2.1 Literature Review

It is relevant to refer briefly to the previous studies and research in the related areas of the subject to find out and to fill up the research gaps, if any. Literature on financial services can generally be found; a number of books are available on banking related aspects as merchant banking, loan syndication, securitization, profitability and productivity etc. but, few studies are undertaken on the role of technology in the banking services.

Uppal R.K. (2010) studies the extent of mobile banking in Indian banking industry during 2000-2007. The study concludes that among all e-channels, ATM is the most effective while mobile banking does not hold a strong position in public and old private sector but in new private sector banks and foreign banks m-banking is good enough with nearly 50 pc average branches providing m-banking services. M-banking customers are also the highest in ebanks which have positive impact on net profits and business per employee of these banks. Among all, foreign banks are on the top position followed by new private sector banks in providing m-banking services and their efficiency is also much higher as compared to other groups. The study also suggests some strategies to improve m-banking services.

Abdullah D.N.M.A. and Rozario F. (2009) study the influence of service and product quality towards customer satisfaction. 149 respondents from one of the well known hotel in Kuala Lumpur, Malaysia are selected as a sample. Psychometric testing is conducted to determine the reliability and validity of the questionnaire. The study finds positive significant relationship between place/ambience and service quality with customer satisfaction. Although, relationship between food quality and customer satisfaction is significant, it is in the negative direction. Future researchers can concentrate on determining attributes that influence customer satisfaction when cost/price is not a factor and reasons for place/ambience is currently becoming the leading factor in determining customer satisfaction.
Aktan B., Teker E. and Erosy P. (2009) examines the usage of internet in Turkey to make a basic due-diligence investigation for the financial institutions, including banking, stock trading, insurance and provision of financial information over the period 2005 and 2008. The findings show that internet usage in Turkey with its young population has continued to grow dramatically in financial services in terms of customers and financial transactions of various natures.

Azouzi Dhekra (2009) aims to check if the current and prompt technological revolution altering the whole world has crucial impacts on the Tunisian banking sector. On the basis of empirical analysis, the study concludes that panoply of factors is affecting the customers-attitude toward e-banking. For instance; age, gender and educational qualifications seem to be important and they split up the group into electronic banking adopters and traditional banking defenders and so, they have significant influence on the customers’ adoption of e-banking. It also shows that despite the presidential incentives and in spite of being fully aware of the ebanking benefits, numerous respondents are still using the conventional banking. Fear of loss because of transactions errors or hackers plays a significant role in alienating Tunisian customers from online banking. Finally, the study highlights the limitations and suggests some research perspectives.

Ganesan R. and Vivekanandan K. (2009) describe a secured hybrid architecture model for the internet banking using Hyperelliptic curve cryptosystem and MD5. This hybrid model is implemented with the Hyperelliptic curve cryptosystem (HECC) and it performs the encryption and decryption processes in an efficient way merely with an 80-bit key size. The various screen shots given in this contribution shows that the hybrid model which encompasses HECC can be considered in the internet banking environment to enrich the privacy and integrity of the sensitive data transmitted between the clients and the application server.

Hua G. (2009) investigates the online banking acceptance in China by conducting an experiment to investigate how users’ perception about online banking is affected by the perceived ease of use of website and the privacy policy provided by the online banking website. The 110 undergraduate students in Chinese University are involved in the
investigation. The study finds that both perceived ease of use and privacy policy have a significant impact on user’s adoption of online banking. The study also investigates relative importance of perceived ease of use, privacy, and security. Perceived ease of use is of less importance than privacy and security. Security is the most important factor influencing user’s adoption. The study also discusses the implications of these results and limitations.

Ismail A., Abdullah M.M.B. and Sebastian K.F. (2009) explore the relationships among service quality features (responsiveness, assurance, and empathy), perceived value and customer satisfaction in context of Malaysia. The empirical data is drawn from 102 members of an academic staff of a Malaysian public institution of higher learning using a survey questionnaire. The results indicate that the interaction between perceived value and responsiveness is not significantly correlated with customer satisfaction, the interaction between perceived value and assurance also does not correlate significantly with customer satisfaction and the interaction between perceived value and empathy correlated significantly with customer satisfaction. Thus the results demonstrate that perceived value has increased the effect of empathy on customer satisfaction, but it has not increased the effect of responsiveness and assurance on customer satisfaction.

Janson N. (2009) analyzes the consequences of the major instability introduced by internet banking on the bank’s ability to manage a liquidity crisis in Northern Rock Bank. The study shows that inconsistency of the Bank of England policy lead to the initial bank run and that because it persists in that direction it further lead to the bank’s bankruptcy. Internet banking does not cause the failure of the bank but it certainly accelerates the fall of the bank which calls for a greater consistency of the central bank role as a lender of last resort. The study concludes that despite the existence of lender of last resort and deposit insurance scheme, markets participants and individual depositors in particular do not like confusing messages during uncertain times.

Kamble S. S., Sawhney S. and Bansal R. (2009) aims to identify online service quality dimensions that facilitate the customer satisfaction for the e-travel and e-mart online retail. Further, they evaluate how well these dimensions are perceived by the customers so as to provide an objective measure of service performance. Ten e-service quality dimensions are
identified and the extent to which current online retailers provide online service attributes are analyzed to be low or moderate on most of the dimensions for both the e-travel and e-mart service providers. The model tested for the relationship between the service quality dimensions and customer satisfaction is also found to be correlated at a low level.

Oghenerukeybe E. A. (2009) describes a user study performed to investigate user’s perception of factors influencing the effective implementation of existing SI objectives and to evaluate the effectiveness of SI in banking web browsers using the Communication-Human Information Processing Model (C-HIP) model, a model proposed by Wogalter in 2006 in the field of warning sciences. Findings reveal that SI is not very effective at alerting and shielding users from revealing sensitive information to spoofed sites. 27 pc participants do not understand the full meaning of the SI noticed in the banking sites while the attention of some users is not captured enough, for they ignore the warnings completely. Even with the presence of SI, 18.3 pc participants still go ahead to submit sensitive information. These outcomes may help the management of banks develop effective security strategies for the future of electronic banking in Nigeria.

Rao N. and Tiwari S. (2009) study the efficiency of 5 public sector banks selected on the basis of deposits size in 2005. The study concludes that all employee efficiency factors have insignificant influence on deposits, assets and advances, from branch efficiency, only operating profits per branch and from operating efficiency, cost of deposits have significant and positive impact. Liquidity influencing factors and ultimate profit factors do not influence deposits, assets and advances significantly although all profit factors have negative effect. The study also suggests some measures to improve efficiency.

Riquelme H.E., Mekkaoui K.A. and Rios R.E. (2009) identify which customer service and online attributes predict overall satisfaction, determine that if satisfied customers use more online banking features than less satisfied customers and the characteristics of less satisfied customers. The sample of 185 customers is drawn from one of the main banks in Kuwait, the Middle East and multiple regression and discriminant analysis are used to analyze the data. The findings suggest that satisfaction can be generated through improving courtesy, content, timeliness and product and services offered and the majority of the customers in the sample
are satisfied or very satisfied with the service and online systems attributes. The study explores that companies that offer a wide product portfolio and relevant website content accompanied by prompt and courteous response create satisfaction online.

Thulani D., Tofara C. and Langton R. (2009) explore the extent of adoption and usage of internet banking by commercial banks in Zimbabwe. The study concludes that while the majority of the banks in Zimbabwe have adopted internet banking, usage levels have remained relatively low, as not many customers are using this innovation in Zimbabwe. Compatibility with existing legacy systems, cost of implementation and security concerns are the challenges faced by banks in the adoption of IB. The implications of the study are that banks in Zimbabwe should vigorously promote the usage of IB among customers while Government and the Reserve Bank of Zimbabwe should increase investments targeted at infrastructure development so as to encourage banks and individuals alike to adopt the innovation.

Hugar S.S. and Vaz N.H. (2008) evaluate the customer orientation in public sector banks for 5 public sector, 3 new private sector and 3 foreign banks are selected. The study concludes that new private sector banks have more ATMs at the end of March 2006 followed by SBI group where 77.5 pc branches are fully computerized and 18.2 pc are partially computerized. Business per employee and profits per employee are higher in foreign banks where SBI has received more number of complaints followed by ICICI. The study also suggests adopting CRM by public sector banks to stand strong in competitive environment.

Kaleem A. and Ahmad S. (2008) aims to collect bank employees’ perceptions of the potential benefits and risks associated with electronic banking in Pakistan. The study shows that public bank employees who have professional degrees consider ‘minimizing transaction costs’ and ‘reduction in HR requirements’ as the most and the least important benefits of electronic banking respectively. Private bank employees having masters or bachelor degrees, and less than 10 years experience, perceive ‘time saving and minimizing inconvenience’ as the major benefits of electronic banking. Branch managers viewed ‘facilitates quick response’ as the most important benefit of electronic banking. Bankers in all segments consider ‘government access to data’ as the biggest risk associated to electronic banking. The empirical analysis
suggests that bankers in Pakistan perceive electronic banking as tool for minimizing inconvenience, reducing transaction costs and saving time.

Migdadi Y.K.A. (2008) aims to identify the quality of internet banking service encounter of the retail banks in Jordan, and to identify the quality dimensions that should be improved or sustained. The study evaluates the banks' web sites by using the web site quantitative evaluation method (QEM) in March 2008 for sixteen retail banks in Jordan. The results indicate that the banks in Jordan have significant positive quality of the internet banking service encounter, further the banks' web sites are rich in their content and significant in the navigation, but the speed of home page download and web site accessibility should be developed in the future.

Munusamy J. and Fong V. O. (2008) examine the level of customer satisfaction with regard to IBBM’s training services. The study investigates the dimensions of service quality that have significant effect on customer satisfaction in IBBM’s training services. The study finds that the dimensions of service quality and customer knowledge are positively correlated to customer satisfaction among IBBM’s corporate clients. However, only four factors, namely, competence, credibility, accessibility, and tangibles have significant effect on customer satisfaction. Therefore, the management of IBBM should focus efforts on upgrading areas of competence, credibility, accessibility and tangibles in order to continually increase customer satisfaction for continued profitability and success in training business.

Murali R., Richard S., Nafis A. and Mudiarasan K. (2008) evaluate consumer perceptions on quality of e-services and Internet banking adoption in Malaysia. The data is collected from 150 retail banking customers of the Klang Valley area. Results show that Internet banking users and non-users have different expectations towards e-service quality preferences. Not all of the dimensions are preferable by the respondents. The study also discusses implications and recommendations to improve Internet banking service quality in Malaysia.

Qureshi T.M., Zafar M.K. and Khan M.B. (2008) evaluate the customer acceptance of online banking. Study concludes that majority of customers are accepting online banking culture because of many favorable factors, usefulness, security and privacy are the main perusing
factors to accept online banking system in Pakistan. The other factor is amount of information which is provided to the customers by different means like advertisement through print and electronic media about online banking is useful in customer acceptance of online banking in Pakistan. These factors have a strong and positive effect on customers to accept online banking system. Online banking system is getting appreciation in different parts of the country due to which almost 50 pc of the customers have shifted from traditional banking system to online banking system.

Ramalingam P. (2008) studies the usage pattern of credit card holders of SBI, ICICI and ABN banks of Kanchipuram town in Tamil Nadu. The study concludes that higher income group and married persons utilizes the cards to the maximum mainly for impulse purchases due to convenience and Citibank cards are more popular because of dominance in advertising. The study also reveals that Master and Visa cards are the leading card brands in India and suggests the banks to improve overall functioning to provide satisfied credit card services.

Uppal R.K. (2008) analyzes the quality of ebanking services in the changing environment. The sample size of bank customers is 25. The data is collected through pre-tested and well structured questionnaire in Ludhiana, Punjab in May 2006. The study concludes that the customers of ebanks are satisfied with the different e-channels and their services in the spread of ebanking services. It also suggests some measures to make ebanking service more effective in the future. The present study is mainly concerned with the Indian banking industry in general and particular those banks that are producing service through e-channels i.e. ebanks.

Vanniarajan T. and Nathan S.M. (2008) compare the SERVPERF scale on various service quality factors and analyze their impact on the customer’s satisfaction. A systematic random sampling technique is adopted. The findings of the study identify the reliability, responsiveness, assurance, tangibles and empathy as the various service quality factors. The study shows that there are significant variations regarding the respective effects of these observed dimensions on satisfaction and that satisfaction leads to different types of behavioral intentions. Providing reliable banking transaction with promises of reliability, responsiveness and assurance seem to be must appealing service criterion to the target consumers.
Amin Hanudin (2007) studies technology acceptance of internet banking among undergraduate students in Malaysia based on modified version of Technology Acceptance Model (TAM) and develops a technology acceptance model for internet banking. The results suggest that perceived usefulness (PU), perceived ease of use (PEOU) and perceived credibility (PC) have a significant relationship with behavioral intention. Further, these measures are good determinants for undergraduate acceptance for internet banking. Results also suggest that PU and PEOU have a significant relationship with computer self-efficacy (CSE). The study is useful in providing the understanding of the TAM among undergraduate from Malaysians’ perspective.

Eboli L. and Mazzulla G. (2007) propose a tool for measuring customer satisfaction in public transport. Specifically, a structural equation model is formulated to explore the impact of the relationship between global customer satisfaction and service quality attributes. The public transport service analyzed is the bus service habitually used by University of Calabria students to reach the campus from the urban area of Cosenza (southern Italy). To calibrate the model, some data collected in a survey addressed to a sample of students is used. The proposed model can be useful both to transport agencies and planners to analyze the correlation between service quality attributes and identify the more convenient attributes for improving the supplied service.

Khan M.S. (2007) examines the service quality of education sector and internet banking by employing SERVQUAL. The data is collected through questionnaire from students, alumni, parents and recruiters of technical institutions for education quality and from internet banking customers for internet banking quality. The study employs factor analysis to differentiate the dimensions of service quality into different factors and concludes that all type customers are more concerned with academic factor to improve the education service quality while in case of internet banking customers are satisfied with reliability of services but not very much satisfied with user friendliness dimensions. The results indicate that privacy/security and fulfillment do not contribute significantly towards the overall service quality and the males and females differ in their views towards service quality dimensions. The study also suggests some measures to improve service quality and explore future areas of further research.
Madhavankutty G. (2007) concludes that the banking system in India has attained enough maturity and is ready to address prudential management practices as comprehensively as possible, which an integral part of policy is making. Banking in India is poised to enter yet another phase of reforms once the door opens further to foreign players in 2009. This requires further improvement in technology management, human resource management and the ability to foresee rapid changes in the financial landscape and adopt quickly. At present, there is a huge hiatus between the top management earnings of state owned banks and private, as well as foreign banks. Banks have to lay down sound risk management strategies and internal capital adequacy assessment committees to ensure that they do not diverge from the prudential requirements.

Mishra J.K. and Jain M. (2007) study various dimensions of customer satisfaction in nationalized and private sector banks. Two-stage factor analysis is computed to arrive at the dimensions of customer satisfaction. The study analyzes ten factors and five dimensions of customer satisfaction for nationalized and private sector banks respectively. The study concludes that satisfaction of the customers is an invaluable asset for the modern organizations, providing unmatched competitive edge, it helps in building long term relationship as well as brand equity. The best approach to customer retention is to deliver high level of customer satisfaction that result in, strong customer loyalty.

Seelanatha S. l. (2007) examines the changes in banking sector during 1989 – 2004 in terms of efficiency, productivity and market structure in Sri Lanka by employing DEA and Malmquist Productivity Index (MPI). The study shows negative trend in efficiency during the first half of study period and a slight positive trend during the end of the second half and concludes that deregulation may have failed to improve efficiency. Technical efficiency in intermediation has positive relationships with profitability, operational risk, liquidity etc. and negative with product quality and line of business. The study also concludes that banks’ relative market power and technical efficiency have significant influence on ROA and suggests some recommendations to improve the efficiency.
Uppal R.K. and Kaur R. (2007) analyze the efficiency of all the bank groups in the post banking sector reforms era. Time period of study is related to second post banking sector reforms (1999-2000 to 2004-05). The study concludes that the efficiency of all the bank groups has increased in the second post banking sector reforms period but these banking sector reforms are more beneficial for new private sector banks and foreign banks. This study also suggests some measures for the improvement of efficiency of Indian nationalized banks.

Uppal R.K. (2007) concludes that Indian banking industry has undergone radical changes due to liberalization and globalization measures undertaken since 1991. A highly satisfied and delighted customer is a very vital non-financial asset for the banks in the emerging IT era. This study is based on the responses of 768 customers of public sector banks, Indian private sector banks and foreign banks operating in Amritsar District of Punjab in month of September 2007. Time is major factor which affects the quality and reputation of banks. Ebanks provide quick services and that is why they are becoming more popular. Hence, it is very essential that all bank groups should place the right kind of systems to further cut down on service time and render instantaneous services to the customers.

Agboola A. A. (2006) examines electronic payment systems and tele-banking services in 36 banks of Nigeria and data is collected through questionnaires from bank workers during 2005. Findings reveal that connectivity via use of Local Area Network (LAN) and wide area network has facilitated electronic transfer of funds. 35 banks have fully networked their system to ease communication of account information. The use of Smart Cards, Point of Sales System and Computerized Credit Ratings are not very popular as less than half of the studied banks have fully adopted them. ATM, Electronic Home and Office Banking and Telephone Banking are the least fully adopted technologies due to low level of economic development, epileptic supply of power, high cost, fear of fraudulent practices and lack of facilities necessary for their operation. The study concludes that tele-banking is capable of broadening the customer relationship, retain customer loyalty and enable banks to gain commanding height of market share if their attendant problems are taken care of.
Ahuja G. and Singh (2006) study the perceptions of 160 customers of Indore in respect of credit cards especially their growth in India. The study concludes that ICICI in India is the largest cards issuer with customer base of above 3 millions. But only 14 pc of Indians are using these cards that too, are of 40 -50 years of age. There are about 2/3rd of males as compared to 1/3rd females and 89 pc customers possessing higher education level whereas from occupational point of view, the majority of card holders are businessmen or servicemen and 71 pc are using to make payments like hotels bills, club bills etc. 36 pc use at least twice a month. Overall, study concludes that banks should give equal attention to female customers also with special rebates and other benefits, secondly ensures their safety from malpractices involved in its usage.

Akter S. and Ghosh S.K. (2006) examine the gap between expectations and perceptions of customers in Dhaka city of Bangladesh regarding banking services with a special focus on SERVQUAL model. The study concludes that in four dimensions like reliability, empathy, tangibility, assurance, the gap between perceptions and expectations is significant except responsiveness where it is insignificant means banks do not extend that level of services which will satisfy the customers’ expectations. The study also suggests some recommendations to minimize this gap.

Al-Tamimi and Jabnoun (2006) compare the service quality and banks’ performance between National and Foreign Banks in the UAE i.e. Abu Dhabi, Dubai and Sharjah. The banks’ performance is analyzed and based on two indicators i.e. ROI and ROA for the time period from 1987 to 2000. The study concludes that there is no significant difference between national banks and foreign banks in overall service quality and also in dimensions of tangibles and empathy but in case of human skills there is a significant difference and foreign banks are found to be superior. The study also concludes that the relationship between service quality and banks’ performance can be in both directions either bank should improve service quality to improve their profitability or vice-versa.

Banknet India (2006) conducted an online survey on 316 ATM users during the month of August-September, 2006 and survey is limited to India to get insight into users’ perceptions. It is concluded from the survey that the most use (56 pc) of ATM services is for bill payments
and pre-paid mobile recharge where 64 pc respondents feel comfortable with depositing cash/cheques through ATM but they have to wait in long queues and find no money left in the machine. Most of the respondents (81 pc) claimed to know about fee charged at other bank ATMs and 20 pc demand more privacy. Overall, ATMs are preferred over branch banking by majority (95 pc) respondents show the increasing popularity of ebanking among the public.

Chopra V.K. (2006) highlights the importance of IT and business re-engineering in achieving the objectives of banks. The paper concludes that PSBs and old private sector banks are slow in imbibing technology in their operations, whereas new private sector banks and foreign banks are early adopters of the technology and increasing the competition. The paper emphasizes that IT along with the business process re-engineering can provide ideal technology environment catering to the stated business objectives.

Consumer Voice (2006) conducted a survey to study the customer satisfaction level of 3100 serving banks, credit and debit card holders, who are covered during the period September 2005 to November 2005. The survey is conducted in eight cities, where the maximum numbers of respondents come from SBI (17.10 pc) followed by ICICI Bank (8.80 pc) and the maximum surveyed customers belong to the age group of 26-34 years. The study reveals that Citibank has the most dissatisfied customers and most of the customers are shifting from public sector banks to private sector banks, mainly due to convenient availability and due to restricted functioning hours of public sector banks. Overall, only 6 pc of the respondents use internet banking and most of them (16.3 pc) are registered with HSBC followed by ICICI Bank (12.6 pc). Overall, the study concludes that Standard Chartered Bank, Vijaya Bank and Syndicate Bank steal the march, the little known the United Western Bank performs impressively and Citibank is the most over-rated bank.

Garg and Jham (2006) investigate factors that influence Indian customers to adopt ATMs by using factor analysis and focused on the influence of demographic and psychological variables of 296 customers of six selected banks such as SBI, PNB, ICICI, HDFC, ABN and IDBI. It is examined that most of the respondents are below the age of 35 years and the users with lesser experience face more problems in comparison to other and they look for reliability
of information. There are problems of dim vision of screen and they use ATMs maximum for withdrawals and rarely for deposits.

Kasman and Kasman (2006) study the impact of technical change on the costs as well as environmental factors of banking firms operating in 11 Central European Countries by using Fourier-flexible cost function specification for the period 1995-2002. It is concluded that technical progress, on an average, reduced banks’ total cost in five countries that ranges between 0.48 pc and -0.25 pc. The decline in technical change during 2000-02, indicates that the introduction of new technology has been fully utilized starting from 2000. The study again concludes that larger banks are benefited significantly more from cost savings than smaller banks, suggests consolidation of smaller banks to get more benefits of cost reduction due to technical change.

Krishnaveni R. and Prabha D.D. (2006) recognize the need to develop long term relationship with customers to prosper in competitive environment. Banks have realized the need to adopt a people oriented approach as compared to solely the profit oriented approach towards improving customer service. In this study a sample of 27 banks is selected at random from the list of 49 public and private sector banks. The study reveals that among the different internal service quality dimensions taken up for the study, offering the right information and facilities to the employees will improve internal service quality perceptions better than the other dimensions.

Kukkudi and Deene (2006) study the impact of ATMs on customer satisfaction with special reference to SBH in Gulbarga district with sample size of 100 respondents. It concludes that ATMs are used mostly by the age group of 25 – 35 years comprising more male members. 79 pc uses ATMs weekly where 85 pc are aware about the restrictions concerning ATMs usage and the numbers of ATMs are sufficient to meet current needs. It suggests popularizing ATMs among the maximum customers.

Kumar N. K. (2006) discusses various phases of computerization from automating the accounting process and back office function to the current phase of inter-bank connectivity through Real Time Gross Settlement (RTGS). The study emphasizes on some key IT issues
like driving factors, IT budget, process re-engineering, outsourcing etc. It concludes that although IT is introduced in banking but compared to the automation level adopted in some developed countries, it is imperative to further improve and stabilize the mechanization process in Indian banking industry.

Kumar S. and Sujit K.A. (2006) explain the importance, usage and implementation of e-purse in different countries including India. The study highlights some issues related to e-purse as well as its implementation in Indian context as compared to foreign countries. It concludes that e-purse is still at a nascent stage in India as compared to other e-facilities like credit/debit cards, ATMs etc. The study suggests making e-purse more user friendly like credit cards, providing wider base in terms of issuer, location and service providers to facilitate its usage at transportation services, educational institutions, shopping malls etc.

Kumar and Walia (2006) produce information on integrated approach adopted by Indian banks and discussed how Indian banks are aligning their services as per global requirement. The study visualizes that per transaction cost through various channels as it is the least i.e. Rs.0.10 per transaction through internet-banking while Rs.1.00 if transact manually. The percentage of computerization in all Indian banks is only 24 pc up to 2003 and 52 pc branches of public and old private sector banks are computerized whereas 100 pc computerization is made in new private sector banks and foreign banks, mainly due to less spending only 0.5 pc of its revenue on information technology by the public sector banks where new private sector banks spend 4-5 pc and foreign banks spend 9 pc on IT. Very few banks like SBI, Bank of Baroda, and Bank of India etc. are reorienting their strategies to become more focused. The study suggests that given the confidence and competence to public sector banks too, Indian banking sector will surely touch new heights in the years to come.

Nair K.N.C. (2006) explores the future challenges of technology in banking and reveals that automation of 20 pc branches covering 80 pc business followed by large banks conveniently ignores their rural branches. The study concludes that technology usage has improved the efficiency of operations in banks and reduced the cost as ATM transaction costs 25-30 pc of a counter transaction and electronic system has made the banking easy and more attractive but
also risky because of ignorance of human touch. It also points out how IT poses a bright future in rural banking.

Phitkariwala D.K. (2006) study the issues related to cheque truncation system to improve customer services in banks. As the number of cheques issued are continuously rising and the cost of banks and business for producing, issuing and maintaining cheque payment system is ever increasing but the cheque transaction system helps to handle this problem very easily. The study suggests that when it will be implemented to the whole country, it is certain to revolutionize the payment mechanism giving a big jump towards the efforts of providing better technology based customer services.

Pepreya B.K. (2006) suggests that Internet-banking is very useful for prompt payments and provide various facilities to the customers for 24 hours, anywhere anytime. But some risks related to security are involved still every customer wants a number of facilities anywhere anytime. So Internet-banking should be cheap, best affordable and secure from the present risks.

Sakar B. (2006) studies the performance of 11 Turkish commercial banks listed in Istanbul Stock Exchange by using DEA approach. The study concludes strong correlation between input variables but it is weak between input and output variables. The banks with less than 200 branches and 5000 employees have the best DEA variables returns to scale (VRS) scores and banks having less than 3 pc market share have higher scores. Overall, the study concludes that efficiency score is 93 pc though outputs and scale efficiency scores differ widely.

Sakkthivel A.M. (2006) aims at providing a specific focus to identify the impact of demographics in influencing Indian Internet users in consuming different services online. The survey is conducted of 570 internet users of Banglore. The study reveals that age and occupation have significant impact on consuming different categories of services online. The study also shows the significance of demographics influence on online consumption of services in the growing Indian market. There are enormous opportunities present for online marketers to tap the potential of rapidly increasingly online market space in India. The
understanding and mapping of online consumers through demographics could enable their focus better.

Srivastava C. (2006) studies the role of CRM in marketing of services in selected six banks, three from each public and private sector banks. The study concludes that 76 pc of the respondents are males and majority of them are government employees, only 56 pc respondents feel employee’s behaviour friendly towards them and 91 pc from the private sector banks are very happy with the way the bank employees treat them while dealing with the banks. Overall, it is concluded that the concept of CRM in the banking sector has a long way to go in creating sustainable competitive advantage, which is being successfully implemented by most of the private sector banks but public sector banks are still in wait for something else.

Tiwari B. and Herstatt (2006) examine the installation of mobile banking and mobile financial services provided in Germany and other countries. 50 banks worldwide have been selected, half of them from Germany during May/June, 2005. From Indian banks, Bank of Punjab, HDFC, ICIC are dominating, providing mobile-financial services to their customers. The study explains different ways/methods to provide mobile-services that contain technical part with some case studies. The study concludes that mobile banking applications are gaining popularity amongst banks and suggests mobile banking to take the route of online banking.

Uppal R.K. (2006) studies the impact of computerization on the performance of public and private sector banks. The study is based on primary and secondary data. The study concludes that the performance of fully computerized banks (HDFC, PNB, IDBI, ICICI and OBC) is much better than the partially computerized banks. In inter-bank group comparison, all bank groups show significant difference in profitability and productivity. Primary survey concludes that majority of the customers are satisfied with computerization of banking services where urban sector respondents show keen interest in computerization of banking business.

Uppal R.K. (2006) analyzes the profitability of four major bank groups that is SBI and its associates (G-I), Nationalized banks(G-II), New private sector banks (G-III) and foreign banks (G-IV) in the second post banking sector reforms era and concludes that there is a
significant difference in the profitability of various major bank groups. The average profitability is the highest in the foreign banks and new private sector banks but the public sector banks are far behind in many parameters due to the significant and negative effects of burden whereas new private sector banks have higher profitability and the lowest burden with positive impact of interest income and expenditure. The paper suggests some strategies for the survival of PSBs in the liberalized and globalized environment.

Jham Vimi and Garg P. (2006) examine the factors which enhance satisfaction with internet-banking services with the help of factor analysis. The study concludes that customers do not prefer to use internet for many transactions, therefore least satisfied for foreign exchange requirements, credit card payments but privacy and trust play an important role in usage of internet but satisfaction is very low. Customers are highly satisfied with buying and selling of stocks and the internet is used maximum for applying loans and Indian customers’ satisfaction depends on reliability, efficiency. The study suggests the banks to satisfy customer needs on priority basis.

Arora and Verma (2005) study the performance evaluation of PSBs in the post reform period on the basis of four performances. The study concludes that the performance of Corporation Bank in case of financial and operational parameters is higher as compared to other PSBs under study but Indian Bank recorded low as scored poor in some parameters of operational performance. On the other side Vijaya Bank scored well in profitability parameters but UCO Bank scored negative growth in case of all parameters of profitability except operating profits as percentage to working funds and in case of productivity Union Bank of India ranked good but UCO bank rank lower. Overall, it concludes that Indian Banking System is becoming increasingly mature in terms of transformation of business process and the appetite for risk management.

Awamleh R. and Fernandes C. (2005) employ the Diniz (1998) model to evaluate websites of 19 foreign and 16 local banks in the United Arab Emirates. Data is collected from internet banking users in the United Arab Emirates in September 2004 and to examine the data, a factor analysis and multiple regression analysis are conducted. Results suggest that although the banking sector in the United Arab Emirates is a regional leader, internet banking in the
United Arab Emirates is yet to be properly utilized as a real added value tool to improve customer relationship and to attain cost advantages. It reveals that convenience and security of internet banking transactions have a significant impact on satisfaction. The study also discusses implications of results and future research areas.

Chakrabarti R. and Chawla G. (2005) employ DEA approach to evaluate relative efficiency of Indian banks during 1990-2002. The study concludes that efficiency in terms of ROA, operating profits, net interest margin, turnover per rupee of employee expense is higher and NPAs are lower in foreign banks. It also reveals that foreign banks are considerably more efficient on value basis than all other bank groups followed by Indian private sector banks but from quantity perspective, Indian private banks seem to be doing the best while foreign banks are the worst performers while the public sector banks are the laggards.

Goi C. L. (2005) studies the status of ebanking in Malaysia especially the challenges and opportunities. The study concludes that Malaysia still has not reached a critical mass to ensure a sustained momentum, which can only be achieved if the nervousness of trading via Internet is overcome. Technologies are already here, it is the desire and willingness that needs to be converted into action. Malaysian banks will have to develop appropriate ebanking strategies to successfully compete both in the local and global marketplace. Proper understanding and planning is required to deploy the strategy or service effectively and safely.

Jui-Chu, Jin-Li and Kang-Liang (2005) study the cost efficiency of 35 general commercial banks in Taiwan from 1995-2001 with the use of number of ATMs to evaluate the degree of electronization of banks and employs Stochastic Frontier Analysis (SFA). The study compares the banks’ operating efficiency before and after 1997 Asian Financial Crisis. The study concludes that simply increasing the number of ATMs as well as branches does not effectively improve the status of banks’ efficiency, a bank must also engage in other electronic business also. The banks’ cost efficiency index before 1997 Asian Financial Crises is lower than that after the crisis. The average operating performance of banks in Taiwan is going down.
Malhotra and Singh (2005) provide theoretical aspect of internet-banking and observe that internet-banking enables the banks to deliver services at a lower cost than any existing mode of delivery i.e. $0.01 as surveyed conducted in US and convenient for customers. The study reports that internet is not 100 pc secure as it entails risk of operational security, privacy, reputation, legal etc. The study also analyzes the current state of internet-banking in India and concludes that only 33 banks, representing 37 pc of total Indian commercial banks are providing transactional banking services in one form or the other where the share of new private sector banks is higher with all banks providing internet services and 4 banks are fully transactional where FBs represent only 15 pc. At the end it suggests that Indian banks should make effective policies to make it secure to achieve customer confidence, removing all types of risks with proper built-in-safeguard system to manage these risks.

Rao N.V.M., Singh P. and Maheshwari N. (2005) study e-Business models and real-life experiments that have been circling around the e-business models in some selected banks chosen, from public sector and private sector banks. The study concludes that most of the banks offering Internet banking facility in India has high overall scores indicating high quality of their websites at all the functional and interactivity levels. ICICI Bank, State Bank of India and Bank of India now have mobile ATMs or vans that go along a particular route in a city and are stationed at strategic locations for a few hours every day. Almost all the internet banks have privacy statements and about half of these have a security statement. The model suggests that the performance of the banking sector has improved considerably. It is believed that a mathematical approach proposed in this paper will find extensive application in other sectors of the economy also.

Saha P. and Zhao Y. (2005) analyze the relationship between service quality and customer satisfaction in internet banking and five service quality dimensions are selected. A qualitative research approach is used to get a better understanding of this issue. A small quantitative survey has been also conducted to support the results obtained from the qualitative study. Nine service quality dimensions i.e. efficiency, reliability, responsiveness, fulfillment, privacy, communication, personalization, technology update and logistic/technical support are identified in this study. The quality performance of all the nine dimensions is shown to have a strong impact on customer satisfaction.
Singh B. and Malhotra P. (2005) investigates the profile of commercial banks that offer Internet banking by employing univariate statistical analysis, relative to other commercial banks with respect to profitability, cost efficiency, and other characteristics. The study finds that among all banks, 51.6 pc are transactional internet banks with 75.4 pc assets and 73.3 pc deposits share. Foreign banks are providing all services followed by Indian private sector banks whereas public sector banks provide only 30.8 pc services through internet banking. It is also found that internet banking has significant impact on profitability of private sector banks while insignificant in public and foreign banks. It also suggests some measures to enhance and improve internet banking in India.

Singh I. and P. Kumar (2005) analyze the efficiency of Indian banking sector from 1991 to 2003 in terms of technical and allocation efficiency with the use of Data Envelopment Analysis (DEA). The study concludes that relative efficiency is the highest in SBI group followed by nationalized banks and foreign banks whereas lower level of labour efficiency is associated with private sector banks. Technical efficiency is also better in public sector banks than the private sector banks and is comparable to foreign banks. Allocation efficiency is the highest in foreign banks. Overall, public sector banks are still better performers than the private sector banks and slightly lower than the foreign banks. Their better efficiency is primarily due to their bigger size, but still has a scope of further improvements by following appropriate pricing and product strategies and modern marketing practices.

Singla and Arora (2005) study the comparative performance of Canara Bank and Indian Bank for 4 years from 2000-01 to 2003-04 with the help of various profitability and productivity ratios. The study reveals that both the banks have improved their financial performance during the study period where Canara Bank has an upper hand in growth of deposit, advances and average working funds. In the case of net NPAs to net advances ratio it is decreasing in both the banks but more in Indian Banks where it is decreased form 10.60 pc in 2000-2001 to 2.71 pc in 2003-04 where it is 2.89 pc in Canara Bank in 2003-04. In case of productivity, it is rising in both the banks but remained much higher in Canara Bank.
Matousek R. and Taci A. (2004) examine the cost efficiency of the 38 selected Czech commercial banks in 1990s by applying the distribution free approach model and compare the performance of different bank groups. The study concludes that efficiency levels at good small banks have been actually above comparative levels at old big banks during 1993-95 although not very significantly performed better over a six years 1993-98. It concludes that efficiency of Czech banking sector increases during analysis period and foreign banks are more efficient than the other banks, although their efficiency is comparable with the good small banks’ efficiency in early years of their operation. The study reveals that early privatization of state-owned commercial banks and more liberal policy towards foreign banks will enhance the efficiency in the banking system.

Prasuna G.D. (2004) analyzes the performance of Indian banking sector based on annual results of the financial year 2003-04 by using CAMEL model to assess capital adequacy, asset quality, management and earnings and liquidity of 65 banks whose annual results are available. The study concluded that overall performance is better in 2003-04 as compared to 2002-03 the total income of nationalized banks increased by 7.7 pc, private sector banks recorded 9.81 pc growth whereas foreign banks have grown by 9.41 pc. Similarly, the banks have improved their capital adequacy and sound asset quality with reduced NPAs. Liquidity position is observed as better in all the banks. It is concluded that the coming fiscal will prove to be a transition phase for Indian banks as they will have to align their strategic focus to increasing interest rates.

Singh S. (2004) empirically studies the appraisal of customer services of PSBs in terms of level of customer service and satisfaction determined by brand, location and design, variety of services, rates and changes, systems and procedures etc. The study concludes that staff behaviour is very polite and services are provided even in the late hours. Study reveals that 62 pc respondents answer that immediate credit is not given for outstation cheques, 93 pc feel that they do not hold periodical meetings and services are not provided according to the given schedules. It concludes that services of private sector banks are better than the services of public sector banks.
Casu B. and Molyneux P. (2003) evaluate the productive efficiency of European banks during 1993-1997 by using efficiency measures derived from Data Envelope Analysis (DEA). The study concludes that since the EU’s Single Market Programme there has been a small improvement in bank efficiency level and there are marked differences in bank efficiency levels across EU countries which are mainly because of country specific aspects of the banking technology.

Costanzo L.A., Keasey K. and Short H. (2003) analyze a case of telephone banking as a strategy adopted by first and second movers of innovations taking place in UK financial services industry. The study reveals that the successful innovators (First Direct) have adopted the logic of value innovation while the second movers have followed conventional logic. 90 pc first direct customers are satisfied while in case of other banks, not more that 70 pc customers are satisfied. The study concludes that differentiation in financial market place is not achieved with the implementation of distribution channels or just technology but bringing to the market unprecedented value helps.

Das M. S. (2003) develops an objective method for ranking the Nationalized Banks. In this study, four aspects of banks’ performance business performance, efficiency, safety and soundness and labour productivity during 2000-01 and 1999-2000 for all 17 NBs have been analyzed. The study concludes that during 2000-01, overall, Corporation Bank has emerged as the topmost bank followed by Andhra Bank and OBC whereas in business performance, PNB is the topmost, followed by Bank of India and Union Bank of India. In terms of efficiency, Corporation Bank, in safety and soundness, Andhra Bank and in labour productivity, Corporation Bank is the topmost and the listed banks ranked higher than the unlisted ones.

Dhillon, Batra and Dhyani (2003) study the impact of relationship marketing and trends of customer relationship in selected PSBs (SBI) and private sector banks (ICICI) in Chandigarh. The study concludes that ICICI bank is doing well in credibility, access, communication, understanding the customers, tangibles, reliability, responsiveness, competence and courtesy as their mean value is greater than that of SBI but from security point of view, SBI is better. The study suggests that PSBs can also improve their image by relationship marketing and further this relationship marketing will be helpful in transforming the Indian banking system.
Mishra B.S. (2003) examines whether allocative efficiency of Indian banking system has improved after the introduction of financial sector reforms in the early 1990s. Efficiency for 23 states of India is also compared and finds improvement in overall allocative efficiency of majority states in the post reforms period. The study also concludes that improved efficiency is more marked for the service sector than for industry across the states as agriculture and industry sector witness a decline in allocative efficiency.

Olga L. (2003) concludes that development of ebanking in Estonia is expected to be good as 43 pc of population use internet and 57 pc use internet for banking business mostly for domestic payments, pre-defined payments and account statement. On the basis of interviews with specialists responsible for ebanks developments, the study also concludes that number of internet banking transactions are increasing because of lesser cost i.e. 15 cents for internet banking as compared to $1.07 for branch banking. Almost all the banks have invested in expanding IT systems and ebanking services as successful strategy for future development as they use price concessions, sale of bank services packages and non-banking services.

Elyasiani E. and Rezvanian R. (2002) contrast the production technologies and cost characteristics of foreign owned banks (FOBs) and domestic owned banks (DOBs) within a cost minimization context. In the study, labour, capital and borrowed funds are inputs and consumer loans, real estate loans, investment securities and other earning assets are output. The study concludes that cost structures are not identical in FOBs and DOBs but scale and scope economy measures, relative to own-group cost structure are not widely different and no clear pattern can be established between measures and ownership type. An increase in production of investment securities has no effect on average cost of production and hence there is no threat of dominance or shift in financial decision making from USA to outside world through cost channel.

Sureshchandar G.S., Rajendran C. and Anantharaman R.N. (2002) adopt a different approach and view customer satisfaction as a multi dimensional construct just as service quality, but argues that customer satisfaction should be operationalized along the same factors (and the corresponding items) on which service quality is operationalized. Based on this approach, the
link between service quality and customer satisfaction has been investigated. The results indicate that the two constructs are indeed independent but are closely related, implying that an increase in one is likely to lead to an increase in another.

Bamber L.S. and Hughes K.E. II (2001) employ ABC system in Buckeye National Bank which has suffered falling profits despite a shift in customers. The study analyzes the cost through traditional and ABC system where cost is compared for paying checks, providing teller services and responding to customer account inquiries for retail and business customers separately. The study concludes that original cost shows retail customers are cheap as costs $1.90 as compared to business customers ($51.30) which suggests to increase retail customers base but ABC system witnesses that retail customers cost $11.15 while business customers cost $23.55 because retail customers use much more than 10 pc of three activities. The study suggests employing ABC system as it tells the actual factor of cost to control.

Swamy B.N.A. (2001) analyzes the comparative performance of different bank groups in India over the period 1995 to 2000 and studies the impact of deregulation and competition in a liberalized economy. The study concludes that share of public sector banks in assets of all scheduled commercial banks is the highest but recorded steady decline whereas new private sector banks have succeeded to enhance their share in assets witnessed deterioration in the profit performance. Although, public sector banks have succeeded to reduce cost and NPAs but still have high costs and NPAs as compared to new private sector and foreign banks which reflect the favourable effect of technology adoption by private banks. Overall, profit performance of foreign banks is superior mainly due to greater share of income generated from fee-based activities.

Chowdhary and Pareek (2000) study the impact of IT on service sector and focused on issues and challenges faced by the service sector. The study explores many key areas like tangibilizing the services, mass customization of services, customer education etc. that help in improving the customers satisfaction level in services sector. In the study, it is said that every area of service sector is now providing online services such as online reservations for railway tickets, airway bookings, hotels, online admissions and other competitive tests etc. that have resulted in increased productivity, cost savings, higher employee satisfaction and increased
level of customer services. The study concludes that IT leveraged services marketing is the order of the day and will remain in future too.

Heggade O.D. (2000) analyzes the range of customer services provided by the banks along with their impact on customer-banker relations. Study deals with Indian banks in general and banks of Dakshana Kenara District in particular. 500 bank customers, 50 bank managers and 50 bank officers and clerks selected through stratified sampling were surveyed through questionnaires and interviews. The study concludes that public sector banks, although improved but are far behind their counterparts mainly because they are operating mostly on labour-intensive basis rather than computerization of their operations and electronic system. The study also reveals that banking habits of people in this district are good and majority of the customers are satisfied with banks’ customer services. A modest degree of customers’ shifting between different public sector banks and different public and private sector banks has been observed. Employees in majority are satisfied with office space and communication facilities. The study also highlights some problems and suggests possible measures to solve the problems.

Mankidy J. (2000) analyzes that banks have moved away from traditional functions of acceptance of deposits and disbursal of loans to a variety of products suited to the changing needs of today’s customers. The paper reveals that computerization has been slow process but however, bank employees and trade unions have slowly come to terms with the inevitability of the change. Banking industry, like most other industries the world over, is currently undergoing a major transformation process. Customer expectations have also simultaneously increased manifold with the result that banks clients. They demand a multitude of products and services from their banks. It is realized early enough that, to function effectively in an increasingly competitive environment, banks have to adopt newer ways of operations and in this context use of information technology will be imperative.

Sachdeva J. (2000) examines the global environment of e-commerce in different countries such as US, Europe, Singapore and India. The study analyzes the increase in user percentage of various e-channels of e-commerce like internet, computers, mobiles etc. from 1999 to 2003. It is concluded that the number of e-channel users is increasing. The study concludes
that India is far behind in using e-commerce at global graph. India should start to implement e-commerce at large scale to gain the mastery of e-commerce. The main emphasis is on general view of e-commerce related aspects where analysis of implementation problems would be an added advantage.

T. Padamasai (2000) evaluates the profitability, productivity and efficiency of Indian five big public sector banks i.e. SBI, PNB, BOB, BOI, Canara Bank as these are big five banks among the Indian nationalized commercial banks and have places in world’s top 40 banks also. Six parameters such as deposits, advances, investments, profits, net NPAs and CAR of five banks have been analyzed separately for all the selected countries and the various parameters of productivity, profitability and efficiency are compared by naming it as B-Efficiency Model. The study concludes that productivity and profitability of five big banks has increased throughout the post-reforms period in terms of selected ratios of each parameter, but on account of efficiency, the performance of the top five banks is very dismissal as inefficiency has increased during the study period. It suggests that if the government sells its share in the profit making banks, it will be able to bail out the weak banks.

Drucker P.F. (1995) analyzes the need for ABC system in banking sector. The study explores that the banks are identifying new applications like activity based pricing, integrating ABC and performance management. The study also highlights the need for process losing information, better ongoing measures of performance, and linkages from ABC foundation to other initiations, new challenges like regular up dates, focus on data integrity, use of non-banking concepts etc. in implementation of ABC system. Resurfacing of time based approach, awareness and management of key capacity drivers, flexible models are suggested to close the gaps. The study concludes that financial institutes can continue to invest in technology and human resources that will lead to even more successful ABC initiatives, and ultimately, sustained performance improvement of their organisations.

Kaushik S. (1995) examines that why the productivity of banks is low whether due to social measures or not. Comparative productivity and profitability of public sector banks, nationalized banks and private sector banks is analyzed with the help of various ratios through average, correlation, regression, and factor analysis. It also studies the relative significance of
adverse profitability. The study concludes that the productivity of public sector banks show greater decline as compared to that of private sector banks, which further reduces their profits. While analyzing the various parameters of cost, it is concluded that lack of proper cost control measures in public sector banks is a major factor adversely affecting their profitability.

Malik A.K. (1995) investigates the impact of change by adopting computerization in the working of an education institution and the impact is related with the nature of technological change on organizational structure, work process, motivation and moral of users as well as their productivity. The study conducts through questionnaires and interview with simple statistical techniques such as mean and chi-square test. The focus of the study is on managing the technological change. The study concludes that technological change has resulted in increased productivity of users and the change is being accepted by the users because of their personal enthusiasm rather than well-planned activity of the management.

Garg M. (1994) compares the profitability of Indian scheduled commercial banks with foreign banks for the period of 1970 to 1990. The study reveals that Indian scheduled commercial banks have achieved remarkable progress in last two decades under study, particularly in branch expansion in rural areas, deposits mobilization and credit deployment to priority sector and small borrowers but their profits have not kept pace with their growth and hence, their share in profits have come down, whereas foreign banks with a much smaller geographical spread and resources base, earn almost as much as by way of profits as the 20 nationalized banks put together. It is concluded that there is a lot of difference in the pattern of advances and investments and even lending rates of Indian and foreign banks. The study suggests giving more autonomy to Indian commercial banks in their functioning.

Sharma (1993) studies the need of computerization in Indian banking system. The study reveals that computerization has become almost inevitable in the present changing environment to keep pace with the advanced technology, innovations etc. Computerization has made the banking activities easy, saving time, cheap and convenient with use of credit cards and ATMs. At the end, it concludes that computerization has accelerated the productivity and efficiency of banks. Even when there are some problems, we can convert the defects of such systems by expanding banking and computer education, and then modern
computerized banking can be introduced to bring better quality of life with minimum possible expenditure.

Chand Suresh (1986) studies the cost and profitability of Indian commercial banks from 1970 to 1982. The study provides broad pattern of cost of different services in relation to total cost, the cost per unit of monetary output, cost per physical transaction, and cost per account for each of the services rendered by the banks. The comparison of services costs reveals some interesting variations mainly due to hike in export credit interest rate, fall in establishment expenditure etc. and concludes that monetary policy measures have significant impact on profitability of all the banks. Secondly, study analyzes the profitability of bank groups and observes a declining trend. Foreign banks fare better than the Indian banks in terms of most profitability ratios. Their performance, particularly in 1977 are much better than various Indian bank groups. The study suggests the banks to evolve a profit planning machinery so as to ensure efficient management of funds through financial produce and appropriate methods.

The studies conclude that transformation is taking place and IT is playing vital role in bringing this transformation. No doubt, studies have been conducted in various aspects of transformation and its impact on banks performance in foreign countries but in Indian context, not a single comprehensive study is conducted on this aspect. Despite, research papers and articles have been written on some aspects of information technology and transformation. Hence, it is a need of the hour to explore the related aspects of transformation, its impact on Indian banks and further opportunities and challenges to better manage transformation with IT. The present study is devoted to how transformation is taking place in Indian banks, role of e-channels in banks’ efficiency and what the customers and banks employees observe about e-services of the banks. The study also analyses the service quality in partially and fully IT-oriented banks. On the basis of empirical analysis, study travels around the problems of banks in managing transformation through IT and suggests some possible measures to manage the problems in a better way. The study ends with the conclusion that ebanking is a challenging opportunity for the number of public and all the old private sector banks.
2.2 How This Study is Different from Earlier Studies
No comprehensive study on this area is conducted during the period of post-economic reforms and financial sector reforms in India. Some articles/research papers that have appeared in different journals, highlight the significance of IT in banks. The lack of comprehensive studies in India inspired to study:
- Comparative cost advantages of e-delivery channels
- Extent to use e-delivery channels
- Which e-delivery channel is most popular and cost effective?
- Impact on efficiency in terms of productivity and profitability of banks, which are using e-delivery channels
- Perceptions and acceptability of IT in the banks of customers and bank employees.

2.3 Objectives of the Study
1. To analyze the various products/services distributional channels and their impact on productivity of banks.
2. To study and analyze the comparative efficiency in terms of profitability in partially IT-using banks and ebanking in India.
3. To study the extent of comparative cost differences between the banks/bank groups while managing transformation through different e-delivery channels.
4. To study the problems and prospects for ebanking in India and predict the future of ebanking in India.
5. To suggest possible measures in the light of problems, if any, how to mould these challenges into opportunities.
6. To study the perceptions of bank customers, bank employees regarding the use of various products/services delivery channels and their acceptability in urban Punjab. The study will also analyze:
   - To ascertain the number of existing bank customers availing ebanking services.
   - To determine the switch over rate of customers from traditional public sector banks to modern IT equipped banks.
   - To determine the factors considered by customers while selecting a bank for availing e-services.
   - To ascertain the reasons for not availing e-services by bank customers.
   - To ascertain the problems, if any, faced by customers while availing e-services.
2.4 Hypothesis
H0: Employee Productivity/Branch Productivity is not significantly correlated with e-channels in pre and post-ebanking period.

H0: Profitability is not significantly correlated with each e-channel in pre and post-ebanking period.

H0: The perceptions of bank customers regarding ebanking services are not significantly different with respect to bank groups, age, income and occupation.

H0: The perceptions of bank employees regarding ebanking services are not significantly different with respect to bank groups and work experience.

2.5 Research Methodology
The study is concerned with the banking industry in India. Post-liberalization, privatization and globalization period has shown transformation in banking industry. Particularly, with the introduction of IT in banking industry a lot of changes have taken place in public sector banks but slowly whereas in new private sector banks and foreign banks working in India, these changes have come at fast pace because these banks are fully computerized by birth. Many public sector banks are managing transformation manually not through IT channels (due to some internal and external constraints) but on the other hand new private sector banks and foreign banks are managing whole process through e-channels. New private sector banks and foreign banks as compared to public sector banks provide many new products and services.

2.5.1 Research Design
The study is confined to Indian Banking Industry. Hence, the universe of the study is banking industry of India. The performance is analyzed on bank, bank group and industry level. Four bank groups and further four banks from each bank group have been selected for the study. The study is descriptive and empirical in nature where secondary and primary data is used to address the objectives.

The Indian banking industry was divided into four major bank groups for the purpose of the required analysis:

Public Sector Banks
(SBI and its Associates-7 and Nationalized Banks - 19) (26 Banks)
Old Private Sector banks (15 Banks)
New Private Sector banks (7 Banks)
Foreign Banks (32 Banks)
IDBI was excluded from Public Sector Banks Group because it do not justify the data requirements as it is included in the group from 2004-05 financial year but the data is taken from 1996-97. It was included for the data at banking industry level. These bank groups were further divided into two groups i.e. partially IT-oriented banks and fully IT-oriented banks (ebanks). Partially IT-oriented banks are those with partially computerization and electronic system while fully IT-oriented banks have complete electronic system to provide customer services.

2.5.2 Sample Design
Total 16 banks, four from each bank group were selected on the basis of their market share in business and net profits in the year 2003-04. The four banks with higher market share among the respective bank groups were selected. The distribution of sample banks is given as per their ranking in market share in business and net profits. The consolidated data was used to calculate productivity and profitability of these banks at bank, bank group and industry level.

<table>
<thead>
<tr>
<th>Rank</th>
<th>G – I (Public Sector Banks)</th>
<th>G – II (Old Private Sector Banks)</th>
<th>G – II (New Private Sector Banks)</th>
<th>G – II (Foreign Banks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>Canara Bank (CB)</td>
<td>The Federal Bank Ltd. (FB)</td>
<td>HDFC Bank</td>
<td>Citibank</td>
</tr>
<tr>
<td>III</td>
<td>Punjab National Bank (PNB)</td>
<td>The Karnataka Bank Ltd. (KB)</td>
<td>Axis Bank (UTI Bank)</td>
<td>The Hongkong and Shanghai Banking Corporation (HSBC)</td>
</tr>
<tr>
<td>IV</td>
<td>Bank of Baroda (BOB)</td>
<td>ING Vysya Bank Ltd. (VB)</td>
<td>Indusind Bank (INDUS)</td>
<td>ABN Amro Bank (ABN)</td>
</tr>
</tbody>
</table>

2.5.3 Parameters of the Study
The performance of a bank can be measured by number of indicators. Profitability and productivity are the most important and reliable indicators as give a broad indication of the capability of a bank to increase its earnings. For measuring the profitability and productivity of Indian banking industry, various parameters were selected to analyze overall efficiency of the banks.
2.5.3.1 Productivity

The study addresses the objectives by making cross-sectional and inter-temporal analysis on the basis of 13 indicators. These indicators were divided into two categories. One set of indicators measure output in terms of input in number of employees, i.e. manpower productivity, another set of indicators measures branch productivity. These set of indicators are as follows:

Per Employee Indicators (Manpower Productivity)

- Deposits per employee \( : \) \((D/E)\)
- Credit per employee \( : \) \((CR/E)\)
- Business per employee \( : \) \((BUS/E)\)
- Total Expenditure per employee \( : \) \((TEXP/E)\)
- Total Earnings per employee \( : \) \((TER/E)\)
- Establishment expenses per employee \( : \) \((ESTB/E)\)
- Spread per employee \( : \) \((S/E)\)

Per Branch Indicators (Branch Productivity)

- Deposit per branch \( : \) \((D/BR)\)
- Credit per branch \( : \) \((CR/BR)\)
- Business per branch \( : \) \((BUS/BR)\)
- Total Earnings per branch \( : \) \((TER/BR)\)
- Total expenditure per branch \( : \) \((TEXP/BR)\)
- Establishment expenses per branch \( : \) \((ESTB/BR)\)

2.5.3.2 Profitability

For measuring the profitability of commercial banks, the study employs three types of ratios:

Spread Ratios

1. Interest Earned as percentage of Working Funds
2. Interest Expended as percentage of Working Funds
3. Spread as percentage of Working Funds

Burden Ratios

1. Non-Interest Income as percentage of Working Funds
2. Non-Interest Expenditure as percentage of Working Funds
3. Burden as percentage of Working funds
Profitability Ratios

1. Net Profit as percentage of Total Income
2. Net Profit as percentage of Total Deposits
3. Net Profit as percentage of Working Funds

2.5.3.3 Factors Affecting Profitability/Productivity

1. Computerized Branches as percentage of Total Branches \( (X_1) \)
2. ATMs as percentage of Total Branches \( (X_2) \)
3. Credit Cards as percentage of Total Branches \( (X_3) \)
4. Internet Banking as percentage of Total Branches \( (X_4) \)
5. Mobile Banking as percentage of Total Branches \( (X_5) \)
6. Tele Banking as percentage of Total Branches \( (X_6) \)
7. IT Index \( (X_7) \)

2.5.3.4 Average T-Score

For getting overall results of productivity and information technology, combined values were calculated by converting the original variables of respective factors into standardized/normal score. T-scale based on t-scores was used for to compute index for employee, branch, financial and total productivity and information technology. T-scores were normalized standard scores converted into distribution with a mean of 50 and S.D. of 10. In scaling of individual items, the mean is at zero and S.D. is 1.00. Hence, the point of reference is zero and the unit of measurement is 1.

In this study, following formula has been used to determine T-scores:

\[
T \text{-Score} = 50 + \frac{10}{\text{S.D.}} \times (X - \text{Mean})
\]

Here;

- S.D. = Standard deviation of the original scores
- X = Specific score in question

Five types of average scores have been worked out in the form Index of each factor. All the original items of each factor were standardized at this T-score and then average of these items was taken as combined value of that factor. In this study, employee productivity index, branch productivity index, financial productivity index, total productivity index and IT index were worked out. The T-scores of total productivity index were combined from employee, branch
and financial productivity index and then the impact of IT index on all productivity indexes was analyzed to obtain overall impact of IT on banking sector.

2.5.4 Sample Design for Empirical Study

Second part of the study is related with perceptions of bank customers and employees regarding acceptability and use of ebanking services in India. For an empirical survey, the study is confined to urban Punjab only because electronic system is not much developed in semi-urban and rural areas and the districts with banks providing more ebanking facilities were surveyed at random. For empirical data collection, 12 banks were selected. Only the banks providing ebanking services to the customers were selected for the study. The survey was conducted over sample size of 384 bank customers and 132 bank employees comprising managers, employees and clerks. The survey was conducted at random through well-structured and pre-tested questionnaires and interviews. The bank customers from different socio-economic background (age, income, occupation, education and gender) were surveyed from different branches. Two questionnaires, separate for bank customers and bank employees were prepared and to ensure comprehensiveness and internal consistency of each questionnaire a pilot study was conducted. On the basis of pilot survey, some questions were deleted and some were changed due to inadequate results.

2.5.4.1 Sample Selection

The sample for this study was selected through the following stages.

Stage-I: From all the banks of Indian banking industry, 3 groups as G-I represents SBI and its associates and Nationalized Banks (NBs), G-II represents New Private Sector Banks (NPSBs) and G-III represents Foreign Banks (FBs) were selected for the survey. All these bank groups have passed through various stages started with manual work, shifted to partially computerized and then fully computerized but now started to venture into ebanking. New Private Sector Banks and Foreign Banks are fully computerized by birth now started to work as ebanks. Old private sector banks were excluded because majority of these banks are not providing sufficient ebanking services to the customers.

Stage-II: (Source for the selection of ebanks for this study): For this case study, 12 banks were selected, four from each bank group. These banks are those which are selected for efficiency analysis on the basis of their market share in business and net profits. Again those branches of these banks were chosen which are providing all ebanking services and managing the whole business electronically.
Stage-III: (Universe): This empirical study is totally concerned with the selected ebanks of urban Punjab only. Urban Punjab includes districts having branches of selected ebanks providing customer services electronically. The major districts for survey were Ludhiana, Amritsar, Jalandhar, Patiala and Bathinda.

Stage-IV: (Selection of bank customers and bank employees): A list of customers was collected from each selected bank. From the list, every fourth customer was chosen for the survey. Total 384, 128 from each bank group were chosen from all the customers of selected ebanks. The selected customers were those using two or more e-delivery channels and having knowledge regarding e-delivery channels. Those customers were selected who:

(i) continued to deal with the banks for last 3 years or more
(ii) only individual, saving/current account or both account holders
(iii) business class, service class, professionals.

<table>
<thead>
<tr>
<th>G – I (Public Sector Banks)</th>
<th>Banks</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBI</td>
<td>32</td>
<td>HDFC 32</td>
</tr>
<tr>
<td>PNB</td>
<td>32</td>
<td>ICICI 32</td>
</tr>
<tr>
<td>CB</td>
<td>32</td>
<td>INDUS 32</td>
</tr>
<tr>
<td>BOB</td>
<td>32</td>
<td>Axis 32</td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
<td>Total 128</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G – II (Indian Private Sector Banks)</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFC</td>
<td>32</td>
</tr>
<tr>
<td>ICICI</td>
<td>32</td>
</tr>
<tr>
<td>INDUS</td>
<td>32</td>
</tr>
<tr>
<td>Axis</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G – III (Foreign Banks)</th>
<th>Banks</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABN</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Citibank</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>SCB</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>HSBC</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
<td></td>
</tr>
</tbody>
</table>

The bank employees 132 in total, 44 from each bank group were selected. The selected employees were those:

(i) working with selected ebanks
(ii) using/having knowledge about all e-delivery channels
(iii) managers, executives, clerks

These bank employees were surveyed from the selected ebanks of all bank groups on convenient basis. Further 11 bank employees were selected at random from each bank group. The distribution of total sample is given below.

64
Chart 2.3
Distribution of Total Sample Size of Employees among the Selected Banks

<table>
<thead>
<tr>
<th></th>
<th>G – I (Public Sector Banks)</th>
<th></th>
<th>G – II (Indian Private Sector Banks)</th>
<th></th>
<th>G – III (Foreign Banks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks</td>
<td>Employees</td>
<td>Banks</td>
<td>Employees</td>
<td>Banks</td>
<td>Employees</td>
</tr>
<tr>
<td>SBI</td>
<td>11</td>
<td>HDFC</td>
<td>11</td>
<td>ABN</td>
<td>11</td>
</tr>
<tr>
<td>PNB</td>
<td>11</td>
<td>ICICI</td>
<td>11</td>
<td>Citibank</td>
<td>11</td>
</tr>
<tr>
<td>CB</td>
<td>11</td>
<td>INDUS</td>
<td>11</td>
<td>SCB</td>
<td>11</td>
</tr>
<tr>
<td>BOB</td>
<td>11</td>
<td>Axis</td>
<td>11</td>
<td>HSBC</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>Total</td>
<td>44</td>
<td>Total</td>
<td>44</td>
</tr>
</tbody>
</table>

2.5.5 Time Period for the Study
Time period for the study was taken from post second banking sector reforms i.e. from 1996-97 to 2006-07, because the true impact of liberalization and globalization can be studied only after second banking sector reforms period as competition is increased, IT Act, 2000 is implemented, free entry of foreign and private sector banks, implementation of WTO with new facilities etc. This mixed factors affect on banking industry has been studied in the selected time period. The time period was divided into two part pre-ebanking period (1996-97 to 2000-01) and post-ebanking period (2001-02 to 2006-07) to better explore the impact of information technology on the banks’ efficiency in terms of different parameters.

2.5.6 Collection of Data
The present study is based on secondary and primary data. Secondary data was collected for the analysis of profitability and productivity from following publications;

i) Performance Highlights, Various Issues, IBA (Mumbai) 1996-97 to 2006-07
ii) IBA Bulletin (Special Issues), 1996-97 to 2006-07
iii) Report on Trend and Progress of Banking in India, 2000 to 2009
iv) Indian Banking at a Glance, 2006
v) Annual Reports of these Banks.

Various other RBI publications, The Financial Express, The Economic Times, and the Monthly Review of the Banks have also been consulted for the required data. The data regarding number of e-channels (ATMs, Credit Cards, Internet Banking Branches, Mobile Banking Branches and Tele Banking Branches) was collected from IT departments of respective banks through the cooperation of IBA, Mumbai.

The primary data was collected through pre-tested and well draft questionnaire from bank customers and bank employees personally.
2.5.7 Analysis of the Data
The ratios were analyzed and interpreted by calculating Mean, Standard Deviation, Co-efficient of Variations to get a better picture of the performance of Indian commercial banks. Weighted Average Score (WAS) has also been calculated to draw ultimate conclusions from customer perceptions. Despite this, correlation co-efficient and R-square were also calculated to study the relationship between productivity and selected factors affecting of productivity where r-square provides more useful information as it tells the extent of relationship between the factors under study. Ranking method is also used for various conclusions where ranking is made on the basis of average and total score. To make study more reliable, growth rates, various statistical techniques, co-efficient of contingency, regression analysis, Chi-square, t-test and factor analysis were used. Data is calculated with the help of SPSS 15.00 Version.

2.6 Scope of the Study
This study covers various information technology tools, used to manage the transformation in banks. In general, the study covers all the banks of major five bank groups (RRBs and Cooperative banks are excluded) and in particular, the banks in the sample selected from each bank group on the basis of their market share in deposits, advances and net profits in the year 2003-04. To know the perceptions of customers and bank employees regarding the use of IT in banks to manage the transformation in the banks, 516 customers and employees of Urban Punjab are surveyed. The study also analyzes the comparative costs in partially and fully IT-oriented banks and their services quality.

2.7 National Status of the Present Research
At a time when economy, the world over, is undergoing a radical transformation due to the all pervasive influence of IT and it is growing at a fast pace, the number of changes occurred in the total economy like work culture, structure, systems etc. One sector that has undergone fundamental changes as a consequence of the application of IT has been financial sector and banking is not an exception. The new technology has radically altered the traditional ways of doing banking business. We realize that in the coming days IT will contribute substantially to banking industry’s efficiency. The significant transformation of the banking industry in India is clearly evident from the changes that have occurred in the financial markets, institutions and products. If Indian banks are to compete globally, the time is opportune for them to institute sound and robust risk management practices.
The current research work is a comprehensive study regarding the various issues and challenges faced by the banking industry and also explore the various opportunities by using IT in managing transformation in banking industry. In this study a comprehensive survey has been conducted to know the perceptions and extent of acceptability of IT among the bank customers and employees. The study highlights the extent of awareness in society regarding the use of IT in banks. As the results of the study are favorable for IT, so public sector banks and old private sector banks should also rapidly adopt IT for managing transformation, this implication will solve many problems of the public sector banks.

To cap it all, this study will helpful to the society and also to the nation. After studying various aspects of managing transformation through IT, accordingly country can make a comprehensive policy regarding the managing of the bank transformation through IT. This study will surely capture the attention of all the concerned/experts because excellent changes and growth has been observed during this study. It will help to make policies to make our banks globally competitive by the full adoption of IT.