60000 monthly and not any respondents belong to 60001 and above category and have been using internet banking services since last two year or less.

In 2 – 3 year category there are 648 (54%) of total respondents using internet banking services. 120 (18.5) respondents within this category use internet banking since last 2 – 3 years and have a monthly income of 20,000 or below. 336 (51.9%) respondents within this category are using internet banking services since last 2 – 3 years and have a monthly income of Rs. 20,001 – 40,000. 168 (25.9%) respondents within this category are using internet banking services since last 2 – 3 years and have a monthly income of Rs. 40,001 – 60,000. Only 24 (3.7%) respondents within this category and have been using internet banking since last 2 – 3 years and having a monthly income of 60,001 and above.

In three or more year category there are 216 (18%) respondents out of 1200. Within this category 24 (11.1%) respondents have been using internet banking since last 2 – 3 years and have a monthly income of 20,000 or below. 192 (88.9%) respondents within this category are using internet banking services since last 2 – 3 years and have a monthly income of Rs. 20,001 – 40,000. In 40001 – 60000 and 60001 and above, there are no respondents who are using internet banking service since last three years or more.

Out of the total 1200 respondents 192 (16%) respondents are using internet banking since last 1-2 year and have a monthly income of Rs. 20000 and below. Total 792 (66%) respondents are using internet banking since last 2-3 year and have a monthly income of Rs. 20001 – 40000. 192 (16%) respondents are using internet banking since last 3-above year and have a monthly income of Rs. 40001 – 60000.

Table – 6.8 : Cross Tabulation
Residential Versus How long have you been using internet banking

			Residential Area			
			Urban	Semi Urban	Rural	Total
How long have you been using internet banking	1 – 2 (Year)	Count	240	24	72	336
		% within How long have you been using internet banking	71.4%	7.1%	21.4%	100.0%
		% within Residential Area	38.5%	25.0%	15.0%	28.0%
		% of Total	20.0%	2.0%	6.0%	28.0%
	2 – 3 (Year)	Count	216	72	360	648
		% within How long have you been using internet banking	33.3%	11.1%	55.6%	100.0%
		% within Residential Area	34.6%	75.0%	75.0%	54.0%
		% of Total	18.0%	6.0%	30.0%	54.0%
	3 – Above (Year)	Count	168	0	48	216
		% within How long have you been using internet banking	77.8%	0.0%	22.2%	100.0%
		% within Residential Area	26.9%	0.0%	10.0%	18.0%
		% of Total	14.0%	0.0%	4.0%	18.0%
Total		Count	624	96	480	1200
		% within How long have you been using internet banking	52.0%	8.0%	40.0%	100.0%
		% within Residential Area	100.0%	100.0%	100.0%	100.0%
		% of Total	52.0%	8.0%	40.0%	100.0%

Total 336 respondents are using internet banking services since 1-2 years out of which 240 are in urban area, 24 in semi urban and 72 lives in rural areas.

Out of 624 respondents, 52% those who live in urban areas and have been using internet banking services. There are only 14% who have been using internet banking since more than three years while majority 20% respondents who live in urban areas and have been using internet banking services since last 1-2 years. Out of 96 suburban respondents no one use internet banking service since last three years or more. 72 respondents have been using internet banking services since last 2-3 years and only 24 since last 1-2 years.

There are 648 respondents who have been using internet banking services since 2-3 years out of which 360 live in rural areas and 216 live in urban areas.

Total 216 respondents have been using internet banking services since last three years or more in which 168 live in urban areas and 48 live in rural areas while none of the respondents belong to suburban areas in this category.

Out of 480 rural respondents, there are 360 respondents who have been using internet banking services since last 2-3 years and only 48 respondents have been using internet banking services since last three years or more and 72 respondents since last 1-2 years.

Out of total 1200 respondents, 624 live in urban areas while 480 respondents lives in rural areas. Out of total, 648 respondents have been using internet banking services since last 2-3 years and 336 respondents have been using internet banking services since last 1-2 years.

Table – 6.9 : Cross Tabulation Family Type versus How long have you been using internet banking					
			Family type		Total
			Joint	Single	
How long have you been using internet banking	1 – 2 (Year)	Count	120	216	336
		% within How long have you been using internet banking	35.7%	64.3%	100.0%
		% within Family type	62.5%	21.4%	28.0%
		% of Total	10.0%	18.0%	28.0%
	2 – 3 (Year)	Count	72	576	648
		% within How long have you been using internet banking	11.1%	88.9%	100.0%
		% within Family type	37.5%	57.1%	54.0%
		% of Total	6.0%	48.0%	54.0%
	3 – Above (Year)	Count	0	216	216
		% within How long have you been using internet banking	0.0%	100.0%	100.0%
		% within Family type	0.0%	21.4%	18.0%
		% of Total	0.0%	18.0%	18.0%
Total		Count	192	1008	1200
		% within How long have you been using internet banking	16.0%	84.0%	100.0%
		% within Family type	100.0%	100.0%	100.0%
		% of Total	16.0%	84.0%	100.0%

In 1 – 2 year duration of internet banking use, there are 336 (28%) respondents out of which 120 (10%) respondents live in a joint family while 216 (18%) respondents are living in a single family. In 2 - 3 year duration of internet banking use, there are 648 (54%) respondents, out of which 72 (6%) respondents live in a joint family while 576 (48%) respondents are living in a single family.

In 3 - above year duration of internet banking use there are 216 (18%) respondents out of which 0 (0%) respondents live in a joint family while 216 (18%) respondents are living in a single family.

Table – 6.10 : Cross Tabulation
Number of Earning members in a family versus How long have you been using internet banking

			Number of other earning member in a family			Total
			One	Two	Three & More	
How long have you been using internet banking	1 – 2 (Year)	Count	144	72	120	336
		% within How long have you been using internet banking	42.9%	21.4%	35.7%	100.0%
		% within Number of other earning member in a family	31.6%	13.0%	62.5%	28.0%
		% of Total	12.0%	6.0%	10.0%	28.0%
	2 – 3 (Year)	Count	288	288	72	648
		% within How long have you been using internet banking	44.4%	44.4%	11.1%	100.0%
		% within Number of other earning member in a family	63.2%	52.2%	37.5%	54.0%
		% of Total	24.0%	24.0%	6.0%	54.0%
	3 – Above (Year)	Count	24	192	0	216
		% within How long have you been using internet banking	11.1%	88.9%	0.0%	100.0%
		% within Number of other earning member in a family	5.3%	34.8%	0.0%	18.0%
		% of Total	2.0%	16.0%	0.0%	18.0%
Total		Count	456	552	192	1200
		% within How long have you been using internet banking	38.0%	46.0%	16.0%	100.0%
		% within Number of other earning member in a family	100.0%	100.0%	100.0%	100.0%
		% of Total	38.0%	46.0%	16.0%	100.0%

In 1 – 2 year duration of internet banking use, 336 respondents belong to this category out of the total respondents. Within this category, 144 respondents are having only one earning member in their family while 72 respondents are having

two earning members in their family and 120 respondents are having three and more earning members in their family.

In 2 – 3 year duration of internet banking use, 648 respondents belong to this category out of the total respondents. Within this category, 288 respondents are having only one earning member in their family while 288 respondents are having two earning members in their family and 72 respondents are having three and more earning members in their family.

In 3 – above year duration of internet banking use, 216 respondents belongs to this category out of the total respondents. Within this category, 24 respondents are having only one earning member in their family while 192 respondents are having two earning members in their family and no respondents are having three and more earning members in their family.

Out of the total, 456 respondents are having only one earning member in their family and have been using internet banking services irrespective of the duration. 552 respondents are having two earning members in their family and have been using internet banking services irrespective of the duration. 192 respondents are having three or more earning members in their family and have been using internet banking services irrespective of the duration.

Table – 6.11 : Cross Tabulation Type of a bank Versus How long have you been using Internet Banking							
			Tick the type of a bank in which you have bank account				Total
			Pvt.	Public	Foreign	Co-op.	
How long have you been using internet banking	1 – 2 (Year)	Count	144	72	96	24	336
		% within How long have you been using internet banking	42.9%	21.4%	28.6%	7.1%	100.0%
		% within Tick the type of a bank in which you have bank account	24.0%	23.1%	40.0%	50.0%	28.0%
		% of Total	12.0%	6.0%	8.0%	2.0%	28.0%
	2 – 3 (Year)	Count	288	216	120	24	648
		% within How long have you been using internet banking	44.4%	33.3%	18.5%	3.7%	100.0%
		% within Tick the type of a bank in which you have bank account	48.0%	69.2%	50.0%	50.0%	54.0%
		% of Total	24.0%	18.0%	10.0%	2.0%	54.0%
	3 – Above (Year)	Count	168	24	24	0	216
		% within How long have you been using internet banking	77.8%	11.1%	11.1%	0.0%	100.0%
		% within Tick the type of a bank in which you have bank account	28.0%	7.7%	10.0%	0.0%	18.0%
		% of Total	14.0%	2.0%	2.0%	0.0%	18.0%
Total		Count	600	312	240	48	1200
		% within How long have you been using internet banking	50.0%	26.0%	20.0%	4.0%	100.0%
		% within Tick the type of a bank in which you have bank account	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	50.0%	26.0%	20.0%	4.0%	100.0%

The output of the above table shows that 600 (50%) respondents are using internet banking services irrespective of the duration of use and having a bank account in private banks. 312 (26%) respondents are using internet banking services irrespective of the duration of use and have a bank account in public banks. 240 (20%) respondents are using internet banking services irrespective of the duration of use and have a bank account in foreign banks. 48 (4%) respondents are using internet banking services irrespective of the duration of use and have a bank account in cooperative banks.

Table – 6.12: Descriptive Statistics Dependent & Independent Variables		
Variables	**Mean**	**SD**
Efficiency		
The speed of log in of your account	3.80	.980
Availability of the important information on the bank website	3.10	.749
User friendly website	3.30	.749
Availability of appropriate instructions and guidelines	3.60	.800
Server efficiency during transaction	3.40	.800
The speed of logout of your account	3.40	.800
Rate above Criteria to measure efficiency of a Bank	5.00	0.000
Reliability		
Reliability of Webpage	2.80	.400
Service Beyond the Banking Hours	3.40	1.201
Message about Completion of Transaction	3.20	.980
Page Download facilities	3.40	.490
Accuracy of Information	3.00	1.096
Information Contents and Text Understanding	2.40	1.020
Satisfaction Level of Service in comparison of Charges	2.80	1.601
Easiness of Transaction money to Branched/Banks	3.40	1.357
Convenient ATM Location	3.60	1.357
Maximum Withdrawal Criteria for ATM	4.00	.895
Account Statement Through SMS/E-mail Services	3.20	.400
Reputation of Bank	2.40	.490
Maintaining Error free Records	2.40	.800
Rate Above Criteria to Measure the Reliability of a Bank	2.60	1.020
Service Delivery System		
Promptness of Bank response at the time of occurrence of the Problem	2.20	.400
Promptness in problem Solving	3.20	1.470
Online Customer Service Representative Connectivity	2.80	.749

Customer Service Representative on Telephone	4.20	.749
Variables	**Mean**	**SD**
Bank Initiative to Educate Customer	2.40	.800
Bank Response to Complain	2.20	.749
Ability of Bank Representative	2.20	.400
Behavior and Attitude of Employee/Customer Service Representative	2.80	1.167
Rate Above Criteria to Measure the Service Delivery System of a Bank	3.20	.980
Expectation of a Customer		
Confirmation Message for the Service Availed	2.80	1.167
Online Purchase Facility	2.20	.400
Fulfillment of Customer Instructions	3.00	1.674
Rate Above Criteria to Measure the Expectation of a Customer	3.00	1.674
Secrecy of Customer		
Secrecy of a Personal Information	3.00	.633
Protection of a Cookies to collect information	3.00	.633
Secrecy of your credit card Information	2.60	.800
Reliability of bank undertaking for not sharing the information	3.40	.490
Rate Above Criteria to Measure the Secrecy of a Customer	2.80	.980
Tangibles		
Technological Advancement	2.40	.800
Visually appealing physical facilities	3.19	.751
Smart Employee	2.80	.749
Visually appealing material associated with service	2.60	.490
Bank Modify their home page Occasionally	3.20	.749
Rate Above Criteria to Measure Tangibles	3.40	1.020
Overall Satisfaction	**3.02**	**.29**

Table 6.12 shows the outcome of descriptive statistics of all the variables included in the study. The table gives an idea about the level of satisfaction of all independent

variables included to measure the over all satisfaction of internet banking users. One of the important independent variable for measuring the satisfaction level of internet banking users has been used in this study has been considered as Efficiency. To find out the overall efficiency, six different attributes were used on the basis of literature review and mentioned in the previous chapter. Among six attributes of efficiency the speed of log in of your account has the highest mean value i.e. 3.80 with a standard deviation of 0.98 with minimum value 2 and maximum value 5 which is close to good on five point scale. 98% variation observed among the respondents as far as the level of satisfaction with internet banking is concern.

Availability of information on bank website has the lowest mean among all six attributes to measure efficiency i.e. 3.1 out of 5 which is just above average with a standard deviation of 0.749 with a lowest value of 2 and highest value of 4. 74% variations have been observed among the respondents as far as the level of satisfaction with internet banking is concern. Rest of the attributes had almost the same value in between 3 and 4 out of 5. None of the attributes have a mean value of 4 and above which indicate that efficiency of a bank may be improved with a technical advancement and a continuous technical improvement. Among the six attributes in efficiency, availability of the important information on bank's website needs to be updated. Bank should keep all the important information on their website for improving the satisfaction level of customer. The website is designed in such a way that each and every customer uses it easily and understands its usefulness. There is also need to improve in log out speed for customer greater satisfaction level. The attributes identified to measure the efficiency 100% respondents' rate 5 out of 5 which means modal is best fitted as far as the expectation of a customer is concern.

The second important independent variables for this study is Reliability, which has 13 attributes to find out the over all reliability of a customer. Respondents are well satisfied with the maximum withdrawal criteria from ATM with a mean value of 4 and standard deviation 0.895. But the attributes from which majority of the respondents are dissatisfied are reliability of web page, information contents and text understanding, satisfaction level of service in comparison to charges, reputation of a Bank maintaining error free record.

Maintaining error free records, reliability of a web page and reputation of a bank has the lowest mean 2.4 out of 5. Which indicate that these three attributes among all, need more attention for improving the satisfaction level of the respondent. Bank should keep the reliable information on their website and avoid unnecessary documentation on the website. Respondents are dissatisfied with text understanding so banks need to check the simplicity of text and contents. For better understanding bank should keep the simple and easy to understand sentence and avoid the phrase and abbreviation. Respondents are dissatisfied with service charge of a bank so bank need to modify their charges as per the customer expectation. Finally to improve the over all reliability of a customer, bank need to focus on these dissatisfied attributes to enhance the satisfaction level of internet banking users.

Service Delivery System the third important independent variable for this study has an eight attributes. Among these attributes customer service representative on telephone has the highest mean value 4.20 which is good enough and the bank response to complain has the lowest mean value 2.2. The major attribute from which respondents are dissatisfied are behavior and attitude of employee, ability of bank representative, bank response to complain, bank initiative to educate customer, connection with online service customer representative and the promptness of bank response at the time of occurrence of problem. In this section

respondents are only satisfied with the availability of the customer representative on telephone and the promptness in problem solving.

Bank need to train and educate their employees as far as attitude and behavior of employees are concern. The staff should understand the value and importance of a customer. To improve the other attributes of this section professional advancement is required and this can be achieved through the training and development program.

Expectation of a customer is one of the important variables to measure the satisfaction level of internet banking users. Total three attribute were identified to find out the over all expectation of the customer in internet banking services. Among these customers are satisfied with fulfillment of customer instructions while they are dissatisfied with confirmation message after the service availed and online purchase facility.

To improve the over all satisfaction bank need to provide the online purchasing facility confirmation message on the mobile of the internet banking service users.

Secrecy of a customer is another important variable identified for this study to measure the customer satisfaction level of internet banking services. Total four attributes were identified to measure the secrecy of a customer adopted by the banks. Among four attributes respondents are satisfied with not sharing the information with others while the dissatisfaction of the respondents includes secrecy of credit card information. With the technological advancement now a days customers are frequently using the credit card/plastic money. But the risk factor of being hacked by some one is more in that so bank need to give more attention to protect the customer credit card information.

Tangible is the last important factor to measure the satisfaction level of internet banking users. There are five attribute identified in this section which is important to measure the satisfaction of the internet banking users. Among these attributes respondents are dissatisfied with technological advancement and smart employee with a mean of 2.4 and 2.8 respectively as shown in table 6.12. Banks need to adopt the new and latest technology for the better satisfaction level of their customer. Smartness of employees where the customers of a bank are dissatisfied need to be hire some smart employee to attract customer in this competitive global scenario.

Table – 6.13 : Factor Analysis						
Communalities	**Variables**					
	F1	**F2**	**F3**	**F4**	**F5**	**F6**
The speed of log in of your account	.998					
Availability of the important information on the bank website	.996					
User friendly website	.996					
Availability of appropriate instructions and guidelines	.998					
Server efficiency during transaction	.999					
The speed of logout of your account	.999					
Reliability of Webpage		.998				
Service Beyond the Banking Hours		.998				
Message about Completion of Transaction		.996				
Page Download facilities		.996				
Accuracy of Information		.994				
Information Contents and Text Understanding		.999				
Satisfaction Level of Service in comparison of Charges		.999				
Easiness of Transaction money to Branched/Banks		.998				
Convenient ATM Location		.998				
Maximum Withdrawal Criteria for ATM		.986				
Account Statement Through SMS/E-mail Services		.991				
Reputation of Bank		.997				
Maintaining Error free Records		.998				
Promptness of Bank response at the time of occurrence of the Problem			.956			
Promptness in problem Solving			.938			
Online Customer Service Representative Connectivity			.953			
Customer Service Representative on Telephone			.965			
Bank Initiative to Educate Customer			.947			
Bank Response to Complain			.970			
Ability of Bank Representative			.942			

Communalities	Variables					
	F1	F2	F3	F4	F5	F6
Behavior and Attitude of Employee/Customer Service Representative			.943			
Confirmation Message for the Service Availed				.989		
Online Purchase Facility				.991		
Fulfillment of Customer Instructions				.994		
Secrecy of a Personal Information					.999	
Protection of a Cookies to collect information					.993	
Secrecy of your credit card Information					.997	
Reliability of bank undertaking for not sharing the information					.992	
Technological Advancement						.997
Visually appealing physical facilities						.970
Smart Employee						.995
Visually appealing material associated with service						.998
Bank Modify their home page Occasionally						.997
Overall Satisfaction	.985					
Extraction Method: Principal Component Analysis.						

Construct validity seek agreement between a theoretical concept and a specific measuring device or procedure. Construct validity of the survey instruments was tested using factor analysis.

Factors were extracted from the survey responses using principal component extraction method with varimax rotation. Factors with Eigen value above 1 and loading of at least 0.40 is accepted as a desired result of PCA (Hair et al 1992).

Total 6 factors are included in the factor analysis i.e. Efficiency of a bank, Reliability of a bank, Service Delivery System, Secrecy of Customer, Expectation of Customer and Tangibles.

F1 indicate the Efficiency of a bank, in which six attributes, the speed of log in of your account, availability of the important information on the bank website, user friendly website, availability of important instructions and guidelines, server efficiency during transaction and the speed of log out of account have been loaded and found to be more appropriate with Eigen value of more than .800 and hence no factor from this category has been excluded for this study.

F2 indicate the reliability of a bank, in which 13 attributes, reliability of webpage, service beyond the banking hours, message about the completion of transaction, page download facilities, accuracy of information, information contents and text understanding, satisfaction level of services in comparison to charge, easiness of transferring money to branches/bank, convenient ATM location, maximum withdrawal criteria for ATM, account statement through SMS/e-mail, reputation of bank and maintaining error free records have been loaded and found to be more appropriate with a Eigen value of more than .900 and hence no attributes have been excluded from this study.

F3 indicate the service delivery system of a bank, in which 8 attributes, promptness of bank response at the time of occurrence of problem, promptness in problem solving, online customer service representative connectivity, customer service representative on telephone, bank initiative to educate customer, bank response to complain, ability of bank representative and behavior and attitude of employee/customer service representative have been loaded and found to be appropriate for the inclusion of attribute in this study. Hence all attributes had been considered for the final analysis of the data.

F4 indicate the expectation of a customer, in which 3 attributes, confirmation message for the service availed; online purchase facility and fulfillment of customer instructions have been loaded in the factor analysis and found to be appropriate for

the inclusion of attributes in this study. Hence all attributes have been considered for the final analysis of the data.

F5 indicate the secrecy of a customer, in which 4 attributes, secrecy of personal information, protection against cookies to collect information, secrecy of your credit card information and reliability on bank undertaking for not sharing the information have been loaded in the factor analysis and found to be appropriate for the inclusion of attribute in this study. Hence all attribute have been considered for the final analysis of the data.

F6 indicate the tangibles of a bank, in which 5 attributes, Technological advancement, visually appealing physical facilities, smart employees, visually appealing materials associated with service and bank modify their home page occasionally have been loaded in the factor analysis and found to be appropriate for the inclusion of attribute in this study. Hence all attribute have been considered for the final analysis of the data.

The results of factor analysis shows that all the attributes has a value of more than .900 which is best fitted for statistical analysis and validate the construct of the study. Not any value is found below .400, hence not a single attribute has been dropped out from the study.

Regression Analysis [Efficiency]:

In this study the Efficiency has been used as the dependent variable and the six attributes used to measure the efficiency of a bank, namely the speed of log in of your account, availability of the important information on the bank websites, user friendly website, availability of the important instructions and guidelines, service efficiency during transactions and the speed of log out of account has been used as an independent variables. In this study, the OLS regression model has been used to determine the significance level of the attributes for the efficiency of a bank. The basic model used is as under:

Efficiency of a bank = f (the speed of log in of your account, availability of the important information on the bank websites, user friendly website, availability of the important instructions and guidelines, service efficiency during transactions and the speed of log out of account) Mathematically it can be written as:

$$[EB = \alpha + ß_1x_1 + ß_2x_2 + ß_3x_3 + ß_4x_4 + ß_5x_5 + ß_6x_6 + e]$$

Where,

EB = Efficiency of a Bank

X_1 = the speed of log in of account

X_2 = availability of the important information on the bank websites

X_3 = user friendly website

X_4 = availability of the important instructions and guidelines

X_5 = service efficiency during transactions

X_6 = speed of log out of account

The α is constant while $ß_s$ are coefficients of estimates and e is the error term.

Table 6.14 : Descriptive Statistics of Efficiency			
	N	Mean	Std. Deviation
The speed of log in of your account	1200	3.800	.9802
Availability of the important information on the bank website	1200	3.200	.7486
User friendly website	1200	3.200	.7486
Availability of appropriate instructions and guidelines	1200	3.600	.8003
Server efficiency during transaction	1200	3.400	.8003
The speed of logout of your account	1200	3.400	.8003
Over all Efficiency	1200	3.433	.7720
Valid N (list wise)	1200		

[Source: SPSS regression results of the primary data]

The Above table shows the mean value depicting the over all efficiency of a bank. As far as this descriptive statistics is concerned, over all efficiency of a bank is above average with a mean value of 3.43 on a 5 point likert scale. Respondents are fairly satisfied with speed of log in of account, appropriate instructions and guidelines, service efficiency, speed of log out. The respondents are less satisfied on user friendly website and availability of important information on bank website. However a regression analysis has been used as a tool to identify and to explain the attributes or independent variables affecting the level of over all efficiency of a bank.

The over all regression model and its ANOVA are summarized as follows:

Table 6.15 : Model Summary [Efficiency]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.995[a]	.991	.991	.0282011
a. Predictors: (Constant), The speed of logout of your account, The speed of log in of your account, User friendly website, Availability of appropriate instructions and guidelines				

[Source: SPSS regression results of the primary data]

Table 6.16 : ANOVA[a] [Efficiency]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100.375	4	25.094	31552.617	.000[b]
	Residual	.950	1195	.001		
	Total	101.326	1199			
a. Dependent Variable: Overall Satisfaction						
b. Predictors: (Constant), The speed of logout of your account, The speed of log in of your account, User friendly website, Availability of appropriate instructions and guidelines						

[Source: SPSS regression results of the primary data]

It is clear from the ANOVA test that shows the table significance value 0.05 is greater than the calculated significance value .000. It reflects the null hypothesis at 5% level of significance. It means there was a significant correlation between dependent and Independent variables. Therefore over all efficiency of a bank depends on the identified attributes (independent variables) used in this research. But it does not mean that all identified attributes have significant correlation with over all efficiency of a bank.

The over all predictability of the model is shown in table 6.15. The adjusted R^2 value of .991 indicates that model explains 99% of the attributes are responsible for overall efficiency measures. The ANOVA table shows the significant F values which implies that the model and data are well fitted in explaining the over all efficiency of a bank. Based on the data found in the table 26 it can be interpreted that the independent variables or attributes such as user friendly websites and availability of appropriate instructions and guidelines have a strong impact on overall efficiency of a bank. Hence the other variables were dropped out from the final analysis based on 99% level of significance.

Table 6.17 : Regression Coefficients Analysis of the Model						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	1.672	.004		410.720	.000
	The speed of log in of your account	-.230	.003	-.775	-89.326	.000
	User friendly website	.212	.003	.545	82.171	.000
	Availability of appropriate instructions and guidelines	.600	.003	1.651	208.373	.000
	The speed of logout of your account	-.180	.003	-.494	-69.737	.000
a. Dependent Variable: Overall Satisfaction						

[Source: SPSS regression results of the primary data]

On the basis of above findings following regression model has been developed:

[EB = 1.672 + .212X_1 + .600X_2] Where,

EB = Efficiency of a bank
X_1 = User friendly website
X_2 = Availability of appropriate instructions and guidelines

Coefficient analysis shows the relationship between Dependent variable and each Independent variable. According to significance value, Efficiency of a bank and Availability of appropriate instructions and guidelines has a significant correlation with over all efficiency of a bank. Here table significance value is 0.05 which is greater than calculated significance value 0.000. So these factors have a greater positive impact on efficiency of a bank.

In regression coefficient analysis (table 6.17) Beta value of X_1 (User friendly website) is .545 which indicate that 100% change in user friendly website leads to 54.5% change in over all efficiency of a bank. While the Beta value of X_2 (Availability of appropriate instructions and guidelines) is 1.651 which indicate that 100% change in Availability of appropriate instructions and guidelines leads to 165% change in over all efficiency of a bank.

Regression Analysis [Reliability]

In this study the Reliability has been used as the dependent variable and the thirteen attributes/independent variables have been used to measure the reliability of a bank, namely the Reliability of Webpage, Service Beyond the Banking Hours, Message about Completion of Transaction, Page Download facilities, Accuracy of Information, Information Contents and Text Understanding, Satisfaction Level of Service in comparison of Charges, Easiness of Transaction money to Branched/Banks, Convenient ATM Location, Maximum Withdrawal Criteria for ATM, Account Statement Through SMS/E-mail Services, Reputation of Bank and Maintaining Error free Records. The author has run the OLS regression model to determine the significance level of the attributes for the Reliability of a bank. The basic model was as follows:

Reliability of a Bank = f(Reliability of Webpage, Service Beyond the Banking Hours, Message about Completion of Transaction, Page Download facilities, Accuracy of Information, Information Contents and Text Understanding, Satisfaction Level of Service in comparison of Charges, Easiness of Transaction money to Branched/Banks, Convenient ATM Location, Maximum Withdrawal Criteria for ATM, Account Statement Through SMS/E-mail Services, Reputation of Bank and Maintaining Error free Records) Mathematically it can be written as:

$$[RB = \alpha + ß_1x_1 + ß_2x_2 + ß_3x_3 + ß_4x_4 + ß_5x_5 + ß_6x_6 + ß_7x_7 + ß_8x_8 + ß_9x_9 + ß_{10}x_{10} + ß_{11}x_{11} + ß_{12}x_{12} + ß_{13}x_{13} + e]$$

Where,

RB = Reliability of a Bank
X_1 = Reliability of Webpage
X_2 = Service Beyond the Banking Hours
X_3 = Message about Completion of Transaction
X_4 = Page Download facilities

X_5 = Accuracy of Information
X_6 = Information Contents and Text Understanding
X_7 = Satisfaction Level of Service in comparison of Charges
X_8 = Easiness of Transaction money to Branched/Banks
X_9 = Convenient ATM Location
X_{10} = Maximum Withdrawal Criteria for ATM
X_{11}= Account Statement through SMS/E-mail Services
X_{12}= Reputation of Bank
X_{13}= Maintaining Error free Records
There α is constant while $ß_s$ are coefficients of estimates and e is the error term.

Table 6.18 : Descriptive Statistics [Reliability]

	N	Mean	Std. Deviation
Reliability of Webpage	1200	2.700	.5525
Service Beyond the Banking Hours	1200	3.155833	1.2400931
Message about Completion of Transaction	1200	3.109167	1.0048669
Page Download facilities	1200	3.273333	.7204546
Accuracy of Information	1200	2.94	1.129
Information Contents and Text Understanding	1200	2.483333	1.0514959
Satisfaction Level of Service in comparison of Charges	1200	2.800	1.6007
Easiness of Transaction money to Branched/Banks	1200	3.314167	1.3485726
Convenient ATM Location	1200	3.600	1.3570
Maximum Withdrawal Criteria for ATM	1200	3.708333	1.1019418
Account Statement Through SMS/E-mail Services	1200	3.200	.4002
Reputation of Bank	1200	2.483333	.5944325
Maintaining Error free Records	1200	2.319167	.8393766
Reliability of a Bank (Over all)	1200	3.023141	.5217574
Valid N (list wise)	1200		

[Source: SPSS regression results of the primary data]

Table 6.18 shows the mean value depicting the over all Reliability of a bank. As far as this descriptive statistics is concerned, over all reliability of a bank is above average with a mean value of 3.02 on a 5 point likert scale. Respondents are fairly satisfied with Service beyond the Banking Hours, Message about Completion of Transaction, Page Download facilities, Easiness of Transaction money to Branched/Banks, Convenient ATM Location, Maximum Withdrawal Criteria for ATM and Account Statement Through SMS/E-mail Services.

The respondents are less satisfied with the Reliability of Webpage, Accuracy of Information, Information Contents and Text Understanding, Satisfaction Level of Service in comparison of Charges, Reputation of Bank and Maintaining Error free Records. However a regression analysis is to run to identify and to explain the attributes or independent variables affecting the level of over all reliability of a bank. The over all regression model and its ANOVA are summarized as follows:

Table 6.19 : Model Summary [Reliability]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.996[a]	.992	.992	.0456495

a. Predictors: (Constant), Maintaining Error free Records, Reliability of Webpage, Account Statement Through SMS/E-mail Services, Message about Completion of Transaction, Maximum Withdrawal Criteria for ATM, Reputation of Bank, Service Beyond the Banking Hours, Page Download facilities, Accuracy of Information, Easiness of Transaction money to Branched/Banks, Information Contents and Text Understanding, Convenient ATM Location, Satisfaction Level of Service in comparison of Charges

[Source: SPSS regression results of the primary data]

Table 6.20 : ANOVA [Reliability]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	323.933	13	24.918	11957.467	.000[b]
	Residual	2.471	1186	.002		
	Total	326.405	1199			
a. Dependent Variable: Average						
b. Predictors: (Constant), Maintaining Error free Records, Reliability of Webpage, Account Statement Through SMS/E-mail Services, Message about Completion of Transaction, Maximum Withdrawal Criteria for ATM, Reputation of Bank, Service Beyond the Banking Hours, Page Download facilities, Accuracy of Information, Easiness of Transaction money to Branched/Banks, Information Contents and Text Understanding, Convenient ATM Location, Satisfaction Level of Service in comparison of Charges						

[Source: SPSS regression results of the primary data]

It is clear from the ANOVA test that shows the table significance value 0.05 is greater than the calculated significance value .000. It reflects the null hypothesis at 5% level of significance. It means that there was a significant correlation between dependent and Independent variables. Therefore, over all reliability of a bank depends on the identified attributes/independent variables used in this research. But it does not mean that all identified attributes have a significant correlation with the overall reliability of a bank.

The over all predictability of the model is shown in table 6.19. The adjusted R^2 value of .992 indicates that model explains 99% of the attributes are responsible for overall reliability measures. The ANOVA table shows the significant F values which implies that the model and data are well fitted in explaining the over all reliability of a bank. Based on the data found in the table 30 it can be interpreted that the independent variables or attributes such as Satisfaction Level of Service in comparison of Charges, Information Contents and Text Understanding, Easiness of Transaction money to Branched/Banks and Message about Completion of Transaction have a strong impact

on overall reliability of the bank. Each and every independent variable has some positive impact on reliability in this particular situation. Hence no any variables were dropped out from the final analysis based on 99% level of significance.

Table 6.21 : Regression Coefficients Analysis of the Model [Reliability]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-.154	.020		-7.762	.000
Reliability of Webpage	.104	.004	.110	26.659	.000
Service Beyond the Banking Hours	.068	.002	.161	35.286	.000
Message about Completion of Transaction	.104	.003	.199	33.315	.000
Page Download facilities	.072	.003	.100	24.626	.000
Accuracy of Information	.071	.002	.154	35.202	.000
Information Contents and Text Understanding	.106	.003	.213	34.165	.000
Satisfaction Level of Service in comparison of Charges	.076	.003	.234	24.908	.000
Easiness of Transaction money to Branched/Banks	.080	.002	.206	35.818	.000
Convenient ATM Location	.065	.003	.168	18.885	.000
Maximum Withdrawal Criteria for ATM	.051	.002	.108	29.618	.000
Account Statement Through SMS/E-mail Services	.130	.006	.100	20.250	.000
Reputation of Bank	.077	.004	.088	21.778	.000
Maintaining Error free Records	.062	.004	.099	17.124	.000
a. Dependent Variable: Average					

[Source: SPSS regression results of the primary data]

On the basis of the above findings following regression model have been developed:

$$[RB = -.154 + .104X_1 + .068x_2 + .104x_3 + .072x_4 + .071x_5 + .106x_6 + .076x_7 + .080x_8 + .065x_9 + .051x_{10} + .130x_{11} + .077x_{12} + .062x_{13}]$$

Where,

RB = Reliability of a Bank

X_1 = Reliability of Webpage

X_2 = Service Beyond the Banking Hours

X_3 = Message about Completion of Transaction

X_4 = Page Download facilities

X_5 = Accuracy of Information

X_6 = Information Contents and Text Understanding

X_7 = Satisfaction Level of Service in comparison of Charges

X_8 = Easiness of Transaction money to Branched/Banks

X_9 = Convenient ATM Location

X_{10} = Maximum Withdrawal Criteria for ATM

X_{11}= Account Statement through SMS/E-mail Services

X_{12}= Reputation of Bank

X_{13}= Maintaining Error free Records

Coefficient analysis shows the relationship between Dependent and Independent variable. According to significance value, Reliability of a bank and satisfaction level of service in comparison of charges, Information contents and text understanding, easiness of transaction money to branches/banks and message about completion of transaction. Here table significance value is 0.05 which is greater than the calculated significance value 0.000. So these factors have a greater positive impact on reliability of a bank.

In the regression coefficient analysis table 6.21, Beta value of X_1 (Reliability of web page) is .110 which indicate that 100% change in reliability of web page leads to 11% change in over all reliability of a bank. Beta value of X_2 (Service beyond the banking hours) is .161 which indicate that 100% change in Service beyond the banking hours leads to 16.1% change in over all reliability of a bank.

Beta value of X_3 (Message about completion of transaction) is .199 which indicate that 100% change in Message about completion of transaction leads to 19.9% change in over all reliability of a bank. Beta value of X_4 (Page download facilities) is .100 which indicate that 100% change in Page download facilities leads to 10% change in over all reliability of a bank. Beta value of X_5 (Accuracy of information) is .154 which indicate that 100% change in Accuracy of information leads to 15.4% change in over all reliability of a bank. Beta value of X_6 (Information Contents and Text Understanding) is .213 which indicate that 100% change in Information Contents and Text Understanding leads to 21.3% change in the overall reliability of a bank.

Beta value of X_7 (Satisfaction Level of Service in comparison of Charges) is .234 which indicate that 100% change in Satisfaction Level of Service in comparison of Charges leads to 23.4% change in the overall reliability of a bank. Beta value of X_8 (Easiness of Transaction money to Branched/Banks) is .206 which indicate that 100% change in Easiness of Transaction money to Branched/Banks leads to 20.6% change in the overall reliability of a bank. Beta value of X_9 (Convenient ATM Location) is .168 which indicate that 100% change in Convenient ATM Location leads to 16.8% change in the overall reliability of a bank. Beta value of X_{10} (Maximum Withdrawal Criteria for ATM) is .108 which indicate that 100% change in Maximum Withdrawal Criteria for ATM leads to only 10.8% change in the overall reliability of a bank.

Beta value of X_{11} (Account Statement through SMS/E-mail Services) is .100 which indicate that 100% change in Account Statement through SMS/E-mail Services leads to 10% change in the overall reliability of a bank. Beta value of X_{12} (Reputation of Bank) is .088 which indicate that 100% change in Reputation of Bank leads to 8.8% change in the overall reliability of a bank. Beta value of X_{13} (Maintaining Error free Records) is .099 which indicates that 100% change in Maintaining Error free Records leads to 8.8% change in the overall reliability of a bank.

Regression Analysis [Service Delivery System]:

In this study the Service Delivery System (SDS) has been used as the dependent variable and the eight attributes/independent variables used to measure the service Delivery System (SDS) of a bank namely Promptness of Bank response at the time of occurrence of the Problem, Promptness in problem Solving, Online Customer Service Representative Connectivity, Customer Service Representative on Telephone, Bank Initiative to Educate Customer, Bank Response to Complain, Ability of Bank Representative and Behavior and Attitude of Employee/Customer Service Representative. The author has run the OLS regression model to determine the significance level of the attributes for the Service Delivery System (SDS) of a bank. The basic model was as follows:

Service Delivery System (SDS) of a Bank = f (Promptness of Bank response at the time of occurrence of the Problem, Promptness in problem Solving, Online Customer Service Representative Connectivity, Customer Service Representative on Telephone, Bank Initiative to Educate Customer, Bank Response to Complain, Ability of Bank Representative and Behavior and Attitude of Employee/Customer Service Representative).

Mathematically it can be written as:

$$[SDS = \alpha + ß_1x_1 + ß_2x_2 + ß_3x_3 + ß_4x_4 + ß_5x_5 + ß_6x_6 + ß_7x_7 + ß_8x_8 + e]$$

Where,

SDS = Service Delivery System of a Bank

X_1 = Promptness of Bank response at the time of occurrence of the Problem

X_2 = Promptness in problem Solving

X_3 = Online Customer Service Representative Connectivity

X_4 = Customer Service Representative on Telephone

X_5 = Bank Initiative to Educate Customer

X_6 = Bank Response to Complain

X_7 = Ability of Bank Representative

X_8 = Behavior and Attitude of Employee/Customer Service Representative

The α is constant while ß$_s$ are coefficients of estimates and e is the error term.

Table 6.22 : Descriptive Statistics [Service Delivery System]

	N	Mean	Std. Deviation
Promptness of Bank response at the time of occurrence of the Problem	1200	2.25	.5506
Promptness in problem Solving	1200	3.27	1.3177
Online Customer Service Representative Connectivity	1200	2.80	.7486
Customer Service Representative on Telephone	1200	3.52	1.3592
Bank Initiative to Educate Customer	1200	2.40	.8003
Bank Response to Complain	1200	1.99	.8966
Ability of Bank Representative	1200	2.20	.4001
Behavior and Attitude of Employee/Customer Service Representative	1200	2.02	1.1242
Service Delivery System of a Bank	1200	2.57	.4516
Valid N (list wise)	1200		

[Source: SPSS regression results of the primary data]

Table 6.22 shows the mean value depicting the over all Service Delivery System of a bank. As far as this descriptive statistics is concerned, over all Service Delivery System of a bank is below average with a mean value of 2.57 on a 5 point likert scale. Respondents are only satisfied with Promptness in problem Solving and Customer Service Representative on Telephone.

The respondents are dissatisfied with Promptness of Bank response at the time of occurrence of the Problem, Online Customer Service Representative Connectivity,

Bank Initiative to Educate Customer, Bank Response to Complain, Ability of Bank Representative and Behavior and Attitude of Employee/Customer Service Representative. However a regression analysis has been done to identify and to explain the attributes or independent variables affecting the level of overall Service Delivery System of a bank. The overall regression model and its ANOVA are summarized as follows:

Table 6.23 : Model Summary [SDS]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.994[a]	.987	.987	.0508154

a. Predictors: (Constant), Behavior and Attitude of Employee/Customer Service Representative, Bank Initiative to Educate Customer, Bank Response to Complain, Customer Service Representative on Telephone, Promptness of Bank response at the time of occurrence of the Problem, Promptness in problem Solving, Ability of Bank Representative, Online Customer Service Representative Connectivity

[Source: SPSS regression results of the primary data]

Table 6.24 : ANOVA [SDS]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	241.535	8	30.192	11692.290	.000[b]
	Residual	3.075	1191	.003		
	Total	244.611	1199			

a. Dependent Variable: Average

b. Predictors: (Constant), Behavior and Attitude of Employee/Customer Service Representative, Bank Initiative to Educate Customer, Bank Response to Complain, Customer Service Representative on Telephone, Promptness of Bank response at the time of occurrence of the Problem, Promptness in problem Solving, Ability of Bank Representative, Online Customer Service Representative Connectivity

[Source: SPSS regression results of the primary data]

It is clear from the ANOVA test that shows the table significance value 0.05 is greater than the calculated significance value 0.000. It reflects the null hypothesis at 5% level of significance. It means that there was a significant correlation between dependent and Independent variables. Therefore, overall Service Delivery System (SDS) of a bank depends on the identified attributes/independent variables used in this research. But it does not mean that all identified attributes have a significant correlation with over all Service Delivery System of a bank.

The over all predictability of the model is shown in table 6.23. The adjusted R^2 value of .987 indicates that model explains 98% of the attributes responsible for over all Service Delivery System measures. The ANOVA table shows the significant F values which implies that the model and data are well fitted in explaining the over all Service Delivery System of a bank. Based on the data found in the table 34 it can be interpreted that the independent variables or attributes such as Promptness in problem Solving, Customer Service Representative on Telephone, Bank Initiative to Educate Customer and Bank Response to Complain have a strong impact on the overall Service Delivery System of a bank. Each and every independent variable has some positive impact on the Service Delivery System in this particular situation. Hence the other variables with a low beta value such as Promptness of Bank response at the time of occurrence of the Problem and Ability of Bank Representative were dropped out from the final analysis based on 99% level of significance.

Table 6.25 : Regression Coefficients: Analysis of the Model [SDS]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	.147	.018		8.111	.000
Promptness of Bank response at the time of occurrence of the Problem	.099	.004	.121	26.276	.000
Promptness in problem Solving	.123	.003	.358	48.110	.000
Online Customer Service Representative Connectivity	.104	.007	.172	14.668	.000
Customer Service Representative on Telephone	.118	.001	.354	89.828	.000
Bank Initiative to Educate Customer	.152	.004	.269	35.443	.000
Bank Response to Complain	.126	.005	.251	26.825	.000
Ability of Bank Representative	.106	.006	.094	16.755	.000
Behavior and Attitude of Employee/Customer Service Representative	.119	.001	.297	79.501	.000
a. Dependent Variable: Average					

[Source: SPSS regression results of the primary data]

On the basis of above findings following regression model can be developed:

$$\mathbf{[SDS = .147 + .123X_1 + .104x_2 + .118x_3 + .152x_4 + .126x_5 + .119x_6]}$$

Where,

SDS = Service Delivery System of a Bank

X_1 = Promptness in problem Solving

X_2 = Online Customer Service Representative Connectivity

X_3 = Customer Service Representative on Telephone

X_4 = Bank Initiative to Educate Customer

X_5 = Bank Response to Complain

X_6 = Behavior and Attitude of Employee/Customer Service Representative

Coefficient analysis shows the relationship between Dependent and Independent variables. According to significance value, Service Delivery System (SDS) of a bank and Promptness in problem Solving, Online Customer Service Representative Connectivity, Customer Service Representative on Telephone, Bank Initiative to Educate Customer, Bank Response to Complain and Behavior and Attitude of Employee/Customer Service Representative have a high degree of association with the Dependent variable. Here the table significance value is 0.05 which is greater than calculated significance value 0.000. So these factors have a greater positive impact on the Service Delivery System (SDS) of a bank.

In regression coefficient analysis (table 6.25) Beta value of X_1 (Promptness in problem Solving) is .358 which indicate that 100% change in Promptness in problem Solving leads to 35.8% change in over all Service Delivery System (SDS) of a bank. Beta value of X_2 (Online Customer Service Representative Connectivity) is .172 which indicate that 100% change in Online Customer Service Representative Connectivity leads to 17.2% change in over all Service Delivery System (SDS) of a bank.

Beta value of X_3 (Customer Service Representative on Telephone) is .354 which indicate that 100% change in Customer Service Representative on Telephone leads to 35.4% change in over all Service Delivery System (SDS) of a bank. Beta value of X_4 (Bank Initiative to Educate Customer) is .269 which indicate that 100% change in Bank Initiative to Educate Customer leads to 26.9% change in over all Service Delivery System (SDS) of a bank. Beta value of X_5 (Bank Response to Complain) is .251 which indicate that 100% change in Bank Response to Complain leads to 25.1% change in over all Service Delivery System (SDS) of a bank. Beta value of X_6 (Behavior and Attitude of Employee/Customer Service Representative) is .297 which indicate that 100% change in Behavior and Attitude of Employee/Customer Service Representative leads to 29.7% change in over all Service Delivery System (SDS) of a bank.

Regression Analysis [Expectation of a Customer]:

In this study the Expectation of a Customer (EC) has been used as the dependent variable and the three attributes/independent variables used to measure the Expectation of a Customer (EC) namely Confirmation Message for the Service Availed, Online Purchase Facility and Fulfillment of Customer Instructions. The author has run the OLS Regression model to determine the significance level of the attributes for the Expectation of a Customer (EC). The basic model was as follows:

Expectation of a Customer (EC) = f (Confirmation Message for the Service Availed, Online Purchase Facility and Fulfillment of Customer Instructions). Mathematically it can be written as:

$$[EC = \alpha + ß_1x_1 + ß_2x_2 + ß_3x_3 + e]$$

Where,

EC = Expectation of a Customer

X_1 = Confirmation Message for the Service Availed

X_2 = Online Purchase Facility

X_3 = Fulfillment of Customer Instructions

The α is constant while $ß_s$ are coefficients of estimates and e is the error term.

Table 6.26 : Descriptive Statistics [EC]

	N	Mean	Std. Deviation
Confirmation Message for the Service Availed	1200	2.96	1.245
Online Purchase Facility	1200	2.23	.419
Fulfillment of Customer Instructions	1200	3.20	1.447
Expectation of a Customer (Over all)	1200	2.79	.7933509
Valid N (list wise)	1200		

[Source: SPSS regression results of the primary data]

Table 6.26 shows the mean value depicting the overall Expectation of a Customer. As far as this descriptive statistics is concerned, overall Expectation of a Customer is below average with a mean value of 2.79 on a 5 point likert scale. Respondents are only satisfied with fulfillment of Customer Instructions.

The respondents are dissatisfied with Confirmation message for service availed and Online purchase facility. However a regression analysis has been used as a tool to identify and explain the attributes or independent variables affecting the level of over all Expectations of a Customer. The over all regression model and its ANOVA are summarized as follows:

Table 6.27 : Model Summary [EC]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.991[a]	.983	.983	.1045311

a. Predictors: (Constant), Fulfillment of Customer Instructions, Confirmation Message for the Service Availed, Online Purchase Facility

[Source: SPSS regression results of the primary data]

Table 6.28 : ANOVA [EC]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	741.589	3	247.196	22623.041	.000[b]
	Residual	13.068	1196	.011		
	Total	754.657	1199			

a. Dependent Variable: Average

b. Predictors: (Constant), Fulfillment of Customer Instructions, Confirmation Message for the Service Availed, Online Purchase Facility

[Source: SPSS regression results of the primary data]

It is clear from the ANOVA test that shows the table significance value 0.05 is greater than the calculated significance value 0.000. It reflects the null hypothesis at 5% level of significance. It means that there was a significant correlation between dependent and Independent variables. Therefore over all Expectation of a Customer (EC) depends on the identified attributes/independent variables used in this research. But it does not mean that all identified attributes have a significant correlation with the overall Expectation of a Customer.

The over all predictability of the model is shown in table 6.27. The adjusted R^2 value of .983 indicates that model explains 98% of the attributes are responsible for overall Expectation of a Customer measure. The ANOVA table shows the significant F values which implies that the model and data are well fitted in explaining the over all Expectation of a Customer. Based on the data found in the table 6.29 it can be interpreted that the independent variables or attributes such as Confirmation Message for the Service Availed and Fulfillment of Customer Instructions have strong impact on overall Expectation of a Customer. Each and every independent variable has some positive impact on Expectation of a Customer in this particular situation. Hence no any variables were dropped from the final analysis based on 99% level of significance.

Table 6.29 : Regression Coefficients Analysis of the Model [EC]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.127	.023		5.521	.000
	Confirmation Message for the Service Availed	.319	.003	.500	101.814	.000
	Online Purchase Facility	.267	.010	.141	25.627	.000
	Fulfillment of Customer Instructions	.350	.003	.639	110.722	.000
a. Dependent Variable: Expectation of a Customer						

[Source: SPSS regression results of the primary data]

On the basis of above findings following regression model can be developed:

$$\mathbf{[EC = .127 + .319X_1 + .267x_2 + .350x_3]}$$

Where,

EC = Expectation of a Customer

X_1 = Confirmation Message for the Service Availed

X_2 = Online Purchase Facility

X_3 = Fulfillment of Customer Instructions

Coefficient analysis shows the relationship between Dependent and Independent variable. According to significance value, Expectation of a Customer and Confirmation Message for the Service Availed, Fulfillment of Customer Instructions has a high degree of association with the Dependent variable. Here the table significance value is 0.05 which is greater than calculated significance value 0.000. So these factors have a greater positive impact on the Expectation of a Customer (EC).

In regression coefficient analysis (table 6.29) Beta value of X_1 (Confirmation Message for the Service Availed) is .500 which indicate that 100% change in Confirmation Message for the Service Availed leads to 50% change in the overall Expectation of a Customer (EC). Beta value of X_2 (Online Purchase Facility) is .141 which indicate that 100% change in Online Purchase Facility leads to 14.1% change in the overall Expectation of a Customer (EC).

Beta value of X_3 (Fulfillment of Customer Instructions) is .639 which indicate that 100% change in Fulfillment of Customer Instructions leads to 63.9% change in the overall Expectation of a Customer (EC).

Regression Analysis [Secrecy of a Customer]:

The author has used the Secrecy of a Customer as the dependent variable and the four attributes used to measure the over all Secrecy of a Customer namely Secrecy of the Personal Information, Protection of the Cookies to collect information, Secrecy of credit card Information and Reliability of bank undertaking for not sharing the information. The author has run the OLS regression model to determine the significance level of the attributes for the Secrecy of a Customer. The basic model was as follows:

Secrecy of a Customer (SC) = f (Secrecy of a Personal Information, Protection of a Cookies to collect information, Secrecy of you credit card Information and Reliability of bank undertaking for not sharing the information) Mathematically it can be written as:

$$[SC = \alpha + ß_1x_1 + ß_2x_2 + ß_3x_3 + ß_4x_4 + e]$$

Where,

SC = Secrecy of a Customer

X_1 = Secrecy of a Personal Information

X_2 = Protection of a Cookies to collect information

X_3 = Secrecy of you credit card Information

X_4 = Reliability of bank undertaking for not sharing the information

There α is constant while $ß_s$ are coefficients of estimates and e is the error term.

Table 6.30 : Descriptive Statistics [SC]			
	N	**Mean**	**Std. Deviation**
Secrecy of a Personal Information	1200	2.84	.798
Protection of a Cookies to collect information	1200	3.00	.628
Secrecy of you credit card Information	1200	2.59	.809
Reliability of bank undertaking for not sharing the information	1200	3.36	.571
Secrecy of a Customer (Over all)	1200	2.96	.532
Valid N (list wise)	1200		

[Source: SPSS regression results of the primary data]

Table 6.30 shows the mean value depicting the over all Secrecy of a Customer. As far as this descriptive statistics is concerned, over all Secrecy of a Customer is below average with a mean value of 2.96 on a 5 point likert scale. But still respondents are fairly satisfied with Protection of the Cookie to collect information and Reliability of the bank undertaking for not sharing the information.

The respondents are dissatisfied with Secrecy of the Personal Information and Secrecy of you credit card Information. However a regression analysis has been used as a tool to identify and to explain the attributes or independent variables affecting the level of overall efficiency of a bank.

The over all regression model and its ANOVA are summarized as follows:

Table 6.31 : Model Summary [SC]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.991[a]	.983	.983	.0700589
a. Predictors: (Constant), Reliability of bank undertaking for not sharing the information, Protection of a Cookies to collect information, Secrecy of a Personal Information, Secrecy of you credit card Information				

[Source: SPSS regression results of the primary data]

Table 6.32 : ANOVA [SC]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	334.159	4	83.540	17020.285	.000[b]
	Residual	5.865	1195	.005		
	Total	340.025	1199			
a. Dependent Variable: Secrecy of a Customer						
b. Predictors: (Constant), Reliability of bank undertaking for not sharing the information, Protection of a Cookies to collect information, Secrecy of a Personal Information, Secrecy of you credit card Information						

[Source: SPSS regression results of the primary data]

It is clear from the ANOVA test that shows the table significance value 0.05 is greater than the calculated significance value 0.000. It reflects the null hypothesis at 5% level of significance. It means that there was a significant correlation between dependent and Independent variables. Therefore the overall Secrecy of a Customer depends on the identified attributes used in this research. But it does not mean that all identified attributes have a significant correlation with the overall Secrecy of a Customer.

The over all predictability of the model is shown in table 6.31. The adjusted R^2 value of .983 indicates that model explains 98% of the attributes responsible for over all Secrecy

of a Customer measure. The ANOVA table shows the significant F values which implies that the model and data are well fitted in explaining the over all Secrecy of a Customer. Based on the data found in the table 6.33 it can be interpreted that the independent variables or attributes such as Secrecy of your personal information, Secrecy of your credit card and Protection of the Cookies to collect information have a strong impact on the overall Secrecy of a Customer. Hence the other variables were dropped out from the final analysis based on 99% level of significance.

Table 6.33 : Regression Coefficients Analysis of the Model [SC]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.498	.019		25.777	.000
	Secrecy of a Personal Information	.255	.003	.383	81.749	.000
	Protection of a Cookies to collect information	.195	.004	.230	47.985	.000
	Secrecy of you credit card Information	.366	.005	.556	76.369	.000
	Reliability of bank undertaking for not sharing the information	.062	.006	.066	9.818	.000
a. Dependent Variable: Secrecy of a Customer						

[Source: SPSS regression results of the primary data]

On the basis of above findings following regression model can be developed:

$$\mathbf{[SC = .498 + .255X_1 + .195X_2 + .366X_3]}$$

Where,

SC = Secrecy of a Customer

X_1 = Secrecy of a Personal Information

X_2 = Protection of a Cookies to collect information

X_3 = Secrecy of you credit card Information

Coefficient analysis shows the relationship between Dependent variable and each Independent variable. According to significance value Secrecy of a Personal Information, Protection of the Cookie to collect information and Secrecy of credit card Information has a significant correlation with the overall Secrecy of a Customer. Here the table significance value is 0.05 which is greater than calculated significance value 0.000. So these factors have a greater positive impact on the Secrecy of a Customer.

In regression coefficient analysis (table 6.33) Beta value of X_1 (Secrecy of a Personal Information) is .383 which indicate that 100% change in Secrecy of a Personal Information leads to 38.3% change in over all Secrecy of a Customer.

Beta value of X_2 (Protection of a Cookies to collect information) is .230 which indicate that 100% change in Protection of a Cookies to collect information leads to 23% change in the overall Secrecy of a Customer.

Beta value of X_3 (Secrecy of you credit card Information) is .556 which indicate that 100% change in Secrecy of you credit card Information leads to 55.6% change in the overall Secrecy of a Customer.

Regression Analysis [Tangibles]:

In this study Tangibles has been used as the dependent variable and the five attributes/ Independent variables used to measure tangible, namely Technological Advancement, Visually appealing physical facilities, Smart Employee, Visually appealing material associated with service and Bank Modify their home page occasionally. The author has run the OLS regression model to determine the significance level of the attributes for the Tangibles. The basic model was as follows:

Tangibles (T) = f (Technological Advancement, Visually appealing physical facilities, Smart Employee, Visually appealing material associated with service and Bank Modify their home page Occasionally) Mathematically it can be written as:

$$[T = \alpha + ß_1x_1 + ß_2x_2 + ß_3x_3 + ß_4x_4 + ß_5x_5 + e]$$

Where,

T = Tangibles

X_1 = Technological Advancement

X_2 = Visually appealing physical facilities

X_3 = Smart Employee

X_4 = Visually appealing material associated with service

X_5 = Bank Modify their home page occasionally

The α is constant while $ß_s$ are coefficients of estimates and e is the error term.

Table 6.34 : Descriptive Statistics [Tangible]			
	N	**Mean**	**Std. Deviation**
Technological Advancement	1200	2.47	.84
Visually appealing physical facilities	1200	3.19	.75
Smart Employee	1200	2.80	.74
Visually appealing material associated with service	1200	2.60	.49
Bank Modify their home page Occasionally	1200	3.20	.74
Tangible	1200	2.84	.55
Valid N (list wise)	1200		

[Source: SPSS regression results of the primary data]

Table 6.34 shows the mean value depicting the Tangibles of a bank. As far as this descriptive statistics is concerned, tangible of a bank is below average with a mean value of 2.84 on a 5 point likert scale. But still respondents are fairly satisfied with visually appealing physical facility and Bank modifies their home page occasionally.

The respondents are dissatisfied with Technological advancement, Smart Employee and visually appealing materials associated with service. However a regression analysis has been used as a tool to identify and to explain the attributes or independent variables affecting the level of the overall Tangibles score. The overall regression model and its ANOVA are summarized as follows:

Table 6.35 : Model Summary [Tangible]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.999[a]	.998	.998	.0251388
a. Predictors: (Constant), Bank Modify their home page Occasionally, Smart Employee, Technological Advancement, Visually appealing physical facilities, Visually appealing material associated with service				

[Source: SPSS regression results of the primary data]

Table 6.36 : ANOVA[a] [Tangible]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	369.993	5	73.999	117093.911	.000[b]
	Residual	.755	1194	.001		
	Total	370.747	1199			
a. Dependent Variable: Tangibles						
b. Predictors: (Constant), Bank Modify their home page Occasionally, Smart Employee, Technological Advancement, Visually appealing physical facilities, Visually appealing material associated with service						

[Source: SPSS regression results of the primary data]

It is clear from the ANOVA test that shows the table significance value 0.05 is greater than the calculated significance value 0.000. It reflects the null hypothesis at 5% level of significance. It means that there was a significant correlation between dependent and Independent variables. Therefore Tangibles depends on the identified attributes. But it does not mean that all identified attributes have a significant correlation with Tangibles. The overall predictability of the model is shown in table 35. The adjusted R^2 value of .998 indicates that the model explains 99% of the attributes responsible for Tangible measures.

The ANOVA table shows the significant F values which implies that the model and data are well fitted in explaining the tangibles of a bank. Based on the data found in the table 6.37 it can be interpreted that the independent variables or attributes such as Smart Employee, Visually appealing physical facilities and Bank Modify their home page occasionally have a strong impact on the tangibles of a bank. Remaining independent variables are not associated with the Dependent variable or have a less association in comparison to the others. Hence the other variables were dropped out from the final analysis based on 99% level of significance.

Table 6.37 : Regression Coefficients Analysis of the Model [Tangible]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.116	.008		-14.558	.000
	Technological Advancement	.025	.002	.038	12.471	.000
	Visually appealing physical facilities	.353	.003	.476	128.667	.000
	Smart Employee	.407	.005	.549	80.528	.000
	Visually appealing material associated with service	-.062	.011	-.055	-5.452	.000
	Bank Modify their home page Occasionally	.247	.005	.332	49.526	.000
a. Dependent Variable: Tangibles						

[Source: SPSS regression results of the primary data]

On the basis of above findings following regression model can be developed:

$$\mathbf{[T = -.116 + .353X_1 + .407X_2 + .247X_3]}$$

Where,

T = Tangible

X_1 = Visually appealing physical facilities

X_2 = Smart Employee

X_3 = Bank Modify their home page occasionally

Coefficient analysis shows the relationship between Dependent variable and each Independent variable. According to significance value, visually appealing physical facilities, Smart Employee and Bank Modify their home page occasionally has a significant correlation with Tangibles of a bank. Here the table significance value is 0.05 which is greater than the calculated significance value 0.000. So these factors have a greater positive impact on the Tangibles of a bank.

In regression coefficient analysis (table 6.37) Beta value of X_1 (Visually appealing physical facilities) is .476 which indicates that 100% change in visually appealing physical facilities leads to 47.6% change in the Tangibles score.

Beta value of X_2 (Smart Employee) is .549 which indicate that 100% change in Smart Employee leads to 54.9% change in change in the Tangibles score.

Beta value of X_3 (Bank Modify their home page occasionally) is .332 which indicate that 100% change in Bank Modify their home page occasionally leads to 33.2% change in the Tangibles score.

Regression Analysis [Customer Satisfaction, Internet Banking]:

In this study the Customer Satisfaction of Internet Banking has been used as the dependent variable and the six independent variables used to measure the Customer Satisfaction of Internet Banking, Efficiency, Reliability, Service Delivery System, Expectation of Customer, Secrecy of Customer and Tangible. To establish the relationship between dependent and independent variables the author has run the OLS regression model to determine the significance level of the independent variables for the Customer Satisfaction of Internet Banking. The basic model was as follows:

Customer Satisfaction of Internet Banking (CSIB) = f (Efficiency, Reliability, Service Delivery System, Expectation of Customer, Secrecy of Customer and Tangible). Statistically Regression equation can be written as:

$$\mathbf{[CSIB = \alpha + ß_1x_1 + ß_2x_2 + ß_3x_3 + ß_4x_4 + ß_5x_5 + ß_6x_6 + e]}$$

Where,

CSIB = Customer Satisfaction of Internet Banking

X_1 = Efficiency

X_2 = Reliability

X_3 = Service Delivery System

X_4 = Expectation of a Customer

X_5 = Secrecy of a Customer

X_6 = Tangibles

The α is constant while $ß_s$ are coefficients of estimates and e is the error term.

Table 6.38 : Descriptive Statistics [CSIB]			
	N	**Mean**	**Std. Deviation**
Efficiency	1200	3.43	.6617
Reliability	1200	3.04	.4622
Service Delivery System	1200	2.57	.8319
Expectation of a Customer	1200	2.75	1.037
Secrecy of a Customer	1200	2.96	.5854
Tangibles	1200	2.93	.5217
Over all Satisfaction	1200	2.95	.2907036
Valid N (list wise)	1200		

[Source: SPSS regression results of the primary data]

Table 6.38 shows the mean value depicting the over all Customer Satisfaction of Internet Banking users. As far as this descriptive statistics is concerned, over all Customer Satisfaction of Internet Banking users is below average with a mean value of 2.95 on a 5 point likert scale. But the respondents are fairly satisfied with Efficiency and Reliability.

The respondents are dissatisfied with Service Delivery System, Expectation of a Customer, Secrecy of a Customer and Tangibles. However a regression analysis has been applied to identify and explain the independent variables affecting the level of over all customer satisfaction of internet banking users.

The over all regression models and its ANOVA are summarized in the following table number 39 & 40:

Table 6.39 : Model Summary [CSIB]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.996[a]	.991	.991	.0272931
a. Predictors: (Constant), Tangibles, Efficiency, Service Delivery System, Expectation of a Customer, Reliability, Secrecy of a Customer				

[Source: SPSS regression results of the primary data]

Table 6.40 : ANOVA[a] [CSIB]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	100.437	6	16.740	22471.711	.000[b]
	Residual	.889	1193	.001		
	Total	101.326	1199			
a. Dependent Variable: Over all Satisfaction						
b. Predictors: (Constant), Tangibles, Efficiency, Service Delivery System, Expectation of a Customer, Reliability, Secrecy of a Customer						

[Source: SPSS regression results of the primary data]

It is clear from the ANOVA test that shows the table significance value 0.05 is greater than the calculated significance value 0.000. It reflects the null hypothesis at 5% level of significance. It means that there was a significant correlation between dependent and Independent variables. Therefore the overall customer satisfaction of internet banking depends on the six identified independent variables in either way. But it does not mean that all identified independent variables have a significant correlation with overall customer satisfaction of internet banking users.

The over all predictability of the model is shown in table 6.39. The adjusted R^2 value of .991 indicates that model explains 99% of independent variables are responsible for overall Customer Satisfaction of Internet Banking users. The ANOVA table shows the significant F values which implies that the model and data are well fitted in explaining the Customer Satisfaction of Internet Banking users. Based on the data found in the table 6.41 it can be interpreted that the independent variables such as Reliability, Expectation of a Customer, Secrecy of a Customer and Tangibles have a strong impact on the overall Customer Satisfaction of Internet Banking Users. Hence the other variables were dropped out from the final analysis based on 99% level of significance and lower beta value in comparison to the other independent variables.

Table 6.41: Coefficients [CSIB]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.144	.203		.708	.479
	Efficiency	-.264	.069	-.601	-3.832	.000
	Reliability	.540	.045	.859	12.015	.000
	Service Delivery System	.009	.001	.025	7.695	.000
	Expectation of a Customer	.194	.006	.693	33.871	.000
	Secrecy of a Customer	.387	.069	.780	5.646	.000
	Tangibles	.170	.034	.305	5.018	.000
a. Dependent Variable: Over all Satisfaction						

[Source: SPSS regression results of the primary data]

On the basis of above findings following regression model has been developed:

$$\mathbf{[SCSIB = .144 + .540X_1 + .194X_2 + .387X_3 + .170X_4]}$$

Where,

CSIB = Customer Satisfaction of Internet Banking

X_1 = Reliability

X_2 = Expectation of a Customer

X_3 = Secrecy of a Customer

X_4 = Tangibles

Coefficient analysis shows the relationship between Dependent variable and each Independent variable. According to significance value Reliability, Expectation of a Customer, Secrecy of a Customer and Tangibles has a significant correlation with the overall Customer Satisfaction of Internet Banking Users. Here the table significance

value is 0.05 which is greater than the calculated significance value 0.000. So these factors have a greater positive impact on the overall Customer Satisfaction of Internet Banking Users.

In regression coefficient analysis (table 6.41 Beta value of X_1 (Reliability) is .859 which indicate that 100% Reliability leads to 85.9% change in the overall Customer Satisfaction of Internet Banking Users.

Beta value of X_2 (Expectation of a Customer) is .693 which indicate that 100% change in Expectation of a Customer leads to 69.3% change in the overall Customer Satisfaction of Internet Banking Users.

Beta value of X_3 (Secrecy of Customer) is .780 which indicate that 100% change in Secrecy of customer leads to 78% change in the overall Customer Satisfaction of Internet Banking users.Beta value of X_4 (Tangibles) is .305 which indicate that 100% change in Tangibles leads to 30.5% change in the overall Customer Satisfaction of Internet Banking users.

Hypothesis Testing:

Sr. No.	HYPOTHESIS	VARIABLES		Beta Value	T Value	P Value	Decision
		Independent	Dependent				
$H0_1$	Bank treats the customer as individual and provides comparative advantage to the customers [Efficiency of a Bank]	Efficiency of a bank	Satisfaction level of Internet Banking Users	-.601	-3.83	.000	Rejected
$H0_{1a}$	There is no significant relationship between the speed of login of account and the satisfaction level of Internet banking users.	Speed of log in of Account	Satisfaction level of Internet Banking Users	.788	44.30	.000	Rejected

Sr. No.	HYPOTHESIS	VARIABLES		Beta Value	T Value	P Value	Decision
		Independent	Dependent				
$H0_{1b}$	There is no significant relationship between the user friendly bank's website and the satisfaction level of Internet banking users.	User friendly bank's website	Satisfaction level of Internet Banking Users	.643	37.43	.000	Rejected
$H0_2$	Bank has the ability to deliver on the promise [Reliability]	Reliability of a Bank	Satisfaction level of Internet Banking Users	.859	12.02	.000	Rejected
$H0_{2a}$	There is no correlation between bank website running time and the satisfaction level of Internet banking users.	Bank's website running time	Satisfaction level of Internet Banking Users	.943	98.30	.000	Rejected
$H0_{2b}$	Service Charge and the satisfaction level of internet banking users are independent from each other.	Service Charge	Satisfaction level of Internet Banking Users	.600	25.78	.000	Rejected
$H0_{2c}$	There is no significant relationship between Account statement through SMS/ E-mail services and the satisfaction level of Internet banking users.	Account statement through SMS/ E-mail	Satisfaction level of Internet Banking Users	.384	14.41	.000	Rejected
$H0_3$	Bank has the willingness to help the clients [Service Delivery System].	Service Delivery System	Satisfaction level of Internet Banking Users	.025	7.695	.000	Rejected
$H0_{3a}$	There is no significant relationship between the banks provides appropriate infor-mation to customers when a problem occurs and the customer satisfaction of Internet banking.	Banks provides appropriate information to customers when a problem occurs	Satisfaction level of Internet Banking Users	.352	13.01	.000	Rejected

Sr. No.	HYPOTHESIS	VARIABLES		Beta Value	T Value	P Value	Decision
		Independent	Dependent				
$H0_{3b}$	There is no significant relationship between Banks is Educating Customers time to time and the customer satisfaction of Internet banking.	Banks is Educating Customers	Satisfaction level of Internet Banking Users	-.430	-16.46	.000	Rejected
$H0_{3c}$	There is no significant relationship between informing customers when services will be performed and the customer satisfaction of Internet banking.	Informing customers after services performed	Satisfaction level of Internet Banking Users	.253	9.034	.000	Rejected
$H0_{4}$	Bank has ready to fulfill its customer expectation [Expectation of a Customer]	Customer Expectation	Satisfaction level of Internet Banking Users	.693	33.87	.000	Rejected
$H0_{4a}$	Online purchase facilities and Satisfaction level of Internet Banking Users are independent from each other	Online purchase facilities	Satisfaction level of Internet Banking Users	.384	14.41	.000	Rejected
$H0_{5}$	Bank has the ability to inspire trust and confidence in the clients [Privacy]	Secrecy of a Bank	Satisfaction level of Internet Banking Users	.780	5.65	.000	Rejected
$H0_{5b}$	There is no significant relationship between the bank's website is secure for credit card information and the customer satisfaction of Internet banking.	Bank's website security for credit card information	Satisfaction level of Internet Banking Users	.264	9.457	.000	Rejected
$H0_{6}$	Bank has the ability to represent the service physically {Tangibles}	Tangibles	Satisfaction level of Internet Banking Users	.305	5.02	.000	Rejected

Sr. No.	HYPOTHESIS	VARIABLES		Beta Value	T Value	P Value	Decision
		Independent	Dependent				
$H0_7$	There is no significant relationship between age and customer satisfaction of internet banking users	Age of a Respondents	Satisfaction level of Internet Banking Users	-.074	-2.22	.026	Rejected
$H0_8$	There is no significant relation between profession of customer and customer satisfaction of internet banking users.	Profession of a Respondents	Satisfaction level of Internet Banking Users	.034	1.176	.240	Accepted
$H0_9$	Factor determining the satisfaction level of respondents are independent from duration of uses (in year) of internet banking services.	Duration of Internet Banking Uses	Satisfaction level of Internet Banking Users	-.004	-.121	.904	Accepted
$H0_{10}$	Satisfaction levels of respondents are independent from the geographic location of the respondents.	Geographic Location (Selected City of western India)	Satisfaction level of Internet Banking Users	-.025	-.851	.395	Accepted
$H0_{11}$	There is no association between qualification of a respondents and the customer satisfaction of internet banking users.	Qualification of the Respondents	Satisfaction level of Internet Banking Users	-.048	-1.662	.097	Accepted
$H0_{12}$	There is no association between number of earning members in a family of a respondents and the satisfaction level of internet banking users.	Number of earning members in a family of the respondents	Satisfaction level of Internet Banking Users	.033	1.121	.262	Accepted
$H0_{13}$	There is no association between income of a respondents and the satisfaction level of internet banking users.	Income of a respondents	Satisfaction level of Internet Banking Users	.116	4.040	.000	Rejected

Hypothesis $H0_1$, that *Bank treats the customer as individual and provides comparative advantage to the customers is rejected (ß = -.601, t = -3.83 and p < .005).* The result is not expected and is a confirmation of technology acceptance model (Ishaq 2011). Previous studies also came with the same findings (Parasuraman et al 1985, Johnston 1995, Jun & Cai 2001, Yang & Fang 2004). It means that the respondents did not feel that bank treat them as individual and provide comparative advantage to the respondents.

Hypothesis $H0_{1a}$, that *there is no significant relationship between the speed of login of account and the satisfaction level of Internet banking users is rejected (ß = .788, t = 44.30, p <0.05).* This result confirms that TAM model could be used to explain the Internet Banking adoption among customers. From a practical view point we could expect the speed of log in account to make it easier to operate the internet banking and motivate customers to bank online in a much faster way.

Hypothesis $H0_{1b}$, that *there is no significant relationship between the user friendly bank's website and the satisfaction level of Internet banking users is rejected (ß = .643, t = 37.43 and p <0.005).* The relationship between variables is positive with a high degree of correlation indicating that the respondents are highly satisfied with internet banking operations if the website of a bank is user friendly. Therefore the perception of ease of use of internet banking service should increase the satisfaction level of customers which would lead to make more loyal customer and loyalty leads to attract new customer to operate banking services online.

Hypothesis $H0_2$, that *Bank has the ability to deliver on the promise (Customer Satisfaction is totally independent from reliability of a bank) is rejected (ß = .859, t = 12.02 and p <0.005).* The outcome of the study indicates that Customer satisfaction of internet banking users and bank ability to deliver on the promises has strong positive associations which indicate that the bank should deliver the services as per their promises to the customers. Every thing should be open and known to all the customers.

Hypothesis $H0_{2a}$, that *there is no correlation between bank website running time and the satisfaction level of Internet banking users is rejected(ß = .943, t = 98.30 and p < 0.005).* The result is expected and is a confirmation of flexi working policy (Santos 2003). Previous studies on Customer Satisfaction on Internet Banking also came with the same finding (Parasuraman et al 1985 and Jun & Cai 2001). In Indian scenario, most of the banks provide net banking facility up to 7:00 pm but some of the banks provide round the clock service facility to the customers. The perception has been justified with a fact that Customers are strongly satisfied if the banks provide flexibility in operation in terms of timing.

Hypothesis $H0_{2b}$, that *Service Charge and the satisfaction level of internet banking users are independent from each other is rejected (ß = .600, t = 25.78 and p <0.005).* This result is unexpected but confirms that no free lunch is available in this world. Better quality service needs higher amount of cost and service charges. If some one wants to enjoy a superior facility they must go with a greater service charge. Outcomes of the study also shows that there is a strong positive association between service charge and the satisfaction level of internet banking users which indicate that high level of satisfaction needs greater service charge.

Hypothesis $H0_{2c}$, that *there is no significant relationship between Account statement through SMS/ E-mail services and the satisfaction level of Internet banking users is rejected (ß = .384, t = 14.41 and p <0.005).* The outcome of the study shows that there is a moderate positive association between the satisfaction level of internet banking users and the account statement through SMS/e-mail. The result is expected and similar with the finding of Oppewal and Veriens 2000. With the technological advancement customer always prefer to receive an account statement on their mobile or e-mail rather than visit every time physically for such a small service.

Hypothesis $H0_3$, that *Bank has the willingness to help the clients [Customer Satisfaction are independent from Service Delivery System is rejected (ß = .025, t = 7.695 and p <0.005).* The result of the study shows that there is a low positive association between Service Delivery System and the Satisfaction level of Internet Banking users. Beta value indicates that 100% variations in Service Delivery System only affect 2% over all Satisfaction of Internet Banking Users. The respondents feel that internet banking service delivery system have not much attractive features. This attribute has greater influence in physical/traditional banking not in internet banking.

Hypothesis $H0_{3a}$, that *there is no significant relationship between the banks provides appropriate information to customers when a problem occurs and the customer satisfaction of Internet banking is rejected (ß = .352, t = 13.012 and p < 0.05).* Internet banking users have high risk when they performed service through internet so security threat can hampered the overall satisfaction of internet banking users. To improve this risk bank needs to provide appropriate information to customers if they face any problem to keep them better satisfied. The variable shows the moderate positive association between them.

Hypothesis $H0_{3b}$, that *there is no significant relationship between Banks is Educating Customers time to time and the customer satisfaction of Internet banking is rejected (ß = .430, t = 16.46 and p < 0.05).* The result of the study shows that there is a moderate positive correlation between variables. 100% improvement in customer awareness leads to 43% increase in satisfaction level internet banking users. Users with a less awareness do not know the pros and cons of using internet banking and hence they become hesitant to use banking services through internet. So bank should enhance awareness program for the better satisfaction level of respondents.

Hypothesis $H0_{3c}$, that *there is no significant relationship between informing customers when services will be performed and the customer satisfaction of Internet banking is rejected (ß =*

.253, t = 9.034 and p < 0.05). The result shows a moderate positive association between variable. Higher the information about service performed leads to better satisfaction of internet banking users.

Hypothesis $H0_4$, that *Bank has ready to fulfill its customer expectation (Satisfaction Level of Internet Banking Users are Independent from Customer expectation) is rejected (ß = .693, t = 33.87 and p < 0.05).* The result shows that higher the level of fulfilling the customer expectation greater will be the satisfaction level of internet banking users. Expectation of a customer and the satisfaction level of internet banking users have a high positive association between them.

Hypothesis $H0_{4a}$, that *online purchase facilities and Satisfaction level of Internet Banking Users are independent from each other is rejected (ß = .384, t = 14.41 and p < 0.05).* The result of the study indicates that there is a moderate positive association between online purchase facility and the satisfaction level of internet banking users.

Hypothesis $H0_5$, that *Bank has the ability to inspire trust and confidence in the clients (Satisfaction level of respondents are independent from the secrecy of a Bank) is rejected (ß = .780, t = 5.65 and p < 0.05).* The result of the study indicates that secrecy of information and customer satisfaction of internet banking users has a high positive association between them. Enhancement in 100% secrecy level leads to 78% improvement in the overall satisfaction of internet banking users.

Hypothesis $H0_{5a}$, that *there is no significant relationship between the bank's website is secure for credit card information and the customer satisfaction of Internet banking is rejected (ß = .264, t = 9.457 and p < 0.05).* The outcome of the study shows that website is secure for credit card information is a low positive association with customer satisfaction of internet banking users. Greater the security for credit card leads to the better satisfaction level of internet banking users. In these days people are frequently using

plastic money in various types of services but with a high level of misuse chances. Bank should provide strong security checks for online credit card users to enhance the satisfaction of internet banking users.

Hypothesis $H0_6$, that *Bank has the ability to represent the service physically (Satisfaction level of internet banking users are independent from the tangibles) is rejected (ß = .305, t = 5.02 and p < 0.05).* Confirmation of this hypothesis holds a great significance in the context of developing countries like India. The satisfaction of internet banking among Indian customer is bound to increase when the quality of infrastructure / Tangibles will be improved. There is a positive moderate association between these two variables. Beta value indicates that 100% improvement in Tangibles leads to 30% increase in customer satisfaction of internet banking users.

Hypothesis $H0_7$, that *there is no significant relationship between age and customer satisfaction of internet banking users is rejected (ß = -.074, t = -2.225 and p < 0.05).* The result of the study shows that there is a low negative association between the age of the respondents and the satisfaction level of the respondents. The outcome indicates that higher the age lower will be the satisfaction level of internet banking users. A number of reasons might be there behind these phenomena. One of the important reason may be that older people are not well aware about the use of computer than younger people so their satisfaction level is low than younger one.

Hypothesis $H0_8$, that *there is no significant relation between profession of customer and customer satisfaction of internet banking users is accepted (ß = .003, t =1.17 and p > 0.05).* The result of the study shows that customer satisfaction of internet banking users are independent from their profession. Profession does not have any role to play in determining the satisfaction level of internet banking users.

Hypothesis $H0_9$, that *factor determining the satisfaction level of respondents are independent from duration (in year) of internet banking services use is accepted (ß = -.004, t = -.121 and p > 0.05).* The result of the study shows that there in no association between the duration of internet banking use and the customer satisfaction of internet banking users. The perception has been proved wrong that the respondents who are using internet banking since long period has a greater satisfaction in comparison to the newer one. The period of use has no influence on over all satisfaction level of internet banking users.

Hypothesis $H0_{10}$, that *satisfaction levels of respondents are independent from the geographic location of the respondents are accepted (ß = -.002, t = -.851 and p > 0.05).* The result of the study shows that there is no association between geographical region (selected city of western Indian states) and the customer satisfaction of internet banking users. Satisfaction levels of respondents are totally independent from the geographical area. General perception has proved wrong through this finding that city with a high profile and technical advancement had a greater satisfaction. Beta value shows a .2% negative impact of geographical region on customer satisfaction of internet banking users.

Hypothesis $H0_{11}$, that *there is no association between qualification of a respondents and the customer satisfaction of internet banking users is accepted (ß = -.048, t = -.1.66 and p > 0.05).* The result of the study shows that satisfaction levels of respondents are independent from their educational qualification. The negligible negative value of beta shows that more qualified people are less satisfied than the lower qualified respondents.

Hypothesis $H0_{12}$, that *there is no association between number of earning members in a family of a respondents and the satisfaction level of internet banking users is accepted (ß = .003, t = 1.121 and p > 0.05).* The result of the study shows that satisfaction levels of respondents are independent from the earning members in a family of respondents.

Hypothesis $H0_{13}$, that *there is no association between income of a respondents and the satisfaction level of internet banking users are rejected (ß = .116, t = 4.04 and p < 0.05).* There is a low positive association between income of a respondent and the satisfaction level of a respondent. Greater the income higher will be the satisfaction level of the respondent.

CHAPTER – 7

FINDINGS, SUGGESTIONS, MANAGERIAL IMPLICATIONS & CONCLUSION

Introduction:

This chapter is derived to present (i) Findings of the study (ii) Suggestions and Recommendations of the study (iii) Managerial Implication of the Study (iv) Scope for Future Research and (v) Conclusion of the study. The evaluation of the result obtained after the analysis of data is discussed in this section.

7.1. FINDINGS:

The results are evaluated vis-à-vis the objectives have been justified with the support of data. Therefore the objectives of the study are highlighted once again before the discussion of the results. This study has 2 main objectives and 7 sub objectives comprising of:

Main Objective: 1

To identify the factors affecting satisfaction level of internet banking users in a selected cities of western Indian state, which leads to make more loyal customers and hence loyalty leads to the attracting more customers, expansion of business and increase in net profit.

The Qualitative and quantitative methods has been used to measure the customer satisfaction of internet banking users in selected cities of western Indian states. The qualitative study was conducted with the help of SERVQUAL model propounded by the Parasuraman. On the basis of qualitative study various independent variables have been identified to measure the satisfaction level of internet banking users. The instruments used for measuring customer satisfaction by previous various authors on the same topic have been identified and summarized in the following table.

Table 7.1: Summary of Findings as per SERVQUAL Model		
Dimensions	**Measurement Criteria**	**Supportive Articles**
Reliability	The ability of the Internet Bank to keep service promises accurately, consistently and also perform the service right the first time.	Parasuraman's et al (1985) Jun & Cai (2001) Santos (2003)
Responsiveness	The ability of Internet bank to provide prompt service, quick problem solving and convenience services.	Jun & Cai (2001)
Security	Low risk associated with online transaction, personal information safety and online transaction safety.	Yang et al (2004) Jun & Cai (2001)
Ease of Use	Convenience for the customers to interact with the bank through the internet.	Doll & Torkzadeh (1998)
Access	Approachability and ease of contact of service	Jun & Cai (2001)
Service Loyalty	Considers using only same service provider when a need of this service exits	Gremler & Brown (1996)
Recommendations	Customer keep loyal energetically recommend other customers the product and service of the enterprise.	Barnes & Glosenese (1887)
Expected Repurchase	The intension of a customer to repurchase product/ services through a particular e-service vendor.	Beatty et al (1998)
Customer Satisfaction	Evaluation between the customers' expectations and what they would receive from the product and services.	Oliver (1980) TSE & Wilton (1998)

The summary of the finding gives an indication about the tools to measure the Satisfaction Level of Internet Banking Users in selected cities of western Indian States. The factors identified on the basis of above table are as under:

a. EFFICIENCY OF A BANK:

It is related with the Efficiency of a bank in terms of service provided. The main areas covered under this category are account log in of a customer, adequate information on the bank's website, user friendly website, instructions and notice statements for customer on the website, Hangout during transaction process and speed during logout of customer account.

b. RELIABILITY OF A CUDTOMER ON BANK:

It is related with the reliability of a customer on a bank. The main area covered under this category are Reliability of web page, Service beyond the banking hours, message about completion of transaction, page download facility, Accuracy of information, Information contents and text under standings, Satisfaction level of service in comparison of charge, Easiness of transferring money to branches/banks, Convenient ATM location, Maximum withdrawal criteria for ATM, Account statement through SMS/e-mail, Reputation of Bank and Maintaining error free records.

c. SERVICE DELIVERY SYSTEM:

It is related with the service delivery system to a customer by the bank. The main area covered under this category are Promptness of bank response at the time of occurrence of problem, Promptness in problem solving, Online customer service representative connectivity, Customer service representative on telephone, Bank initiative to educate customer, Bank response to complain, Ability of bank representative, Behavior and attitude of Employee/Bank representative.

d. EXPECTATION OF A CUSTOMER:

It is related with the expectation of customers from a bank when they are using internet banking services provided by the banks. The main points covered under this category are Confirmation message for the service availed and Online purchased facilities, Fulfillment of customer instructions.

e. SECRECY OF CUSTOMER:

It is related with the privacy of customer account by the banks. The main points covered under this category are Secrecy of personal information, Protection against cookies to collect information, Secrecy of credit card information and reliability on bank understanding for not sharing the information.

f. TANGIBLES:

It is related with the Tangibles which are seen by everyone everywhere. The main points covered under this category are Technological advancement, Visually appealing physical facilities, Smart employee, Visually appealing materials associated with service and Bank modify their home page occasionally.

Survey instruments was subjected to test of reliability and construct validity to check if the factors identified are scientifically and Statistically valid and reliable. The survey instruments validity and reliability test was satisfactory. Literature review of previous studies also indicated that these variables played significant role in measuring customer satisfaction of internet banking users. Therefore, it could be concluded that the first objective of the study has been successfully achieved.

Main Objective: 2

To measure the satisfaction level of internet banking users in a selected city of western Indian state, which leads to make more loyal customer and hence loyalty leads to the attracting more customer, expansion of business and increase in net profit.

To measure the overall customer satisfaction of internet banking users descriptive statistics and the regression model has been used. The summarized table for over all satisfaction is as under:

Table – 7.2: Over all Satisfaction of Internet Banking Users in selected city of western Indian states.	
Variables	**Mean**
Efficiency	3.43
The speed of log in of your account	3.80
Availability of the important information on the bank website	3.20
User friendly website	3.20
Availability of appropriate instructions and guidelines	3.60
Server efficiency during transaction	3.40
The speed of logout of your account	3.40
Reliability	3.02
Reliability of Webpage	2.70
Service Beyond the Banking Hours	3.16
Message about Completion of Transaction	3.11
Page Download facilities	3.27
Accuracy of Information	2.94
Information Contents and Text Understanding	2.48
Satisfaction Level of Service in comparison of Charges	2.80
Easiness of Transaction money to Branched/Banks	3.31
Convenient ATM Location	3.60
Maximum Withdrawal Criteria for ATM	3.71
Account Statement Through SMS/E-mail Services	3.20
Reputation of Bank	2.48
Maintaining Error free Records	2.31
Service Delivery System	2.57
Promptness of Bank response at the time of occurrence of the Problem	2.25
Promptness in problem Solving	3.27
Online Customer Service Representative Connectivity	2.80
Customer Service Representative on Telephone	3.52
Bank Initiative to Educate Customer	2.40
Bank Response to Complain	1.99

Ability of Bank Representative	2.20
Behavior and Attitude of Employee/Customer Service Representative	2.02
Expectation of a Customer	2.79
Confirmation Message for the Service Availed	2.96
Online Purchase Facility	2.23
Fulfillment of Customer Instructions	3.20
Secrecy of Customer	2.96
Secrecy of a Personal Information	2.84
Protection of a Cookies to collect information	3.00
Secrecy of your credit card Information	2.59
Reliability of bank undertaking for not sharing the information	3.36
Tangibles	2.84
Technological Advancement	2.47
Visually appealing physical facilities	3.19
Smart Employee	2.80
Visually appealing material associated with service	2.60
Bank Modify their home page Occasionally	3.20
Overall Satisfaction	2.95

The above table it can be concluded that customers are dissatisfied with internet banking services and the measure area for dissatisfaction are Reliability of web page, Accuracy of information, Information Contents and Text Understanding, Satisfaction Level of Service in comparison of Charges, Reputation of Bank, Maintaining Error free Records, Promptness of Bank response at the time of occurrence of the Problem, Online Customer Service Representative Connectivity, Bank Initiative to Educate Customer, Ability of Bank Representative, Behavior and Attitude of Employee/Customer Service Representative, Confirmation Message for the Service Availed, Online Purchase Facility, Secrecy of a Personal Information, Secrecy of credit card Information, Technological Advancement, Smart Employee and Visually appealing material associated with service.

Therefore it is concluded that second objective regarding measuring customer satisfaction of internet banking users in selected city of western Indian states has been met.

Sub-Objective 1:

The purpose of this study is to find out the factors (Identified Variables) play an important role to determine the over all satisfaction of internet banking users in the selected city of western Indian State.

To examine the first objective regression analysis has been used to find out the significant variables in determining the over all satisfaction of the internet banking users in selected city of western Indian states. The brief outcomes of the regression analysis are as under:

Table 7.3: Factors Determining the Satisfaction level of Internet Banking Users

Model	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
(Constant)	.144	.203	-
Efficiency	-.264	.069	-.601
Reliability	.540	.045	.859
Service Delivery System	.009	.001	.025
Expectation of a Customer	.194	.006	.693
Secrecy of a Customer	.387	.069	.780
Tangibles	.170	.034	.305
a. Dependent Variable: Over all Satisfaction			

Over all satisfaction as dependent variable and Efficiency, Reliability, Service Delivery System, Expectation of a Customer, Secrecy of a Customer and Tangibles as independent variables has been used to determine the most and least affecting

variables for over all satisfaction of internet banking users. Out of six independent variable Efficiency and Service Delivery System has been found least important variables in determining the over all satisfaction of the internet banking users in selected city of the western Indian states. Thus the first sub objective has been successfully met.

Sub-Objective 2:

To establish the relationship among dependent and independent variables of measuring satisfaction of internet banking users in a selected city of western Indian states.

Table 7.3 shows the out of SPSS of regression analysis in which beta value indicate the relationship among the variables. There is a negative relationship between Efficiency of a bank and over all satisfaction level of internet banking users. Beta value -.601 indicate that efficiency of a bank has a negative influence on satisfaction of internet banking users. 100% leads in efficiency of a bank leads to -60% decline in the satisfaction level of the respondents. Beta value of reliability .859 indicates that 100% increase in reliability leads to 85% increase in customer satisfaction. Beta value of Service Delivery System .025 indicates that SDS has no impact on over all satisfaction of the internet banking users. Beta value of Expectation of Customers .693 indicates that 100% increase in Expectation of Customers leads to 69% increase in customer satisfaction of internet banking users. Beta value of Secrecy of Customers .780 indicates that 100% increase in Secrecy of Customers leads to 78% increase in customer satisfaction of internet banking users. Beta value of Tangibles .305 indicates that 100% increase in Tangibles leads to 30% increase in customer satisfaction of internet banking users.

The above data shows that Reliability, Service Delivery System, Expectation of Customers and Secrecy of Customers had a strong positive association with

customer satisfaction of internet banking users in selected city of western Indian states. Tangibles had low positive association with customer satisfaction and the Efficiency of a bank had the high negative correlation with customer satisfaction of internet banking users in selected city of western Indian states. Therefore it is concluded that second sub objective regarding establishing the relationship between dependent and independent variables to measure customer satisfaction of internet banking users in selected city of western Indian states has been successfully met.

Sub-Objective 3:

To find out the Geographical & Cultural impact on aver all satisfaction of internet banking users among the selected city of western Indian states.

To see the geographical and cultural impact on over all satisfaction of internet banking users among the selected city of western Indian states hypothesis has been tested. The brief out of hypothesis testing are as under:

HYPOTHESIS	VARIABLES		Beta Value	t Value	P Value	Decision
	Independent	Dependent				
Satisfaction levels of respondents are independent from the geographic location of the respondents.	Geographic Location (Selected City of western India)	Satisfaction level of Internet Banking Users	-.025	-.851	.395	Accepted

The above table value clearly indicates that there is no relationship between geographic location of a city and the customer satisfaction of internet banking users. the hypothesis has been tested with a 5% level of significance and two tail. P >.05 hence null hypothesis has been accepted.

Therefore it is concluded that third sub objective regarding geographical and cultural impact on customer satisfaction of internet banking users in selected city of western Indian states has been successfully met.

Sub-Objective 4:

To know how much customers rely on their banks towards maintenance of their account and the privacy issues.

Table 7.2 explains the Privacy of a customer maintained by the bank with a mean value of 2.96 out of 5. Which indicate that banks are maintaining only 60% privacy of internet banking users in a selected city of western Indian states. Therefore it is concluded that fourth sub objective regarding privacy issues maintained by the bank for internet banking users in a selected city of western Indian states has been successfully met.

Sub-Objective 5:

To establish the relationship among Gender, Age, Income and the level of education with the satisfaction level of internet banking service facilities provided by the banks.

To establish the relationship among Gender, Age, Income and the level of education a hypothesis testing has been used and the brief result are as under:

HYPOTHESIS	VARIABLES		Beta Value	t Value	P Value	Decision
	Independent	Dependent				
Satisfaction levels of respondents are independent from the Gender of the respondents.	Gender	Satisfaction level of Internet Banking Users	.103	3.595	.000	Rejected
Satisfaction levels of respondents are independent from the Age of the respondents.	Age	Satisfaction level of Internet Banking Users	-.074	-2.22	.026	Rejected
There is no association between income of a	Income	Satisfaction level of Internet	.116	4.040	.000	Rejected

respondents and the satisfaction level of internet banking users.		Banking Users				
There is no association between qualification of a respondents and the customer satisfaction of internet banking users.	Qualification	Satisfaction level of Internet Banking Users	-.048	-1.662	.097	Accepted

The above table indicates that satisfaction is dependent on gender. Beta value shows the positive relationship between gender and Satisfaction level. Beta value .103 indicates that higher the value of gender higher will be the satisfaction. Higher value in gender has been coded for female. Which clearly indicate that female are more satisfied than male. 100% increase in female users leads to 10% increase in satisfaction level of the respondents.

Satisfaction level is not independent from the age of the respondents as beta value indicates that there is a negative relationship between satisfaction and the age of respondents. Beta value -.076 indicates that lower will the age higher will be the satisfaction level of respondents. So it can be concluded that younger customer of internet banking users are more satisfied than elder one.

In the same manner like gender and age, satisfaction is not independent from the income of respondents. As beta value .116 indicates that positive relationship between satisfaction and income of respondents. Higher the income higher will be the satisfaction level of respondents.

Satisfaction level of respondents are independent from the qualification of the respondents as shown in table p value is greater than .05 so the null hypothesis is accepted. It can be concluded that there is no association between qualification and satisfaction level of respondents.

Therefore it is concluded that fifth sub objective regarding relationship among Gender, Age, Income and the level of education with the satisfaction level of internet banking service facilities provided by the banks has been successfully met.

Sub-Objective 6:

To create awareness of internet banking users that provides a higher level of convenience to both commercial and retail customers. With this service, the bank not only has the opportunity to manage their business better, but can also help their customers achieve a much more efficient process of managing their finances.

This sub objective of the study has been met during the data collection. Awareness has been created among 1200 respondents regarding the benefit and the use of internet banking services. Therefore it is concluded that the sixth sub objective regarding awareness of internet banking among selected city of western Indian states has been successfully met.

Sub-Objective 7:

To recommend banks regarding the improvement which is to be needed if any for successful adoption and operations of internet banking service facilities.

The sub objective can be validated in the next portion of the recommendation part.

7.2: SUGGESTIONS & RECOMMENDATIONS:

The results of this study provide detail information regarding the satisfaction and dissatisfaction of the respondents. Following table shows that respondents are satisfied in less than half of the attributes while dissatisfied in more than half attributes. Banks need to improve the attributes in which respondents are dissatisfied to increase the over all satisfaction level of respondents in selected city of western Indian states.

Sr. No.	Satisfied Attributes	Sr. No.	Dissatisfied Attributes
1	The speed of log in of your account	1	Reliability of Webpage
2	Availability of the important information on the bank website	2	Accuracy of Information
3	User friendly website	3	Information Contents and Text Understanding
4	Availability of appropriate instructions and guidelines	4	Satisfaction Level of Service in comparison of Charges
5	Server efficiency during transaction	5	Reputation of Bank
6	The speed of logout of your account	6	Maintaining Error free Records
7	Service Beyond the Banking Hours	7	Promptness of Bank response at the time of occurrence of the Problem
8	Message about Completion of Transaction	8	Online Customer Service Representative Connectivity
9	Page Download facilities	9	Bank Initiative to Educate Customer
10	Easiness of Transaction money to Branched/Banks	10	Bank Response to Complain
11	Convenient ATM Location	11	Ability of Bank Representative
12	Maximum Withdrawal Criteria for ATM	12	Behavior and Attitude of Employee/Customer Service Representative
13	Account Statement Through SMS/E-mail Services	13	Confirmation Message for the Service Availed

14	Promptness in problem Solving	14	Online Purchase Facility
15	Customer Service Representative on Telephone	15	Secrecy of a Personal Information
16	Fulfillment of Customer Instructions	16	Secrecy of your credit card Information
17	Protection of a Cookies to collect information	17	Technological Advancement
18	Reliability of bank undertaking for not sharing the information	18	Visually appealing physical facilities
19	Bank Modify their home page Occasionally	19	Smart Employee
		20	Visually appealing material associated with service

Reliability of webpage need to be improved because most of the respondents feel that webpage of a bank is not reliable. Banks need to modify their website with accurate, appropriate and jargon free statement with easy to understand text and contents on its website. Most of the respondents feel that information given on the website is not accurate. So they are hesitant to rely on the bank website. Hence this leads to dissatisfaction of internet banking users.

Banks need to modify their charges with respect to services because most of the respondents are not satisfied with the charges by the bank. Higher charge leads to the dissatisfaction level of the respondents. So it is beneficial for bank to reduce the charges to increase satisfaction level of the respondents which leads to make more loyal customer and hence attracting new customer to use internet banking with a low charge which ultimately leads to generate higher profits.

Respondents are highly dissatisfied with online customer service representative while they are satisfied with customer service representative on telephone. So there is a need to rectify the online connectivity of the customer service representative. Most of the bank either does not have online customer service representative or inexperienced online customer service representative. Those who do not have online

customer service representative need to be hire trained and energetic online customer service representative. But those who have already hired need to be trained their online customer service representative. Its leads to promptness in problem solving of a respondent at the time of occurrence of problem, which make customer more satisfied and it gives motivation to the respondents towards the use of internet banking services.

Banks need to provide online purchase facilities and protect the credit card information of internet banking users. Respondents are highly dissatisfied in these areas. Because in this advanced technological era internet banking users wants to purchase online but many of the bank either do not have these facilities or having a facilities with a charges. The banks those who do not have online purchase facilities need to be provide these facilities to increase satisfaction level of the respondents and to make more loyal customer. Otherwise in this competitive era customer switch over to other bank branches those who have online purchase facilities. Providing online purchase facility with a minimum charge not only increase the satisfaction level of respondents but it leads to make customer more loyal, attract new customer which leads to making broader business and hence generate more profits.

Last but not least bank needs to improve the tangibles in which respondents are highly dissatisfied. Most of the respondents are highly dissatisfied in technological advancement. Most of the banks do not update their website and technology for a longer period of time which creates discomfort to the internet banking users. Banks need to advance their technology as per the customer requirement. Otherwise discomfort level creates more dissatisfaction among internet banking users which leads to switch over to the other bank branches. So to stop these entire things bank need to modify their website regularly.

7.3: MANAGERIAL IMPLICATIONS:

Managerial implication of this study divided into two parts namely (i) theoretical and (ii) practical.

The most important theoretical contribution of this study is the development of a SERVQUAL model in the internet banking industry. Internet banking is a relatively new delivery channel offered by the banks in developing country like India and not many studies conducted in this area with the use of SERVQUAL model in Indian context.

Another major theoretical contribution is the extension of SERVQUAL model. Most of the researcher had not considered Customer Expectation as a determinant of satisfaction level of internet banking users in their past studies. But this study considered the Customer Expectation as a determinant variable to measure the customer satisfaction of internet banking users.

This study confirms the positive relationship between majority of the service quality attributes and customer satisfaction. This study also suggests that SERVQUAL is a suitable instrument for measuring the bank service quality in the Indian context. Therefore, bank managers can use this instrument to assess the bank service quality in Western Indian states.

The main aim should be to develop a long-term relationship with the customers. The current study demonstrates that there is a large positive correlation between customer satisfaction and customer loyalty. That means that if the customers are satisfied then they will become loyal. Jones and Sasser (1995) pointed out that there is a huge difference between merely satisfied and completely satisfied customers. Therefore bank managers should pay attention on the complete customer satisfaction.

As a Marketing Manager in the banking industry, it is pertinent that all the components in a service quality program be strictly followed and implemented effectively. Efficiency, Reliability, Expectation of a Customer, Secrecy of a Customer and Tangibles are all equally important in measuring the Customer Satisfaction of Internet Banking Users. Marketing Managers should not only focus on the bank's objective of profits and gains, but must also look into the needs of the customers as well. As a matter of fact, the Marketing Manager should recommend extensive customer-relations training programs for all the frontlines and tellers. In this way it would fortify the bank's core competency in customer satisfaction.

Throughout this research, we have shown the level of concern regarding security and privacy aspect among customers of Internet Banking users in Western India. The result show that customers are ready to adopt online banking if banks provide him necessary guidelines regarding security and privacy aspect because there are many factors trust, familiarity, innovativeness, awareness affects the acceptance of online banking in Western India.

Trust is especially important in online transaction. Banks should provide Customers, useful tips to use of banks website and operational procedure by which customer can enhance their level of trust in online banking and they can increase their uses in future.

Familiarity has also significant impact on the Customer Satisfaction of Internet Banking among adult customers in western India. Banks website design should be very simple by which customers can easily operate.

Innovativeness has influencing factor to enhance the satisfaction level of Internet Banking users. Adult customers are innovative in nature. They are easily ready to adopt online banking if bank motivates them. Organization should segment the market and focus on their needs and preference.

Result of this study provides the banking decision maker and policy maker an insight into the dissatisfied areas. In these days policy maker are thinking about the virtual banking which is largely practiced by the developed nations like USA, UK etc so they will force to banks to rectify their shortcoming to improve the satisfaction level of the respondents. Without highly satisfied customers virtual banking is not possible to introduce in a developing countries like India.

7.4: SCOPE FOR FUTURE RESEARCH

The issues discussed in the limitation section could be taken as a pointer for continuing research in the area. Research on measurement of customer satisfaction of internet banking users in a selected city of western Indian states is still in a nascent stage, there is lot more to be studied and analyzed. Some avenues for continuing study in this exciting field are as under:

[1] The research model (SERVQUAL) used in this study gave sufficiently acceptable results on empirical testing. Still there is a scope for modifying a model. The factors identified by the researcher could be validated further and more factors could be considered for better prediction level of the model. It is seen that multiple regression analysis of the model gave statistically significant results only four of the six variables identified for this study. Therefore further study could look into this and come up with modified alternate models which would be more statistically fit for these types of study.

[2] This study is based on multistage sampling which include the non probability Snow ball and convenience sampling from the selected city of western Indian states. So further study could be done in a more scientific way with a probability sample and with a statistically significant sample size.

[3] Internet banking users among Indian bank account holders is very less and due to this the researcher had faced a problem in identifying the respondents. As acceptance of internet banking expected to improve in the coming year future studies could be conducted in a better and broader way with a large sample size.

[4] The researcher also proposes conducting survey in different part of the country will improve the generalizability of the findings. This is possible through web based survey to conduct the survey through out the country.

[5] Future studies could also investigate the customer perception between users and non users of internet banking by conducting separate survey among both these categories of users.

7.5: CONCLUSION:

Indian economy is witnessing stellar growth over the last few years. There has been rapid development in infrastructure and business front during the growth period. Internet adoption among Indian has been rapidly increasing over the last one decade. Indian banks have also risen to the occasion by offering new channels of delivery to its customer. But proportionately Indian customers of internet banking users are less than the developed nations. It has been observed that dissatisfaction is one of the important reasons for the lesser participation in internet banking. So this study made an attempt to measure the customer satisfaction of internet banking users in a selected city of western Indian states. The researcher tried to identify the important factor that will affect the customer satisfaction of internet banking users. The quantitative analysis of the model confirmed that the factors identified by the researcher namely Efficiency, Reliability, Service Delivery System, Expectation of a Customer, Secrecy of a Customer and Tangibles. The result of the finding shows that

Reliability, Expectation of a Customer, Secrecy of a Customer and Tangibles had positive influence on Customer Satisfaction of Internet Banking users in selected city of western Indian states and the two variables Efficiency and the Service Delivery System had negative influence on Customer Satisfaction of Internet Banking users in selected city of western Indian states.

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ANNEXURE – 1

[SPSS OUTPUT]

Table – 1 : Cross Tabulation
How long have you been using internet banking versus Efficiency

How long have you been using internet banking		[1]	[2]	[3]	[4]	[5]	[6]	[7]	Mean Overall	%
1 – 2 (Year)	Mean	4.00	3.43	3.43	3.71	3.57	3.57	5.00	3.62	72.38
	N	336	336	336	336	336	336	336		
	SD	.927	.730	.730	.701	.730	.730	0.000		
2 – 3 (Year)	Mean	3.70	3.11	3.11	3.56	3.30	3.30	5.00	3.35	66.91
	N	648	648	648	648	648	648	648		
	SD	.975	.738	.738	.832	.809	.809	0.000		
3-above Year	Mean	3.78	3.11	3.11	3.56	3.44	3.44	5.00	3.41	68.14
	N	216	216	216	216	216	216	216		
	SD	1.033	.739	.739	.833	.833	.833	0.000		
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40	5.00	3.43	68.66
	N	1200	1200	1200	1200	1200	1200	1200		
	SD	.980	.749	.749	.800	.800	.800	0.000		

1 = The speed of log in of your account, 2 = Availability of the important information on the bank website, 3 = User friendly website, Availability of appropriate instructions and guidelines, 4 = Server efficiency during transaction, 5 = The speed of logout of your account, 6 = Appropriateness of above criteria to measure efficiency of a bank

Table – 2 : Cross Tabulation
How long have you been using internet banking Versus Reliability

How long have you been using internet banking		[1]*	[2]*	[3]*	[4]*	[5]*	[6]*	[7]*	[8]*	[9]*	[10]*	[11]*	[12]*	[13]*	[14]*	Mean Over all	%
1 – 2 (Year)	Mean	2.86	3.57	3.29	3.43	2.86	2.43	2.71	3.43	3.71	3.86	3.14	2.29	2.43	2.71	3.08	61.53
	N	336	336	336	336	336	336	336	336	336	336	336	336	336	336		
	SD	.350	1.051	1.162	.496	.991	.905	1.580	1.180	1.162	.834	.350	.452	.730	1.032		
2 – 3 (Year)	Mean	2.78	3.33	3.11	3.33	2.93	2.33	2.81	3.37	3.52	4.04	3.26	2.48	2.44	2.59	3.06	61.13
	N	648	648	648	648	648	648	648	648	648	648	648	648	648	648		
	SD	.416	1.248	.876	.472	1.08	1.019	1.542	1.393	1.399	.923	.439	.500	.786	.954		
3-above Year	Mean	2.78	3.33	3.33	3.56	3.44	2.56	2.89	3.44	3.67	4.11	3.11	2.33	2.22	2.44	3.14	62.73
	N	216	216	216	216	216	216	216	216	216	216	216	216	216	216		
	SD	.417	1.250	.945	.498	1.16	1.168	1.796	1.502	1.494	.877	.315	.472	.918	1.168		
Total	Mean	2.80	3.40	3.20	3.40	3.00	2.40	2.80	3.40	3.60	4.00	3.20	2.40	2.40	2.60	3.08	61.53
	N	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200		
	SD	.400	1.201	.980	.490	1.09	1.020	1.601	1.357	1.357	.895	.400	.490	.800	1.020		

1 = Reliability of Webpage, 2 = Service Beyond the Banking Hours, 3 = Message about Completion of Transaction, 4 = Page Download facilities, 5 = Accuracy of Information, 6 = Information Contents and Text Understanding, 7 = Satisfaction Level of Service in comparison of Charges, 8 = Easiness of Transaction money to Branched/Banks, 9 = Convenient ATM Location, 10 = Maximum Withdrawal Criteria for ATM, 11 = Account Statement Through SMS/E-mail Services, 12 = Reputation of Bank, 13 = Maintaining Error free Records, 14 = Rate Above Criteria to Measure the Reliability of a Bank

Table – 3 : Cross Tabulation How long have you been using Internet Banking versus Service Delivery System												
How long have you been using internet banking		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**		
1 – 2 (Year)	Mean	2.15	3.01	2.72	4.01	2.16	2.15	2.15	2.58	3.01	2.62	52.3
	N	336	336	336	336	336	336	336	336	336		
	SD	.353	1.511	.703	.757	.833	.830	.353	1.059	.930		
2 – 3 (Year)	Mean	2.26	3.25	2.78	4.29	2.48	2.18	2.19	2.92	3.32	2.79	55.8
	N	648	648	648	648	648	648	648	648	648		
	SD	.437	1.508	.785	.763	.792	.725	.390	1.184	1.053		
3-above Year	Mean	2.12	3.34	3.00	4.23	2.55	2.34	2.32	2.78	3.12	2.83	56.6
	N	216	216	216	216	216	216	216	216	216		
	SD	.321	1.254	.672	.632	.687	.669	.469	1.229	.750		
Total	Mean	2.20	3.20	2.80	4.20	2.40	2.20	2.20	2.80	3.20	2.75	55
	N	1200	1200	1200	1200	1200	1200	1200	1200	1200		
	SD	.400	1.470	.749	.749	.800	.749	.400	1.167	.980		

1 = Promptness of Bank response at the time of occurrence of the Problem, 2 = Promptness in problem Solving, 3 = Online Customer Service Representative Connectivity, 4 = Customer Service Representative on Telephone, 5 = Bank Initiative to Educate Customer, 6 = Bank Response to Complain, 7 = Ability of Bank Representative, 8 = Behavior and Attitude of Employee/Customer Service Representative, 9 = Rate Above Criteria to Measure the Reliability of a Bank

Table – 4 : Cross Tabulation: How long have you been using internet banking Versus Customer Expectation							
How long have you been using internet banking		[1]	[2]	[3]	[4]	Mean Over all	%
1 – 2 (Year)	Mean	3.00	2.14	3.14	3.14	2.76	55.23
	N	336	336	336	336		
	SD	1.311	.350	1.644	1.644		
2 – 3 (Year)	Mean	2.74	2.26	3.15	3.11	2.72	54.32
	N	648	648	648	648		
	SD	1.142	.439	1.695	1.730		
3-above Year	Mean	2.67	2.11	2.33	2.44	2.37	47.40
	N	216	216	216	216		
	SD	.945	.315	1.494	1.426		
Total	Mean	2.80	2.20	3.00	3.00	2.67	53.33
	N	1200	1200	1200	1200		
	SD	1.167	.400	1.674	1.674		
1 = Confirmation Message for the Service Availed, 2 = Online Purchase Facility, 3 = Fulfillment of Customer Instructions, 4 = Rate Above Criteria to Measure the Reliability of a Bank							

Table – 5 : Cross Tabulation How long have you been using Internet Banking Versus Secrecy of a Customer								
How long have you been using internet banking		[1]	[2]	[3]	[4]	[5]	Mean Over all	%
1 – 2 (Year)	Mean	3.14	3.00	2.86	3.57	3.14	3.14	62.85
	N	336	336	336	336	336		
	SD	.640	.757	.834	.496	.991		
2 – 3 (Year)	Mean	2.93	2.96	2.48	3.33	2.67	2.93	58.51
	N	648	648	648	648	648		
	SD	.605	.577	.739	.472	.944		
3-above Year	Mean	3.00	3.11	2.56	3.33	2.67	3.00	60
	N	216	216	216	216	216		
	SD	.668	.568	.833	.472	.945		
Total	Mean	3.00	3.00	2.60	3.40	2.80	3.00	60
	N	1200	1200	1200	1200	1200		
	SD	.633	.633	.800	.490	.980		
1 = Secrecy of a Personal Information, 2 = Protection of a Cookies to collect information, 3 = Secrecy of your credit card Information, 4 = Reliability of bank undertaking for not sharing the information, 5 = Rate Above Criteria to Measure the Reliability of a Bank								

Table – 6 : Cross Tabulation How long have you been using internet banking Versus Tangibles									
How long have you been using internet banking		[1]	[2]	[3]	[4]	[5]	[6]	Mean Over all	%
1 – 2 (Year)	Mean	2.14	3.00	2.71	2.57	3.14	3.57	2.71	54.28
	N	336	336	336	336	336	336		
	SD	.834	.757	.701	.496	.834	1.051		
2 – 3 (Year)	Mean	2.52	3.24	2.89	2.63	3.22	3.30	2.90	58
	N	648	648	648	648	648	648		
	SD	.739	.706	.786	.483	.685	1.048		
3- above Year	Mean	2.44	3.33	2.67	2.56	3.22	3.44	2.84	56.88
	N	216	216	216	216	216	216		
	SD	.833	.818	.668	.498	.787	.833		
Total	Mean	2.40	3.19	2.80	2.60	3.20	3.40	2.84	56.76
	N	1200	1200	1200	1200	1200	1200		
	SD	.800	.751	.749	.490	.749	1.020		
1 = Technological Advancement, 2 = Visually appealing physical facilities, 3 = Smart Employee, 4 = Visually appealing material associated with service, 5 = Bank Modify their home page Occasionally, 6 = Rate Above Criteria to Measure the Reliability of a Bank									

Table – 7 : Mean Comparison between Gender versus Efficiency of a Bank							
Gender		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Male	Mean	3.72	3.15	3.15	3.54	3.33	3.33
	N	936	936	936	936	936	936
	Std.	1.012	.770	.770	.843	.827	.827
Female	Mean	4.09	3.36	3.36	3.82	3.64	3.64
	N	264	264	264	264	264	264
	Std.	.794	.644	.644	.576	.644	.644
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 8 : Mean Comparison between Age versus Efficiency of a Bank							
Age		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Below – 30 years	Mean	3.82	3.21	3.21	3.64	3.43	3.43
	N	672	672	672	672	672	672
	Std.	.929	.725	.725	.767	.776	.776
31 – 45 Years	Mean	3.91	3.27	3.27	3.64	3.45	3.45
	N	264	264	264	264	264	264
	Std.	.998	.751	.751	.773	.784	.784
45 – 60 Years	Mean	3.71	3.14	3.14	3.43	3.29	3.29
	N	168	168	168	168	168	168
	Std.	1.164	.835	.835	.906	.883	.883
61 – Above years	Mean	3.50	3.00	3.00	3.50	3.25	3.25
	N	96	96	96	96	96	96
	Std.	.871	.711	.711	.871	.834	.834
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 9 : Mean Comparison between Qualification versus Efficiency of a Bank							
Qualification		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Up to HSC	Mean	4.33	3.67	3.67	4.00	3.67	3.67
	N	72	72	72	72	72	72
	Std.	.475	.475	.475	0.000	.475	.475
U.G	Mean	3.79	3.18	3.18	3.57	3.39	3.39
	N	672	672	672	672	672	672
	Std.	1.013	.759	.759	.821	.817	.817
P.G	Mean	3.71	3.14	3.14	3.57	3.36	3.36
	N	336	336	336	336	336	336
	Std.	.960	.743	.743	.822	.812	.812
Professional	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	120	120	120	120	120	120
	Std.	.984	.751	.751	.803	.803	.803
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 10 : Mean Comparison between Profession versus Efficiency of a Bank							
Profession		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Public Sector Job	Mean	3.36	2.91	2.91	3.27	3.09	3.09
	N	264	264	264	264	264	264
	Std.	1.070	.794	.794	.964	.902	.902
Private Sector Job	Mean	4.03	3.34	3.34	3.77	3.54	3.54
	N	840	840	840	840	840	840
	Std.	.845	.674	.674	.637	.691	.691
Business Entrepreneur	Mean	3.00	2.75	2.75	3.00	3.00	3.00
	N	96	96	96	96	96	96
	Std.	1.005	.834	.834	1.005	1.005	1.005
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 11 : Mean Comparison between Gross Monthly Income versus Efficiency of a Bank							
Gross Monthly Income		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Below – 20K	Mean	3.63	3.00	3.00	3.50	3.25	3.25
	N	192	192	192	192	192	192
	Std.	.995	.709	.709	.868	.831	.831
20K – 40K	Mean	3.79	3.21	3.21	3.58	3.39	3.39
	N	792	792	792	792	792	792
	Std.	1.008	.769	.769	.818	.815	.815
40K – 60K	Mean	4.00	3.38	3.38	3.75	3.63	3.63
	N	192	192	192	192	192	192
	Std.	.868	.698	.698	.663	.698	.698
60K - Above	Mean	4.00	3.00	3.00	4.00	3.00	3.00
	N	24	24	24	24	24	24
	Std.	0.000	0.000	0.000	0.000	0.000	0.000
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 12 : Mean Comparison between Residential Area versus Efficiency of a Bank							
Residential Area		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Urban	Mean	3.77	3.15	3.15	3.62	3.38	3.38
	N	624	624	624	624	624	624
	Std.	.933	.718	.718	.789	.789	.789
Semi Urban	Mean	4.50	3.50	3.50	4.00	3.50	3.50
	N	96	96	96	96	96	96
	Std.	.503	.503	.503	0.000	.503	.503
Rural	Mean	3.70	3.20	3.20	3.50	3.40	3.40
	N	480	480	480	480	480	480
	Std.	1.055	.813	.813	.867	.861	.861
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 13 : Mean Comparison between Family Type versus Efficiency of a Bank							
Family type		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Joint	Mean	4.13	3.50	3.50	3.75	3.63	3.63
	N	192	192	192	192	192	192
	Std.	.929	.709	.709	.663	.698	.698
Single	Mean	3.74	3.14	3.14	3.57	3.36	3.36
	N	1008	1008	1008	1008	1008	1008
	Std.	.978	.743	.743	.821	.812	.812
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 14 : Mean Comparison between Number of Other Earning Members in a Family versus Efficiency of a Bank							
Number of other earning member in a family		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
One	Mean	3.68	3.05	3.05	3.58	3.32	3.32
	N	456	456	456	456	456	456
	Std.	.922	.687	.687	.816	.799	.799
Two	Mean	3.78	3.22	3.22	3.57	3.39	3.39
	N	552	552	552	552	552	552
	Std.	1.021	.778	.778	.826	.821	.821
Three - Above	Mean	4.13	3.50	3.50	3.75	3.63	3.63
	N	192	192	192	192	192	192
	Std.	.929	.709	.709	.663	.698	.698
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 15 : Mean Comparison between How long have you been using bank services versus Efficiency of a Bank							
How long have you been using bank services		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Below – 5 Years	Mean	3.82	3.18	3.18	3.64	3.45	3.45
	N	264	264	264	264	264	264
	Std.	.938	.717	.717	.773	.784	.784
5 – 10 Years	Mean	3.80	3.23	3.23	3.60	3.40	3.40
	N	840	840	840	840	840	840
	Std.	.980	.760	.760	.800	.800	.800
10 – 15 Years	Mean	3.75	3.00	3.00	3.50	3.25	3.25
	N	96	96	96	96	96	96
	Std.	1.095	.711	.711	.871	.834	.834
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 16 : Mean Comparison between type of a bank in which you have bank account versus Efficiency of a Bank							
Tick the type of a bank in which you have bank account		The speed of log in of your account	Availability of the important information on the bank website	User friendly website	Availability of appropriate instructions and guidelines	Server efficiency during transaction	The speed of logout of your account
Pvt. Bank	Mean	3.92	3.28	3.28	3.68	3.48	3.48
	N	600	600	600	600	600	600
	Std.	.935	.723	.723	.734	.755	.755
Nationalize Bank	Mean	3.46	3.00	3.00	3.38	3.23	3.23
	N	312	312	312	312	312	312
	Std.	1.010	.786	.786	.925	.892	.892
Foreign Bank	Mean	4.10	3.40	3.40	3.80	3.60	3.60
	N	240	240	240	240	240	240
	Std.	.832	.665	.665	.601	.665	.665
Cooperative Bank	Mean	3.00	2.50	2.50	3.00	2.50	2.50
	N	48	48	48	48	48	48
	Std.	1.011	.505	.505	1.011	.505	.505
Total	Mean	3.80	3.20	3.20	3.60	3.40	3.40
	N	1200	1200	1200	1200	1200	1200
	Std.	.980	.749	.749	.800	.800	.800

Table – 17 : Mean Comparison between Gender versus Tangibles						
Gender		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Male	Mean	2.44	3.22	2.79	2.59	3.21
	N	936	936	936	936	936
	Std.	.778	.737	.758	.492	.723
Female	Mean	2.27	3.09	2.82	2.64	3.18
	N	264	264	264	264	264
	Std.	.864	.794	.717	.482	.835
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 18 : Mean Comparison between Age versus Tangibles						
Age		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Below – 30 years	Mean	2.43	3.20	2.86	2.64	3.25
	N	672	672	672	672	672
	Std.	.776	.731	.743	.480	.739
31 – 45 Years	Mean	2.27	3.09	2.73	2.55	3.09
	N	264	264	264	264	264
	Std.	.864	.794	.751	.499	.794
45 – 60 Years	Mean	2.29	3.14	2.57	2.43	3.00
	N	168	168	168	168	168
	Std.	.883	.835	.731	.496	.758
61 – Above years	Mean	2.75	3.50	3.00	2.75	3.50
	N	96	96	96	96	96
	Std.	.435	.503	.711	.435	.503
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 19 : Mean Comparison between Qualification versus Tangibles						
Qualification		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Up to HSC	Mean	2.00	2.67	3.00	2.67	3.00
	N	72	72	72	72	72
	Std.	.822	.475	.822	.475	.822
U.G	Mean	2.39	3.20	2.75	2.57	3.18
	N	672	672	672	672	672
	Std.	.817	.778	.739	.495	.759
P.G	Mean	2.50	3.29	2.86	2.64	3.29
	N	336	336	336	336	336
	Std.	.733	.701	.743	.480	.701
Professional	Mean	2.40	3.20	2.80	2.60	3.20
	N	120	120	120	120	120
	Std.	.803	.751	.751	.492	.751
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 20 : Mean Comparison between Profession versus Tangibles						
Profession		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Public Sector Job	Mean	2.64	3.45	2.73	2.55	3.27
	N	264	264	264	264	264
	Std.	.644	.657	.751	.499	.618
Private Sector Job	Mean	2.29	3.04	2.86	2.63	3.14
	N	840	840	840	840	840
	Std.	.848	.755	.762	.483	.798
Business Entrepreneur	Mean	2.75	3.75	2.50	2.50	3.50
	N	96	96	96	96	96
	Std.	.435	.435	.503	.503	.503
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 21 : Mean Comparison between Gross Monthly Income versus Tangibles						
Gross Monthly Income		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Below – 20K	Mean	2.63	3.31	2.88	2.63	3.25
	N	192	192	192	192	192
	Std.	.698	.728	.783	.485	.663
20K – 40K	Mean	2.36	3.18	2.76	2.58	3.18
	N	792	792	792	792	792
	Std.	.810	.757	.740	.495	.757
40K – 60K	Mean	2.25	3.13	2.75	2.63	3.25
	N	192	192	192	192	192
	Std.	.831	.783	.663	.485	.831
60K - Above	Mean	3.00	3.00	4.00	3.00	3.00
	N	24	24	24	24	24
	Std.	0.000	0.000	0.000	0.000	0.000
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 22 : Mean Comparison between Residential Area versus Tangibles						
Residential Area		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Urban	Mean	2.50	3.25	2.88	2.65	3.27
	N	624	624	624	624	624
	Std.	.747	.718	.751	.476	.711
Semi Urban	Mean	2.00	2.50	3.00	2.50	2.50
	N	96	96	96	96	96
	Std.	1.005	.503	1.005	.503	.503
Rural	Mean	2.35	3.25	2.65	2.55	3.25
	N	480	480	480	480	480
	Std.	.793	.767	.655	.498	.767
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 23 : Mean Comparison between Family Type versus Tangibles						
Family type		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Joint	Mean	2.00	2.81	2.63	2.50	3.00
	N	192	192	192	192	192
	Std.	.868	.770	.698	.501	.868
Single	Mean	2.48	3.26	2.83	2.62	3.24
	N	1008	1008	1008	1008	1008
	Std.	.764	.726	.754	.486	.718
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 24 : Mean Comparison between Number of Other Earning Members in a Family versus Tangibles						
Number of other earning member in a family		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
One	Mean	2.63	3.37	2.95	2.68	3.32
	N	456	456	456	456	456
	Std.	.666	.666	.760	.465	.654
Two	Mean	2.35	3.17	2.74	2.57	3.17
	N	552	552	552	552	552
	Std.	.814	.761	.736	.496	.761
Three - Above	Mean	2.00	2.81	2.63	2.50	3.00
	N	192	192	192	192	192
	Std.	.868	.770	.698	.501	.868
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 25 : Mean Comparison between How long have you been using bank services versus Tangibles						
How long have you been using bank services		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Below – 5 Years	Mean	2.45	3.23	2.82	2.64	3.27
	N	264	264	264	264	264
	Std.	.784	.766	.717	.482	.751
5 – 10 Years	Mean	2.37	3.17	2.80	2.60	3.20
	N	840	840	840	840	840
	Std.	.796	.737	.749	.490	.749
10 – 15 Years	Mean	2.50	3.25	2.75	2.50	3.00
	N	96	96	96	96	96
	Std.	.871	.834	.834	.503	.711
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

Table – 26 : Mean Comparison between type of a bank in which you have bank account versus Tangibles						
Tick the type of a bank in which you have bank account		Technological Advancement	Visually appealing physical facilities	Smart Employee	Visually appealing material associated with service	Bank Modify their home page Occasionally
Pvt. Bank	Mean	2.32	3.12	2.80	2.60	3.16
	N	600	600	600	600	600
	Std.	.836	.766	.749	.490	.784
Nationalize Bank	Mean	2.62	3.42	2.77	2.62	3.38
	N	312	312	312	312	312
	Std.	.626	.662	.698	.487	.626
Foreign Bank	Mean	2.20	3.00	2.80	2.60	3.10
	N	240	240	240	240	240
	Std.	.874	.776	.750	.491	.832
Cooperative Bank	Mean	3.00	3.50	3.00	2.50	3.00
	N	48	48	48	48	48
	Std.	0.000	.505	1.011	.505	0.000
Total	Mean	2.40	3.19	2.80	2.60	3.20
	N	1200	1200	1200	1200	1200
	Std.	.800	.751	.749	.490	.749

QUESTIONNAIRE

"Customers satisfaction measurement of Internet Banking"

[An Analytical study based on selected customers and Banks in Western India.]

Section A: Demographic Profile of respondent

Name: ----------

Mobile No: ----------

Area of Residence ----------

Email ID: ----------

1) Gender:
   1. Male ☐
   2. Female ☐

2) Age:
   1. Below – 30 years ☐
   2. 31years– 45 years ☐
   3. 45 years– 60 years ☐
   4. 61 years- Above ☐

3) Qualification:
   1. Up to Higher Secondary – [12th] ☐
   2. Graduate ☐
   3. Post Graduate ☐
   4. Professional ☐

4) Profession:
   1. Unemployed ☐
   2. Job in Public Sector ☐
   3. Job in Private Sector ☐
   4. Business Entrepreneur ☐

5) Gross Monthly Income:
   1. Below - 20,000 ☐
   2. 20,001– 40,000 ☐
   3. 40,001– 60,000 ☐
   4. 60,001– Above ☐

6) Residential Area:
   1. Urban Area ☐
   2. Semi Urban Area ☐
   3. Rural Area ☐
   4. Slum Area ☐

7) Family Type:
   1. Joint Family ☐
   2. Single Family ☐

8) Number of other earning members in the family:
   1. None ☐
   2. One ☐
   3. Two ☐
   4. Three – Above ☐

9) Do you have a bank account

1. Yes ☐
2. No ☐

10) Type of your Bank Account :

1. Saving ☐
2. Current ☐

11) Purpose of your Bank Account Operation:

1. Personal ☐
2. Business ☐

12) How Long h ave you been using Banking Services:

1. Less– 5 years ☐
2. 5 years – 10 years ☐
3. 10 years – 15 Years ☐
4. 15 years and Above ☐

13) How Long have you been using Internet Banking:

1. Less– 1 year ☐
2. 1 year – 2 years ☐
3. 2 years – 3 years ☐
4. 3 years and Above ☐

14) Tick the types of a bank in which you have your bank account:

1. Private Bank ☐
2. Nationalized Bank ☐
3. Foreign Bank ☐
4. Cooperative Bank ☐

Section B: Efficiency

Sr. No	Item	1 Very Poor	2 Poor	3 Average	4 Good	5 Very Good
1	The speed of login of your account					
2	Availability of the important information on the bank's website					
3	User Friendly Website					
4	Availability of appropriate Instructions and Guidelines					
5	Server Efficiency during transaction					
6	The speed of logout of your account					
7	Rate above criteria to measure efficiency to a bank					

Section C: Reliability

Sr. No	Item	1 Very Poor	2 Poor	3 Average	4 Good	5 Very Good
8	Reliability of Web Page					
9	Service beyond the Banking hours					
10	Message about completion of transaction					
11	Page Download Facilities					
12	Accuracy of Information					
13	Information contents and texts understanding					

Sr. No	Item	1 Very Poor	2 Poor	3 Average	4 Good	5 Very Good
14	Satisfaction level of services in comparison of charge					
15	Easiness of transferring money to Branches/Bank					
16	Convenient ATM Location					
17	Maximum Withdrawal Criteria for ATM					
18	Account statement through SMS/ E-mail services					
19	Reputation of bank					
20	Maintaining error free records.					
21	Rate above criteria to measure the reliability of a bank					

Section D: Service Delivery System

Sr. No	Item	1 Very Poor	2 Poor	3 Average	4 Good	5 Very Good
22	Promptness of bank response at the time of Occurrence of Problem					
23	Promptness in Problem Solving					
24	Online Customer Service Representative Connectivity.					
25	Customer Service Representative on Telephone					
26	Bank Initiative to Educate Customer					
27	Bank Response to Complain					
28	Ability of Bank Representative					
29	Behavior & Attitude of Employee/Customer service representative					
30	Rate above Criteria to measure Service Delivery System of a Bank					

Section E : Expectation of a Customer

Sr. No	Item	1 Very Poor	2 Poor	3 Average	4 Good	5 Very Good
31	Conformation message for the service availed					
32	Online purchase facility					
33	Fulfillment of Customer Instruction					
34	Rate above Criteria to measure Expectation of a Customer					

Section F: Secrecy of Customer

Sr. No	Item	1 Very Poor	2 Poor	3 Average	4 Good	5 Very Good
35	Secrecy of Personal Information					
36	Protection against Cookies to collect information					
37	Secrecy for your credit card information					
38	reliability on Bank undertaking for not sharing the information					
39	Rate above Criteria to measure Secrecy of a Customer					

Section G: Tangibles

Sr. No	Item	1 Very Poor	2 Poor	3 Average	4 Good	5 Very Good
40	Technological Advancement					
41	Visually appealing physical facilities					
42	Smart employees					
43	Visually appealing materials associated with service.					
44	Bank modify their home page occasionally					
45	Rate above Criteria to measure Tangibles					

Would you like to add any additional criteria that will help to satisfy your need when you use internet banking services: -------

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Thank You