CHAPTER-2

LITERATURE REVIEW

The previous chapter discussed about the details regarding Indian banking sector, concept and practice of e-banking and challenges of e-banking. It also included the rationale of the study. This chapter is based on the review of existing literature on the topic chosen for research. It provides a glimpse of the research studies conducted so far in this field of study.

The review of literature largely deals with the Service quality, concept of e-banking, channels of e-banking, technology adoption model and finally indicates the gap area where this present study has been conducted.

2.1 Definition of E-Banking:

E-banking has been conceptualized and defined differently by the different scholars. Some of the definitions of the E-Banking in various aspects of banking and their nature of service are given below:

- The E-Banking is flexible and user-friendly platform that provides integrated form of services to the customers irrespective of time and place in cost effective and efficient manner. This system is more accountable and responsible than the traditional system.
- It is a strong, flexible and effective communication channel for customers and banks to access, process and exchange information. The customers are empowered to enjoy fast, flexible and convenient banking while the banks are able to utilise their resources in most effective way as where they are needed most.
- The E-Banking is to give more freedom to customers as there is no restriction on when and where availability of the service. The services are available as per the needs and requirements of the customers and banks themselves.
The E-Banking is deployment of new channels to avail/provide banking services for every class of customers in customized form. The foundation stone of e-Banking is the automation of bank branch and its interconnectivity with others for a seamless flow of information.

The E-Banking is more than just a website on the Internet and service accessibility at mobile phones or PDAs (Personal Digital Assistants). It has numerous opportunities in addition to challenges such as security and risks which in turn have their own measures to mitigate in addition to traditional ones.

The E-Banking is a modern decision making approach with an ability to adopt ever-changing environment.

The E-Banking is a process to modernise traditional or new entrant banks with new styles of leadership i.e. management role, customers’ participation, new organisational structures and introduction of numerous service access points.

The E-Banking facilitates in managing internal banking operations to make them simple, transparent, error free to make overall improvement in all business aspects such as efficiency, productivity and profitability.

The E-Banking is not merely a technology implementation. It involves changes in management, technology position as well as business process re-engineering. Therefore, there is need for an inter-disciplinary approach while preparing a blue point of the solution (Sogala, 2003).

The terms ‘Technology-Enabled Banking Self-services’ and ‘Electronic Banking’ have been used interchangeably in many studies. Several definitions of electronic banking exists in the literature. According Daniel (1999), it means the provisioning of information and services by a bank to its customers via computer, telephone or television. According to her, it can also mean the access to the banking services via kiosks or ATMs located in work places or at public locations such as an airport or a railway station.

Uppal (2007) takes a broader definition to include all the services provided by banks through all types of electronic delivery channels such as telephone, Internet, cell phone and so on. Hence as per this definition banking services such as Internet banking,
telephone banking, mobile banking and services provided through ATMs are all brought under its purview.

Sharma (2007) gave a rather interesting definition of electronic banking when he equated it as ‘providing banking service to customer at his/her office/home or at any other place or time wherever the person is- be it traveling, shopping or even in a stadium through the usage of electronic technology’.

The new delivery channels such as ATMs, Telephone Banking and Internet Banking along with better access to customer information have reformed the relationship between banks and customers. Banks are now able to process the customer information for a number of purposes. They have the opportunity to market their products and services online and additional financial services like banc assurance can be targeted at the existing customers and prospects, thus facilitating customization to suit the needs of individual customers (Godse, 2005).

2.2 Evolution of Delivery Channels:

Traditionally, banks in India relied extensively on their reach afforded by their vast branch network to effectively put emerging banks out of competition. This was a high cost strategy considering the high real estate and bank operating expenses. This forced new banks to develop strategies that could help them reach out to end-customer in cost-effective ways. The solution came in the form of delivery channels such as Automated Teller Machines or ATMs, and Internet banking. They turned out to be the growth drivers for private banks in India (Srikanth and Padmanabhan, 2002).

With the infusion of technology into the banking systems it is now possible for the banks to provide multiple delivery channels for provisioning of banking products and services. In India the traditional ‘brick and mortar’ banks are complimenting their operations with ‘brick and click’ strategy. The changed strategy on delivery channels is faced with attendant problems little known before.
2.2.1 Automated Teller Machines (ATMs):

Automated Teller Machine or ATM as it is popularly known, is a device that allows customers who have an ATM card to perform routine transactions without interacting with a human teller. In addition to cash withdrawals, ATMs can handle deposits and enquiries, arrange loans and insurance, arrange buying and selling of stocks and advise customers on different savings and investment schemes (Manoharan, 2007).

HSBC was the first bank to introduce the ATM concept in India way back in 1987. New private sector banks have taken the lead in introducing ATMs initially in a big way to supplement their branch network and to compete with large public sector banks with many branches. ICICI, UTI, HDFC and IDBI together used to account for more than 50% of the total ATMs in India about two years ago. ICICI Bank was the first bank to cross the 1000 mark in India (Thamaraiselvan and Raja, 2007)

But the current scenario has entirely changed with the banks in the public sector like SBI and its associates, Corporation Bank and Syndicate Bank aggressively pursuing the installation of ATMs across the country.

Nationalised banks constituted the largest share of installed ATMs, followed by the new private sector banks, SBI group, old private sector banks and foreign banks. While new private sector banks and foreign banks had more off site ATMs, nationalized banks, SBI group banks and old private sector banks had more on-site ATMs. Understandably foreign banks and new private sector banks depend on off-site ATMs to overcome the limitation of having less number of branches. It is also worth noting that the number of ATM installations as compared to the number of their branches is 3.28 times more for the new private banks and 3.5 times more for the foreign banks.
With the installation base of more than 87,000 ATMs (as on 31, March 2011) all over the country, ATMs are going to play greater role in day-to-day banking transactions. Future ATMs will be more than just cash dispensing machines; they will be providing additional value added services including several non-banking and non-cash ones (Mohanty, 2007). Banking services provided by most banks via ATMs are payment of electricity, telephone, cellular and credit card bills, payment of insurance premiums, and refilling/recharging pre-paid mobile phone connections.

In addition, Citibank and ICICI Bank permit mutual fund transactions through ATMs. Citibank ATMs also let their customers place orders for demand drafts and fixed deposits. ICICI Bank, IDBI Bank and SBI allow their customers to make donations to specific temples or charitable trusts. Customers can also purchase a new Internet connection or buy renewal packs via ICICI Bank ATMs, apart from buying calling cards for domestic/overseas calls. SBI ATMs allow their customers to pay fees for select colleges at specified ATM centres, while IDBI ATMs even let you pay your gas bills and subscription payments for select magazines. Apart from payment services, IDBI ATMs let their customers view news headlines, stock quotes, horoscopes and movies running at theatres (Israni, 2006).

With the aggressive deployment of ATMs, enormous enhancement in productivity could be achieved as the banks in India were able to shift 50 to 80 percent of their respective cash transactions to this channel. This has resulted in a substantial cost savings for the banks as the cost of transactions using ATM is only about 25 to 30 percent of the cost of branch transactions. The experience of The Federal Bank, a prominent old private bank testifies this fact as the new ATMs installed managed to breakeven within six months of their installation. The same bank could shift more than 60 percent of its cash transactions over this channel, even in rural areas within two years of the introduction of ATM networks by it (Nair, 2005).
2.2.2 Tele banking:

Telephone banking which is still another form of technology-enabled banking providing various banking services in the self-service mode through the telephones to its customers. A customer can carry out transactions by accessing his/her account through telephone at any time or from any place throughout the country with the same Tele banking PIN. Tele banking is offered by the banks (Kunjukunju, 2008) through a technology known as Interactive Voice Response System (IVRS). To guarantee security the customer must first authenticate through a numeric or verbal password or through security questions asked by a live representative, a process known as authentication. With the obvious exception of cash withdrawals and deposits, it offers virtually all the features of an automated teller machine account balance information and list of latest transactions, electronic bill payments, funds transfers between customers’ accounts and so on.

Another variant of Tele-banking is sometimes called the phone banking in which a customer talks to a phone banking officer for transacting a banking business. But in the present study this particular service is not being considered as it does not come under the purview of the technology-enabled self-service. Here the service encounter is a telephonic encounter in which services are being provided by the service employee who interacts with the customer over phone.

2.2.3 PC banking:

Is a form of online banking that enables customers to execute bank transactions from a PC via a modem. In most PC banking ventures, the bank offers the customer a proprietary financial software program that allows the customer to perform financial transactions from his or her home computer. The customer then dials into the bank with his or her modem, downloads data, and runs the programs that are resident on the customer’s computer. Currently, many banks offer PC banking systems that allow customers to obtain account balances and credit card statements, pay bills, and transfer funds between accounts.
2.2.4 Internet banking:

Internet banking involves the use of Internet for delivering banking products and services which include transfer of funds, ordering demand drafts, payment of utility bills, stop payments on cheque, obtain account balance, view one’s statement of account online and applying for loan.

Some of the advantages of using Internet banking as far as customers are concerned are:

- The customers can have access to Internet banking 24 hours a day and seven days a week.
- It is cheaper than physically going to the bank branch and they don’t have to wait in a queue to receive services.
- Customisation of banking needs to suit the user is possible.
- Customer can avail the banking services without any geographical constraints.
- A multitude of different banking products and services are provided to the customers. Internet banking provides certain benefits to the bankers as well such as reduced cost of provision of service, savings on manpower, increased productivity and opportunity to target new customer segments.

Dinz (1998) developed a model to classify the services delivered through Internet banking into three roles having different levels like basic, intermediate and advanced levels of services under each role. The different roles mentioned for Internet banking are:

1) Informational: for providing information
2) Transactional for conducting transactions
3) Relationship: for improving customer relationship

As per the RBI’s classification in their Report of Internet banking (2001) the levels of banking services offered through Internet can be categorized into three types:

i. The basic level service banks’ websites which disseminate information on different products and services offered to customers and members of public in general. It may receive and reply to customers’ queries through e-mail.
ii. In the next level simple transactional websites customers to submit their instructions, applications for different services, queries on their account balances etc; but do not permit any fund-based transactions on their accounts.

iii. The third level of Internet banking services are offered by transactional website allow the customers to operate on their accounts for transfer of funds, payment of different bills, subscribing to other products of the bank and to transact purchase and sale of securities etc.

The above forms of Internet banking services are offered by traditional banks, as an additional method of serving the customer or by new banks, who deliver banking services primarily through Internet or other electronic delivery channels as value added services.

ICICI bank was the first one to offer online banking way back in 1996 with the launch of ‘infinity’ and other banks especially those belonging to new private sector and foreign banks followed suit. ICICI Bank kicked off online banking way back in 1996 and a host of other banks soon followed suit. The period from 1996 to 1998 marked the adoption phase even for the Internet as a whole. The usage increased only by 1999 as a result of lower online charges and increased PC penetration combined with a tech-friendly atmosphere. After ICICI Bank, Citibank, IndusInd Bank, HDFC Bank and Timesbank (now part of HDFC Bank), were the early ones to introduce online banking (Padmanabhan, 2002). At first the online banking facility was used as a vehicle for meeting the information requirements of the customers and gradually transaction facilities like fund transfer and third party transfers were introduced.

The proposed setting up of a Credit Information Bureau for online collection and sharing of credit information on borrowers has boosted Internet banking. The deadline set up by the Chief Vigilance Commissioner for computerization of not less than 70 per cent of the bank’s business by end of January, 2001 also gave a thrust to development of banking technology. The recommendations of Vasudevan committee on technological upgradation of banks in India also gave impetus to the implementation on a large scale (Mann and Sahni, 2007).
Malhotra and Singh (2004) had studied the status of Internet banking offered by the private, public and foreign banks operating in India during the year 2004. Their finding at that time was that even though 90 out of 93 of these banks were having websites only 48 of the banks had transactional websites of which they could classify only 34 as fully transactional websites. Of late many public sector banks and scheduled commercial banks like State Bank of India, Bank of India, Bank of Baroda, Syndicate Bank, Allahabad Bank, Punjab National Bank and so on have taken a lead in this area and set up fully transactional websites.

2.2.5 Mobile banking:

Mobile banking is the latest addition to the technology-enabled banking. As the mobile phone penetration in India is quite high with an annual growth rate of about 83.17% mobile banking has immense potential to be a cost-effective method of conducting banking transactions by the Indian customers including the rural population.

Asian countries such as China, Indonesia, India and Philippines are high growth markets for mobile telephones. The Indian mobile sector crossed the 16.5 crore subscriber base at the end of the financial year 2006-07. The number of mobile subscribers has become 405.18 percent of the basic landline subscribers as on March 31, 2007 (Srivastava, 2008).

Mobile banking refers to the provisioning and availability of banking and financial services through the mobile technology. Mobile banking can be provided as a value-added service for the existing customers and at the same time it has the potential to be used as a means to bring into the banking fold the unbanked and under banked segment of the population.

The pioneering bank to offer mobile banking services in India was ICICI bank in the year 1999, followed by HDFC bank and IDBI bank (Aithal, 2008). Among the 11 prominent private sector banks, seven are providing mobile banking facility to their customers. State Bank of India, Bank of Baroda and Corporation Bank are some of the
public sector banks which have started offering this service to their customers.

The classification of the services offered through mobile banking can be done depending on who originates the service ‘Request’ services. Alerts or push services happen when bank sends out information based on an agreed set of rules, for instance the bank sends out an alert when a client’s account goes below a threshold level, or when a debit or credit occurs above a certain limit and so on. Request or pull happens when a customer explicitly initiates a service or information from the bank. Last three transactions, bill payments, cheque book request are all examples of the request services.

Another way to classify the services is based on the nature of services, whether it is transaction-based or enquiry-based. So a request for bank statement is enquiry-based service and a request for fund transfer to some other account is a transaction-based service.

Mobile banking can be enabled through two technologies of which one is SMS (short messaging service) based and the other one being WAP (wireless application protocol). In India, mostly SMS based mobile banking is provided by the banks offering mobile banking since in a country like India majority of the mobile phone users’ handsets have only SMS based services and it is easier and economical to provide the service. But the disadvantage is that the SMS based mobile banking will not be able to support the full breadth of transaction-based services. Mobile banking enabled with the SMS technology uses text messages to initiate mobile application based banking. The customer requests for information by sending an SMS containing a service command to a pre-specified number and the bank responds with a reply SMS containing the specified information.

WAP is similar to Internet banking in its operation and it offers secure online access of web using mobile phones. Banks maintain WAP sites which customers access using a WAP compatible browser on their mobile phones. WAP site offers similar form based interface and allows the customers to access all enquiry and transaction-based services and addition they can also access more complex transactions like trading in securities.
Services such as account balance enquiry account statement enquiry cheque status enquiry cheque book request fund transfer between accounts credit/debit alerts minimum balance alerts payment alerts payments recent transaction history information requests on interest rates rates rates and so on are offered through mobile banking.

2.3 Service Quality and Banking Services:

Conceptualization of service quality has remained a topic of debate among the research scholars and academic circles. However, two main conceptualizations of service quality exist in the literature. Out of this two, one is based on the disconfirmation approach, and the other is based on performance only approach.

Pioneering work (Gronroos, 1984; Parasuraman et. al. 1985 and 1988a) on service quality conceptualized it on the basis of disconfirmation between consumer expectations and perceptions. Gronroos (1984) developed a service quality model with expected service and perceived service as independent variables. The expected service is formed through the firm’s promotional activities, consumer’s past experience, word of mouth communication and consumer needs. According to Gronroos the discrepancy between expectations and perceptions decides the customers’ service quality assessment. The major contribution of this research was that this was the first attempt to conceptualize service quality from the customers’ viewpoint and that it had laid the foundation for future service quality research.

Most comprehensive studies to date in service quality were conducted by Parasuram, Berry and Zeithmal (1985, 1988a, 1988b, 1990, 1991 and 1994a). They developed a conceptual model called the Gaps model of service quality, which showed the various gaps that need to be managed by a service firm in order to provide quality service from its customers’ viewpoint.
According to Parasuram et al. (1988a) service quality could be defined as the overall evaluation of a service firm that results from comparing that firm’s performance as perceived by its customers with their general expectations of how firms in that industry should perform. On the basis of this definition they developed a multi-dimensional service quality assessment instrument called SERVQUAL containing 22 variables divided into five dimensions and the service quality was operationalised as the summated difference or disconfirmation between the customers’ perception (P) and expectations (E) along these variables. This particular SERVQUAL scale has been extensively used in a number of studies covering different service settings.

Subsequently, various studies (Teas, 1993, 1994; Spreng and Olshavsky, 1992) found that the disconfirmation as a method of determining service quality has several conceptual, theoretical and measurement problems. They also argued that the model suffers from the problems with respect to measuring expectations, the coCNUsion stems from the fact that expectations are dynamic (varying from time to time), then again when to measure it, before or after receiving the service. These problems with the disconfirmation model had made researchers to increasingly ignore expectations completely and measuring perceptions as an indicator of service quality (Jayawardhena, 2004). The studies by Andaleeb and Basu (1994) and Mittal and Lassar (1996) propound that this approach results in good predictive power of service quality. Babakus and Boller (1992) and Cronin and Taylor (1992) in their respective works compared the computed difference scores with perceptions and found that perceptions are superior predictor of service quality than disconfirmation. This had led to the designing of performance-only or perception-only scale by Cronin (1994).

The studies by Dabholkar et al. (2000) also proved that the perception measures have higher predictive and explanatory power and have better indicative power in the cases of customer evaluation and intention. In addition, they observed that perception could also allow an understanding of service quality at factor level and proposed all the dimensions of quality as antecedents, rather than components of service quality. It is found by Page and Spreng (2002) that performance-only measure is more reliable and stronger indicator of service quality than expectations.
A study done by Lee, et al. (2000) showed that perception/performance-based measures of service quality capture more of the variation in service quality than do differences measure. So they advocated that the managers place more emphasis on performance perceived by customers rather than the difference between perceived performance and prior expectation. In addition to this, the performance-based scale reduces the number of items to be measured by half as compared to the disconfirmation scale, thereby increasing the parsimony of the survey instrument.

Moreover in case of e-commerce, as found out by Santos (2003), expectations seem to be of lesser of a comparison standard and customers appear to use experience-based standards. According to the study by Yang and Jun (2002) majority of consumers were found not to have a clear idea regarding what expectations they held for online services.

Taking into consideration the problems associated with the disconfirmation model of service quality and the fact that it was measured in an e-commerce environment, this study conceptualized and measured service quality as performance perceived by consumers.

2.3.1 Technology in Service Delivery- Benefits and Challenges:

Technology has been increasingly introduced in the provisioning of services, some of the pioneering works in this area have been done by Dabholkar, (1994a & 1999), Parasuram, (1996 & 2000) and Meuter et al.(2000). With the infusion of technology in the service delivery it is found that many of the shortcomings faced are because of the human element in the traditional service delivery. Some those shortcomings which could be overcome are as follows:

- Heterogeneity of the service delivery could be taken care and uniform standardized services could be provided, if required.
- Alternatively, with the inclusion of technology in the service delivery ‘mass
• customization’ (Pine II, 1993) of services can be achieved, by creating customizable services like ATMs or interactive computer services.

• Services provisioning could be freed of time and place constraints and with advances in information technology and telecommunication it could even be delivered at customers’ homes.

• As lesser number of service employees is required, service could be delivered at lesser cost.

• There is greater perceived control on the part of a given customer when the customer is in direct contact with the technology, as per Dabholkar (1996) like in Internet banking, but in the absence of direct contact like that in telephone banking, there will be less perceived control on the part of a customer. But at the same time some of the challenges of the technology infusion in services delivery are:

  • The customers have increased role in service delivery especially in case of technology-enabled self services as it involves self-creation of services.

  • Increased concerns pertaining to security aspect and trust especially in case of services offered over Internet.

  • Service recovery or response to a service failure becomes complicated due to the absence of service employees.

A study conducted by the Reserve Bank of India (The Indian Internet Banking Journey In 2001) revealed that of 46 major banks operating in India, around 50% were either offering Internet banking services at various levels or planned to in the near future. According to a research report (India Research, Kotak Securities, May 2000) India's Internet user base was an estimated 9 lakh in 2001; it was expected to reach 90 lakh by 2003. Also, while only 1% of these Internet users utilized the Internet banking services in 1998, the Internet banking user base increased to 16.7% by mid-2000.

An empirical investigation has been conducted on the adoption of online banking services among European citizen (Mario Martinez Guerrero in his paper titled “Profiling the adoption of Online banking Services in the European Union”). The use
of e banking services is explained on the basis of socio-demographic and Internet – specific behavioral indicators. The performed analyses provide support for the influence of country, age, profession and several Internet behaviors on the use of E-banking.

Guiltinand and Donnelly (1983), emphasized on the importance of awareness before adoption of any innovative products. Pakistani banks appear to have taken a cue from this, as the strategy of most of the banks have been to create wide spread awareness through its informational websites, before launching onto a full scale transactional websites.

An empirical survey conducted by Sathye (1999) on Australian consumers confirmed this fact. In addition, Internet bank customers would also be curious to find out how the banks would generally deal with erroneous transactions occurring in online transactions. Will the burden of proof be on the customers or the banks would be willing to settle the issue up front and investigate the problem later. The element of trust in this context would determine the security of transacting for consumers generally and determine the acceptability rate of this alternative delivery channel in the long run. On this issue, Stewart (1999) claimed that the failure of the Internet as a retail distribution channel has been attributed to the lack of trust consumers have in the electronic channel and in the web merchants.

Rothwell and Gardiner (1984) observed that there are two fundamental sets of factors affecting user needs, namely price factors and non-price factors.

On the other hand, Guadagni and Little (1983), Gupta (1988), Mazursky et al., (1987) identified price as a major factor in brand switching. If consumers are to use new technologies, the technologies must be reasonably priced relative to alternatives. Otherwise, the acceptance of the new technology may not be viable from the standpoint of the consumer. In view of the Malaysian Government encouragement to move towards the digital era essential costs (access and connection) have been kept at a minimum.
White and Nteli (2004) conducted a study that focused on why the increase in Internet users in the UK had not been paralleled by the increase in Internet usage for banking purposes. Their results showed that customers still have concerns with the security and the safety aspects of the Internet.

Larpsiri et al., (2002) argued that it is not clear whether electronic documents and records are acceptable as sufficient evidence of transactions. They also pointed out that the jurisdiction of the courts and dispute resolution procedures in the case of using the Internet for commercial purposes are important concerns. Disputes can arise from many sources. For instance, websites are not a branch of the bank. It is difficult for the court to define the location of the branch and decide whether they have jurisdiction (Rotchanakitumnuai and Speece, 2003).

Chung, et. al. (2002) in a survey on Internet banking in New Zealand confirmed the fact that security and complication of Internet banking are some of the factors limiting the full acceptance of Internet banking.

Trout (1999) found that security issues are the main factor stopping customers using the Internet for financial services. The study concluded that customers do not yet see the benefit of using the Internet for commerce and that an education campaign would need to be conducted in order to successfully market any new Internet offering. This research predicted that security concerns would diminish over time, as it was perception and not reality giving rise to these concerns.

Internet banking commercial purposes also requires that the level of service provided to customers remain much the same as is provided from a sales force in traditional marketing (Gurau et al., 2001 and McIvor et al., 2000). Communications aspects of service can certainly be enhanced by the web, which is often used as a channel to communicate and provide support to customers in order to improve customer relations (Emiliani, 2000; Klein and Quelch, 1997; McIvor et al., 2000).
Studies on Usage of ATM:

A study conducted on adoption of technology attempted to compare the adoption of retailing technology by elderly and non-elderly customers (Zeitaml and Gilly, 1987). They found the main reason for not using the ATMs to be their preference for personal transahuman tellers.

Marshall and Heslop (1988) found that consumers’ motives for use of technology are useful for predicting subsequent usage. Demographic factors such as higher education levels and employment status are positively related to usage of ATMs, whereas age of the users was negatively related to adoption of ATMs.

Another study on consumer motivation to use banking technology found out that main consumer motivation for using ATMs was its accessibility benefits (Leblanc, 1990). The users tended to be highly educated. They also believed that this technology improved service quality, presented little security risk and fulfilled their need for simple and fast transactions. However, non-users preferred interacting with human tellers and perceived ATM usage to be complex and risky.

Major reasons for adoption of technology as indicated by the respondents happened to be the convenience of hours, speed and convenient locations (Marr and Prendergast, 1991). They found out that non-usage was mainly due to for the preference human contact, and enjoyment of personal visit to the bank.

Lewis (1991) found that users mainly used ATMs for withdrawal of cash and obtaining account balances. Negative factors regarding ATM usage were concern over personal safety, lack of privacy and operational problems such as machine being regularly out of cash or out of order and cards getting stuck in it.

Marr and Prendergast (1994), based on their study, concluded that despite the technological advancements conventional bank branches would not lose their importance, as they are major barriers for potential competitors. But the role of the
employees inside the branches will change as more and more customers move towards self-service technologies. The study further concluded that these customers become more involved in other functions like selling or business development as they will have additional free time. In order to attract customers, the banks should first attract them to their branches, where there is an increasing level of placement of in-branch self service technology to complement the remote location self-service technology.

A study conducted in Australia found that ATM customers mostly used it for cash withdrawal and conducted less than 50% of their transactions through it, hence they concluded that most users perceived ATMs to be just convenient cash dispensers, while the non-users preferred contact with human tellers and had a need for personal service (Rugimbana and Iversen, 1994).

**Wan et al. (2005)** In their study among Hong Kong bank customers they found that ATM was the most frequently adopted channel, followed by Internet banking and branch banking, and telephone banking was the least frequently adopted. Beliefs about possession about certain positive attributes of the channels were predictive about the adoption of ATM and Internet banking than adoptions of branch banking and telephone banking. Demographic factors were associated with the adoption of all channels except ATM. One of the most important implications from the research is that the Theory of Reasoned Action is less predictive in habitual behaviours as in the case of branch banking and telephone banking.

The study amongst retail bank consumers in South Australia attempted to determine the most important predictor of ATM usage patterns by identifying those variables, which distinguish users and non-users (Rugimbana, 1995). The study assessed these in relation to perceptual and demographic factors and found that perceptual variables are far more powerful in predicting the usage patterns. Hence the study concluded that a strategy of concentrating on the most important perceived attributes, in particular relative advantage (convenience) was of prime importance to increase the ATM usage amongst consumers. However demographic and psychographic profiles are important to identify the right customer segments.
Filotto et al. (1997) conducted a study among Italian bank customers and distinguished between the characteristics of ATM users and non-users. They found that even though the adoption rate among the younger users is more in general the public has been largely reluctant to adopt more innovative service delivery mechanisms offered.

Studies on Usage of Phone Banking:

Lockett and Littler (1997) The study was conducted in UK on Direct Banking customers (Phone Banking). It found that risk averse households were less likely to adopt direct banking and households that used other technologies (ATMs and online shopping) were more likely to adopt direct banking. This research concludes that ‘perceived innovation attributes’ appear to be better predictors of adoption behaviour than ‘personal characteristics’.

Al-Ashban and Burney (2001) In their study among the Saudi Arabian consumers regarding the usage of tele-banking services, found that the Saudi consumers’ age, income levels and education are prime factors determining their adoption and usage. In addition to this they found that customers tend to increase their usage of tele-banking services depending on their past experience. They concluded that tele-banking has resulted in substantial cost savings for the banks and has given rise to increasing convenience for the increasingly discerning consumers.

Studies conducted on usage of Internet Banking:

Sathye (1999) The study conducted in Australia investigated the adoption of Internet banking. Security concerns and lack of awareness about the Internet banking were the two main obstacles identified for the non-adoption. It was also pointed out that the young, educated and wealthy groups of customers were the most relevant customer segments for the rapid development of Internet banking market.
IAMAI report on online banking 2006. 43% of online banking user haven’t started online financial transaction because of security reasons, 39% haven’t started because they prefer face to face, 22% haven’t started because they don’t know how to use, for 10% sites are not user friendly and for 2% banks are not providing the facility of Internet banking. According to research 68% of the customers cannot say that when they will be starting the financial transactions through Internet. Maximum numbers of online banking users are male and maximum of them are in age the group of 25-35. Numbers of female users are very less i.e. 17% only. More than 60% of the people who are having account with have accounts in 3-4 banks. Only 37% of Indian Internet users come from Top 10 cities i.e. Mumbai, Bangalore, Delhi, Calcutta, Chennai, Pune, Hyderabad, Ahmedabad, Surat and Nagpur. Another day and another number. As per IAMAI and I-cube, the number of active Internet user (i.e. ones who logon to Internet atleast once a month) is now 32 million and numbers who have used Internet atleast once stands at 46 million.

Jayawardhena and Foley (2000) They did a longitudinal study of 12 Internet Banking websites of UK banks from October 1998 to July 1999. They listed the advantages for banks through using IB as cost savings, increased customer base, mass customization and marketing & communication opportunities, innovation and development of non-core businesses. They categorized Internet banking functions into four: view-only functions, account control functions, applying for new services and reconciliation functions. While the first two are offered by almost all the banking sites the third and fourth functions are offered only by a few sites. They also identified bank websites’ evaluative criteria such as speed, content and design, website navigation, interactivity and security.

Mattila (2001)They found out in Finland that typical users of Internet banking were well-educated male professionals between the ages of 35 to 40. Elderly people especially females over 50 were reluctant to use the IB service. Elderly people associated a bank transaction with human transaction. Experience with computers was a major driver for IB use. Surprisingly security was not a major concern for non-use.
Joseph et al. (1999) investigated the influence of Internet on the delivery of banking services. They found six underlying dimensions of e-banking service quality such as convenience and accuracy, feedback and complaint management, efficiency, queue management, accessibility and customization.

Polatoglu and Ekin (2001) They listed nine factors, some of them were derived from Rogers (1995), which according to them influenced the diffusion of Internet banking (IB). These factors were ‘relative advantage’, ‘observability’, ‘trialability’, ‘complexity’, ‘perceived risk’, ‘type of group’, ‘type of decision’, and ‘marketing effort’. They found that those who use the Internet banking services for the longest time or who use more of its services find Internet banking to be very reliable. Internet banking not only reduces operational costs to banks but also increases customer satisfaction and retention.

Bradley and Stewart (2002) Using a Delphi study they analysed various drivers and inhibitors of the banks adopting Internet banking. The key drivers were the external factors such as competition and industry adoption, low risk, enhanced ability to deal with customers and the availability of technology. The key inhibitors were mostly internal like resistance to change, internal attitudes, internal resources and legal issues.

Karjaluoto et al. (2002) The findings of their research conducted amongst Finnish bank customers showed that ‘prior experience’ with computer and technology along with ‘attitudes’ towards computer, influence both attitude and behavior towards online banking. Since it is found that prior computer experience had a strong influence on Internet banking usage it is advised by them that banks should give training to its customers not only in the usage of Internet but also in the usage of computers.

Gerrard and Cunningham (2003) The study which is done among Singapore bank customers identified eight characteristics relating to the adoption of Internet banking such as social desirability, compatibility, convenience, complexity, confidentiality, accessibility, economic benefits and PC proficiency as eight influential factors of adoption. The results show that adopters of IB perceive the service to be more
convenient, less complex and more compatible to them and more suited to those who are PC proficient.

**Mattila et al. (2003)** This study conducted among mature customers in Finland showed that they are late adopters with more than 75% of them having never used Internet banking. The reasons for non-adoption are problems in using e-banking, expensive start up costs, security aspects and lack of personal services.

**Akinci et al. (2004)** The study conducted in Turkey examines the distinguishing demographic, attitudinal and behavioural characteristics of Internet banking users and non-users. It was found that there are significant differences between the two groups with respect to demographic profiles and attitudes along with different service channel preferences. Users were mid-aged male, more technology-oriented and convenience minded consumers. It also segmented the IB users into ‘speed seekers’, ‘cautious users’ and ‘exposed ones’.

**Eriksson et al. (2005)** The study modifies the Technology Acceptance Model (TAM) proposed by Davis (1989) and applies it to study the adoption of Internet banking in Estonia. The findings are that perceived usefulness of IB is the main reason why bank customers use Internet banking. While the perceived ease of use does not directly increase adoption rate, it leads to greater perceived usefulness.

**Laforet and Li (2005)** They examined demographic, attitudinal and behavioural characteristics of online and mobile bank users in China. Their findings showed that unlike in the west, level of education and age did not influence online/mobile banking adoption. More males were using them, and of the urban population surveyed 33% and 14% respectively were using online banking and mobile banking. Lack of usage by non-users was because of factors like perceptions of risk, lack of computer and technological skills along with the Chinese tradition of cash-carry banking.

**Daniel (1999)** In her research on the UK and Republic of Ireland banks offering online transactional services to customers in their homes, it was found that 25 per cent of the
banks already offer such services while 50 per cent of them are on the verge of offering the same. The study has shown that the ‘Vision of the Future’ in which it is envisaged that the market will be more competitive and customers' requirements for increased accessibility, functionality, and service at lower price is the main driver for adoption of these services by banks.

Black et al. (2002) Consumers’ channel choice in financial services was determined by consumer characteristics, product characteristics, channel characteristics and organizational characteristics, out of which product channel interactions and consumer channel interactions were of particular importance.

Howcroft et al. (2002) The results of this study conducted involving UK bank customers show that the consumers have a preference for a mix of channels rather than exclusive reliance upon one channel. The choice of delivery channels is based on the socio-economic factors and the nature of the financial service sought. The factors encouraging the use of home-based banking were lower fees and improved levels of service, while the factors discouraging were security, fear of likelihood of errors and complexity of websites.

Patricio et al. (2003) The results of the qualitative study done among Portuguese bank customers, shows that in the context of multi-channel service the customers tend to use the channels available in a complimentary way. Implications are that banks should focus on integrated management of service delivery systems. Customer characteristics and the type of financial service influence the channel usage. So in a multiple channel context performance of each channel should not be viewed in isolation but from the point of view of how it contributes to the overall service offering to provide customer satisfaction.

Sathye (1997) reviewed the status of Internet banking in Australia. The study found that only two of the 52 banks started Internet banking services. He opined that education would be a crucial factor for expanding Internet banking in Australia. If customers are convinced about the various advantages of Internet banking they will
start asking for this service from their banks, and will put pressure on the banks to go ahead with Internet banking.

**Filotto et al. (1997)** illustrated that the adoption rates of ATM were higher among young users. In addition, Barnett (1998) findings proved that younger consumers are more comfortable in using e-banking. Katz and Aspden (1997) findings explained that males were more likely to adopt e-banking than females.

**Mookerji (1998)** explored that Internet banking is fast becoming popular in India. Nevertheless, it is still in its evolutionary stage. They expect that a large sophisticated and highly competitive Internet banking market will develop in future.

**Joseph et al. (1999)** examined the influence of Internet on the delivery of banking services. They found six primary dimensions of e-banking service quality such as convenience and accuracy, feedback and complaint management, efficiency, queue management, accessibility and customization.

**Mols (1999)** acknowledged that the Internet banking is an innovative distribution channel that offers less waiting time and a higher spatial convenience than traditional branch banking with significantly lower cost structure than traditional delivery channels. Internet banking reduces not only operational cost to the bank but also leads to higher levels of customer satisfaction and retention. As a result Internet banking is very attractive to banks and consumers, who now have higher acceptance to new technology. (Polatoglu and Ekin, 2001, Mols, 2000, Sathye, 1999, Wisner and Corney, 2001)

**Jeevan (2000)** observed that the Internet banking enables banks to offer low cost and high value added financial services. US web-corporation argues that finally banks are finding that a comprehensive online banking strategy is indispensable for success in the increasingly competitive financial services market. Changes in technology, competition and lifestyles have changed the face of banking and banks in the present environment are looking for alternative ways to provide differentiated services.
Hasan (2002) found that online home banking has come out as a significant strategy for banks to attract and retain customers. About 75 percent of the Italian banks have adopted some form of Internet banking during the period 1993-2000. The study also found that the higher likelihood of adopting active Internet banking activities is by larger banks, banks with higher involvement in off-balance sheet activities, past performance and higher branch network.

Mishra (2005) in his paper explained the advantages and the security concerns about Internet banking. According to him, improved customer access, offering of more services, increased customer loyalty, attracting new customers are the primary drivers of Internet banking. But in a survey conducted by the online banking association, member institutions rated security as the most important concern of online banking.

2.3.1.1 Services Pyramid model:

In order to incorporate the technology dimension into the purview of service encounter and to reflect the resultant complexities Parasuram (1996 & 2000) modified the Services Marketing Triangle Model by adding a fourth end point to represent the all important technology thereby proposing Services Marketing Pyramid Model.

![Service Pyramid Model](image)

Through this model he brought out the importance of managing three more important linkages; company-technology, technology-employee and technology-customer.
From the studies conducted by Bitner, et al (1990) on interpersonal service encounters it is found that there are three key drivers of service encounter satisfaction. They are:

1. Response to customer needs and request
2. Service recovery handling or the kind of response to service delivery systems failure
3. Unprompted or unsolicited actions by service employees.

All these key drivers of encounter satisfaction could be achieved in a much better manner through the effective usage of technology in service encounters (Bitner et al., 2000).

The response to customer needs and request can only be met through customization and flexibility in the service delivery and services are especially amenable to customization as service providers, if empowered, can adjust to fit customers’ individual needs (Kelley, 1993).

One of the major benefits of technology is that it enables the customization of service offerings either through the front-office automation like powerful databases or call management and so on (Hart, 1996). Alternatively customization can be done by the customers themselves while using technology-based self-creative services like ATMs (Mueter et al., 2000).

As far as service recovery is concerned, technology can encourage and enable proper registration of complaints, increasing accessibility of customers to service firms’ employees through different communication channels (Brown, 1997). With the means of technology, frontline employees can affect faster service recovery initiatives through better knowledge of customer and their problems, thanks to databases and other software tools.

Finally, technology is also capable of providing unexpected pleasant surprises to the customers thereby delighting them (Meuter et al., 2000).
2.4 Information Technology and Banking:

2.4.1 Classification of technology-based service delivery options:

Dabholkar (1994b) had classified the technology-based delivery options based on different criteria. First classification depends on ‘who’ uses the technology to deliver ‘what’ services whether it is the employee using the technology in a face-to-face service encounter or the customer’s interface with technology like that in an ATM service. The second categorization is based on the ‘location’ as to where the service is to be delivered. Does the service delivery take place at the service firm’s premises or the customer’s home or office using a PC or is the delivery taking place at a ‘neutral location’ like a shopping mall or airport. The final categorization is based on the contact with the technology, direct as in online banking or indirect as in a telephone banking situation.

2.4.2 Reasons why organizations are introducing SSTs:

One of the primary reasons why firms introduce SSTs is cost saving by way of labour costs, but the customers will be motivated to use them only if the cost savings are passed on to them.

Another reason could be to increase customer satisfaction and loyalty, especially if the new technology is perceived to be better than the interpersonal alternative. Further more organizations might want to reach new customer segments that may not have been reachable earlier, thereby expanding their customer base (Bitner et al., 2002).

2.4.3 Technology-Enabled Self-Services:

In case of self-service options, customer does the creation of services all by himself/herself with minimum intervention of service employees.

Some of the studies investigating the use of self-services are done by Bateson (1983), Darian (1987) and Greco & Fields (1991). These studies tried to identify the profile of the users and the motivating factors that made them prefer these options. Key
findings from these studies are that there is a significant segment of customers who opt for these services even without the added monetary or time saving benefits. The main motivators are convenience, time saving, increased options and better perceived control.

2.4.3.1 Self–Service Technologies (SSTs):

Meuter et al. (2000) have defined self-service technologies as ‘technological interfaces that enable customers to produce a service independent of direct customer service employee involvement’.

According to them, the range of Self-Service Technology (SST) options available today can be classified as in table 2.4.3.1 based on whether it is customer service, direct transactions or self-help which is being provided and also depending upon the type of technology interface which is used such as telephone/interactive voice response, online/Internet, interactive kiosks or Videos/CD.

Table 2.4.3.1: Types of SSTs in Use

<table>
<thead>
<tr>
<th>Interface</th>
<th>Purpose</th>
<th>Telephone /Interactive</th>
<th>Online / Internet</th>
<th>Intractive Kiosks</th>
<th>Video/CD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Services</td>
<td>1.Telephone banking</td>
<td>1.Packing Tracking</td>
<td>1.ATMs</td>
<td>1. Tax Preparation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Order status</td>
<td></td>
<td></td>
<td>2.Telivision/CD-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>training</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Order status</td>
<td></td>
<td></td>
<td>2.Tourist information</td>
<td></td>
</tr>
<tr>
<td>Self Help</td>
<td>1.Information telephone lines</td>
<td>1.Interner information search</td>
<td>1.Bloodpressure Machines</td>
<td>2.Tourist information</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.Distance learning</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Video/CD is typically linked to other technologies to provide customer service and transactions

Source: Meuter et al. (2000)
2.4.3.2 Stages of adoption of SSTs:

Adoption has been defined by Loudon and Della Bitta (2002) as the acceptance and continued use of a product by an individual. The six stages of adoption process of SSTs, as shown in fig 2.4.3.2 shows the various stages of the adoption process through which consumers go through.

First the consumer must be aware that the SST exists. Then they are likely to collect additional information about the SST which becomes the basis of forming evaluative criteria about it. If the SST is found to be advantageous, consumer will try it and while trying if the outcome is satisfying it might lead to repeat use and commitment.

Even if some consumers develop positive attitude towards an SST, their propensity to try it depends on the ‘consumer readiness’ according to Meuter et al. (2005). In their work, Meuter et al. (2005) have shown the predictive capability of ‘consumer readiness’ in determining the consumer trial, the first time usage by the consumer.

![Figure 2.4.3.2: Stages of Adoption of SSTs](source: Bitner, M., Brown, S. and Meuter, M.(2000) Technology Infusion in Service Encounters, *Journal of the Academy of Marketing Science*, 28(1), pp.138-49.)
Customer readiness shows how much a customer is prepared and willing to use an innovation for the very first time. It depends on:

- The perceived capability of a customer to perform a task, which in this case is the use of innovation, is called *ability* (Hoffman and Novak, 1996). The ability also includes the infrastructure needed to engage the SST, for instance the computer and Internet connectivity in case of Internet banking (Bitner et al., 2002).
- *Role Clarity* (Larsson and Bowen, 1989) which is the clear idea regarding what to do.
- Finally *Motivation* (Barczak et al., 1997) which is perceiving benefits while using SSTs as compared to interpersonal options and this motivation varies from individual to individual.

In their original model they had included the antecedent predictor variables which were categorized into ‘Innovation Characteristic ’ and ‘Individual Differences ’. Some of the variables’ effect on the trial of SSTs was partially mediated by consumer readiness, according to their study.

The variables classified under *Innovation characteristics* were *compatibility, relative advantage, complexity, observability, trialability* and *perceived risk*. These constructs are also propounded in the Rogers’ (1995) diffusion of innovation theory and the explanations are given in the latter part of this chapter. The individual differences variables were *inertia, technology anxiety, need for interaction, previous experience* with similar SSTs and *demographic variables* such as age, sex and income. The *demographic variables* and *previous experiences* had been included in their study as they were widely found in adoption studies such as those of Rogers (1995). *The need for interaction* with the service employees, *inertia* towards technology products and *technology anxiety* were included as they were found to be used in the services technology studies such as those done by Dabholkar (1996 & 2000) and Parasuram (2000).

Meuter et al., (2005) had conducted two studies in the context of consumers’ prescription refill ordering through a mail-order pharmacy, first one involving the
adoption of automated interactive voice response (IVR) telephone system and the second one on the adoption of automated Internet based SST of the same company. The studies were conducted within a year of introduction of these services on samples of customers who had used the SSTs and those who were yet to try them.

In the study, many of the above mentioned variables are taken into consideration for analysing the prediction of adoption and determinants of adoption levels of technology-enabled banking self-services. These variables were selected after reviewing the related studies from the literature along with the underlying theories such as Rogers’ Diffusion of Innovation theory and Davis’ technology acceptance model. These will be explained in the subsequent portions of the thesis.

The banks play very vital role for development of nation. The bank is a financial organization that controls, influences and manages finance, which in turn facilitate in development of nation’s economy. It provides an environment that is helpful for the social and economic development. The banks in future cannot survive without the support of Information Technology. To meet the current challenges of this open economy, the banks have been preparing themselves to harness the opportunities that globalization and financial liberalization provided to us through extensive use of IT (RBI, ”IT”, 1999). Any changes in financial sector through modern technology have extensive impact on the overall nation’s economy and its progress.

The banks have been making use of Information Technology as a strategic and operational tool. It is for faster movement of information, deployment of new products and real time management of business. The Information Technology has been facilitating the banks to do accounting automatically (Modi and Ahuja, 2001). The cost per transaction for the banks has come down significantly with the introduction of large-scale automation processes in addition to bringing total transparency in operations (Balasubramanya, 2006).

In India, the Electronic Banking (e-Banking) Technology has been finding its place gradually in many forms. The foundation pillar of e-Banking solutions is the
automation computerisation of bank branches. Computerisation is a part of modern work technology in commercial banks in India and it is no more a matter of choice. It is a call of time, which offers protection against organisational decay and a promise to a healthy growth (Bakshi, 1988). The globalisation of Indian Economy forced the Indian Banks to equip themselves with modern banking technologies to compete in the International market. The followings are the comments of Chairmen/Managing Directors of some of the leading Indian PSU (Public Sector Undertaking) banks on use of IT as an integral component in their banking systems (Alexander, 2003):

- Bank of Baroda’s Chairman and Managing Director P. S. Shenoy: “We are changing business processes and implementing an IT platform simultaneously to catapult ourselves into the global league.”

- Union Bank of India’s Chairman and Managing Director V. Leeladhar says that the unions have totally altered their outlook. “They have understood that computerisation is the only way to survive and flourish. We need to implement IT to survive in this market. The private banks are launching sophisticated products and we need to compete with them,”

- Corporation Bank Chairman and Managing Director Cherian Varghese backs the point: “Computerisation has helped in taking on voluminous transactions like utility bill payments and tax payments, especially in the retail sector. If banks go for retail business, they will not be able to handle their operations without technology.”

The non-availability of services enhances dissatisfaction at customer’s end. The dissatisfied customer feels looted at bank’s end. This lowers the bank’s reputation in the market. The manual registers used to keep records are not suitable to keep secret information because occasionally these are not kept in proper way and take more time to retrieve information. The non- accessibility of service raises doubts on accountability of banks towards their customers; hence proper implementation of IT is the ultimate solution for real time access of information and banking services. The following figure no. F 2.4.3.2 demonstrates how poor management of records leads to lack of confidence at the customer’s end.
Further, the poor management of records leads to corruption. In 90s, we have witnessed a number of scams like the Stock Market Scam, the C.R. Bansali Scam, the telecom scam and so on (Vittal, “Technology and Transparency”, 1998). We are living in a global village where the countries are getting linked rapidly with each other in the global economy. The currencies of the countries are also convertible and the flow of financial capital from one country to another has become a very significant issue. The foreign investors have to have an assurance that the money invested in the emerging markets is being utilized properly. Hence, there is an increasing need of transparency in the decision-making process. It is essential that if we want to attract foreign direct investment in a considerable way, we need to have transparent systems and procedures for decision making. If there is no transparency, there will be an abundant ground for corruption (Vittal, “Technology and Transparency”, 1998).

The Government has launched various kinds of schemes for the progress of the society/states/economy. The poverty alleviation programmes to uplift poor above the poverty line is one of them. The banks have been playing their active role in such programmes for the proper development of the societies. The banks have to monitor the progress of these schemes so that the Government can access the real utilisation of these schemes and if necessary, some modifications may be done in the schemes.
However, the traditional working system has lots of serious delays in monitoring these schemes and the policy makers get the feedback only after a long period (Doshi, 1988).

In words of former Chief Vigilance Commissioner, N Vittal, “Lack of transparency arises out of a number of factors. So, when we have large amount of data to be processed and that too manually, it provides excellent opportunity for frauds. The Harshad Mehta fraud took place because in the Public Debt Office of the Reserve Bank of India there was a manual system, which provided a fifteen-day float. Even today in the banking sector, I find that out of the 65000 branches of the various banks only about 5000 branches have been computerised. Thousands of crore of rupees are lying un-reconciled. This provides a fertile ground for corruption. So if we want greater transparency in the banking system, we need to use the relevant information technology and computerise” (Vittal, “Technology and Transparency”, 1998).

Following are the areas where full-fledged implementation of IT solutions can help the banks to prevent early detection of frauds (Vittal, “Security, Controls and Audit”, 2002):

- Fraudulent encashment of cheques bearing forged signatures occur generally in manual banking system because sometimes the passing officials do not find it convenient to verify the signature stored in signature card cabinets which requires manual location of the signature. In computerised system, the specimen signatures are captured through software in the computer, which provides easy verification and security against tampering.

- Stop payment instructions received from account holders with regard to lost cheques can be put in computer so that a caution signal would be available whenever a lost cheque is presented for payment.

- Manipulation of books by unscrupulous staff by making wrong credit entries can be either prevented or detected promptly because the banking software tallies/balances books on daily basis.

- The reconciliation of transactions relating to drafts issued and paid through
computerised system would help early detection of fraudulent payments. - Frauds relating to local clearing operations may be minimised through prompt reconciliation of number and amount of cheques through computerised system.

- Attempts of unscrupulous staff to perpetrate frauds by raising fake credits through inter branch accounts may be foiled through computerised system for reconciliation of entries between originating branches and responding for reconciliation of entries between originating branches and responding

- By introduction of automatic pass book writing machines can prevent frauds relating to misappropriation of cash receipts by cash department staff.

- Computerisation and continuous updating of data related to stolen/lost drafts on the system can help in reducing the trend of fake demand drafts (DDs). Officer's signatures captured in the computer can be used to verify whether the DDs are signed by the concerned officer or not?

- Lack of proper reconciliation of number and amount of cheques sent by branches to the service branch / main branch on a daily basis have chances of massive frauds. A software system for daily reconciliation, if introduced, can be used to avert or detect such frauds.

- In credit related frauds, it would help banks if computerised database of parties enjoying credit facilities from different banks is available to avoid double financing, to know the state of affairs of the existing account and to ensure that the same persons do not enjoy facilities under different names or firms.

- Database of information of fraudsters, willful defaulters with photographs of the proprietors / partners / directors etc. will help the banking system to be cautioned during opening of new accounts and other banking facilities.

- Quick exchange of information relating to transactions in corporate accounts, remittances, clearance of instruments, payment of dividend warrants, interest warrants, refund orders and reconciliation thereof, etc. will enhance customer service and help
prevent frauds.

Further, the use of IT applications in the banking sector helps in standardisation of activities/procedures in financial services. The standardisation of the services helps the employees to understand work procedures even on their transfers. Further, the standardisation makes it easy to update procedures and identification of errors or bugs in the system.

2.5 The Technology-Enabled Banking Self-Services scenario:

Reflecting on the developments that have taken place during the past three years in the banking technology field in the Indian banks, the RBI has stated the following in its latest Financial Sector Technology Vision Document:

1) Core Banking Systems (CBS) implementation is in full swing with all banks at varying stages of implementation of the same in their branches.
2) This has resulted in the computerization and networking of branches on a larger scale as it is a necessary and essential condition for the implementation of CBS.
3) Even a few of the older banks have now fully implemented CBS across all their branches.
4) There has also been tremendous growth in the use of payment and settlement systems for fund transfers using electronic means, which shows a welcome shift from traditional paper-based transaction flows.
5) Most importantly, one of the major developments during the period was the introduction of new delivery channels for customers. Internet banking, mobile banking, mobile automated teller machines, multi-functional ATMs, shared ATM services, large scale usage of Real Time Gross Settlement (RTGS) for quick, immediate funds transfer and smart card-based transactions as part of initiatives aimed at financial inclusion are some of the landmark developments during this period.
2.5.1 Technology in Indian Banking Sector:

Information and communication technology incorporation by the banks have changed the way in which banking is being done, worldwide. These changes have been pioneered in India by new private sector and foreign banks to enable them to reach a wider customer base as they had limited number of branches. However the public sector and the old private sector banks which were following the traditional method of banking till a few years ago have also realized the benefits that could be reaped through the introduction of technology in their day-to-day operations. So they are also of late increasingly pursuing a technology-centric strategy in banking operations and services delivery as manifested by their adoption of core banking solutions and the introduction of technology-enabled banking solutions (Sambrani and Suryanarayana, 2007).

Banks in India have therefore realized that technology strategy has become the cornerstone of their business strategy and it provides totally new ways of effecting customer transactions and interactions (Godse, 2005). Thrust on the usage of IT in the financial sector in India was heralded by the report of Rangarajan Committee on Mechanisation in Banks, 1984. This report, which is a landmark one, was prepared by the committee constituted under the chairmanship of Dr. Rangarajan in September 1988 to draw up a prospective plan of computerization for a five year period commencing from 1990 to 1994 for the banking industry. This committee identified the purposes of computerization as improvement in customer service, housekeeping, decision-making, profitability and productivity.

V. Leeladhar (2006), Deputy Governor, RBI has described technology as a key driver in the banking industry, the infusion of which has led to new business models and processes. This has revolutionized the provisioning of banking services through introduction of new distribution channels. Banks which have not made enough investments in technology are at peril as they will soon find their customer base eroding. Those banks, which have invested in technology, have gained great mileage through improved competitive advantage and are potentially poised to attract increased market share. Technology adoption has also improved the quality of risk management.
systems in banks.

In India at present considerable divergence exists in the adoption and usage of technology by banks for internal operations as well as for customer interface, as shown below (Financial Sector Technology Vision Document, 2005, RBI):

- The public sector banks are the ones that are facing the greatest challenge since they have to get over their traditional way of functioning and have to change over to latest technology which will have to encompass all their vast branch networks including those at rural centres.
- The foreign banks have systems which are generally of international standards.
- With regard to old private banks, core-banking solutions are being implemented in their metro and urban branches.
- As far as co-operative banks are concerned the bank customers are mostly yet to feel the benefits of IT, as the IT usage is restricted with computerization comprising essentially of accounts related activities
- In case of Regional Rural Banks IT usage is confined to usage of computers as standalone machines.

2.6 Technology Acceptance Model (TAM):

Davis (1989) introduced a modification of the Theory of Reasoned Action (Ajzen and Fishbein, 1980; Ajzen, 2001) called Technology Acceptance Model (TAM) which they proposed would be capable of explaining why people accept or reject new technologies. In his work Davis extended the attitude towards behaviour (B) and behavioural-intention (BI) relationship established in Theory of Reasoned Action (TRA), to the adoption of computers in workplace (Davis et al., 1989). The key factors of this model were ‘perceived usefulness’ and ‘perceived ease of use’ of the innovation, these were key constituents in influencing an individual’s attitude towards using the innovation.

Perceived Usefulness (PU) is defined (Doll et al., 1998) as “the extent to which a person finds that using a system will enhance his/her job performance”. The perceived
usefulness depends upon the capacity of something to act as a means to a desired end or purpose. This means-end relationship shows the reasons for customers using a product or a service (Barczak, 1997).

Perceived Ease of Use (PEOU) is defined (Doll et al., 1998) as “the extent to which a person believes that using a system will be free of effort”. The innovation is easy to use if it is compatible or its operations are similar to the existing ones. Ease of learning is also an important constituent of ease of usage (Erickson et al., 2005). This has been validated through researches done by Adams et al. (1992) and Doll et al. (1998).

Numerous studies found that TAM consistently explains a major portion of variance in the usage behaviour and intentions (Venkatesh and Davis, 2000). Even though the original TAM study was conducted in organizational context where people make more rational choices, there are certain similarities of people adopting self-services technologies for accessing banking services, which is a personal matter. Both are implying low levels of entertainment and high efficiency (Erickson et al., 2005).

The limitations of TAM are that it excludes influence and personal control factors on adoption behaviour. Other aspects such as economic factors and outside influences are also not included (Akkenen and Cavaye, 1999).

Figure 2.6 Technology Acceptance Model. Source: Davis, 1989
2.7 Identification of Research Gap:

From the survey of literature it is found that the framework of TAM has been widely used for the purpose of studying self-service banking services adoption studies especially those pertaining to Internet banking (Erickson et al., 2005; Pikkarainen et. al., 2004; Curran and Meuter, 2005). This framework is also suitably modified by adding additional constructs to capture the peculiarities of the electronic banking services adoption. Some studies have also combined some of the aspects from the Rogers’ diffusion of innovation framework with those from the TAM model to propose a hybrid framework, for instance the study by Kolodinsky et al. (2004) on the adoption of electronic banking technologies by US consumers. TAM has been used for research in various technological studies (Venkatesh and Davis, 2000). O’Cass and Fenech (2003) suggested that although TAM has been specifically used in the acceptance of computer-based technologies they find that its robustness and parsimonious structure allows its usage in other technological adoption with required adjustments. Researchers have suggested the addition of external variables to improve the predictive power of the model (Davis, 1989). For instance Wang et al. (2003) had used an extended model of TAM with the addition of credibility and self-efficacy.

The review of literature also reveals that there are number of factors responsible for adoption of technology. These factors not only include the demographic factors but users’ personality related and psycho-graphic factors also.

The present doctoral research study aims at understanding these demographic factors and psychographic factors that are responsible for the adoption e-banking technology. The research methods adopted for this purpose is illustrated in the next chapter.