Chapter No. 02

Review of Literature

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2.1 Introduction:

Over the years several studies have been conducted both at the industry and firm level to examine the impact of IT on productivity and profitability. It is relevant to refer briefly to the previous studies and research in the related areas of the subject. Here such studies are discussed in which impact of IT on banking industry is studied. Plenty of literature is available on subjects like E-banking, Internet banking, IT and banking etc. Some of them have drawn on statistical correlation between IT spending and performance measures such as profitability or stock’s value for their analysis. Some of them have discussed the impact of IT on world banking industry. Some of them have studied the impact of IT on Indian banking industry. Though each study delivers different analysis but ultimately the aim is same, to study IT and banking. So, while taking review of literature, these all studies are assembled here, analyzed and presented as follows.

2.2 Review of Literature:

Rangarajan Committee –II (1988), based on the norms worked by it, 827 branches of the Public Sector banks were identified for full branch computerisation up to March 2000 of which around 4620 were computerised as on March 99. Meanwhile, the networking of the already computerised branches also assumed urgency and some of the banks have started inter-connecting their computerised branches using leased telephone lines or Very Small Aperture Terminals (VSATS). This is meant to provide a more comprehensive service to customers and at the same time give banks better centralised control over the branch operations. As of now, new private sector and foreign banks have an edge over public sector banks as far as implementation of technological solutions is concerned. However, the latter are in the process of making huge investments in technology. The financial Reforms that were initiated in the early 90s and the globalisation and liberalisation measures brought in a completely new operating environment to the banks that were till then operating in a highly protected milieu.
The arrival of foreign banks and financial institutions, the setting up of a number of private banks and the measures of de-regulation that encouraged competition has led to a situation where the survival of those who do not join the race will become difficult. Unless the state-of-the-art IT was introduced as early as possible, winning new business and even holding on to the old one will become increasingly difficult. Services and products like "Anywhere Banking", "Tele-Banking", "Internet banking", "Web Banking", "E-banking", "E-commerce", "E-business" etc. have become the buzzwords of the day and the banks are trying to cope with the competition by offering innovative and attractively packaged technology-based services to their customers.

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

The present level of MIS covers, basically, information needed for control, performance monitoring, decision making etc. and encompasses most activities in administrative offices like processing of statutory returns under Reserve Bank of India Act, monthly/quarterly performance reports from branches, credit information/BSR, inter-branch transactions, personnel inventory, provident fund accounting, profit and loss accounts, cash and investment management, stationery stock accounting, and branch housekeeping etc.

As per Comptroller’s Handbook (1999) “Internet banking” refers to systems that enable bank customers to access accounts and general information on bank products and services through a personal computer (PC) or other intelligent
device. Internet banking products and services can include wholesale products for corporate customers as well as retail and fiduciary products for consumers. Ultimately, the products and services obtained through internet banking may mirror products and services offered through other bank delivery channels. Some examples of wholesale products and services include:

- Cash management.
- Wire transfer.
- Automated clearinghouse (ACH) transactions.
- Bill presentment and payment.

Examples of retail and fiduciary products and services include:

- Balance inquiry.
- Funds transfer.
- Downloading transaction information.
- Bill presentment and payment.
- Loan applications.
- Investment activity.
- Other value-added services.

Other internet banking services may include providing internet access as an Internet Service Provider (ISP). The OCC has determined that a national bank subsidiary may provide home banking services through an internet connection to the bank’s home banking system and, incidental to that service, may also provide internet access to bank customers using that service (see OCC Interpretive Letter No. 742, the “Apollo” letter). Historically, banks have used information systems technology to process checks (item processing), drive ATM machines (transaction processing), and produce reports (management Internet Banking 2 Comptroller’s Handbook information systems). In the past, the computer systems that made the information systems operate were rarely noticed by customers.

Today, web sites, electronic mail, and electronic bill presentment and payment systems are an important way for banks to reach their customers. National banks have experimented with various forms of online banking for many years. Some
of the early experiments involved closed systems where the customers accessed banks through a dial-in or cable TV connection. These systems limited a bank’s potential customer base because they required out-of-area customers to either incur long-distance charges on their phone bills or subscribe to a particular cable TV service to access the bank. With the widespread growth of the internet, customers can use this technology anywhere in the world to access a bank’s network. The internet, as an enabling technology, has made banking products and services available to more customers and eliminated geographic and proprietary systems barriers. With an expanded market, banks also may have opportunities to expand or change their product and service offerings.  

ICMR (2002), as more banks entered internet banking arena, the competition between the banks also increased. This compelled the banks to focus on capturing new markets and customers and adopting advanced technology on the internet. In the light of these developments, industry watchers remarked that “Internet banking had arrived in a big way. Though it had a long way to go compared to the global standards, it was beginning to be seen as a replacement for the traditional banking set up in the future”. Banks have been quick to adopt rapidly evolving electronic and telecommunication technologies to deliver an extensive line of value added products and services to their customers. By the early 1990s, direct dial-up connections, personal computers, tele-banking and automated teller machines (ATMs) became common in most developed nations. Internet banking evolved in the mid-1990s when internet and the World Wide Web began to catch on. Soon, many major banks in the US and Europe began to use the internet to provide banking services. Internet banking is a web-based service that enables the bank’s authorized customers to access their account information. It allows the customers to log on to the bank’s website with the help of a bank-issued identification and a personal identification number (PIN).  

Nitsure, R.R. (2003), this article indicates the E-banking Challenges and opportunities lies in the banking industry. E-banking has the potential to transform the banking business as it significantly lowers transaction and delivery costs. This article discusses some of the problems of developing countries which have
a low penetration of information and telecommunication technology, lacking in realizing the advantages of E-banking initiatives. Major concerns such as the 'digital divide' between the rich and poor, the different operational environments for public and private sector banks, problems of security and authentication, management and regulation and inadequate financing of small and medium scale enterprises (SMEs) are highlighted.

Picado, Gonzalez & Eckelman (2004), this study investigated the customer satisfaction using QFD and a research on service quality and customer satisfaction has become significant in the service industries. This study develops a case study that considers both external and internal service management issues and subsequent service innovations based on the framework of quality function deployment (QFD). The application of the customer window quadrant (CWQ) and the action plan matrix in the analysis of customer and service elements constitute a different approach for QFD. Some benefits and disadvantages of the QFD process are discussed as compared to extant service quality and customer paradigms. Finally, suggestions and directions are offered for future applications, with particular interest in the E-bank service management issues.

Asghar (2004), the study depicts that online banking and the web channel are here to stay. Financial services rely on multiple distribution channels and E-banking represents the channel of the future. Success stories around E-banking have taken shape through a mix of innovation and experience. The financial services sector needs to apply both these factors to their advantage to produce the desired results. Win-win implementation of E-banking not only requires high internet penetration rates and stable infrastructures, but more importantly, for companies to realize the powerful revenue opportunity of this business arm vis-à-vis the traditional brick and mortar system of operation. Therefore, it is imperative that all E-banking implementations are seamlessly integrated with the core 'traditional' services thereby making the online experience truly holistic for the customer.
Anthony (2004), this article discusses the importance of usability within the E-banking sector and identifies common usability problems and ways to resolve them. It is widely recognised that online banking provides more revenue per customer and costs less per transaction than any other channel, including phone banking. Encouraging news from Forrester Research states that by 2007 the number of Europeans banking online will double to 130 million. Based on the principles of Human Computer Interaction (HCI), web usability has become a recognised success factor for all E-business, including online banking. Users most enjoy those sites that provide clear information, easy navigation and an engaging customer experience. Yet people will naturally gravitate to the ones which are easiest to use and offer the best service. Banks aiming to profit the most from the increase in online banking volumes should consider the usability and accessibility of all aspects of their site to welcome them.

As per RBI Report 2005, competition is the buzzword among scheduled commercial banks. All categories of banks have been investing on computerisation and use of advanced communication networks. The directive by the Central Vigilance Commission (CVC) to PSU banks to achieve 100 per cent computerisation has imparted urgency to the process of technological advancement. While new private sector banks, foreign banks and a few older private sector banks have been enjoying a head start in adopting “core banking solutions”, PSU banks too have fallen in line rather vigorously. Besides, all PSU Banks, except eight, had achieved 100 per cent full/partial computerisation as on March 31, 2005. Of 27 PSU banks, as many as nine (with seven out of eight in the SBI group) had 100 per cent computerised branches; nineteen had more than 50 per cent.

The application of internet communication network has made it possible for banks to aggressively open ATMs as a convenience to their customers as well as to reduce servicing costs. On-site and off-site ATMs together have constituted as much as one-third of branches of all scheduled commercial banks. Foreign banks have ATMs more than four times the number of their total branches (441 per cent) followed by new private sector banks (377 per cent). Total number of ATMs managed by PSU banks stands at 9992 (or 21 per cent of their total branches) which compares
with 4985 managed by new private banks and 777 managed by foreign banks. With cybercafés and kiosks springing up in different cities access to the Net is going to be easy. Internet banking (also referred as E-banking) is the latest in this series of technological wonders in the recent past involving use of internet for delivery of banking products & services.

**Banknet India (2006),** in its research paper, “Present level of computerization”, discussed views of various researchers. One illustration of the industry level studies is that of Morrison and Bernlt (1990) which found that in manufacturing industry ‘estimated marginal benefits of investment in IT are less than the marginal cost, implying the problem of over investment. More specifically they found that for each dollar spent on IT, the marginal increase in output was only 80 cents. The study by Parsons, Gotlieb, and Denny (1993) is one of the studies that deal with the impact of IT in banking productivity. They conclude from their estimation of data from five Canadian banks using translog production function that, while there is a 17-23 percent increase in productivity with the use of computers, the returns are very modest compared to the levels of IT investments.

Lichtenberg (1995) on the other hand, concludes that there are significant benefits from investment in IT to the firms. Using Cobb-Douglas production functions, he found increasing returns on investment in computers. They further found that one information system (IS) employee is equivalent to six non-IS employees in terms of marginal productivity.

Brynjolfsson and Hitt (1996) however, caution that these findings do not account for the economic theory of equilibrium which implies that increased IT spending does not imply increased profitability. More recent firm level studies, however, point a more positive picture of IT contributions towards productivity. These findings raise several questions about mis-measurement of output by not accounting for improved variety and quality and about whether IT benefits are seen at firm level or at the industry level. Such issues have been discussed in detail by Brynjolfsson (1993) and to a lesser extent by Brynjolfsson and Hitt (1996).
Brynjolfsson and Hitt (1996) in their study by using Cobb-Douglas production function have found that computerization aids to the firm’s level output significantly. In fact they found that computer related capital investment contributes 81 percent to the marginal increase in output, where as non-IT capital contributes only 6% to the marginal output. They also show that IS labor is more than twice as productive as non-IS labor. Most of such studies relating to the contribution of IT towards firm’s level productivity have been restricted to the manufacturing industry, possibly owing both to a lack of data at the firm level in the service industry and perhaps, more significantly, in the difficulty of unambiguously identifying the “output” of a service industry. The latter problem is particularly persistent in the banking industry, which is the focus of this study.

The other study to examine the effect of IT investment on both productivity and profitability in the US retail banking sector is conducted by Prasad and Harker (1997). They conclude that additional investment in IT capital may have no real benefits and may be more of strategic necessity to stay within the competition. However, the results indicate that there are substantially high returns to increase in investment in IT labor.

Another important study undertaken by offsite monitoring and surveillance division of department of Banking Supervision (2002) used financial indicators to derive indirect linkages by assuming computerization as one of the factor in the improvement in efficiency. They concluded that higher performance levels have been achieved without corresponding increase in the number of employees. Also, it has been possible for public sector banks and old private banks to improve their productivity and efficiency over a period of five years.

The other study conducted by Launardi, Becker and Macada (2003) found competition, products and services, and customers, the main strategic variables affecting the IT and there is no difference of opinion between IT executives and other functional executives, regarding their perception of the impact of IT on strategic variables.
Choudhari and Tripathy (2004) applied DEA to measure the relative performance of public sector banks and conclude that the Corporation Bank is the efficient in all indicators i.e. profitability, financial management, growth, productivity, and liquidity, while Oriental Bank of Commerce is next most efficient. Liberalization and financial sector reforms during the last one decade have brought the issue of productivity and profitability of banks into the limelight. Profitability of banks has been under strain on account of declining net interest margin and increasing competition. The comfortable business of accepting deposits and lending at administered rates has been dented following deregulation of interest rates and increase in competition after the entry of private and foreign banks. In the changing context, banks with a high degree of cost effectiveness, increased efficiency and customer centric approach would survive. Use of modern risk management practices, exploring ways to increase non–fund based income, analysis and control over expenses and greater use of information technology have become imperative to protect their bottom-lines in the deregulated environment.

Information Technology (IT) innovations in the last few years have changed the landscape of banks in India. Today, IT seems to be the prime mover of all banking transactions. Electronic and Information Technology together are bringing a swift change in the way banks operate, especially offering better delivery channels and customers’ friendly services. Anywhere banking, telebanking, mobile banking, net banking, automated teller machine(ATMs), credit cards, debit cards, smart cards, call centers, CRM, data warehousing have totally transformed the banking industry. Today almost all the major banks in India like ICICI Bank, UTI Bank, Citibank, Standard Chartered Bank, ABN Amro, SBI and PNB are offering online services to their customers. ATMs have emerged as the most favored channel for offering banking services to the customers in the world. In India, currently, there are two types of customers – one who is a multi-channel user and the other who still relies on the branch as the main I channel.

The primary challenge for banks is to provide consistent service to customers irrespective of the kind of channel they use. The channels broadly cover the primary channels of branch (i.e. teller and ATM), phone (i.e. call centre, interactive voice response unit), and internet channel (i.e. personal computer, browser, wireless)
banking. Banks in India have all set for transformed branches, enhanced telephone services, and internet banking functions. Even for PSBs, the ongoing and future investments are massive. The available data about the investment plans in PSBs in IT in the year 2003–04 indicates that all major PSBs have earmarked the hefty amount of Rs. 2200 crore (The Financial Express Oct. 17, 2003).

Veneeva (2006), this article describes that world is changing at a staggering rate and technology is considered to be the key driver for these changes around us. Many activities are handled electronically due to the acceptance of information technology at home as well as at workplace. Internet can be seen as a truly global phenomenon that has made time and distance irrelevant to many transactions. The evolution of electronic banking started from the use of automatic teller machines (ATM) and has passed through telephone banking, direct bill payment, electronic fund transfer and the revolutionary online banking (Alter, 2002). The future of electronic banking according to some is the acceptance of WAP enabled banking and interactive TV banking (Petrus & Nelson, 2006). But it has been forecasted that among all the categories, online banking is the future of electronic financial transaction. The rise in the E-commerce and the use of internet in its facilitation along with the enhanced online security of transactions and sensitive information has been the core reasons for the penetration of online banking in everyday life.

Maumbe (2006), this study depicts that most banks throughout the world, ICT has become the back bone of financial service delivery and finance networks have shifted from paper-based to the digital mode. However, digital financial service delivery confronts a number of challenges regarding its efficacy in closing the “financial divide” affecting the poor. Although E-banking is considered an inexpensive way to reach clients, its accessibility is hindered by a number of factors including poor internet penetration, lack of E-banking awareness and customer inflexibility to new technology. In developing countries most of which are characterized by extreme poverty and poor infrastructure, universal internet based service provision remains indefinable. Further, the author argues that developing nations need to improve educational standards and computer literacy prior to broad-
based adoption and constructive use of internet services. As result, the poor and unemployed remain disadvantaged in terms of access to rural internet based services. Real access to “well functioning” and “efficient financial services” has the potential to empower poor communities.  

Kamiya (2006), this article show that Indian banks are trying to make your life easier. Not just bill payment, you can make investments, shop or buy tickets and plan a holiday at your fingertips. In fact, sources from ICICI Bank tell us, "Our internet banking base has been growing at an exponential pace over the last few years. Currently around 78 per cent of the bank's customer base is registered for internet banking." To get started, all you need is a computer with a modem or other dial-up device, a checking account with a bank that offers online service and the patience to complete about a one-page application--which can usually be done online. You can avail the following services: Bill payment Services, Fund Transfer, Credit Card, Internet shopping, and Investment though internet etc. Due to the internet banking the life of an individual becomes easy and raises the standard of life of the humans.  

Bauer, Malik & Falk (2006), this article reviews the measuring the quality of E-banking portals. In the internet economy, the business model of web portals has spread rapidly over the last few years. Despite this, there have been very few scholarly investigations into the services and characteristics that transform a web site into a portal as well as into the dimensions that determine the customer’s evaluation of the portal’s service quality. Based on an empirical study in the field of E-banking the authors validate a measurement model for the construct of web portal quality based on the following dimensions: security and trust, basic services quality, cross buying services quality, added value, transaction support and responsiveness. Findings – The identified dimensions can reasonably be classified into three service categories: core services, additional services, and problem-solving services. Originality/value – The knowledge of these dimensions as major determinants of consumer’s quality perception in the internet provides banks a promising starting point for establishing an effective quality management for their E-businesses.
Awamleh (2006), this study analyses the internet banking channels and service preferences of educated banking consumers in the UAE and examines the factors influencing the intention to adopt or to continue the use of internet banking among both users and non-users of internet banking. It is shown that although the banking sector in the UAE is a regional leader, internet banking in the UAE is yet to be properly utilized as a real added value tool to improve customer relationship and to attain cost advantages. The Technology Acceptance Model (TAM) was used to identify factors influencing the intention to adopt and continued use of internet banking customers. Data was collected from internet banking users and potential users in the United Arab Emirates and factor analyses and multiple regression analyses were conducted to examine the data. Relative usefulness is introduced as one of the factors and is defined as the degree to which a new technology is better than existing ones. There is a significant difference between users and non-users on six of the seven factors identified. Further, it was revealed that relative usefulness, perceived risk, computer efficacy and image had a significant impact on continued usage of internet banking for IB Users, while relative usefulness and result demonstrability were the only ones significant for non users of internet banking. The effects of age, gender, income, and E-commerce users also explored. Result demonstrability is significant for all categories of non-users except for those with income below AED 7,000. Implications of results were discussed, and future research directions outlined.

Shah & Braganza (2007), this survey indicates the critical success factors in E-banking and the author suggest in this article that the organizational factors, which are critical to the success of e-banking are investigated. Different pieces of literature report different factors as key to success and generally based on subjective, perceptual data. A synthesis of existing literature is a basis for survey questions. The data was collected from UK based financial sector organizations who are offering their services on electronic channels, using postal questionnaires. The top factors found to be most critical for the success in E-banking are: quick responsive products/services, organizational flexibility, services expansion, systems integration and enhanced customer service. An important lesson from this research is that
organizations need to view the E-banking initiative as a business critical area rather than just a technical issue. They need to give attention to internal integration, which may include channels, technology and business process integration, and improving the overall services to their customers.

Malhotra, P. & Singh, B. (2007) stated about this research tells us that the larger banks, banks with younger age, private ownership and higher expenses for fixed assets, higher deposits and lower branch intensity evidence a higher probability of adoption of this new technology. Banks with lower market share also see the internet banking technology as a means to increase the market share by attracting more and more customers through this new channel of delivery. Further, the adoption of internet banking by other banks increases the probability that a decision to adopt will be made. An understanding of the factors affecting this choice is essential both for economists studying the determinants of growth and for the creators and producers of such technologies. From this perspective, understanding the factors determining the adoption of technology becomes highly relevant from the policy point of view. Moreover, the studies on the adoption of financial innovations are related to developed markets, e.g. US or European banking markets. Hence, this paper contributes to the empirical literature on diffusion of financial innovations, particularly Internet banking, in a developing country.

E-Banking:

As per Md. Abdul Hannnan Mia, Mohammad Anisur Rahman, Md. Main Uddin (2007) the term Internet Banking or E-Banking or both are used as supplement. E-Banking is the one of the major part of E-Financing. Hertzum et al. (2004) defined E-Banking as web-based Banking. In other words E-Banking refers to the banking operations, which is done over World Wide Web. However, more comprehensive and well-established definition is given by the United Nations Conference on Trade and Development (UNCTAD). This definition covers almost all area of E-Banking. Internet banking refers to the deployment over the internet of retail and wholesale banking services. It involves individual and corporate clients, and includes bank transfers, payments.
E-Banking information architecture is modeled as client-server architecture. A client operating through a PC linked to internet opens the special E-banking site of his bank and then, using a set of special secure numbers, gets access to his bank accounts and has the opportunity to consult them, as well as to make all necessary payments and transfers from his personal accounts.

When the transaction number is exhausted the bank sends him a new set of numbers for his individual transfer sessions. In some cases the bank provides customized software. The bank software program can also be utilized offline, for example for preparing the payment orders offline and then making the actual order online. The client receives all numbers separately, mainly by mail. The bank also provide clients with similar facilities in its premises so that clients can use the bank equipment such as an ATM or a special facility linked to the main terminal facility called Multimat, permitting them to effect the same account examination, payment and transfer operations without consulting the bank staff.

Shripad Vaidya (2007) stated that, in the days of virtualisation where working mothers and travelling sales team prefer to use flexi-time and remote jobs profile, internet is being adopted as a parallel medium of communication, transaction, and social networking. Internet banking is fast gaining momentum across the globe for its convenience and ease of conducting transactions at a speed and service levels never dreamt of, a decade ago. In spite of its multiple advantages, there is a need to step back and re-think on perceptions it carries with the masses. Is internet banking truly replacing the layers of branch banking in a big way? Is internet banking a definitive future of how world people will transact over net? There are enough evidences of internet banking gaining considerable adoption in developed and to a lesser extent in developing countries.

However ample evidence exist to suggest that internet banking has been highly is accepted in only specific line of services and yet global bankers have to fight a fierce battle when internet banking will be a truly serious and parallel banking channel, complementing offline banking in a big way. Developing and deploying internet banking is an extremely tough call for a modern day banker. At one side the
cost and efforts of maintenance of E-banking infrastructure may not necessarily justify the benefits to every bank. And at the same time, intangible cost of not providing internet banking channel is also huge and may affect the opportunities loss for banks. Having said that, in today’s context, providing full-fledged internet banking services is more of “when and not if” and the benefits are comparable to “chicken or egg” theory.

In the first generation of internet banking, i.e. pre Y2K era, banks in the developed world provided basic facilities such as view balance, statements, checkbook request, stop payment instructions, electronic bill payment (EBP) etc. In post Y2K era banks aggressively adopted various services such as Electronic Bill Presentment and Payment (EBPP), customized reporting, account aggregation over multiple bank accounts, investment banking, also portfolio / investment management, comprehensive money management, and trade finance etc. Y2K was also an era when few “internet only” banks were established, and out of which these only Japanese have truly survived by now. Rest of the world is struggling to keep this “internet only” concept alive.

In the present regime of 2006 and beyond, the banks are concentrating on targeting the incremental service-level in online banking value-chain e.g. developing creative ways of countering security threats, targeting comprehensive supply chain management for entire life cycle of a transaction utilizing straight through processing (STP), aligning internet banking with multiple channels to offer the best-in-breed technological upgrades to the customer including Electronic Fund Transfer (EFT) / bulk transfers using RTGS, mobile banking services etc, targeting internet banking as a medium to generate new business and attracting either offline or fresh customer through effective ways of cross-selling, establishing cross border services for various corporate as well as consumer segment. Internet Banking is also been used as mode to create profile driven marketing campaign for various banking products.
Some Learning by banks:

- Internet is one of the most cost effective channel of conducting banking operations. It is estimated that Internet banking offers up to a minimum of 60% (and much more at higher volumes) cost saving over normal offline banking.

- Bankers across the world have realized that customer using online banking have lesser attrition in comparison to other channel of banking and offer a relatively loyal customer to the bank.

- Per product usage per customer for internet banking channel is growing exponentially comparing offline banking.

- As per Gartner, on an average, companies save about 45 cents every time they send an account statement electronically instead of by paper mail. A bank that sends monthly account statements by paper mail to 5 million customers would spend $27 million more than if it sent electronic statements.

- Many banks have started waiving or reducing transaction fees on internet banking accounts and are also offering higher deposit rates to attract this cost-effective channel of banking transaction.

- Some of the banks have initiated added incentives to customers by offering creative products e.g. combining loans as well as salary accounts ensuring superlative benefits to consumers, which enable considerable saving to customers. In fact some of these schemes can be availed only in online mode.

- Branch managers across the globe have realized that internet banking offers is not a hindrance or competition to their business growth, but it complements the operations as it actually reduces the excessive burden of servicing customers.

- Banks are offering customized reporting aligning with tools such as “Quicken 2007 or Microsoft money” for customers to analyze their income, expenditure items in
various heads and this helps individual families to study / budget their spending from E-banking statements.

“Offering image view for checks already processed” is a value-add facility to the consumer after modern day regulations such as “check 21” have established it’s footprint in USA. Banks in developed countries are also enabling customer to remote deposit checks using scanned images of checks.

Banks are struggling to defy the threats of hacking, Phishing, keystroke logging, Trojan horses etc. The organization-wide extensive IT security policy involving establishing protection to IT and network infrastructure, anti-intrusion initiatives, multiple audit programs, tracking suspicious trends, disaster recovery and business continuity, regulatory compliance, customer education and awareness programs are being utilized to counter external threats and save consumers from any probable attacks. Federal Financial Institutions Examination Council’s (FFIEC) in USA have mandated “two-factor authentication” to the banks, which warrants banks to provide additional security layer as against only “single factor” of login ID and Passwords. But in few cases such as “Man-in-middle” attacks have countered the recently mandated two-factor authentication as well. A major industry-wide drive is needed to counter the security threats in terms of actions from banks as well as customers.

Banks are now providing liability guarantees for any unauthorized transaction over internet, but a lot is desired as compelling restrictive clauses in the “small-print” not doing enough justice to customer’s apprehension towards security threats.

Even the Morgan Stanley, Dean Witter Internet research (2008) emphasized that Web is more important for retail financial services than for many other industries. Internet banking is changing the banking industry and is having the major effects on banking relationships. Banking is now no longer confined to the branches were one has to approach the branch in person, to withdraw cash or deposit a cheque or request a statement of accounts. In true internet banking, any inquiry or transaction is processed online without any reference to the branch (anywhere banking) at any time. Providing internet banking is increasingly becoming a "need to
have" than a "nice to have" service. The net banking, thus, now is more of a norm rather than an exception in many developed countries due to the fact that it is the cheapest way of providing banking services.

**Divya Singhal and V. Padhmanabhan (2008)** stated that, internet banking is the term used for new age banking system. Internet banking is also called as online banking and it is an outgrowth of PC banking. Internet banking uses the internet as the delivery channel by which to conduct banking activity, for example, transferring funds, paying bills, viewing checking and savings account balances, paying mortgages and purchasing financial instruments and certificates of deposits (Haque et al, 2009). Internet banking is a result of explored possibility to use internet application in one of the various domains of commerce. It is difficult to infer whether the internet tool has been applied for convenience of bankers or for the customers’ convenience. But ultimately it contributes in increasing the efficiency of the banking operation as well providing more convenience to customers. Without even interacting with the bankers, customers transact from one corner of the country to another corner.

There are many advantages of online Banking. It is convenient, it isn’t bound by operational timings, there are no geographical barriers and the services can be offered at a minuscule cost (IAMAI’s, 2006). Electronic banking has experienced explosive growth and has transformed traditional practices in banking (Gonzalez et al., 2008). Private banks in India were the first to implement internet banking services in the banking industry. Private banks, due to late entry into the industry, understood that the establishing network in remote corners of the country is a very difficult task. It was clear to them that the only way to stay connected to the customers at any place and at anytime is through internet applications. They took the internet applications as a weapon of competitive advantage to corner the great monoliths like State Bank of India, Indian Bank etc. Private banks are pioneer in India to explore the versatility of internet applications in delivering services to customers.

As per prediction of Broadie et al (2007) the E-banking is leading to a paradigm shift in marketing practices resulting in high performance in the banking industry. Delivery of service in banking can be provided efficiently only when the
back ground operations are efficient. An efficient back ground operation can be conducted only when it is integrated by an electronic system. The components like data, hardware, software, network and people are the essential elements of the system. Banking customers get satisfied with the system when it provides them maximum convenience and comfort while transacting with the bank. Internet enabled electronic system facilitate the operation to fetch these result.

An in-depth analysis would help to understand that internet enabled electronic bank system differentiates from traditional banking operation through faster delivery of information from the customer and service provider. Additionally, it has to be noted that the banking operations does not transfer physical currencies instead it transfer the information about the value for currencies. I-banks enable transfer of information more swiftly on-line (Salawu et.al, 2007). In service organizations like banks, information flows more than physical items. In the commercial world, especially in most advanced societies today, money is rather carried in information storage medium such as cheques, credit cards and electronic means that in its pure cash form. According to christopher et al (2006), E-banking has become an important channel to sell the products and services and is perceived to be necessity in order to stay profitable in successful. The perception is the formed as a result of interpreting the experience. There is a growing interest in understanding the users’ experience (Hiltunen et al., 2002,); as it is observed as a larger concept than user satisfaction. From this perspective, assessing the user experience is essential for many technology products and services (Wilson & Sasse, 2004)

Customers have started perceiving the services of bank through internet as a prime attractive feature than any other prime product features of the bank. Customers have started evaluating the banks based on the convenience and comforts it provides to them. Bankers have started developing various product features and services using internet applications.

Routray (2008), the study describes that Mobile and Wireless communication devices are becoming enablers for organizations to conduct business more effectively and efficiently. One of the most effective applications is mobile banking (M-banking). For any application to gain recognition technological
advancements play a vital role. To make M-banking application a success bandwidth management is an important issue. The increased flexibility and mobility feature of wireless ATM and its bandwidth on demand function is motivating a large number of carriers towards deployment of the WATM networks. But there are certain issues which are required to be addressed in WATM. The issues are cost effective planning of network, location management and handover management. In this paper we have suggested and evaluated a technological framework for the M-banking application using wireless ATM which optimizes the bandwidth usage and provides an effective handover management. Simulation results show that the resultant framework is very effective in handling the bandwidth and the handover issue in wireless ATM and provides an effective WATM framework model.

Laukkanen, P., Sinkkonen, S. & Laukkanen, T. (2008), the purpose of this paper is to further the understanding of innovation resistance by dividing internet banking non-adopters into three groups based on their intentions to use the innovation. Thereafter, the aim is to identify how the resistance differs in these customer groups. This study identifies three groups of internet banking non-adopters, namely postponers, opponents and rejectors. The data were collected by conducting an extensive postal survey among the retail banking customers in Finland who had not adopted internet banking.

The measurement development was based on consumer resistance theory and the earlier literature on internet banking. Principal component analysis was used to classify the resistance items into five adoption barriers derived from the earlier literature. Thereafter, analysis of variance was used to analyze the statistical differences in resistance to internet banking between the three groups. Significant differences were identified between the groups explored. The resistance of the rejectors is much more intense and diverse than that of the opponents, while the postponers show only slight resistance. The results also indicate that psychological barriers are even higher determinants of resistance than usage and value, which are constructs related to ease-of-use and usefulness determining acceptance in the traditional technology acceptance model. Moreover, the findings highlight the role of self-efficacy in bank customers’ risk perceptions to internet banking. This study provides further understanding of what inhibits internet banking adoption by
comparing three non-adopter groups with respect to their resistance to internet banking. It also has implications for management in overcoming non-adopters’ resistance to the innovation.

Hsun, K.S. (2008), this study considers the coherence of the financial service sector and adopts different observational variables to identify innovation capital (training and R&D density) and process capital (IT system sufficiency). The results show that human capital has a direct impact on both innovation capital and process capital, which in turn affect customer capital; while finally, customer capital affects business performance. In addition, there is a negative relationship between process capital and customer capital in the financial service sector. It suggests that in the financial service sector, customer satisfaction relies on a sufficient degree of training and R&D density. Intemperate investment on the support of E-banking operation systems may not be a good answer.

Siddharth Agarwal (2009) stated that, one has to approach the branch in person, to withdraw cash or deposit a cheque or request a statement of accounts. In true internet banking, any inquiry or transaction is processed online without any reference to the branch (anywhere banking) at any time. Providing internet banking is increasingly becoming a "need to have" than a "nice to have" service. The net banking, thus, now is more of a norm rather than an exception in many developed countries due to the fact that it is the cheapest way of providing banking services. Banks have traditionally been in the forefront of harnessing technology to improve their products, services and efficiency. They have, over a long time, been using electronic and telecommunication networks for delivering a wide range of value added products and services. The delivery channels include direct dial-up connections, private networks, public networks etc. and these devices include telephone, personal computers including the Automated Teller Machines, etc. With the popularity of PCs, easy access to internet and World Wide Web (WWW), internet is increasingly used by banks as a channel for receiving instructions and delivering their products and services to their customers. This form of banking is generally referred to as internet banking, although the range of products and services offered by different banks vary widely both in their content and sophistication.
India’s banking sector is growing at a fast pace. India has become one of the most preferred banking destinations in the world. The reasons are numerous: the economy is growing at a rate of 8%, Bank credit is growing at 30% per annum and there is an ever expanding middle class of between 250 and 300 million people (larger than the population of the US) in need of financial services. All this enables double-digit returns on most asset classes which is not so in a majority of other countries. Foreign banks in India achieving a return on assets (ROA) of 3%, their keen interest in expanding their businesses is understandable – even more so when compared with the measly 1% average ROA for the Top 1000 banks in the world. From the perspective of banking products and services being offered through internet, internet banking is nothing more than traditional banking services delivered through an electronic communication backbone, viz. internet. But, in the process it has thrown open issues which have ramifications beyond what a new delivery channel would normally envisage and, hence, has compelled regulators world over to take note of this emerging channel. Some of the distinctive features of I-banking are:

1. It removes the traditional geographical barriers as it could reach out to customers of different countries / legal jurisdiction. This has raised the question of jurisdiction of law / supervisory system to which such transactions should be subjected.

2. It has added a new dimension to different kinds of risks traditionally associated with banking, heightening some of them and throwing new risk control challenges.

3. Security of banking transactions, validity of electronic contract, customers’ privacy etc., which have all along been concerns of both bankers and supervisors have assumed different dimensions given that internet is a public domain, not subject to control by any single authority or group of users.

4. It poses a strategic risk of loss of business to those banks who do not respond in time, to this new technology, being the efficient and cost effective delivery mechanism of banking services.

5. A new form of competition has emerged both from the existing players and new players of the market who are not strictly banks.
Reeti, Sanjay, and Malhotra, A. (2009) stated about the Customers’ perspectives regarding E-banking in an emerging economy. So that, the author determining various factors affecting customer perception and attitude towards and satisfaction with E-banking is an essential part of a bank’s strategy formulation process in an emerging economy like India. To gain this understanding in respect of Indian customers, the study was conducted on respondents taken from the northern part of India. The major findings depict that customers are influenced in their usage of E-banking services by the kind of account they hold, their age and profession, attach highest degree of usefulness to balance enquiry service among E-banking services, consider security & trust most important in affecting their satisfaction level and find slow transaction speed the most frequently faced problem while using E-banking.

Uppal, R.K. & Chawla, R. (2009), this study highlights customer perceptions regarding E-banking services. A survey of 1,200 respondents was conducted in October 2008 in Ludhiana district, Punjab. The respondents were equally divided among three bank groups namely, public sector, private sector and foreign banks. The present study investigates the perceptions of the bank customers regarding necessity of E-banking services, quality of E-banking services, bank frauds, future of E-banking, preference of bank customers regarding banks, comparative study of banking services in various bank groups, preferences regarding use of E-channels and problems faced by E-bank customers. The major finding of this study is that customers of all bank groups are interested in E-banking services, but at the same time are facing problems like, inadequate knowledge, poor network, lack of infrastructure, unsuitable location, misuse of ATM cards and difficulty to open an account. Keeping in mind these problems faced by bank customers, this paper frames some strategies like customer education, seminars/meetings, proper network and infrastructure facilities, online shopping facilities, proper working and installation of ATM machines, etc., to enhance E-banking services. Majority of professionals and business class customers as well as highly educated and less educated customers also feel that E-banking has improved the quality of customer services in banks.
B. Dizon, J.A. (2009), In this study they have founded that while big banks still conduct the bulk of their business in brick and mortar bank branches, the finance sector has been increasingly investing on E-banking facilities to offer 24-hour, queue free services to their regular clients, whether through ATM machines, mobile phones or the internet. "E-Bankings appeal is primarily its convenience. Clients nowadays want instant results; they don't want to wait anymore," said Francisco M. Caparros, Jr., senior vice-president of Asia United Bank and president of Banc Net. It's also turned out to be a more efficient way to process transactions, as E-banking does away with most of the paperwork that clients have to accomplish. "A lot of people don't like filling forms," Mr. Caparros added. "Online banking, in particular, relies on user names and passwords which need to be protected," said Ferdinand G. La Chica, first vice-president and marketing group head for Sterling Bank of Asia.

These anti-theft barriers are at times supplemented by transaction passwords and "tokens", often a keychain-like device that is issued to the client and generates random, one-time passwords to enable him to log into his account online. Last year, the Rural Bank Association of the Philippines announced that its members are looking to appoint local merchants like sari-sari stores as third party agents where consumers can open new accounts and make large payments. Such informal outlets will enable banks to reach out to small-income businesses and individuals, particularly those in the agrarian sector, most of who are based outside the city.

Azouzi, D. (2009), this paper aims to check if the current and prompt technological revolution altering the whole world has crucial impacts on the Tunisian banking sector. Particularly, this study seeks some clues on which we can rely in order to understand the customers' behavior regarding the adoption of electronic banking. To achieve this purpose, an empirical research is carried out in Tunisia and it reveals 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. Furthermore, this study shows that despite the presidential incentives and in spite of being fully aware of the E-bankings benefits, numerous respondents are still
using the conventional banking. It is worthy to mention that the fear of loss because of transactions errors or hackers plays a significant role in alienating Tunisian customers from online banking.

Abishek singh, Om Shankar, Vikas Kumar and Tapan ray (2009) in their study stated that E-banking nowadays is the common trend here in our country. No more falling in line in banks, no more waiting tons of hours in the bank, no more days and weeks of waiting. All can be done with one card, one gadget. It’s easy, it works, and most importantly, people like it. But still, some people are having a hard time using this kind of technology mostly people who are used to do things the old traditional way. With the use of advertising, people are now motivated to use E-banking because again, it eliminates the hassle encountered when using the old process of banking. The advancement of electronic banking or commonly known as E-banking, began with the use of automatic teller machines (ATMs) and has included telephone banking, direct bill payment, electronic fund transfer, online banking and other electronic transactions. For many people, they believe that the E-banking will go to the direction of mobile banking. Also, some people believe that online banking will be the most popular method in the future.

In order for users/customers to use their banks online services, they need to have a personal computer and an internet connection. Also, their personal computers will be their assistant who will assist them in their transactions and services. Examples of those transactions are paying bills, attaining information about accounts and loans, and etc. In addition, those transactions offered by different banks are continuously changing and are being improved because of some banks wants to attain competitive advantage with other banks. The banking industry should always adapt to the new technology today and basically make the necessary adjustments to gain competitive advantage with other competing banks.

Electronic banking is sometimes defined as the provision of retail and small value banking products and services through electronic channels either through mobile devices, automated teller machines, or even the internet. It is also often used to describe processes in which customers can perform banking transactions without
visiting a physical institution E-banking made an auspicious debut when automated
teller machines (ATMs) were introduced it revolutionizing how we viewed the usual,
brick-and-mortar bank structure. Today, ATMs have become a common customer
delivery channel that is mainly in urban centers and sometimes even in the
countryside. Aside from ATMs, other innovations have taken place such as phone and
internet banking which again provide customers the ability to access banking services
from various locations and at a 24 hour by 7 days basis.

With these developments, customers are able to enjoy the many
conveniences and lower costs that are offered by the said innovations. However, it can
be seen that the poor and low income segment is still underserved or do not fully
enjoy the benefits of such innovations. For example, ATMs have a nationwide
presence but there is a concentration in urban areas, which are not easily accessible to
those residing in the countryside. In addition, ATMs would require that you have a
bank issued ATM card. The banks that typically issue ATM cards are the larger banks
with which poor and low income individuals do not transact. The smaller banks like
rural banks do not yet have the vast ATM networks as the bigger banks. Another
example is internet banking services, which has significantly increased convenience
for clients, as they are able to perform certain transactions without leaving their home
or workplace.

However, this service is available only to those who have internet
connection or are, at the very least, computer literate. In the same manner as ATM
services, the poor and low income clients will not be able to fully enjoy the benefits of
this service.

These unique E-banking characteristics include:

- Speed of technological change
- Changing customer expectations
- Increased visibility of publicly accessible networks (e.g. the internet)
- Less face-to-face interaction with financial institution customers
- Need to integrate E-banking with the institution’s legacy computer systems
• Dependence on third parties for necessary technical expertise
• Proliferation of threats and vulnerabilities in publicly accessible networks

Siba Sankar Mahapatra, Sreekumar and Mohammaed Sadique Khan (2009) stated that, the financial reforms that were initiated in the early 1990s and the globalisation and liberalisation measures brought in a completely new operating environment to the banks. The bankers are now offering innovative and attractive technology based services and products such as ‘Anywhere Anytime Banking’, ‘Tele-Banking’, ‘Internet Banking’, ‘Web Banking’, etc. to their customers to cope with the competition. The process started in the early 1980s when Reserve Bank of India (RBI) set up two committees in quick succession to accelerate the pace of automation of operations in the banking sector.

A high level committee was formed under the chairmanship of Dr. C. Rangarajan, then Governor of RBI, to draw up a phased plan for computerisation and mechanisation in the banking industry over a five-year time frame of 1985–1989. The focus by this time was on customer service and two models of branch automation were developed and implemented. Having gained experience in the earlier mode of computerisation, the second Rangarajan committee constituted in 1988 drew up a detailed perspective plan for computerisation of banks and for extension of automation to other areas such as funds transfer, e-mail, BANKNET, SWIFT, ATMs, I-banking, etc.

The Government of India enacted the Information Technology Act, 2000 (generally known as IT Act, 2000), with effect from 17 October 2000 to provide legal recognition to electronic transactions and other means of electronic commerce. RBI had set up a ‘Working Group’ on I-banking to examine different aspects of I-banking. The Group had focused on three major areas of I-banking such as (1) technology and security issues, (2) legal issues and (3) regulatory and supervisory issues. RBI had accepted the recommendations of the ‘Working Group’ and accordingly issued guidelines on ‘internet banking in India’ for implementation by banks. The ‘Working Group’ has also issued a report on I-banking covering different aspects of I-banking.
Internet banking in India is currently at a nascent stage. While there are scores of companies specializing in developing I-banking software, security software and website designing and maintenance, there are few online financial service providers. ICICI bank is the first one to have introduced I-banking for a limited range of services such as access to account information, correspondence and recently, funds transfer between its branches. ICICI is also getting into E-trading, thus offering a broader range of integrated services to the customer. Several finance portals for provision of non-banking financial services, E-trading and E-broking have come up. Commercial applications such as Electronic Bill Presentment (EBP) and Procurement systems may not be introduced in India immediately, but are likely to have a greater impact than the retail applications. The corporate sector is adequately computerised and has already recognised the important role of E-commerce in future. Increasingly, companies are setting up websites even where there are no immediate tangible benefits to them from doing so.

**Status of E-banking in India:**

In Indian context, many publications throw light over the importance of I-banking and also its prospects for the Indian banking industry. Unnithan and Swatman (2001) studied the drivers for change in the evolution of the banking sector, and the move towards electronic banking by focusing on two economies, Australia and India. The study found that Australia is a country with internet ready infrastructure as far as telecommunication; secure protocols, PC penetration and consumers’ literacy are concerned. India, by comparison, is overwhelmed by weak infrastructure, low PC penetration, developing security protocols and consumer reluctance in rural sector. Although many major banks have started offering I-banking services, the slow pace will continue until the critical mass is achieved for PC, internet connections and telephones. However, the upsurge of IT professionals with growing demands is pressuring the government and bureaucracy in the country to support and develop new initiatives for a faster spread of I-banking.

Rao and Prathima (2003) provided a theoretical analysis of I-banking in India, and found that as compared to the banks abroad, Indian banks offering online
services still have a long way to go. For online banking to reach a critical mass, there has to be sufficient number of users and the sufficient infrastructure in place.

Various authors have found that I-banking is fast becoming popular in India (Gupta, 1999; Pegu, 2000; Dasgupta, 2002). However, it is still in its evolutionary stage. By the year 2006–2007, a large sophisticated and highly competitive I-banking market will develop. Almost all the banks operating in India are having their websites, but only a few banks provide transactional I-banking.

The internet users in India

The role of internet is becoming inevitable to corporate and society. Across the world, governments and corporate are increasingly working towards the better utilisation of the internet. The internet which was initially perceived as a communication media is now metamorphosing into a powerful business media (Sakkthivel, 2006). According to the Internet & Online Association of India (IOAI), the Indian internet population is currently over 25 million and is expected to grow to 100 million by 2007 (Survey by New Media Review, 2005). In July 2005, internet World Stats reported that there were 39,200,000 internet users in India representing 3.6% of the population. (Internet World Stats, August 2005). Even with millions of web users in its cities, the internet penetration rate for India remains well below 5%. Despite India’s technology outsourcing power, the country’s internet penetration rate is low.

JuxtConsult, a research firm based in New Delhi (2005), surveyed urban internet users in April 2005 by talking to 30,000 Indian web users about their lifestyle and their web use. There are about 17.5 million urban dwellers in India who use the internet consistently with an additional 5.2 million who use it occasionally. Among the urban users surveyed by JuxtConsult, about one half are involved in business in some way, and students make up 20% of the total.

Several studies have been conducted and many have written on how technology can be presented so that it could be adopted easily by people, some of which are discussed here.
Prof. Chowdari Prasad, Vamshi Krishna Arumbaka (2009), discussed in their research paper about the views of researchers like, Parasuraman (2000) illustrates that optimism and innovativeness are drivers of technology readiness, while discomfort and insecurity are inhibitors. These findings suggest that, if consumers are not “ready” to be internet banking users, they are likely to express discomfort and insecurity about the service and feel less optimistic and innovative about the technology.

Ostlund (1974) extended Rogers’(1971) seminal work on diffusion in identifying risk as influential to adoption process. Diffusion studies, amongst other things, generally find that adopters are more innovative, less risk averse, perceive an innovation as being less complex and offer relative advantages. Perceptions of non-adopters about these factors are usually the complete opposite (i.e. non-adopters are less innovative, more risk averse, etc.).

Financial Services' researchers, such as Black et al. (2002) and Gerrard and Cunningham (2003) have more recently sought to appraise the theory of diffusion in the context of internet banking and establish if there are grounds for extending the theory. Gerrard and Cunningham (2003) for example, found that adopters perceived internet banking as being more convenient and more compatible with the adopter's lifestyle. Non-adopters perceived the service as being more complex and requiring a higher level of PC skills.

Mary Modahl (2001) an analyst at Forrester Research, has spent the past several years researching the impact of the internet on business, using questionnaires, focus groups and interviews. To make sense of the marketplace, she has developed a concept she calls "Technographics," an approach that examines and ranks computer users by their comfort level with technology and how likely they are to use the internet. This scheme yields three basic users: Early Adopters, Mainstream Users and Laggards. These groups can be further broken down into such subgroups as "Handshakers, Successful Professionals with low technology tolerance"; "Gadget Grabbers, lower-income consumers focused on tech-based entertainment"; and "New-Age Nurturers, affluent believers in technology for family and education.” Understanding this segmentation model, argues Modahl, is vital for companies eager to remain profitable. Role of technology in customer-company interactions and the
number of technology-based products and services have been growing rapidly. Although these developments have benefited customers, there is also evidence of increasing customer frustration in dealing with technology-based systems.

Polaris Software Lab (2010), In this study Polaris Software Lab Limited (POLS.BO), a leading Financial Technology Company, launched Intellect (TM) PRIVACY based on state-of-the-art technology and four patents filed by the Indian Institute of Technology Madras. IndusInd Bank has become the first bank in India to implement Intellect (TM) PRIVACY, an online and internet banking security card, for its internet banking customers. The technology will protect customers and banks from practically all kinds of phishing attacks, viz. deceptive e-mail, key/screen logger, brute force/dictionary attacks and Trojans, etc. Intellect PRIVACY uses multi factor, dynamic authentication technology providing for authorizing online banking transactions, in a completely secure platform.

Commenting on the innovation, Professor L S Ganesh, Coordinator of the programmer, said, "At IIT Madras, the Department of Computer Science and Engineering and the Department of Management Studies got particularly interested in designing an internet security technology that is cost efficient and easy to use in a rapidly growing E-commerce scenario, and transferring it commercially. We chose the Cost-Usability-Security (CUS) approach to arrive at a solution and Polaris Software created an eminently usable application for the banking industry. IndusInd Bank, which was looking for providing greater security for web based transactions, became the first organization to adopt it." Intellect PRIVACY is a simple plastic card that customers can use to generate a one-time password (OTP) for carrying out any kind of online banking transaction including the sign on. Banks can issue booklets containing a desired number of cards that would last many transactions. The card has no pilferage value by itself and customers can easily manage its life cycle, including making a request for a new booklet and reporting loss of cards through online banking.

Malhotra, Pooja & Singh, B. (2010), This study is an attempt to present the present status of internet banking in India and the extent of internet
banking services offered by internet banks. In addition, it seeks to examine the factors affecting the extent of internet banking services. The data for this study are based on a survey of bank websites explored during July 2008. The sample consists of 82 banks operating in India at 31 March 2007. Multiple regression technique is employed to explore the determinants of the extent of internet banking services. The results show that the private and foreign internet banks have performed well in offering a wider range and more advanced services of internet banking in comparison with public sector banks.

Among the determinants affecting the extent of internet banking services, size of the bank, experience of the bank in offering internet banking, financing pattern and ownership of the bank are found to be significant. The primary limitation of the study is the scope and size of its sample as well as other variables (e.g. market, environmental, regulatory etc) which may have an effect on the decision of the banks to offer a wide range of internet banking services. The purpose of the study is to help fill significant gaps in knowledge about the internet banking landscape in India. The findings are expected to be of great use to the government, regulators, commercial banks, and other financial institutions, e.g. co-operative banks planning to offer internet banking, bank customers and researchers.

The bankers as well as society at large will come to know where the banks lag in terms of adoption of internet banking and in providing different products and services. An understanding of the factors affecting the extent of internet banking services is essential both for economists studying the determinants of growth and for the creators and producers of such technologies. Moreover, this paper contributes to the empirical literature on diffusion of financial innovations, particularly internet banking in a developing country i.e. India.

ICMR (2010) the research organisation stated that, the most significant benefit of internet banking is the ready accessibility of bank accounts at all times. The inconvenience of visiting and waiting at the banks is also eliminated. This result in enhanced customer satisfaction reduced customer attrition and increased customer base. Internet banking considerably reduces transaction costs for the banks.
According to a study conducted by consultants Booz-Allen & Hamilton, the cost of an average transaction on the internet is as low as 13 cents, compared to $1.07 through the branch, 54 cents through the telephone and 27 cents through the ATM. The study also stated that internet banking helped banks reduce the branch load and attract future customers. In India, the cost of one banking transaction through the internet amounted to 10 paise to the bank, as compared to Re.1 through a branch, 45 paise through an ATM, 35 paise through phone banking and 20 paise through debit cards. The low transaction costs and the promising picture painted by analysts induced many banks in India to introduce internet banking services during the late 1990s. However, only few of them succeeded in moving beyond the launch of the website. ICICI's internet banking service 'Infinity' became the most recognized and popular service in the country, providing a wide range of products and services.

2.3 Conclusion:

The concluding remarks after studying above reviews of literature are as follows. Technological developments and the use of information technology (IT) have transformed the functioning of the financial sector in the country. Banks in India have used IT not only to improve their own internal processes but also to increase facilities and services to the customer. Furthermore, the large scale increase in the number of transactions handled by banks has enhanced the dependence of banking sector on modern technology, including use of computers. Apart from reducing transactions costs, the use of technology has also provided new avenues to banks to expand their outreach, especially in the remote and rural areas. The process of computerisation which marked the starting point of all technological initiatives, is reaching near completion for most of the banks.

The use of electronic payments, both retail and card-based, increased in recent years, reflecting the increased adoption of technology. The electronic payment systems such as electronic clearing service (ECS) – both debit and credit, national electronic funds transfer system (NEFT), card based payment (credit and debit) are becoming increasingly popular as indicated by the increase in transactions through retail electronic payment methods. Both the variants of ECS, i.e. ECS (credit) and ECS (debit) for direct credit such as salary and pension payments and the other for
direct debit such as collection of bills, insurance premia and equated monthly installment payments of loans are being increasingly preferred.
2.4 References:


