CHAPTER- 2
REVIEW OF LITERATURE

2.1 Studies Related to Banks
2.2 Studies Related to Customers
2.3 Studies Related to Service Quality
2.4 Studies Related to Technology
CHAPTER-II
REVIEW OF LITERATURE

To-day, we cannot think about the success of a banking system without information technology and communication. It has enlarged the role of banking sector in the economy. The financial transactions and payment can now be processed quickly and easily. The banks with the latest technology and techniques are more successful in the competitive financial market. They have been able to generate more and more business resulting in their greater profitability.

Various empirical and theoretical studies have been undertaken at the national and international level to analyze the impact of e-banking and information and communication technology (ICT) on banking sector, customers, service quality and payment system. The studies mainly focus upon e-banking impact on productivity and profitability primarily due to core banking system, electronic fund transfer, real time gross settlement system and electronic clearing services. From the customer angle the studies primarily focus upon; why customers choose e-banking products and increase in their level of satisfaction due to phone banking, mobile banking, internet banking, website services, ATMs, etc. These services have not only improved the satisfaction level of customers, but also helped in reduction of processing time and transaction time. The productivity of banks in terms of time saving and attending the customers at the branches has also improved. The review of following studies throws light upon different aspects of e-banking. To know the impact of e-banking on various aspects, the research studies undertaken for the review have been classified into four categories, i.e., studies related to banks, studies related to customers, studies related to service quality and studies related to technology.

2.1 Studies Related to Banks:

Dannenberg and Kellner (1998), in their study, overviewed the opportunities for effective utilization of the Internet with regard to the banking industry. The authors evaluated that appropriate application of today’s cutting edge technology could ensure the success of banks in the competitive market. They evaluated the services of banks via internet as websites provide sophisticated line of products and services at low price. The authors analyzed that transactions via internet reduce the risk of data loss to customers, chance to cut down expenses, higher flexibility for bank employees, re-shaping the
banks’ image into an innovative and technologically leading institutes, etc. The researchers found that banks could move one step further by entering into a strategic alliance with internet service provider. So, the bank of tomorrow stands to be feasible with today’s technology.

Daniel (1999), in his research paper, described e-banking as the newest delivery channel offered by the retail banks in many developing countries. The objective of the study was to analyze the current provision of electronic services of major retail banking organizations in the UK. The researcher through a questionnaire found that 25% banks in the UK were those already providing e-banking services, 50% banks were testing or developing such services while 25% were not providing any e-banking services. Electronic channels, PC, digital TV and all these provide greater accessibility and services at lower price. To make services more adaptable, customers should be provided maximum choice and convenience. Restriction and limitation within organization to operate the services and its market share or strength were viewed as important to decide and operate the e-banking services.

Sathye (1999), in his research paper, explored the factors affecting the adoption of internet banking by Australian customers. The author stated that internet and other virtual banking had significantly lower the cost structure than traditional delivery channels. So, the banks should encourage customers to use internet for banking transactions. The author also emphasized that for adoption of internet banking, it was necessary that the banks offering this service made the consumers aware about the availability of such a product and explain how it adds value to the other products. The analysis of the study showed that security concerns and lack of awareness stand out as the reasons for non-adoption of internet banking by Australian customers. However, internet should be considered as a part of overall customers’ service and distribution strategy. These measures could help in rapid migration of customers to internet banking resulting in considerable saving of operating costs of banks.

Talwar (1999) examined the IT Revolution in banking sector which had not only provided improved service to the customer, but also reduced the operational cost. The author brought out that computerization of banks, introduction of Real Time Gross Settlement System, setting up of Infinet, Electronic Payment Products(such as Electronic Clearing Service) had ensured better resource management, systematic efficiency and substantially reduced inter-branch reconciliation entries. However fear of hacking, tampering of data, secrecy maintenance were certain issues which pose threats on usage
of electronic banking. The challenges in banking sector were manifold but still the constitution of National Payment Council by RBI and development of the integrated payment and settlement system was a step in this direction to remove the obstacles coming in the way of using electronic banking.

Wenninger (2000) evaluated the emerging role of electronic commerce in banks. E-commerce had created new form of competition and compelled banks to make choices about the services they offer, the size of their branch network and extent of their support to inter-bank payments network. The main objective of the study was to understand the changes that had taken place with the introduction of electronic commerce. Development of e-banking products such as electronic billing, establishing internet portals, electronic checks, ATM, etc. had provided additional services to customers’. The author also emphasized upon the strategic and operational risks which arise in banking sector. These could be minimized with a cost efficient electronic process.

Kamesam (2001) studied the changes that took place in the Indian banking industry which emphasized on technological advancements and profitability in banks. Technology has helped in centralized data storage with decentralized processing which has helped in reduction of costs and NPAs. Further, emergence of services such as electronic data interchange (EDI), usage of smart cards, RTGS, e-commerce; all resulted in increasing the level of profitability and productivity of banks. The author concluded that in order to reduce crimes, security audit should be done which will be helpful in improving customer service, increase systematic efficiency and thus increased productivity and profitability.

Unninthan (2001) described the impact of e-banking adaptation on Australian and Indian banking sectors with the help of qualitative and quantitative analysis. The researcher found that Australia had a strong platform for e-banking growth with 37.7 per cent of population willing to engage in e-banking mostly in urban areas due to literate young working population with discretionary income. However, India by comparison was played by weak infrastructure, low PC penetration and consumer reluctance in rural sector. But the professionals are compelling the government and bureaucracy in the country to support and develop new initiatives at a faster speed of internet banking. However, in both the countries, e-banking was a successful strategic weapon for banks to remain profitable in a volatile and competitive market place

Yakhlef (2001) evaluated the services provided through internet and website. The researcher explored the major services of Swedish banks provided via internet. The
objective of the study was to see whether internet banking services were compliment or competitive to brick and mortar bank branches. The results of the study indicated that although internet banking provided more safe, convenient and efficient services to the customers, yet as far as personal contact and direct information was concerned, brick and mortar was more preferable than internet. Internet has reduced number of branches of banks, added value to the customers, attracted new customers and developed more customized services but at the same time it also requires huge investment, infrastructure and trained employees of bank. So, internet was not a substitute rather compliment of brick and mortar concept.

**Aki (2002)** highlighted the impact of technology in banking sector. New technologies cannot replace the branch network but these can support old methods of delivering the services. The author evaluated the structural change in Finnish banking sector from the period 1993 to 2002 which showed that 42 per cent of households have internet connection with banks and 90 per cent have mobile banking services. ICT has had both inter-sectoral and intra-sectoral impact. The author concluded that main goals of management of technology were to improve customer satisfaction, reduce cost and develop new methods to collect and analyze the customer information.

**Alu et al. (2002)** reviewed that information technology was rapidly changing the banking industry. The study evaluated the impact of IT on the banking industry in Nigeria. The analysis was done through a structured questionnaire and out of 260 respondents, 86 per cent agreed that IT was really helping the banks, 83.1 per cent agreed that IT had a great positive impact on services rendered by the banks and 66.5 per cent disagreed that IT had an effect on services rendered by the banks. The study revealed that IT had appreciable effect on banks’ productivity, cashier’s work, banking transactions, bank patronage, bank service delivery and customers’ services. This affects the growth of banking industry because now customers can withdraw money from any branch of their bank. The study also revealed that telephones, computer systems, LANs were available and being used by all the banks, while WANs, EFT and wireless phones were available in some of the banks. To make an effective use of e-banking, there should be adequate supply of power and that’s the major deterrent of e-banking technique used in Nigeria.

**Gurau (2002)** analyzed the situation of online banking in USA and Europe. The author described that there were more than 1500 websites of banks all over the world. Most of banks in USA had internet presence, while in Europe, most of banking websites were from UK, Germany, Spain, Italy and France. The author also found that in 2005,
distribution channels used by banks included 10 per cent internet banking, 65 per cent multi-channel, 10 per cent telephone banking and 15 per cent through bank branches, whereas in 1998, it was only 15 per cent direct banking and 85 per cent in branch banking. The author concluded that successful introduction of e-banking services proved to be a complex operation which requires the harmonization of all interacting elements of economic and financial system.

**Harris and Spence (2002),** in their paper, explored the ethics of business to business electronic commerce with focus on banking sector. The researchers had chosen a case study of online foreign exchange developments at an investment bank. The important areas include freedom of choice, trust and transparency of business-to-business transaction and limits to responsibility with regard to facilitation of fraud. The authors found that e-banking had forced the banking sector to recognize, restructure and reconsider its institutional arrangements. The challenges of e-banking services would be successful for banks only if fraudulent activities could be controlled, transparency in transaction could be maintained, ethical rules and regulation to be followed so that e-banking could be widely acceptable among customers.

**Durkin and Howcroft (2003)** evaluated that the banker-customer relationship was improved through mobile, phone and internet banking. The authors found that new technology has made the banks very competitive and profitable and internet has played a key role in it. Perception of bankers and customers regarding the use of internet was examined. They pointed out that as consumer usage of remote bank delivery channels increases, relationship management will become more important. Further, the combination of traditional and new delivery channels, if followed, can help to improve their productivity and profitability.

**Joseph and Stone (2003),** in their paper, explored that customer friendly technology such as ATM, internet banking and telephone banking has been used by the banks to reduce the cost of providing services, and to increase the customer loyalty and market share. Technology plays a vital role in delivery of banking service. The study highlighted that access, location, security and ease of use of ATM machines appears to be the most important component for banking customers for the adoption of e-banking. However, banks should emphasize more on providing speedy and efficient service to the customers. Further, bank managers should conduct periodic marketing studies to understand the level of technological services by the customers so that adequate service could be delivered at the right time.
Lustik (2003) analyzed the main criteria for successful inter-bank strategy and brought out benefits of e-banking from the viewpoint of banks, their clients and the economy in general. The author explained that banks in Estonia had achieved significant success in the implementation of electronic banking. The findings of the paper were helpful to understand the main reasons and factors responsible for the rapid growth of electronic banking. The author further revealed that making payment via e-banking creates overall economy savings to the amount of 0.93 per cent of GDP. Electronic banking was not a small application to computer fans and innovative adopters, and a profound research was needed to map its customer base for the enhancement of value creation process.

Mattila et al. (2003) evaluated the electronic banking adoption in Finland. The study showed that the proportion of people in Finland, who have adopted online banking, was higher than anywhere else in the world. All the Finnish banks offered a full range of internet banking services. The researchers also found that different people have different attitude towards new technology. Some were innovators, who were interested in new technology and positive towards it. Some were early adopters and some were late adopters who have negative attitude towards it. Laggards had extremely negative attitude towards it. The study also found that matured customers were late adopters of internet banking. However, expensive start up, security and lack of personal service were main hindrances in the use of electronic banking. The study brought out that most customers found insufficient or non-existent training as the main reasons in the use of new technology, and also found web pages confusing and difficult to understand.

Sureshchander and Rajendran (2003), in their paper, focused on investigating the important factors of customers’ perceived quality in banks of developing economy like India. The authors had taken 15 public sector banks, 14 private banks and 14 foreign banks for the period under study. The researchers found that there seems to be a great variation in respect of services offered by three groups of banks. They used core services such as human element, systemization of services, tangibility of services and social responsibility as critical factors. They analyzed that three groups of banks in India seem to vary significantly in terms of service quality factors but from the customer perception of service quality, it could be acceptable only if customers’ need could be satisfied at the right time in a right manner.

Yu and Boon (2003), in their study, examined the implications of technological advances in the banking sector in Malaysia. An empirical study was made through a
structured questionnaire. The results highlighted that electronic channels provide alternatives for faster delivery of banking services to the customers. They described that prior to adoption of electronic channels like ATMs, kiosks, internet banking; investment costs must be identified to ensure a more cost-effective and efficient execution of e-channel services. The authors analyzed the commercial banks in Malaysia via frequency analysis and factor analysis. The results of the study indicated that banks’ operation management was the main factor affecting the success of ATMs, PC and branch banking, while product innovation and knowledge development factors were found to have most significant effect on the success of banking kiosks and phone banking respectively.

Lustik (2004), in his study, tried to assess the profitability of electronic banking services for the banks. In order to analyze the cost structure for traditional and electronic channel transactions, the author explored the implementation techniques of activity based costing (ABC). The results of the study indicated that electronic channels provide cost saving for banks and their clients. The study revealed that with help of ABC technique, banks can reduce and regulate some costs. It was also found that the decrease in transaction costs after introduction of electronic channels was slower than expected as existing traditional channels could not be closed at the same speed as the new electronic channels were introduced.

Lympero and Chaniotakir (2004) evaluated the implication of e-banking adoption through a survey of the branch employees’ perception. The researchers framed a questionnaire of 527 branch employees and analyzed the existence of four distinct factors which were hard advantages, soft advantages, market effects and risks. The authors selected 17 commercial banks for the study. They highlighted the advantages which influence the employees feel easy to adopt e-banking, i.e., cost alienation, customers service and foreign competition. They focused that branch employees’ perception toward e-banking depends upon their position in branch hierarchy, qualification, employers’ size and type of ownership. So, in order to facilitate the promotion of e-banking services, bank managers should make systematic efforts in exploiting internet marketing processes such as continuous education, flawless information and an attempt to minimize negative perception.

Suleiman et al. (2005) studied the impact of E-banking on Malaysian banking sector. The study aimed at providing an overview of E-banking adoption in Malaysia. Out of 53.9 per cent, who used e-banking, 85 per cent used it for savings bank facility, 55.8 per cent for current account facility, 37 per cent for bill payment, 35.3 per cent for
visa/master card and 30.8 per cent used for third party transfer. The researchers analyzed websites of the banks in order to know the impact of e-banking. Evaluation of websites contained 32 elements, and a survey was conducted to obtained customers’ perspective of e-banking. The researchers overviewed that results of the study cannot be generalized to the general population. Nevertheless, the results provide a fair indication of what services e-banking users find useful and which group of customers were likely to use the services more.

_Heng Michael et al. (2006)_ analyzed the impact of e-banking on brick and mortar banks through innovation model. The researchers’ analyzed 8 core capabilities to assist the banks migrated to e-banking environment. Their capabilities fall into two groups relating to configuration of existing business model. They suggested that banks need to develop uniquely innovative services and products on the one hand and innovative business model that changes the way banks operate on the other. They concluded that eight core capabilities (technical dynamic capabilities and business dynamic capabilities) provided a blueprint for sustaining a bank’s ability to exploit e-banking.

_Siam (2006)_ evaluated the effects of electronic banking on the profitability of Jordanian banks. The study investigated the reasons behind providing electronic banking services through internet, their impact on banking services in general, and banks profitability in particular. The results of the study revealed that electronic banking services had a negative impact on the profitability of banks in the short run because of increased capital costs involved in technical and electronic infrastructure, cost of training to employees and also the cost involved in creation of environment where the banks can operate smoothly. However, these services had a positive impact in the long run on the profitability of banks. The researcher recommended that banks need to carry out awareness and promotion campaigns to educate clients and aware them of feasibility through reduced time, cost, effort and also to hold training courses for employees to understand the e-banking business strategies.

_Manoharan (2007)_ highlighted the e-payment system in India and its performance impact on Indian banking sector. The author described that competition in banking industry had forced the banks to rethink the way they operate their business. So, e-banking has made it possible to find alternate banking practices. In the paper, the author divided the payment system in India into three parts, i.e., large value payment system, retail payment system, and retail electronic system. Each one includes different categories of e-payment. The author studied the performance of various Indian payment
systems in the last three years in which RTGS emerged as the principal payment system in India for wholesale payment. The study focused that having a huge opportunity of e-payment system in India still 90 per cent of transactions were cash based. So, an effort should be made to increase the use of e-payment, and RBI should make efforts to strengthen the legal framework of electronic banking system.

Ramani (2007) studied the impact of e-payment system on Indian banking sector. E-payment was required for handling large volume of business payment and remittances for hassle free, quicker and faster payment remittances at low cost, and paperless transactions. The researcher highlighted various steps taken by RBI for the e-payment. It includes RTGS, deferred net settlement system such as electronic clearing services debit and credit, electronic fund transfer and NEFT. The researcher studied that these methods had increased the use of core banking solutions, data warehousing and data mining. E-payment had reduced the chances of fraud, improved customer service by cutting the delay in payment obligation.

Singh and Malhotra (2007) made an attempt to discover factors affecting a bank’s decision to adopt internet banking in India. The study was based on 88 banks comprising of public, private and foreign banks covering financial years from 1997 to 2005. The results of the study showed that large banks having high fixed expenses, high income and expenditure tend to use more technology. Banks had used internet banking as complementary channel to existing branch network. However, the private and foreign banks were quick adopter to internet banking than public sector banks. The adoption of this innovation by other banks increases the probability that a decision to adapt will be made as it has increased the profitability and productivity of banks.

Kautish (2008) described the paradigm shift of banking sector from traditional banking to online banking. The objective of the paper was to discuss the derivation of value added tool of online banking system which was used to attract new customers and retain the existing ones. It helped the banks to acquire more business from existing customers. People preferred to use online banking because of its availability, better performance, ubiquity, speed and its effectiveness. Further, the author discussed two bank models integrated banking model where the banks provide internet banking services as an extension to their basic services like ATM and phone banking. So, it is a kind of hybrid approach and the other was stand alone internet banking model, where the banks totally rely on the online channel. To improve the services through e-banking, banks should think from the customers’ perspective and there should be creativity and
innovation in designing and implementation of e-banking processes. The author concluded that as e-banking was a relatively new concept in the global banking scenario so the best of this concept was yet to come.

Suresh (2008) highlighted that recently developed e-banking technology had created unpredicted opportunities for the banks to organize their financial products, profits, service delivery and marketing. The objectives of the study were to evaluate the difference between traditional and e-banking, and to identify the core capabilities for the best use of e-banking. The author analyzed that e-banking will be an innovation if it preserved both business model and technology knowledge, and disruptive if it destroys both the model and knowledge. He also differentiated e-banking from traditional banking in five ways, namely, value proportion, market scope, cost structure, profit potential and value network. However, in order to exploit technical and business capabilities of e-banking, banks should generate more customers inside and outside India so that more revenues could be generated that lead to better future of Indian economy.

2.2 Studies Related to Customers:

Simon and Victor (1994) examined the reasons why ATM card holders accept or reject EFTPOS and how they viewed the risk of EFTPOS when compared to credit and cash. The authors signified that more marketing research and consumer participation was needed in designing and introducing e-banking services so as to gain more user acceptance. They signified that in order to reduce fears in the minds of people regarding security, it was required to introduce risk reduction techniques such as money back guarantee, live demonstration and free trial to reduce psychological, financial and time loss risk. The researchers suggested that to prove e-payment methods more successful, it should be based on proper marketing risk, prompt service support, sufficient legal protection and awareness.

Krishnan (2001) examined the evolution of E-banking in Malaysia and analyzed the various electronic delivery channels used by local banks to assess the consumer reaction to these delivery channels. The objective of the study was to present progressive development of e-banking, electronic delivery channels and some pertinent issues for successful implementation of E-banking. The study was based on a sample of 300 bank customers, and revealed that 90 per cent of respondents visit their bank branches at least once every month, 63.3 per cent customers indicated four or more visits to ATMs every month, 20 per cent of the respondents were using tele-banking services. Only 6.7 per cent customers indicated that they would not be interested at all using these services. The
results showed that among different channels of e-banking like mobile banking, internet banking, ATM’s, PC banking; ATMs were widely accepted by the people. The researcher also found that bank branches and interaction with human tellers were still important. 60 per cent of the respondents had internet access at home and it presents a positive indication of PC banking in future. The author concluded that for successful implementation of e-banking, the major pre-requisites were legal and physical infrastructure because e-banking requires a lot of tangible and technological changes in banks.

Karjaluoto (2002), in his paper made an attempt to determine those factors that influence the formation of consumer attitude toward electronic banking. The author studied that how attitude towards technology in general impact on consumer behaviour in an IT environment. The author identified the beliefs, attitudes and intention of consumer towards e-banking by means of 30 in-depth interviews and a mailed questionnaire in Finland. The results of the study indicated that educated and relatively wealthy segment use more electronic banking services. The author also recognized that a negative attitude toward technology, valuing personal service and demographic characteristic were found to be the most substantial barrier in adoption of electronic banking in Finland.

Singh and Singh (2002) described that technology has provided customers new ways of delivering the products. Banks began to look e-banking as a mean to replace traditional banking. E-banking products and services like ATM, EFT were a source of differentiation for all the banks. The researchers analyzed the revised technology adoption life cycle model. Customers were divided into five categories that are innovators, visionaries, pragmatists, conservatives and skeptics and application of technology and marketing of banking services was done on that basis. The authors explained that the banks required a dynamic strategic technique for adoption of innovative technology. As customers became more sophisticated, it becomes imperative for the banks to consider the use of technology to respond to the continuous changing requirement.

Ibbotson and Moran (2003) evaluated the increased use of electronic banking channels by small and medium enterprise (SME) banking customers. The level of usage and satisfaction with electronic banking channels in the Northern Ireland was studied. The objective of the study was to judge the relationship between banks and their small corporate clients and the growing use of internet as a delivery channel for financial
services. The results of the study indicated that the level of satisfaction with e-banks was quite high according to those customers who were using telephone, PC and internet banking. However, some enterprises were already in the process of delivery and also seem to be satisfied with the use of electronic channel of delivery. But the findings of the study highlighted the need for further investigation of potential adoption of e-banking by SME banking clients in Northern Ireland.

Li and Worington (2004) described the connectivity between the adoption rate of internet banking and electronic connectivity. The researchers reported that electronic connectivity was discussed through three components: personal computer connectivity, internet connectivity and mobile connectivity. The researchers used regression to analyze the relationship. The results of the study indicated that changes in the electronic connectivity had a significant impact on the adoption rate of internet banking. The results also indicated that proportion of internet banking customers would increase at various speeds relative to the increase in internet connectivity, PC connectivity and mobile connectivity. This might help banks to predict their future base of internet banking customers and thus an appropriate marketing effort towards internet banking.

Pikkarainen et al. (2004) highlighted that electronic banking technology had created new ways of handling daily banking affairs especially via online banking channel. The authors adopted technology acceptance model to leverage the online environment. The model indicated online banking acceptance among private banking customers in Finland through a sample survey. The findings of the study indicated that perceived usefulness, information on online banking, security and privacy, quality of service, ease of use on the website were the main factors influencing online banking acceptance. The authors suggested that banks should now more concentrate on their e-banking issues so that online banking could become more popular and adaptive for customers.

Singh (2004) examined the impact of online banking and internet banking. The objective of the study was to find who uses internet, why and where. It also examined the respondents’ reasons for not using banking online. The data was collected from two universities of Kwazunatal. The researcher analyzed that males use more internet banking than females. Main services used through websites were inter-account transfer, paying accounts, checking balance/ statement, communication with the banks, etc. Security was the main issue for not using banking online. The author suggested that to make online banking more adaptive, websites should be more attractive, more
informative and colourful. Training should be given to customers. Charges of online facilities should also be less. Banks should advertise and publicize their new products and services offered on the websites so as to make internet banking more popular among customers.

Erickson et al. (2005) studied the technology acceptance of internet banking in Estonia. The objective of the study was to see that to what extent customers accept internet banking as a tool for the satisfaction. The findings of the study suggested that internet banking proved to be beneficial for the customers. However, banks need to put much efforts not only into making a user friendly internet bank, but also to explain their customers how the internet bank was useful to them.

Kassim (2005) explored the growing needs and expectations of the consumers in Qatar. Due to competition, the banks had to offer a broader range of products and services at more competitive prices through more efficient and convenient channels. The study investigated the discrepancy between customer expectation and perception toward E-banking services. The author compared the expected and perceived value of E-banking services through mean responses which showed that largest discrepancies were found in the availability of instructions and personnel assistance on how to use e-banking services and functionality. The author concluded that to increase overall service quality of E-banking, management and employees should find out what customers expect in terms of procedure handling, efficiency, accessibility and updated information about products and services.

Lassar et al. (2005) explored the relationship between consumer innovativeness and self-efficacy on the internet, online banking adoption and electronic commerce. To understand the relationship, they used technology adoption model (TAM) which suggested that use of technology based system totally depends upon the consumers feeling and attitude towards it. The findings of the study suggested that level of consumers’ innovations matters when it comes to adapting and utilizing e-banking products and procedures. The results showed that products like telephone banking, EFT, online banking required active consumer role in using the product, while in bill payment, consumer needs only set up process initially and then monitor on a semi-regular basis. The author concluded that banks offering e-banking need to recognize the importance of consumer innovation characteristics so that consumer can be well benefited.

Wan et al. (2005) evaluated the adoption of four major banking channels i.e. branch banking, ATM, telephone banking and internet banking in Hong Kong banks.
They also highlighted the influence of demographic variables and psychological variables in adopting the distribution channels. The results of the study indicated that among four channels, ATM was most frequently used followed by internet banking and branch banking. Telephone banking was the least adopted banking channel. Customers adopted these channels because of safety, security, convenience and speediness offered by them. The researchers suggested that banks should improve their website designs and navigations, strengthen website security, allow more ways in which customers could check the accuracy of their transactions and provide more useful financial information in a well organized manner.

**Boatang (2006)** explored some of the issues that affected the key decisions of banks while adopting e-banking techniques. The decisions were related to entering e-banking, e-banking channel choice, customers and managing conflicts. The findings of the study indicated operational constraints related to customer location, the need to maintain customer satisfaction and the capabilities of the banks. The author pointed out the need for African banks to understand customer needs, corresponding service to offer, the resources and partnership required to offer it, and develop appropriate e-banking strategies that maximized value for both customer and banks.

**Chalam and Nageswara (2006)** focused that as the computer touched each and every aspect of the economy, so banking sector was not an exception to it. The objective of the study was to find out change in banking sector through the techniques of e-banking. The authors evaluated several e-banking products like ATM, EFT, ECS, EDI, telebanking, etc. E-banking had benefitted to the individual through anywhere, anytime banking; to traders and merchants through immediate settlement of payment; to banks through unlimited network, online banking, attracting and retaining the customers, debit and credit card facilities; and to the nation through globalization of trade, more exports, more transparency in business, etc. The researchers concluded that emerging challenge in e-banking was due to lack of awareness among people, no cyber laws by government and low density of telephone lines and low computerization of banking activities. They recommended that banks should adopt hardware and software security measures, appoint skilled personnel and adoption of digital signature certification authority so as to tackle the major challenges in e-banking.

**Flavian et al. (2006)** explored how customers’ perception of traditional bank influence their decision to adopt the services of the internet. The researchers found that if the customer trusts in brick and mortar bank then it was possible that they feel more
motivated to use the online services offered by the same bank due to trustworthiness of the customer in the traditional banking system. The results of the study suggested that to use internet banking; trust, income, age, sex, education and employment were the most affecting factors for the use of online banking services and the banks can reduce their costs and widen their market through online banking adoption.

Gan et al. (2006) examined consumer choices between electronic banking and non-electronic banking in New Zealand. The authors evaluated that decision to use electronic banking was hypothesized to be a function of service quality, perceived risk factors, price factors, service product characteristics, individual factors and demographic variables. The findings showed that service quality, perceived risk factors, user input factors, employment and education were the dominant variables that influence consumers choice of electronic banking channels. The authors observed that consumer use e-banking because of its suitability, convenience and reliability.

Lichtenstein and Williamson (2006) in their research article gave an outlook as to how and which specific factors affect the consumer decision, whether or not to choose internet banking services in the Australian context. The findings of the study brought out that convenience was the main motive for customer to bank on the internet, while there was a range of other influential factors that may be modulated by banks. The research suggested that banks will be able to manage consumer experiences with moving to internet banking only if they understood that such experience involves a process of adjustment and learning over time, and not merely the adoption of new technology.

Nelubiri and Sinti (2006) examined the impact of internet banking on customers’ attitude, their needs and behaviour. The objective of the study was to see the internet banking adoption in Malaysia. The authors used five perceived attributes that is relative advantage, compatibility, complexity, trialability and absorbability for IB adoption. The results of the study indicated that for better understanding of internet banking acceptance, it was very necessary to observe customer attitude and perception towards internet banking. So, the banks should adopt such internet banking facilities which could enhance processing of transaction, inter-activity and customization.

Robbins (2006) tried to evaluate whether the adoption of e-banking by the banks affected the importance of bank location. The study looked into the state of consumer adoption of e-banking products and growth of e-banking products since 1995. The study also investigated whether consumer choice had changed as a result of increased e-banking use and how banks had responded. The study also questioned why location was
still important today. The author focused that e-banking was not a perfect substitute of physical presence of banks in the market. Consumers want the convenience of e-banking products but only of those banks which fall close to their place. So, the location of a bank branch and electronic banking were complementary to each other.

Walter (2006) evaluated why people use or choose technology enabled services like internet banking, telephone bill paying and internet shopping service. The author used a behavioural model for the study. The findings of the study showed that customers’ adoption rate to use internet and telephone banking was influenced by their willingness to use service, their personal capacity to engage in the service, the risks and advantage involved in the services. The paper also brings out depict that while choosing technology enabled services, customers want convenience, time saving, faster service and security. The author concluded that for more use of technology enabled services, it should make more customers friendly, reduce the system complexity and undue waiting time involved in the service handling.

Laukkanen (2007) highlighted the attributes in multi-channel electronic banking. The main objective of the study was to understand the diverse retail channel preference of online bank customers by examining their channel attribute preferences in electronic banking. For the research purpose, the author divided the customers into two groups—those who pay their bills over the internet, and those who use a mobile phone for the service. With the help of Conjoint analysis, the results of the study revealed that internet and mobile users differ in their preferences towards electronic channels attributes in bill paying. It was found that screen size followed by location and response time were the most important attributes for internet users. However, locations followed by screen size and response time were the most important attributes for mobile users. The author concluded that banks and producers should diversify consumer group so that the use of electronic banking techniques and services could be increased.

Liao and Wong (2007) empirically explored the major considerations associated with internet-enabled e-banking systems and systematically measured the determinants of customer interactions with e-banking services. In order to study customers’ interaction with internet banking, the respondents were asked to explain the extent of using internet banking services. The results suggested that perceived usefulness, ease of use, security, convenience and responsiveness to service requests significantly explained the variation in customer interactions. Exploratory factor analysis and reliability test indicated that these constructs were relevant and reliable. Confirmatory factor analysis confirmed that
they possessed significant convergent and discriminatory validities. Both perceived usefulness and perceived ease of use have significant impact on customer interactions with e-banking services. Perceived security, responsiveness and convenience also represented the primary avenues influencing customer interactions. In particular, stringent security control was critical to e-banking operations. The findings had managerial implications for enhancing extent of e-banking operations and developing viable e-banking systems and services.

2.3 Studies Related to Service Quality

Joseph et al. (1999) evaluated the impact of electronic banking on the service delivery by the banks to its customers. Researchers reviewed that when customers were in direct contact with the technology (such as internet banking), they can exercise better control, whereas when there was absence of direct contact (such as telephone banking), lesser control was perceived. A sample of 440 electronic banking customers was taken, and 300 usable questionnaires were analyzed. Six factors model was used to adequately represent the data, and the factors chosen were convenience, accuracy, efficiency, queue management, accessibility and customization. The study examined customers’ perception for electronic banking services, attributes of electronic banking services and consumer perception of e-banking. The study suggested that banks should provide statements of all transactions; customers should be provided toll free numbers; and banks should also develop electronic banking facilities to meet the needs of elderly and disabled people.

Nataraajan and Angur (1999), in their paper, examined the applicability of alternative measures of service quality in the developing economy like India and accessed related issues in that context. They analyzed that technological changes were causing banks to rethink their strategies for services offered to both commercial and individual customers. The researchers in the study put an emphasis on SERVQUAL and SERVPERF models of service quality measured on 5-point likert scale. The results indicated that although many banks had provided financial incentives to customers to utilize ATM, EFT and ECS but still the customers and banks believed in personnel banking and traditional banking services.

Mantel (2000), in his study, proposed a framework for describing why consumers use electronic banking products such as electronic bill payment, credit cards, debit cards, stored value and e-cash for their banking needs. The author explained that consumer behaviour was consistent with their preference, which includes convenience,
incentives, control, privacy, security and personnel involvement. The paper suggested that consumers make rational decisions regarding the use of alternative of E-payment instruments rather than irrationally resistant to change. Migration towards electronic banking products was more dependent on establishing business cases rather than overcoming consumer reluctance. Further, the study provided that greater control, convenience and communication power were some of the reasons which made the consumers shift to electronic payment products.

Zeithaml (2002) focused on service delivery through electronic channels. The study presented the definition, conceptualization and measurement of electronic service quality, and then offered some ideas for future research. As the author focused on measuring the service quality of web based services, therefore, E-SQ has been divided into two scales; E-SQ core scale and recovery scale. Efficiency, reliability and privacy form the core scale which could be used to measure customer perception of service quality. However, responsiveness, compensation and contact were to be known as recovery scale. The overall construct of E-SQ was identified first in terms of its dimensions, then its attributes that compare each dimension. The author concluded that demographic, behaviour and experience also affect E-SQ which was not included in the study but needs to be investigated.

Fang and Shih (2004), in their paper, highlighted that with the liberalization and internalization of the financial market, banks had to face intense pressure for high service quality and administrative efficiency. The authors made an attempt to prove that how an individual’s belief, attitude, subjective norms and perceived behaviour could influence the bank to change its strategy and policy according to their need and convenience. Theory of planned behaviour (TPB) and theory of reasoned action (TRA) were studied for the said purpose. The results of the study were supported towards TPB and TRA and provide a good fit to the data. The authors concluded that banking online proved to be extremely beneficial to the customers because of saving in cost, time, space it offers and its quick response to complaints and its delivery of improved services.

Bauer et al. (2005), in their study, validated a measurement model for the construction of website portals quality based on three dimensions that were core services, additional services and problem solving services. These dimensions were major determinants of consumer quality perception for e-banking services. However, security, trustworthiness represented the basic demands of portal users. E-banking web-portal represented a bundle of services and functions. It could not be described as a one

59
dimensional customer rating. In fact, it was represented by multi-dimensional and multifactor construct. The author concluded that by comparing e-service quality model with traditional service quality model, more detailed insights in the field of quality perception were required in order to have detailed vision about quality.

Gabriel et al. (2005) tried to evaluate the quality of banking services and customer satisfaction. The authors surveyed 11936 customers of Brazilin banks. They explored five factors for assessing the services of these banks, i.e., 1. Relationship with the customer, 2. Business and financial transactions, 3. Information technology, 4. Brand, 5. Image of the bank. Out of these five factors, first two factors have significantly higher impact on customer satisfaction. The authors highlighted that as information technology changes very fast, so utmost care should be given while providing quality service to customer. Further, with the advent of information technology, banks should diversify the portfolio of services so that the customers could not move to another bank.

Raopun (2005) evaluated the level of internet banking services in Thailand and compared the overall service quality of internet banking. The author used eight dimensional quality model given by David A. Garvin, namely, performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. The results of the study indicated that reliability, security system and information accuracy were the most important perspectives and least important was the perceived quality of commercial bank. The results of the study could be used as a guideline to set up a form of service in order to satisfy the needs of target group accurately and appropriately.

Sarangapani and Mamatha (2008a) explained the concept of e-banking and highlighted all the concerns and challenges while implementing the same. The authors emphasized that e-banking was necessary not only for improving the quality of services rendered to the customers but also for better marketing of products. The authors evaluated various e-banking modems for banking transactions like ATM, EFT, ECS, SPNS, PC banking, mobile banking and internet banking. But they mainly emphasized on virtual banking, smart cards, e-cheques and internet banking. They analyzed the websites of various banks for internet banking adoption in which private sector banks were providing maximum IB services followed by public sector banks, foreign banks and old private sector banks. The author suggested some measures which could contribute towards greater adoption of e-services. The customers should be taken into confidence that the transactions made by them are risk free, and there is no scope of any fraud.
Further, they should also be assured that hackers can do no harm to their interests. Furthermore, the system should be free from legal intricacies.

2.4 Studies Related to Technology

Aggarwal (2003), in his paper, looked for such avenues where e-banking could play significant role in e-democracy. The author discussed two case studies on the implementation of e-banking in digital democracy. One was farmer service and other was e-seva. While applying e-banking in e-democracy, services become more secure, efficient, transparent and fast. It becomes a win-win situation for all, for banks its low cost, for government its better service, for business its fast and secure, and for citizens its transparent and efficient. The author evaluated that e-banking could be used for successful e-banking for online bill payment, online brokerage, online account management, anywhere banking, etc. The author concluded that e-banking services provide one stop service and informational unit that provides great benefits to banks, customers, employers and government.

Arora (2003) made an attempt to prove that technology had a definitive role in facilitating transactions in the banking sector; and the impact of technology had resulted into the introduction of new products and services by various banks in India. The author discussed various initiatives taken by the banks to manage transformation and these initiatives had brought customers the convenience of anywhere, anytime banking. The author concluded that technology was a facilitator for advancement in the core business of banking and not an end in itself.

Hogarth and Hilgert (2004) highlighted that electronic banking technology represents a variety of different services, ranging from common ATM services and direct deposit to Automatic Bill Payment (ABP), Electronic Transfer of Funds (EFT) and computer banking (PC banking). The use of e-banking technologies had grown rapidly in the USA, while others have been adopting it slowly. The authors explored such factors that affect the adoption to adopt three e-banking technologies and changes in these factors over time. They suggested that e-banking technologies could not be aggregated into a single category, and thus, “one size fits all” would not work. The use of e-banking depends upon how it helps in saving time, decrease the errors, improving inaccurate accounting and preventing in manipulation of data.

Laforet and Li (2005), in their study investigated the market status of online / mobile banking in China. The objective of the study was to identify the target customers for online and mobile banking, and to compare the attitude of users and non-users
towards e-banking with respect to a number of factors such as technology, security, convenience, etc. The authors selected a sample of 300 respondents from six major cities of China. The results showed that online and mobile banking users were predominantly males not necessarily young and highly educated. Security was the most important factor that motivated Chinese consumer for the adoption of online banking. But the main problems faced by the customers of Chinese banks in online banking were perception of risks, computer & technological skills, and lack of awareness.

**Ashiya (2006)** evaluated developments made by electronic payments. The author evaluated different modes of e-payment used across the globe. The main objective of the study was to find the current offerings and development provided by electronic payments. The author evaluated different modes of e-payment such as plastic cards, debit cards, credit cards, smart cards, electronic cheques etc. These electronic ways provided an excellent instrument for payment system. The author analyzed that security was the main concern among electronic payments. However, e-payment this sophisticated technology could be used as a tool for the enhancement of customer loyalty and business of banks as it had reduced the risk & cost and could increase the customer loyalty.

**Enders et al. (2006),** in their paper, addressed a fundamental problem of the disruptive innovation theory which lies in the difficulty to categorize new technologies into sustaining and disruptive innovation. The researchers first discussed basic principles of disruptive innovation theory, outlined five main strategic diversions that incumbent firms need to address when they face disruptive circumstance in their industry. They further discussed different e-banking modes used by Nordea banks, i.e., e-identification, e-signature services, e-billing services, e-salary function, e-payment function. However, e-banking services should be properly analyzed for the relativity of disruption.

**Jain and Hundal (2006)** described the importance of mobile banking and barriers in the adoption of mobile banking. The paper examined the forces that can act as barriers in mobile banking service adoption. The objective of the study was to find the reasons why the people had not fully accepted the technology though it provided much advantage to the banking customers as compared to previous technologies. The paper attempted to identify the various barriers, viz. access problems, dissatisfaction and inability of service providers in the adoption of mobile banking services. The results of the study indicated that consumers got disheartened by the complicated function while accessing the mobile banking services which lead to rise in their dissatisfaction level, as no proper guidance was provided to them. The researchers suggested that service
providers should be aware of the problems of their customers. The findings of the study gave a brief outlook for the practical implication for managers and policy-makers who have to make strategies and decisions in order to cater the unexplored service market.

**Krishnamurthy (2006)** highlighted the advantages, risks, innovations and convenience involved in e-banking. ATM, telephone, internet and cluster banking helped banks to deliver the products more effectively. The author, in his paper, also described operational efficiency of e-banking. It included basic e-banking, simple transactional and advanced transactional e-banking. Each site offered a differential kind of services to customers. The author also commented upon some risks such as loss of secrecy of the customers, financial stability, fraud prone possibilities, eruption of legal claims, etc. So, the author suggested that banks should adopt such a strategy in which risks and innovation in banking products move parallel and simultaneously.

**Paul (2006)** discussed the role of technology and scope of remote channels, their implication, strength, weakness, opportunity and threat in banking sector. The author evaluated that IT development affects banking in two ways. Firstly, it had contributed in reduction of costs associated with management of information by replacing paper based and labour intensive methods with automated processes. Secondly, it had modified the ways in which customers had access to banks’ services and products. The researcher found that the introduction of RTGS, NDS, and CFMS had increased the safety, security, efficiency and soundness in payment system. Lastly, the author revealed that technology had a great impact on the structure of banking sector in the form of bank branches, bank personnel and alliance.

**Raghvan (2006)** highlighted the transformation in the banking sector due to effect of information technology, tele-communication and electronic data processing. He also attempted to visualize the perception of banks in India in the year 2020 taking into account the impact of internet banking, ATMs, EFT on the performance of banks and initiative taken in liberalization, privatization and globalization. He also evaluated the future of online and internet banking. Due to tangible and proven benefits, automation of manual processes; online and internet banking was slated to increase manifold. Ho also evaluated that currently an estimated 46 lakh net users were online and this was estimated to touch 160 lakh by March 2008. Furthermore, he analyzed the projected indicators of banks in India in 2020 with special emphasis on internet banking, online banking and electronic banking.
Raja et al. (2008) evaluated the impact of e-payment system on the business opportunities. They identified that due to the growth of internet users, various electronic payment mechanisms had been developed to cater the diversity of applicants. The researchers classified the e-payments into three main groups, namely, cash like systems, check like systems, and hybrid systems which were further classified into credit cards, debit cards and electronic cheques. They identified three main issues related to e-payment that were security issues, low interest among businessmen, and heavy reliance on traditional payment methods. They also analyzed that there were technical and cultural problems which hinder the path of e-payments. However, to make e-payments more effective, security threats should be reduced; and people should be realized that traditional payment methods were more time consuming than electronic payment methods. They should also be realized that plastic card payments were more convenient, easier and more secure than cash or cheques.

Sarangapani and Mamtha (2008b) studied the impact of Information Technology on banking sector and its security related aspects. Due to recent developments in banking industry and with introduction of Basel-I and II implementation; customers are more demanding now and it requires innovation in banking services. The researchers found that now the banking industry has been more customer-oriented with unlimited market place, extensive product breadth and e-enabled services provided to the customers. The IT initiatives in banking industry have resulted into reduction of time. Introduction of negotiated dealing system, screen based trading and RTGS for online settlement of inter-bank transfers of fund had also resulted into safe, secure and quick movements of funds. The authors also studied e-security aspects of banking which pose damage and threat to the existing e-banking system. It includes unauthorized access to computer system or network, stealing information, e-mail bombing, data diddling, denial of service, viruses, etc. The authors concluded that existing legal framework was adequate to meet the challenges of e-banking; and it had become essential to create awareness of e-banking among customers, banks and society.

Different attempts have been made by the researchers to give a close look to the concept of electronic banking. The review of literature provided that e-banking services have a negative impact on banks’ profitability in the short run because of increased capital costs on account of technical and electronic infrastructure, training their employees and also to create the environment where the banks can electronically operate smoothly. However, these services have a positive impact on the profitability of banks in
the long run. Despite the increasing importance of E-banking services, the research pertaining to E-banking in Indian context has been limited. While concluding, it can be said that e-banking services are complementary to the existing branch network and not a substitute to it.