CHAPTER - II

REVIEW OF RELATED LITERATURE
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2.1 INTRODUCTION

Review of literature is essential for every research to give a good start for an investigation. Through the review of earlier studies relating to the impact of ICT towards bank employees, the various stages in which the researches were done over years and how such researches reached its present state of knowledge are understood. It is an indispensable part of the present study which enlightens the various dimensions of subject under study. In order to make the present study more consistent and more amenable and to infuse the element of vitality, an insight into the various research works already done in the field of impact of ICT towards bank employees in different areas at different times become indispensable. Hence, the present chapter briefs the reviews of earlier studies related to ICT and banking sector.

2.2 ICT IN BANKING INDUSTRY

Rangan et al (1988) in their study titled “The technical efficiency of U.S. Banks”, tried to measure the technical efficiency of banking industry, said that A total of 215 samples of banks were drawn from the Federal Deposit Insurance Corporation on the Reports of Condition and Reports of Income for year-end 1986. The analysis revealed that the banks could have produced the same level of output with just 70 per cent of the inputs actually used. This type of inefficiency was the result of wasting resources and almost all of the banks were operating at constant returns to scale. Besides, regression analysis indicated that technical efficiency measure was positively related to bank size and negatively related to product diversity¹.

Aly et al (1990), in their study titled “Technical, Scale, and Allocative Efficiencies in U.S. banking: An Empirical Investigation”, made an attempt to measure the pooled data of 322 banks for analysis has been collected from the Federal Deposits Insurance Corporation tapes on the Reports of Condition and Reports of Insurance for the year 1986. The study identified that inefficiency in banks mainly attributed to under utilisation or wasting of inputs rather than choosing the incorrect input combinations (allocative inefficiency). The study also revealed that there was no significant difference in efficiency between branch banks and non-branching unit banks and overall and technically efficiency were negatively related to product diversity and positively related to extent of urbanization2.

Dannenberg and Kellner (1998) in their study titled “The Bank of Tomorrow with Today’s Technology” evaluated that appropriate application of today’s cutting edge technology could ensure the success of banks in the competitive market. They evaluated the services of banks via internet as websites provide sophisticated line of products and services at low price. The authors analyzed that transactions via internet reduce the risk of data loss to customers, chance to cut down expenses, higher flexibility for bank employees, re-shaping the banks’ image into an innovative and technologically leading institutes, etc. The researchers found that banks could move one step further by entering into a strategic alliance with internet service provider. So, the bank of tomorrow stands to be feasible with today’s technology3.

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Lozana-Vivas (1998) in her study titled “Efficiency and Technical Change for Spanish banks” examined the effectiveness of deregulation in improving the cost efficiency of the Spanish banking industry by adopting Thick Frontier and Data Envelopment Analysis methods. Separate panel data for the years 1985-91 of 88 Spanish commercial banks and 55 savings banks have been considered for analysis. The study identified that deregulation was associated with a decrease in relative cost efficiency for commercial banks but no change for savings banks and in both types of institutions operating with cost inefficiency which was almost completely composed of technical rather than allocative.

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

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

Talwar (1999) in his study titled “IT and Banking Sector” examined the IT Revolution in banking sector which had not only provided improved service to the customer, but also reduced the operational cost. The author brought out that computerization of banks, introduction of Real Time Gross Settlement System, setting up of Infinet, Electronic Payment Products(such as Electronic Clearing Service) had ensured better resource management, systematic efficiency and substantially reduced inter-branch reconciliation entries. However fear of hacking, tampering of data, secrecy maintenance were certain issues which pose threats on usage of electronic banking. The challenges in banking sector were manifold but still the constitution

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of National Payment Council by RBI and development of the integrated payment and settlement system was a step in this direction to remove the obstacles coming in the way of using electronic banking\textsuperscript{7}.

Wenninger (2000) in his study titled “Emerging Role of Banks in E-commerce” evaluated the emerging role of electronic commerce in banks. E-commerce had created new form of competition and compelled banks to make choices about the services they offer, the size of their branch network and extent of their support to inter-bank payments network. The main objective of the study was to understand the changes that had taken place with the introduction of electronic commerce. Development of e-banking products such as electronic billing, establishing internet portals, electronic checks, ATM, etc. had provided additional services to customers’. The author also emphasized upon the strategic and operational risks which arise in banking sector. These could be minimized with a cost efficient electronic process\textsuperscript{8}.

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


helpful in improving customer service, increase systematic efficiency and thus increased productivity and profitability9.

Unninthan (2001) in his study titled “Impact of E-banking Adaptation on Australian and Indian Banking Sector” described the impact of e-banking adaptation on Australian and Indian banking sectors with the help of qualitative and quantitative analysis. The researcher found that Australia had a strong platform for e-banking growth with 37.7 per cent of population willing to engage in e-banking mostly in urban areas due to literate young working population with discretionary income. However, India by comparison was played by weak infrastructure, low PC penetration and consumer reluctance in rural sector. But the professionals are compelling the government and bureaucracy in the country to support and develop new initiatives at a faster speed of internet banking. However, in both the countries, e-banking was a successful strategic weapon for banks to remain profitable in a volatile and competitive market place10.

Aki et al. (2002) in her study titled “Management of Technology in Banking” highlighted the impact of technology in banking sector. New technologies cannot replace the branch network but these can support old methods of delivering the services. The author evaluated the structural change in Finnish banking sector from the period 1993 to 2002 which showed that 42 per cent of households have internet connection with banks and 90 per cent have mobile banking services. ICT has had both inter-sectoral and intra-sectoral impact. The author concluded that main goals

of management of technology were to improve customer satisfaction, reduce cost and develop new methods to collect and analyze the customer information\textsuperscript{11}.

\textbf{Alawode, et.al. (2002)} in their report titled \textit{“Information and Communication Technology (ICT) and Banking Industry”} viewed that Information and Communication Technology, the language of the new age and its grammar which is Science has become an indispensable and veritable tool for enhancing effectiveness and efficiency in all other aspects of life. Banking industry has learnt the grammar and understands the language of the new age and tremendously transforms the Industry from what it used to be to the economic mover of the whole wide world, through the magic hands of Computer Science innovations. The adoption of ICT in banks has improved customer services, facilitated accurate records, provides for Home and Office Banking services, ensures convenient business hour, prompt and fair attention, and enhances faster services. The adoption of ICT improves the banks’ image and leads to a wider, faster and more efficient market. It has also made work easier and more interesting, improves the competitive edge of banks, improves relationship with customers and assists in solving basic operational and planning problems. \textbf{This paper work analyses the impacts made by the Information and Communication Technology in the Banking Industry, and some of the unexploited areas of the Information and Communication Technology in the industry\textsuperscript{12}.}

\textbf{Alu et al. (2002)} in their article titled \textit{“The Effect of Information Technology on the Growth of Banking Industry in Nigeria”} reviewed that


\textsuperscript{12} Alawode et.al. (2002). “Information and Communication Technology (ICT) and Banking Industry”. Department of Computer Science, Federal Polytechnic Ilaro, Ogun State, Nigeria.
information technology was rapidly changing the banking industry. The study evaluated the impact of IT on the banking industry in Nigeria. The analysis was done through a structured questionnaire and out of 260 respondents, 86 per cent agreed that IT was really helping the banks, 83.1 per cent agreed that IT had a great positive impact on services rendered by the banks and 66.5 per cent disagreed that IT had an effect on services rendered by the banks. The study revealed that IT had appreciable effect on banks’ productivity, cashier’s work, banking transactions, bank patronage, bank service delivery and customers’ services. This affects the growth of banking industry because now customers can withdraw money from any branch of their bank.

The study also revealed that telephones, computer systems, LANs were available and being used by all the banks, while WANs, EFT and wireless phones were available in some of the banks. To make an effective use of e-banking, there should be adequate supply of power and that’s the major deterrent of e-banking technique used in Nigeria.

Durkin and Howcroft (2003) in their study titled “Relationship Marketing in Banking Sector: The Impact of New Technologies” evaluated that the banker-customer relationship was improved through mobile, phone and internet banking. The authors found that new technology has made the banks very competitive and profitable and internet has played a key role in it. Perception of bankers and customers regarding the use of internet was examined. They pointed out that as consumer usage of remote bank delivery channels increases, relationship management will become more important. Further, the combination of

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traditional and new delivery channels, if followed, can help to improve their productivity and profitability\textsuperscript{14}.

Joseph and Stone (2003), in their paper titled “Service Quality in Banking Sector: The Impact of Technology on Service Delivery” explored that customer friendly technology such as ATM, internet banking and telephone banking has been used by the banks to reduce the cost of providing services, and to increase the customer loyalty and market share. Technology plays a vital role in delivery of banking service. The study highlighted that access, location, security and ease of use of ATM machines appears to be the most important component for banking customers for the adoption of e-banking. However, banks should emphasize more on providing speedy and efficient service to the customers. Further, bank managers should conduct periodic marketing studies to understand the level of technological services by the customers so that adequate service could be delivered at the right time\textsuperscript{15}.

Lustik (2003) in her study titled “Electronic Banking in Estonia” analyzed the main criteria for successful inter-bank strategy and brought out benefits of e-banking from the viewpoint of banks, their clients and the economy in general. The author explained that banks in Estonia had achieved significant success in the implementation of electronic banking. The findings of the paper were helpful to understand the main reasons and factors responsible for the rapid growth of electronic banking. The author further revealed that making payment via e-banking creates overall economy savings to the amount of 0.93 per cent of GDP. Electronic banking


was not a small application to computer fans and innovative adopters, and a profound research was needed to map its customer base for the enhancement of value creation process\textsuperscript{16}.

**Mattila et al. (2003)** in their study titled “Internet Banking Adoption among Mature Customers: Early Majority or Laggards?” evaluated the electronic banking adoption in Finland. The study showed that the proportion of people in Finland, who have adopted online banking, was higher than anywhere else in the world. All the Finnish banks offered a full range of internet banking services. The researchers also found that different people have different attitude towards new technology. Some were innovators, who were interested in new technology and positive towards it. Some were early adopters and some were late adopters who have negative attitude towards it. Laggards had extremely negative attitude towards it. The study also found that matured customers were late adopters of internet banking. However, expensive start up, security and lack of personal service were main hindrances in the use of electronic banking. The study brought out that most customers found insufficient or non-existent training as the main reasons in the use of new technology, and also found web pages confusing and difficult to understand\textsuperscript{17}.

**Yu and Boon (2003),** in their study titled “Success Factors in E-channels: The Malaysian Banking Scenario” examined the implications of technological advances in the banking sector in Malaysia. An empirical study was made through a structured questionnaire. The results highlighted that electronic channels provide


alternatives for faster delivery of banking services to the customers. They described
that prior to adoption of electronic channels like ATMs, kiosks, internet banking;
investment costs must be identified to ensure a more cost-effective and efficient
execution of e-channel services. The authors analyzed the commercial banks in
Malaysia via frequency analysis and factor analysis. The results of the study
indicated that banks’ operation management was the main factor affecting the
success of ATMs, PC and branch banking, while product innovation and
knowledge development factors were found to have most significant effect on the
success of banking kiosks and phone banking respectively\(^{18}\).

De P K (2004) in his study titled “Technical Efficiency, Ownership and
Reforms: An Econometric Study of Indian Banking Industry” made an attempt to
estimate the technical efficiency of public, private and foreign banks in both pre-
reform as well as post-reform period by using the Stochastic Frontier Approach with
specification of Cobb-Douglas production function. The study used panel data of 65
banks from 1985-86 to 1995-96 have been obtained from the various reports of Indian
Banks’ Association. The results revealed that the liberalisation has no effect on
the efficiency of Indian banking industry but foreign banks were more efficient
compared to the public and private sector banks\(^{19}\).

Tejmani Singh N and Ranjeeta Devi (2005) in their article titled
“Information Technology in the Banking Sector” concluded that the information
revolution has undoubtedly changed the manner in which information is prepared,
packaged, delivered and used. Thus, IT has brought about a tremendous change in the


Banking Industry”. Indian Economic Review, 39(1), 261.
day-to-day activities of entrepreneurs. IT allows banks to be flexible in the way they do business by making it easy for customers to obtain cash or make payments electronically. It also provides very rapid changes in the balance of payments by cash or electronically and thus makes information about opportunities for investment more readily available. Banks can use IT to replace labour in some tasks and soft capital in others, add to hard capital or apply any combination of these. IT has reduced the distance and blurred the political, ethnic and national boundaries. Infosys, Wipro and NIIT are, for example, developing IT in both urban and rural India. Also armed with a technology backbone, banking will remain the best business model for managing liquidity and creating trust.

Shirley J (2006) in her study titled “The Impact of Information Technology on the Banking Industry: Theory and Empirics” examined that the effects of information technology (IT) in the US banking industry. It is believed that IT can improve bank’s performance in two ways: IT can reduce operational cost (cost effect), and facilitate transactions among customers within the same network (network effect). The empirical studies, however, have shown inconsistency on this hypothesis; some agree with the Solow Paradox, some are against. Since most empirical studies have adopted the production function approach, it is difficult to identify which effect has dominated, hence the reasons attributed have been the difference in econometric methodology and measurement. This paper attempts to explain the inconsistency by stressing the heterogeneity in banking services; in a differentiated model with network effects, we characterize the conditions to identify these two effects and the conditions for the two seemingly positive effects to turn negative in the equilibrium. The results

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are tested on a panel of 68 US banks over 20 years, and we find that the bank profits decline due to adoption and diffusion of IT investment, reflecting negative network effects in this industry\textsuperscript{21}.

Chu-Fen Li (2007) in her study titled “The Role of Information Technology in Operating Cost and Operational Efficiency of Banks: An Application of Frontier Efficiency Analysis” explored that how information technology, operating cost, and operational efficiency are related to each other in banking. It is well known that the adoption of information technology can reduce organizational operating cost and improve operational efficiency. However, the intuitive impacts should be evaluated in greater detail. This paper proposes a framework for measuring the performance of information technology application, which provides us with empirical evidence as follows. First, low operational efficiencies exist in the banking industry during the study period. These inefficiencies are in nature ascribable to a combination of both wasteful overuse of information technology resources and inappropriate scale of information technology investments. Second, operational efficiencies measured by two frontier efficiency analyses, data envelopment analysis and stochastic frontier approach, present a significant strong relationship. Third, for an individual inefficient bank, the operational efficiency can be enhanced if the total amount of information technology investments is enlarged. Fourth, the different ownership type has a significant effect upon the performance contributions of information technology application. Fifth, to enhance performance, banks can reduce operating costs by increasing the number of financial cards issued and improve operational efficiency by installing

more automated teller machines and providing customers with a wide variety of information technology services. Furthermore, the mutually-owned banks require a cutback in information technology personnel as well to enhance performance\textsuperscript{22}.

Achimugu Philip (2008) in his study titled “The Impact of Information Technology in Nigeria’s Banking Industry” presented the current trend in the application of IT in the banking industries in Nigeria and gives an insight into how quality banking has been enhanced via IT. The paper further reveals that the deployment of IT facilities in the Nigerian Banking industry has brought about fundamental changes in the content and quality of banking business in the country. This analysis and clarification of how Nigerian Banks have used IT to reengineer their operations is detailed through literature review and observation. Three categories of variables that relate to the use and implementation of information technology devices were considered in this paper. These include the nature and degree of adoption of innovative technologies; degree of utilization of the identified technologies; and the impact of the adoption of IT devices on the bank operations\textsuperscript{23}.

Agboola (2008) in her article titled “Optimizing the Use of Information and Communication Technology (ICT) in Nigerian Banks” identified that various Information and Communication Technology (ICT) in use and determined how they could be utilized for optimal performance on business transactions in the banking industry. The selected transactions for the study are deposit, withdrawal, enquiries, reference letters, opening and closing of accounts, funds transfer, special bills, loans


and overdraft. The study concluded that banks should incorporate ICT into their strategic plans for effective performance in payment and delivery systems. Adoption and allocation of ICT should be based on proper analysis to determine the type, nature and extent of products required for effectiveness and efficiency.

Salim Al-Hajri (2008) in his study titled “The Adoption of e-Banking: The Case of Omani Banks” addressed that what are the enablers and the inhibitors of e-banking adoption in the Omani banking industry. In this study, four perceptions issues were explored: relative advantage; organizational performance, customer relationship and ease of use. From an analysis of 15 semi-structured interviews, the findings revealed that all these four perceptions issues jointly provided an excellent understanding of what were the enablers and inhibitors of e-banking adoption.

Anyasi F I, and Otubu P.A. (2009) in their article titled “Mobile Phone Technology in Banking System: Its Economic Effect” mentioned that the mobile phone to provide financial services to those with or without access to traditional banks. This paper outlined vividly the use of mobile phone in the banking industry, its economic implications, and in general a systematic look into the various forms of mobile banking with emphasis on the security measures that makes the whole process safe for adoption. The emergence of mobile banking technology systems has implications for the general discussions about mobile telephony in the developing world. Existing theory about the significance of mobile communications in the developing world has focused on voice and text messaging. More so, the emergence


of mobile banking also underscores how, occasionally, innovations emerge from unexpected places and have the capability of reconfiguring the significance of a technology to its users, offering a way to lower the costs of moving money from place to place and opening a way to bring more users into contact with formal financial systems.

Krishna Murari (2009) in his study titled “Employee’s Perception towards Adoption of IT in Banking Service: A study of Indian Public and Private Sector Banks” revealed that State Bank of India (SBI) has become the first Indian bank to adopt technology and improving IT infrastructure as per the above said dimensions and ICICI Bank tops among private banks. New private banks and foreign banks have understood the mantra and hence appointing people with fresh and creative mind with full of knowledge of latest technology and whereas public bank depends on senior staff. The SBI has vast branch of networks in rural, popular and uneducated areas, to which the level of automation and efficiency of services are immaterial. According to the estimate made by the Swiss Banking Association in 2006, India topped the worldwide list for black money with almost $1,456 billion stashed in Swiss banks. This amounts to 13 times the country's total external debt. Many terrorist activities have been occurred in the past three year due to money laundering and reverse money laundering activities from banks in India. Government is taking steps to restore the credibility.

Sanath Jayasena (2009) in her study titled “Information and Communication Technology Usage and Bank Branch Performance” analysed

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that the relationship between Information and Communication Technology (ICT) usage and overall performance of bank branches done from a perspective of a leading commercial bank in Sri Lanka. Most of the banks in Sri Lanka are geared for comprehensive banking solutions with extensive branch networks. Empirical data collection was done in the year 2008 and analyzed with the theoretical data. A sample of 18 branches was selected using the non-probability sampling technique. Perceptions of branch managers, staff members and customers were collected using a survey method. All 18 branches selected are of an equivalent grade according to the grading set by the bank. Three types of questionnaires were designed for branch managers, branch staff and customers. Both structured and semi-structured questions were included in the questionnaires with 5 point and 4 point likert scale. Data analysis was done using bivariate correlation and linear regression. Pearson’s correlation coefficient was used to measure the linear relationship between variables.

The analysis revealed that ICT usage has a positive linear relationship with financial performance and quality performance of bank branches. Bank branch performance was found to have a correlation with factors such as staff attitude towards ICT usage, ICT literacy level of branch staff and scope and complexity of the ICT applications28.

Tauseef Ahmad (2009) in his study titled “Impact of Information Technology on Banking Accounting System - A Case Study of State Bank of India (Rajasthan)” stated that the impact of information technology on work life has been one of the most talked about issues over the recent years. Chief executive officers spending millions of dollars on information technology face the critical issue

of assessing the impact of this technology on work. In this study, the data collected from the financial statement of the State Bank of India have been analyzed with the help of different accounting and statistical tools. **The techniques used are Trend analysis and ratios analysis to record the performance of SBI particularly during pre and post introduction of IT**

**Madueme Ifeoma Stella (2010)** in her article titled “**Evaluation of the Impact of Information Communication Technology on Banking Efficiency**” discovered that information technology improved the efficiency of such banks after its adoption. **Hence the recommendations made are: increased investment in information communication technology by banks, diversification of software packages for greater operational efficiency supply, more favourable importation policies and encouragement of local industries that are into information technology acquisition, production and assembly by the government to achieve optimal performance and greater utilisation of information technology gadgets**

**Mohammad and Angela Lee (2010)** in their study titled “**Factors Affecting Bank Staff Attitude towards E-Banking Adoption in Libya**” aimed to bridge this gap by investigating the key factors affecting bank staff’s attitude towards e-banking technology, a step necessary to understand what makes effective the introduction of e-banking projects in Libya. **This paper draws on existing literature on technological developments in the banking industry and the findings from semi–structured interviews with key bank staff of a leading commercial bank in Libya. A number**

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of factors of e-banking technology adoption are identified that affect adoption. Finally, it identified lessons that can guide future e-banking implementation projects in Libyan banks. Lessons can be taken for other Arab countries\textsuperscript{31}.

Olorunsegun Shittu (2010) in his study titled “The Impact of Electronic Banking in Nigeria Banking System Critical Appraisal of Unity Bank PLC” viewed that the electronic banking system has become an important practice among commercial banks in Nigeria. The introduction of this electronic banking has improve banking efficiency in rendering services to customer, It was in line with this that the study aim at examine the impact of electronic banking system in Nigeria. Through the cluster sampling technique, data was collected by means of questionnaires from 40 Unity Bank officers and the result shows that Unity Bank electronic banking guidelines are in line with the CBN electronic banking guideline. The bank has an effective electronic banking system which has improve its customer’s relationship and satisfaction. To this end, It is recommended that the bank information technology training programme should be encourage among the staff of Unity Bank, necessary legal codes banking should be established in order to enhanced growth of the industry\textsuperscript{32}.

Rawani M and Gupta M (2010) in their study titled “Role of Information Systems (IS) in Banks: An Empirical Study in the Indian Context” made an attempt to explore empirically the difference in the role of IS in the banking industry, i.e., between public sector, private sector, and foreign sector banks operating in India.

\textsuperscript{31} Mohammad and Angela Lee (2010). “Factors Affecting Bank Staff Attitude towards E-Banking Adoption in Libya”. \textit{EJISDC}, 42(2), 1.

The study indicates that IS plays a supportive role in public sector banks and a strategic role in private and foreign sector banks. The study also indicates that the future impact of IS does not vary significantly with the banking groups.\(^{33}\)

**Mahardika Aditya (2011)** in his study titled “Factors Determining Acceptance Level of Internet Banking Implementation” stated that to determine the factors influencing acceptance level of internet banking by the bank customers in Surabaya. There are ten constructs compiled into a structural model to explain the customer acceptance level of internet banking, i.e. awareness of service, security, quality of internet connection, computer self efficacy, perceived usefulness, perceived ease of use, perceived enjoyment, trust, attitude towards using, and adoption intention. The data were collected using convenience sampling method by randomly taking all the bank customers that have used internet banking in Surabaya. Only 193 questionnaires were taken and analyzed due to some circumstances. The method of analysis is by means of partial least square (PLS) using the program of Smart PLS 2.0. The results show that the overall proposed hypotheses are accepted except two hypotheses relationship between awareness of service to the perceived usefulness and security to the perceived usefulness are considered to have no significant relationship. The management implication and suggestions for the banks as internet banking service providers are also discussed.\(^{34}\)

**Obasan Kehinde Agbolade (2011)** in their study titled “Information and Communication Technology and Banks Profitability in Nigeria” provided that the role of information in the actualization of various organizational objectives cannot be


over-emphasized has it ensure prompt delivery of resources essential to attain an
enviable ends. The contemporary business milieu is very dynamic and experiences
rapid changes due to creativity, innovation, hi-tech changes, increased perception and
demands from clients. Using a primary data sourced through a structured
questionnaire administered to selected banks in south-west Nigeria and the Ordinary
Least Square approach econometric techniques, this study examined the nature of the
relationship that exist between Banks Profitability and the Adoption of Information
and Communication Technology. The data analysis showed that a positive correlation
exists between ICT and banks profitability in Nigeria. **This implies that a marginal
change in the level of the investment and adoption of ICT in the banking
industry will result to a proportionate increase in the profit level. This is
confirmed by the level of the regression coefficient as well as the factor analysis
which revealed that an insignificant size of profit exist without the introduction
of the ICT.**

Sanjay Dhingra (2011), in his study titled “**Measuring IT Effectiveness in
Banks of India for Sustainable Development**” pointed out that Banks in India have
invested heavily on deployment of information technology (IT) in the past one
decade. IT over the years has become business driver rather than a business enabler.
Sustainable development of banks depends heavily on effective use of IT. **This calls
for measuring the effectiveness of IT in these banks. This paper identifies the
economic methods of measuring IT effectiveness on the basis of review of
literature on the subject.**

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35 Obasan Kehinde Agbolade (2011). “Information and Communication Technology and Banks

36 Sanjay Dhingra (2011). “Measuring IT Effectiveness in Banks of India for Sustainable
Uppal R. K (2011) in his article titled “Banking with Information Technology – Emerging Challenges and Potentials” concluded that transformation is taking place almost in all categories of the banks. This transformation will helpful to cope with new economic and financial policies of the banks. IT is playing a crucial role to create the drastic changes in the banking ind. particularly in the new private sector and foreign banks. The private banks take a big share of cake; our public sector banks are still lagging behind regarding the various financial parameters. The immense opportunities are also available for the public sector banks if they change/modify and adopt new policies to combat the different recent challenges. It can be concluded that mere introduction of IT alone will no be sufficient to bring necessary performance improvement and to get the competitive edge. Intelligent people are required to use such intelligent tools. Thus, even though IT management is a challenge flow in future banking scenario, marketing not technology is going to be the challenge. 

Yunus (2011) in his study titled “Technology innovation and Nigeria banks performance: The assessment of employee’s and customer’s responses” revealed that technological innovation influenced banks employee’s performance, customer’s satisfaction and improvement in banks profitability. The study recommends effective management of technological innovation for improved employees performance, customer’s satisfaction, sustainable profit, increased return on
investment, returns on equity, and to promote competitiveness in the Nigerian banking industry.

Alhaji Abubakar (2012) in his study titled “The Impact of Information and Communication Technology on Banks Performance and Customer Service Delivery in the Banking Industry” mentioned that information and communication technology (ICT) has become the heart of banking sector, while banking industry is the heart of every robust economy. If it collapses so will the economy. This is absolutely evident from current recession in European banks crises, and in turn. The effect of globalization, competition and innovation in the banking industry by its providers to offer their services makes essential the understanding of how various aspects of consumer behaviour affect the innovation and respond to customer service delivery. Within this context this paper has considered a critical literature review of previous researchers with the objective to examine the impact of Information and Communication Technology on banks performance and customer service delivery. This paper also makes of a critical review of peer reviewed, scholarly and organizational literature regarding the impact of ICT on banks’ performance to examine if banks have successfully achieved effective customer’s service delivery, by providing high level of customer service through online delivery channel, besides operating cost minimization and revenue maximization.

Alhaji et. al (2012) in their study titled “Information and Communication Technology in Nigerian Banks: Analysis of Services and Consumer Reactions”

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mentioned that the Information and communication technology has become an important practice among commercial banks in Nigeria. The introduction of ICT has improved banking efficiency in rendering services to customer. The role of ICT in the actualization of various organizational objectives cannot be overemphasized has it ensure prompt delivery of resources essential to attain an enviable ends. Business organizations, especially the banking industry is operating in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate with ICT at the centre of the change curve. ICT has resulted in new delivery channels for banking products and services in Nigeria such as the automated teller machines (ATM’s), mobile banking and Internet banking. In this context, the purpose of this study was to analyse the service and consumer reactions on ICT in the Nigerian banking industry, analyze the various electronic delivery channels utilized by commercial banks and to assess the consumers’ reactions to these delivery channels.

Kayode. Samson (2012) in his study titled “Information and Communication Technology: Effect on Profitability and Survival of Nigerian Commercial Banks” examined the effect of Information Technology on profitability and survival of Nigerian Commercial banks. Various literatures were reviewed that showed the effect of Information Technology on bank profitability and survival. Both primary and secondary data were used in the study. Chi-square technique was used in testing the study hypothesis. The study revealed that Information technology had significant impact on bank profitability and survival in that it encouraged the customers to increasingly patronize the bank and therefore the banks remaining

profitable. The study revealed that ICT development showed an increase in operation development. Therefore, it is imperative for bank management to intensify investment in ICT products to facilitate speed and enhancement of service delivery, convenience and accurate service. *The study recommended that the financial institution training centers should provide incentive for adequate training of financial (banking) personnel in accordance with the demands of the financial industry now and in the future*\(^4\).

**Morufu Oladejo (2012)** in his study titled “*Bankers Perceptions of Electronic banking in Nigeria: A Review of Post Consolidation Experience*” revealed that electronic banking has gained increasing popularity and thus attracted the attention of both academics and practitioners. This paper aims to collect bank employees’ perceptions of the potential benefits and risks associated with electronic banking in Nigeria most especially the post consolidation era. Primary sources were used to collect the data and were analyzed via mean score analysis. *The results suggest that bankers in Nigeria perceive electronic banking as tool for minimizing inconvenience, reducing transaction costs, altering customers queuing pattern and saving customers banking time. The consolidation era witnessed upsurge in Electronic banking. Similarly, bankers believed that electronic banking increases the chances of government access to public data, increases the chances of fraud and that there is a lack of information security*\(^4\).


Prof. M.C. Sharma and Abhinav Sharma (2013) in their article “Role of Information Technology in Indian Banking Sector” mentioned that the Information technology refers to the acquisition, processing, storage and dissemination of all types of information using computer technology and telecommunication systems. Technology includes all matters concerned with the furtherance of computer science and technology and with the design, development, installation and implementation of information system and applications. Information technology architecture is an integrated framework for acquiring and evolving IT to achieve strategic goals. It has both logical and technical components. Computer hardware, software, voice, data, network, satellite, other telecommunications technologies, multimedia are application development tools. These technologies are used for the input, storage, processing and communication of information. Information technology includes ancillary equipment, software, firmware and similar procedures, services etc. Modern high throughput technologies are providing vast amounts of the sequences, expressions and functional data for genes and protein. One of the most difficult challenges is turning this enormous pool of information into useful scientific insight and novel therapeutic products⁴³.

Basweti Ogachi Kevin et.al. (2013) in their article “Impact and Challenges of Information Communication Technology Adoption in the Tanzanian Banking Sector” pointed out that the banking sector across the globe is embracing ICT technologies and using as part of business strategy for expansion, revenue increase, extension of customer network and creating competitive advantage among banking institutions. This paper is an effort to investigate the impacts and challenges of ICT⁴³.

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adoption in the Tanzanian banks. The population is forty eight respondents, four managers were selected from twelve banks and out of the 48 questionnaires distributed, 42 were collected i.e 87.5% response, purposive sampling was used and the data collected was analyzed using SPSS, the researcher employed use of mean and standard deviation. The study found out that there is a need for bankers to educate public in the use of online banking products, invest more into ICT infrastructure and the government to reduce tax of ICT gadgets. This study recommends that individual technologies need to be investigated, impact of adopting other individual technologies, profitability and performance issues should also be investigated to open up and clear the way for policy and business decisions.

2.3 ICT IN OTHER INDUSTRIES

Yunus Adeleke Dauda (2005) in his article titled “Technological Change and Employee Performance in Selected Manufacturing Industry in Lagos State of Nigeria” examined that how employee relation could be employed for technological change management. It also seeks to determine effective method of using technological innovation for improved performance in the Nigerian manufacturing industry. Two hypotheses were formulated to determine the relationship between technological change and employee skill; and between technological change and employee performance. Question based on the hypotheses were formulated and 1256 questionnaires were distributed to select 30 manufacturing industry in beverages, textile, steel, cement and chemical industry in Nigeria.

Findings reveal that employee relations do not have significant relationship with technological change. The paper recommends that employee relation should be considered in the management technological change for profitability, competitiveness and survival of the Nigerian Manufacturing industry.

Satchidananda S and Srinath Srinivasa (2006) in his study titled “An ICT Based Framework for Improving Rural Credit Delivery” analysed that the flow of credit to agricultural and other rural activities in India for improving rural productivity and economic welfare. In this context, we propose an ICT-based solution for improving the delivery of credit and other services to the rural areas through unbundling and outsourcing of the rural banking operations. The solution involves setting up of a common infrastructure for rural data collection, information management and processing and sharing of the multi-service delivery channel by banks and other service providers with a view to substantially reducing the transaction costs and improving the speed and quality of delivery.

Meera Lal (2007) in his study titled “Information Technology Initiatives – Impact on Self Help Groups in India” analysed that innovations, efficiencies, merit analysis, professional and evidence based decision making should become the hallmark of national culture and be embraced by rural ICT. Commitment to the mainstreaming of gender parity issues and greater involvement of women SHGs are needed at all levels. As the prices of relevant technology and software like ATMs, biometrics, voice recognition, smartcards and PDAs continue to fall, more

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organizations will be able to take advantage of the benefits. Improvements will make operations secure, increase transparency and scalability, reduce repetitive tasks and provide data-mining capabilities to compete efficiently and manage operations better, in particular for rural development\textsuperscript{47}.

Singh Mohammad Nazim D K (2008) in his article titled “Impact of Information Technology and Role of Libraries in the Age of Information and Knowledge Societies” highlighted that the problems faced by the Library & Information Service (LIS) sector in India and achievements over the years using modern information technologies. The acquisition of knowledge has therefore been the thrust area throughout the world. The economy of present times depends no longer on visible resources and capital goods but on invisible knowledge and information. Therefore, poor nations as well as poor individuals can create wealth through active contacts and use of knowledge and information. Libraries of the 21st century can help fight poverty and narrow the gap between rich and poor. For the first time in history poor are getting opportunity to enhance their wealth through the creation and use of knowledge. And libraries are taking a central role in this notable movement\textsuperscript{48}.

Fredrick S. Odoyo and Gupta H.P (2009) in their article titled “Factors Hindering ICT Implementation in Indian Insurance Industry: An Empirical Study” concluded that insurance firms and other financial institutions in India planning to offer technology tailored products and services need to focus more on training their employees with information technology skills to make use of the


hardware and software already implemented. It was observed from the study that many insurance firms surveyed are focusing on implementing ICT systems but have forgotten those who will make them work. Among the factors hindering proper implementation of IT systems were low intentions of firms selling their products and services online, traditional attitudes and security reservations. The study will helpful to the legislators and regulators to realize the importance of setting up machineries to look after the security standards of products and services provided using various ICT systems. Laws should be properly defined to implicate the cyber criminal who may be out of crack and hack the network supporting the provisions of insurance services. The way forward seems easy when regulators, legislators, financial institutions and clients will come together, and cooperate to implement ICT systems in harmony49.

Geoff Walsham (2010) in his article titled “ICTs for the Broader Development of India: An Analysis of the Literature” analysed that many ICT-based initiatives have taken place over the last decade and some positive effects have resulted. However, the beneficiaries are almost always not the poorest or most disadvantaged groups, it is hard to scale up initiatives to have effects throughout India, and the need for attitudinal and institutional change remains a fundamental problem. It is argued that ICTs should not be seen as ‘silver bullets’ for development but neither are they irrelevant. Rather, they are potentially important contributors towards development in India but only through their integration in wider socio-technical interventions50.


Rosnaini Mahmud & Mohd Arif Hj. Ismail (2010) in their article titled “Impact of Training and Experience in Using ICT On in-Service Teachers’ Basic ICT Literacy” stated that the technology in schools does not necessarily mean high uptake by the teachers. Teachers need to equip themselves with adequate ICT knowledge and skills to be able to perform better as facilitators and designers of students’ learning. The aim of this paper is to report on a study that explored the impact of ICT training and ICT experience on teachers’ basic ICT literacy in terms of ICT knowledge, skills and attitude. The study employed a quantitative approach in the form of a survey. A total of 303 teachers were randomly selected as research samples. Data were gathered through a set of instruments consisting of an ICT attitude questionnaire, and ICT knowledge and skills tests. Data were analyzed descriptively and inferentially using mean, percentage, frequency and multivariate analysis of variance (MANOVA). Findings demonstrated that majority of the teachers had moderate basic ICT knowledge and skills, and perceived ICT positively. Formal ICT training and experience in using ICT were found to influence and contribute to teachers’ ICT literacy significantly. There is a felt need for more dynamic and proactive measures to be taken by the relevant authorities to ensure teachers are fully prepared to teach the 21st century students who are heavy users of technology in the real world outside the classroom 51.

Anand Rai (2012) in his study titled “The Role and Impact of Information and Communication Technologies (ICT) in Microfinance” stated that the Microfinance services available to the poorest people, especially investment loans for micro business development, are recognized as an important part of poverty reduction

strategies. As the industry matures, MFIs face a competitive environment, forcing them to balance the goals of outreach and sustainability. However, in spite of its successes, microfinance has not been able to reach to the poorest of the poor particularly in the low density population areas of Madhya Pradesh, Orissa, Bihar, Uttar Pradesh etc. in India. The main reason behind this gap is the cost of credit delivery. Information and communication technology (ICT) is an important driver and the great hope, although it brings with it fundamental changes to the microfinance delivery mechanisms that have become almost sacred for the microfinance sector.

This research is at the intersection of inquiry on ICT for development and the digital divide, the impact of microfinance, and the use of ICT in the financial services industry. We discuss the role and impact of ICT on outreach and sustainability at the industry levels.

Pankajakshi R and Shailaja M. L. (2012) in their article titled “The role of Information and Communication Technologies (ICTs) in Service sector” concluded that the great proponent of the national competitive advantage (Micheal Porter) observes that the major sources of competitive advantage are cost and quality. In one sense, the ICTs enable an organization to exploit all these sources in the best possible way. In the present context, the ICTs will enable the organization to exploit the advantages available through technological advancements to take timely decision. Because, they give right information at the right time to take decisions and implement the same. If timely decisions are not taken, then the competitors may overtake. In this way, the ICTs enable both the managerial decision making as also the purchase decision by the potential service seekers. Thus this is a double-edged weapon to

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improve the competitive advantage in service markets. Thus, the ICTs being what they are have become the defining feature of competitive advantage. Excellent competitors prosper and grow while wealthier rivals are restructured or go out of business. The only way to truly reform service sector is to reform the nature of competition itself.

2.4 CONCLUSION

The review of related literature narrated above makes it clear many researches were made relating to use of technology in banks, impact on profitability and effect on the performance of banks, ICT for customer servicing, use of ICT in other sectors like insurance, teaching, rural credit, microfinance, manufacturing and service sector. In another dimension the studies were frequently found at international and national level, formal literature on impact of ICT on bank employees is found missing at micro level, namely, a district of a state. Hence, the present analysis is a sincere attempt to fill the research gap on the title “A Study on Impact of Information Communication Technology on the Employees of Banks in Virudhunagar District”.