SUCCESS OF IMPLEMENTATION OF CORE BANKING SOLUTIONS – A STUDY OF FACTORS INVOLVED

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Certificate

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It is also certifying that relevant corrections and modifications suggested by the audience during the pre-synopsis seminar and the recommendations of the Doctoral Committee of the researcher have been incorporated in the thesis.

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DECLARATION

I **Ms.AyanaJohny**, part time research scholar, Reg.No. 3716, School of Management Studies, Cochin University of Science and Technology, hereby declare that the work presented in the thesis: "**Success of Implementation of Core Banking Solutions: A Study of Factors Involved**" being submitted to Cochin University of Science and Technology for award of Ph.D. degree under the faculty of Social Science is the outcome of the original work done by me under the supervision of **Dr.M.Bhasi**, Professor, School of Management Studies, Cochin University of Science and Technology, Kochi. This work did not form part of any dissertation submitted for the award of any degree, diploma, associateship, or any other title or recognition from any university/institution.

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ABSTRACT

Information and Communication Technology (ICT) has elevated from being just an organizational support system to becoming a driver for organization strategy and business processes. Technology and its applications are of strategic significance to current organizations. In fact, in an information rich economy, innovative and judicious implementation of Information Technology can effect cost reduction, upgrade product quality, improve customer service, or even integrate customer's operations with its own operations, thus ensuring repeated business (Bassellier,2004). Richard Nolan (1970) developed a growth model in which he envisaged that organization should pass through six stages of learning and growth before advance information systems are adopted. Nolan envisages that if a new information system is introduced in any organization before workers are comfortable with the ongoing system, or if too much information system is introduced at once, confusion and dislocation will result in system failure.Over the past few years, we have seen core banking solution roll outs happening in thousands of branches across the country – with banks grappling with the challenges of implementation and rollout. However these challenges have been gradually overcome and core banking solution has been successfully implemented. The CBS implementation was not in accordance to the theory propagated by Richard Nolan. Banks were at different level of technology adoption or different types of technology running parallel with the manual process and lacked technical skill in advanced systems. The researcher found that a holistic and clear picture of the core banking solution implementation process and the challenges posed and methods to overcome these challenges were not clearly understood and recorded in a comprehensive manner. Therefore there is a need to bring the experiences and insights of the CBS implementation process into a single model for better implementation of such large IT projects in service industry.

This study is descriptive in nature, and makes use of qualitative research techniques to explain how different factors contributed to the success of core banking implementation from the real life experience of the experts involved in the core banking implementation project. Two main questions the research tries to answer are what factors contribute to the success of information technology adoption and implementation and how the factors identified affect CBS implementation. In order to get a better understanding of the complex process of implementation, the entire process was seen as a combination of five stages, each of which involves a separate set of internal factors and process. Expert interview, banking industry scan and extensive literature review led to the identification of thirty four factors contributing to IT implementation success. The case study method of inquiry was employed to analyze how the factors identified affected the implementation stages. Four cases were selected. Data was collected through pre interview response form, in-depth interview and secondary evidence. In depth analysis of individual case and a cross case synthesis was done by developing a data array of the five stages of IT implementation and the detailed discussion of the factors drawing support from the existing literature.

The study results showed that IT implementation is a process of organizational change. As the outcome of the study the researcher developed a holistic model for successful information technology implementation in organizations. The model had the following stages: Decision to adopt a new technology - Gaining commitment of stake holders to the project – Organizational readiness for the project implementation – User acceptance of the new system – Routine use of the system. Each stage had its own set of factors which influence the success of each stage outcome and ultimately the success of the IT implementation as a whole.

Contents

Chapter -3
LETERATURE REVIEW 39-66

Chapter -4
RESEARCH METHODOLOGY 67-97

Chapter -5
CASE DATA ANALYSIS: INDIVIDUAL CASE ANALYSIS... 99-211

Chapter -6
CASE DATA ANALYSIS: CROSS CASE
SYNTHESIS AND DISCUSSION........................ 213-250

Chapter -7
RESEARCH FINDINGS, RECOMMENDATION
AND CONCLUSION.. 251-259

REFERENCES
APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVATIONS

ATM	Automated Teller Machine
ALPM	Advanced Ledger Posting Machines
BCP	Business Continuity Plan
BPR	Business Process Re Engineering
CRM	Customer Relationship Management
C.V.C	Central Vigilance Commission
CBS	Core Banking Solution
CRM	Customer Relationship Management
CD	Compact Disc
DD	Demand Draft
CIM	Customer Information Maintenance
DSS	Decision Support System
EOD	End of Day
EDI	Electronic Data Interchange
ERM	Enterprise Resource Management
GLM	General Ledger Maintenance
HO	Head Office
IDRBT	Institute for Development and Research in Banking Technology
ICT	Information and Communication Technology
IT	Information Technology
IS	Information system
LAN	Local Area Network

LPG	Liberalization, Privatization, Globalization
LPM	Ledger Posting Machine
MIS	Management Information system
PIRF	Pre Interview Response Form
POS	Point of Sale
RFP	Request for Proposal
RBI	Reserve Bank of India
RRB	Regional Rural Banks
SLA	Service Level Agreements
STP	Straight Through Processing
SBI	State Bank of India
TBA	Total Branch Automation
UAT	User Acceptance Testing

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Chapter - 1

INTRODUCTION

Contents	1.1	**Background of the Study**
	1.2	**Significance of the Study**
	1.3	**Problem Statement**
	1.4	**Operational Definition**
	1.5	**Key Research Questions**
	1.6	**Objectives of the Study**
	1.7	**Methodology**
	1.8	**Organization of Thesis**

The Information Technology (IT) Revolution has no doubt dovetailed cutting edge developments in every sphere of human endeavour. In fact, in information rich economy, innovative and judicious implementation of IT can effect cost reduction, upgrade product quality, improve customer service, thus ensuring repeated business (Bassellier and Benbasat, 2004).But what is too often overlooked is the fact that although IT can provide a number of solutions and benefits, they also beget their own set of problems and concerns in the organizational setting. Studies show that, the technical fragment of IT implementation is justone component of a series of events between initial decision for the adoption of technology and final evaluation. During that time, a wide range of factors, both internal and external to the organizational environment react with implementation processes and ultimately become part of the output value of the original technology investment.

1.1 Background of the Study

1.1.1 Theoretical Background

Information technology undergoes continuous and dynamic development. This means that organization around information technology cannot be uniformly regulated. Each organization learns from its experience with technology. Richard Nolan in 1973 developed a model that describes the growth and development of IT in an organization. The model divides the development of IT in an organization into different stages, with each stage having its own set of problems regarding the application, users and management of IT. Hence the factors for the management of IT in each stage will be different. The stages are shown in the figure 1.1.
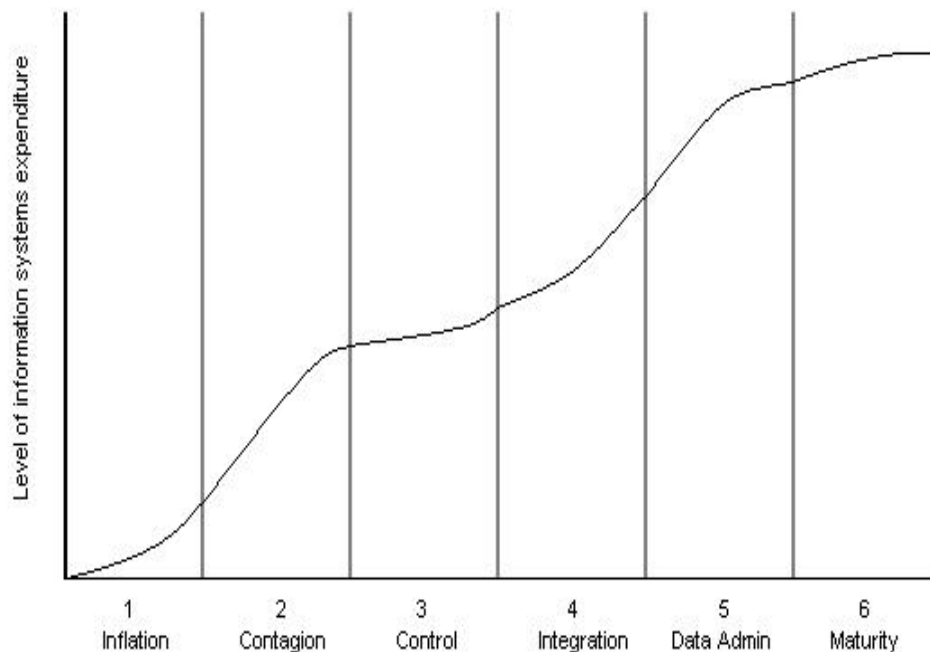
Source: Nolan and Koot(1979)Nolan Six Stages Model

Figure 1.1: Nolan Growth Model

Stages of the Growth Model

1. Initiation: an organization becomes acquaintance with automation. The main objective is to introduce automation to cost savings in labour intensive operations. Only computer specialists are involved. There is no user involvement at this stage.

2. Contagion: as organizations familiarity with the systemincreases, possibilities of more task automation are looked into. Users began to involve in system development. Link between the systems within the same department.

3. Control: a need for controlof the automated activities and cost emerges. Organizations start using standards and check list for automation process. User involvement increases.

4. Integration: organization computer systems linked with data communication and other technologies to achieve strategic advantages.

5. Data Administration: changes from internal oriented activity to external oriented activity. Support suppliers and customers. Different application architecture is mapped.

6. Maturity: the entire information technology will be demassed in the entire organization and will become strategy driven management resource.

Nolan also postulates an 'S' shaped curved in learning and growth, which describes the experience of most organizations with information technology. The curve shows slow early experience and learning and is

followed by a period of rapid learning and growth. Organizations should gain this learning experience before it can adopt new systems. According to Nolan managers who do not recognize the need to pass through theses stages jeopardize the ability of the organizations to implement efficient and effective information system. Nolan suggests that if a new information system is introduced in any organization before workers are comfortable with the ongoing system, or if too many information systems are introduced at once, confusion and dislocation will result in system failure. But in exceptional situations (heavy loss, merger/take over, industry and government regulations) the organization may decide to temporarily introduce an imbalance in the growth process and even to skip a few stages of growth process. Such situations are extremely risky but not completely impossible. If the organization have to leapfrog over the stages organization should have experienced and skilled managers, efficient planning and conducive organizational set up (Nolan and Koot, 1994).

1.1.2 Domain Background: Information Technology Adoption by Indian Banks

India is somewhat of a late comer to the technology revolution in banking. The process of computerization of the banking industry in India started in the mid-1980s. The stages of technology adoption in the banking industry are as follows:

Electro Mechanical Ledger Posting Machines (1980) is the use of electrical or small machines for posting ledger transactions. This breakthrough came in September 8th 1983 when the Indian's Banks Association signed its IV Bipartite agreement with Employee's union.

Advanced Ledger Posting Machines (1985) are standalone electronic ledger posting machines with attached memory modules to do ledger posting functionsfor computerization of the front endand back end operations of the bank, based on recommendations in the report of the Committee on Bank Mechanizationunder the chairmanship of Dr. Rangarajan, Deputy Governor RBI (1984).

Total Branch Automation (1990) system automated both the front-end and back-end operations within the same branch. Architecturally, some TBA was centralized solutions with a powerful central server maintaining the database, with multiple terminals. Deregulation was a major reason for this technology advancement.

Core Banking Solutions (2000) is a set of robust software components designed to perform the core activities in a bank. Basic functionality includes, customer information maintenance and accounting transactions processing. The CBS have developed over the years to include loans, deposits and integration of delivery channels and accounting standards. Presence of foreign banks with state of the art technology, pressure of the Central Vigilance Commission and technological advancements led to a fast adoption of CBS by banks in India.

Challenges in Core Banking Solution Adoption

Core Banking Solution implementation was not in accordance with the theory propagated by Richard Nolan. When banks went for CBSadoption, they had manual branches, ALPM branches and TBA branches running parallel. The IT departments were not fully developed and the user's involvement was limited. Most of the banks did not have any learning experience with past

systems. CBS was adopted more from pressure than an initiative. Moreover CBS was a large project spreading over 3-9 years, from the year of the project initiation. People from different level of authority were involved and people from different locations were working on the same project. By the year 2010 all the banks had migrated to CBS and are now stabilizing after the initial hiccups. Many Organizational, Technological, Individual, Project and External factors had playedmajor roles in the successful CBS implementation.

Way Ahead

IT vision document of the Reserve Bank of India(2011-2017) has set an agenda for commercial banks to move forward from their core banking solutions to enhanced use of IT in areas like MIS, regulatory reporting, overall risk management, financial inclusion and customer relationship management. It also dwells on possible operational risks arising out of adopting technology in the banking sector which could adversely affect financial stability and emphasizes the need for internal control, risk mitigation systems, fraud detection and business continuity plans. This shows that banks have a long way to go in technology adoption and use. The researcher feels that this is the right time to learn from the experiences of the CBS implementation project and get an understanding of the factors helped in the success of CBS implementation. This learning experience can help in the future technology projects which in turn can help in time and cost saving from project failures.

1.2   Significance of the Study

According to Ward (1995) an in-depth understanding of the specific issues related to IT implementation is essential for the establishment of appropriate principles and effective approaches with regard to the management of large information system in an organization. Each individual issue is

important in its own context as well as producing multiple impacts which affect the organization and implementation of IT within it.The banking and financial industry is transforming itself in unpredictable ways, powered in an important way by advances in information technology. While IT offers new opportunities to the banks it also poses many challenges as innovation of IT applications, blurring of market boundaries, new competition, change in business model, and changes in organizational set up (Liao and Cheung, 2001). However, to successfully cope with the challenges of new technology, banks must understand the nature of the challenge and the capability barriers it presents (Southard and Siau, 2004).In such cases banks should gain organizational capabilities and resources for smooth adoption of these technologies.

Over the past few years, we have seen core banking solution roll outs happening in thousands of branches across the country – with banks grappling with the challenges of implementation and rollout. However these challenges have been gradually overcome, with appropriate amount of planning, innovation of process and technology. In the area of IT in banking, a good portion of the research conducted prior to this study (Prakash and Malik 2008, Sharma 2009, Agbolade 2011, Tater ey.al 2011) tends to focus mainly on the acceptance of technology products like internet banking, mobile banking. There are also studies which focus onindividual issues in IT implementation or different factors for successful IT implementation. A holistic picture of the implementation process and the factors for successful CBS implementation is lacking. This study gives a holistic view of the different stages of IT implementation, the issues in each stage and the factor for successful IT implementation. With hundred per cent CBS rollout in Indian banks, the researcher feels that this is the right time to learn from the experiences of CBS

implementation project.An investigation into the CBS implementation process and learning from the experience and insights of the implementation experts and implanting the factors contributing to successful IT implementation, into a holistic model, can act as a blue print for large information technology projects.

The study is significant because it provides:

1.   A discussion of different stages of IT implementation along with the issues each stage has and the factors for overcoming the issues.

2.   Incorporation of the learning experience of technology implementation experts into a holistic model for successful IT implementation that can act as a base model for service sector organizations for large IT implementation projects.

1.3   Problem Statement

The successful implementation of IT in any organization depends on a multitude of important and interrelated factors (Beaumaster,1999). Over the past two decades efforts have been made by researchers to get a better understanding of the problems surrounding IT adoption, their use and impact in organizations. Unfortunately very few research regarding this topic specifically address the process of IT implementation especially in financial sector. Much of the research currently available in this regard comes from research and experiences in the manufacturing sector. Studies conducted in financial sector are mostly using the Technology Acceptance Model. Management Information System literature also speaks about the technical aspect of the system development and implementation stages, not much is

spoken about the organizational readiness for acquiring software and the implementation procedure.

With increase in competition from foreign banks which state of the art technology and pressure from Central Vigilance Commission to clean up the historical data and to adopt specific data reporting procedure, Indian banks did not have the time to wait for their existing system to scale up to meet the requirements. They had to go in for the advanced banking solutions available in the market. With manual branches, standalone computer systems and total branch automation systems running parallel, bankswere posed with a great challenge of CBS implementation.

In the words of a banker:

"Changing a CBS for a running bank is like changing the engine of a 747 jet in midair. The success or failure of such project often has a career altering effects on the people involved".

However these challenges have been gradually overcome, with appropriate amount of planning, innovation of process and technology. Now it is time for the banks to move beyond CBS and adopt more advanced technologies. The experience and learnings from the CBS implementation project can act as a blue print for the upcoming technology projects. But the review of the banking industry literature and the interview of the experts in banking and banking technology reveal that the experiences and learnings from such large IT project have not been captured. TheCBS projects were mostly handled by IT consultants, who no longer are a part of the organization. People who worked in the project are now in different branches in different parts of the country. Hence the problem for the study can be stated as:

Core Banking Solution was a very large organizational wide, long duration implementation project, involving different level of people at different span of time. A holistic and clear picture of the implementation process, the challenges posed and methods to overcome these challenges were not clearly understood and recorded in a comprehensive manner. Therefore there is a need to bring the experiences and insights of the CBS implementation process into a single model for better implementation of such large IT projects in service industry.

1.4 Operational Definition

The study looks at IT implementation from the school of thought which viewsany new technology adopted by an organization as an innovation and implementation as an organizational change process. The theoretical definitions are taken from this school of thought.

Implementation

Theoretical definition: Klein and Sorra(1996) "Implementation is a critical gateway between the decision to adopt innovation and the routine use of the innovation within an organization".

Operational Definition:*all activities in different stages between- the decision to adopt a Core Banking Solution and the routine use of the Core Banking Solution in the bank.*

Implementation Success

Theoretical definition: Klein and Sorra(1996) "For implementation to be a success, the application should be no longer perceived as something new, and the targeted employees use a given innovation consistently and well"

Operational Definition:*for CBS implementation to be a success the application should be no longer perceived as something new, all the employeesstart using the Core Banking Solution consistently and well.*

Implementation Factors

Operational Definition: all those factors which helped the organization for better adoption and diffusion of IT within the organization.

1.5 Key Research Questions

The primary objective of the research is to build a holistic model integrating stage wise technology implementation process with the factors affecting the stage wise outcome. This study will be based on the experiences of CBS implementation carried out in Indian banks and the existing literature on IT adoption and implementation.The two main questions the researcher tries to answer are '**WHAT**' factors contribute to the success of CBS implementation, and '**HOW**' the factors identified affected the implementation process.

Researcher's attempt to understand the different stages of CBS implementation for better understand of the issues related to the stages revealed that CBS implementation did not follow specific stage process. Banks purchased a competent software solution and implementation was mostly a trial and error method. So in order to getcommand of the many issues surrounding the problems of CBS implementation and to identify the factors which helped to overcome those issues, this study breaks down the implementation into five stages adopted from the six-stage model of IT implementation by Kwon and Zmud (1987). The stages were:

Initiation – Adoption – Adaptation – Acceptance - Routinization

Factors contributing for successful IT implementation were related to the stage wise outcome. A detailed discussion of the related literature is presented in the next chapter. The research questions for this study are:

- What factors contribute to the success of adoption and implementation of Information Technology in organizations?

- How the factors identified affect the stage wise outcome of implementation process?

- Can the factors identified be aggregated and categorized into different stages of implementation depending on their impact on the stage wise outcome?

1.6 Objective of the Study

To answer the above research questions, the researcher sets the following research objectives,

1. Todivide Core Banking Implementation process into different stages.

2. To identify the factors influencing successful implementation of CBS.

3. Categorizing of the factors identified into different stages depending on their impact on stage wise outcome.

4. Develop a model incorporating the stages and factors affecting the stage wise outcome for successful implementation of information technology

1.7 Methodology

The research strategy used in the study is Descriptive Research using Case Research Method. The case study research method has been shown to be relevant to situations where understanding the relations between information related technologies and organizational contexts are important (Orlikowskiand Baroudi,1991) and where the focus is on understanding the dynamics present in single settings. The research designed used in the study is a holistic multiple case design, where the entire bank is taken as a single unit of analysis and studied in detail. The study focuses on four cases instead of one thus a multiple case design. To answer the research questions of 'WHAT' and 'HOW' the factors affect the success of CBS implementation, the research process was carried out in three stages. The first two stages answer the question 'what' by identifying the factors affecting IT implementation in organizations and in third stage case study was carried out to answer the question 'how' the factors affect the implementation process. The three stages are as follows:

1. **Factor Database Creation** - The researcher started with an interview with the banking experts. Based on the expert opinion and literature review a six-stage model of IT implementation developed by Kwon and Zmud(1987) was modified and selected to serve as a foundation, because it allows to comprehensively explore the process of IT implementation and fits in the operational definition of implementation. This stage also acted as the base stage for the development of the factor database. A database of factors contributing to the success of IT implementation was developed from literature review, expert opinion and the banking industry review

2. **Consolidation of Factors** - This stage linked the initial gathering of general information about the factors to description of the main factors affecting the implementation stages. The factor data base was mailed to the experts for revaluation and consolidation. Thirty Four factorswere found to be important for the study.

3. **Case Study** - Case study method of inquiry was used to find the answer for the research question, how the factors identified affected the success of CBS implementation. A sample of four cases was selected. Data was collected through a pre interview response form (PIRF) and in-depth interview and secondary sources. The PIRF acted as a base for the development of the in-depth interview questions. The in-depth interview was conducted by developing a case study protocol. The use of the case study protocol was to increase the reliability of the data collection method. The data collected was analysed and single case and cross case descriptions were developed.

1.8 Organization of the Thesis

In chapter 1, an introduction and background information to the study is given. The remaining chapters are as follows:

Chapter 2 – Technology adoption in Indian banking industry, gives the literature support for the basis of the study. The chapter looks into technology adoption stages in the banking industry. The Core Banking Adoption and Implementation process, challenges in CBS implementation and the factors helped in successful CBS implementation and finally describes the motivation for the study.

Chapter 3 – Literature Reviewshows the review of literature under four heads- general IT literature, IT implementation process literature, Implementation success factor studies and studies on Core Banking Solutions.

Chapter 4 – Research Methodologydiscusses the methodology used for the conduct of the research the data collection tools and the data collection method employed.

Chapter 5 – Case Analysis: Individual Case Analysisdiscusses the data analysis methods used and proceeds to analyse the four individual cases.

Chapter 6 – Cross Case Synthesis and Discussions first looks for the similarities and differences in each case with interpretations from the case synthesis, the chapter then proceeds to the discussion of the stages of IT implementation and the factors involved based on the cross case synthesis.

Chapter 7 – Research Findings, recommendations and conclusion show the findings of the research, the model proposed based on the findings, the limitation of the study and the conclusion.

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REVIEW OF TECHNOLOGY TRENDS IN INDIAN BANKING INDUSTRY

Contents	2.1	Establishing the Need for Mechanization and Computerization
	2.2	Significance of the Study
	2.3	Core Banking Solution
	2.4	Motivation for Research

Indian banks are somewhat a late comer in adoption of technology in banking.The process of computerization of thebanking industry in India started in the mid-1980s. It had adifficult beginning due to many reasons such as, opposition from trade unions, lack of technology infrastructure and skilled manpower. Fortunately, there has been asignificant change in attitude and the Indian banking industries well on the road in using the full potential of computers andcommunications technology. This chapter introduces the different phases of technology adopted by Indian banks, the challenges faced and factors which helped the banks to overcome the challenges. This industry review is limited in scope as it focuses on only technology trends starting from 1980. The industry review was conducted by review of secondary data collected from articles, documents, text books, Reserve Bank of India reports and Institute of Development and Research in Banking Technology reports from the year 1980. The purpose of this chapter is to identify the context in which the study took place and the conditions which motivated the research.

2.1 Establishing the Need for Mechanization and Computerization

2.1.1 Growth of the Banking Industry

In India, introduction of computers in financial sector began in a small way in early sixties. Life Insurance Corporation was perhaps the first to introduce a computer in 1963 for maintaining and processing of Insurance policies.Indian banking sector was not seriously drawn towards mechanization of operations, particularly with regard to customer related activities. Banks focused on mass recruitment which was also a part of their strategic social goal. In such an environment banks feared that computerization would result in large volume of retrenchment and unemployment. It was at this time that SBI introduced ICL 40 column punched card equipment to help with the reconciliation of large volumes of inter branch transactions. In early 1960s SBI brought its first computer (an IBM 1401 supported by a battery of about one hundred 80-column punched card machines) to assist the reconciliation. TheNationalization of the major public sector banks in 1969 marked a new era of Indian Banking System. One and half decade growth of Indian Banking since nationalization (1969-1985) is evident from the increase in bank branches from 8200 to 52700 in, deposits from 4600 cr. to 85800 cr., advances from 3600 cr. to 56300 cr.(Source RBI website). These expansion and the diversification of the banking activities and the spread of the banking activities to semi urban and rural areas have subjected the bank managers to meet the demands of increased manpower, specialized skill in various fields and better customer service and better housekeeping. The management, therefore, watched with keen interest any new developments on the technological scene that may help them in ensuring effective functioning of the bank and accepting new challenges ahead. Fortunately the experience in computerization and

mechanization gained by the counterparts in USA, England and Japan helped and guided the Indian banking sector to overcome their problem.

While there was tremendous growth in the banking system in terms of both volume and diversity of activity, certain traditional aspects of banking, viz. accounting and internal control, close monitoring of the borrower account, housekeeping and customer service were not apparently in place. Thus computerization of basic branch activities became essential for the smooth functioning of the banks. The following points highlight the need for computerization.

1. Fast Reconciliation – Rapid expansion of the branches and rapid increase in the customer baseresulted in huge increase in the daily transactions. Lakhs of transactions were done manually. However this was costing the banks not only in monetary terms but also in terms of delays, intermittent frauds, which could be detected only after months.

2. Better Customer Service –Being a service industry, banks sell their services. The success of the banks thus depends on the range and the quality of the service provided. Manual systems of operations have led to improper branch timings, delay in bank transactions like cheque encashment, cheque issue, DD issue, passbook updating etc.

3. Improving Housekeeping–The report of the committee headed by EraSezhian submitted to the parliament in 1984 recognized the importance of housekeeping in banks (cited in Farhat 1988). According to the committee, the situation in respect of accounting and balancing of books at various levels were alarming. Out of 28 public sector banks, 12 could not even furnish details of position of outstanding inter bank accounts even after one year of closing.

4. Information for Control and Decision Making –Head office of the banks performs two major functions - planning and control over branches. For proper planning and controlling information have to be collected about deposits, advances, foreign exchange business, transaction volumes, frauds, complaints, manpower, salary, expenditure etc.

2.1.2 Regulatory Changes

2.1.2.1 Bipartite Agreement

The need for computerization in banks was felt for a long time, but only a few banks like State Bank of India and Indian Overseas Bank had their own in-house computers, which were used for centralized information processing. Likewise RBI used computers for basic statistical processing. Other than this, there was no major breakthrough in the Indian banking Industry till 1980. A major breakthrough came in 8th September 1983 when the Indian Banks Association signed its IV Bipartite agreement with Employee's union. This agreement paved the way for computerization in Indian Banking Industry even though in a limited way.

The settlement covers two aspects – Computerization and Mechanization.

a) Computerization – the settlement provides that computers and mini computers may be used in the banks for
*   Clearing Operations
*   Reconciliation
*   Transfer/remittance of funds
*   Foreign exchange transactions
*   Management of investments
*   Management of information systems
*   Personal inventory, provident fund and pension

- Inventory control
- Merchant banking
- Salary and pay roll

b) Mechanization – the settlement also provides that accounting machines, electric/electronic, other than computers can be used in

- Current accounts
- Savings bank accounts
- Cash credits and loan accounts
- Other deposit accounts
- General ledger accounts
- Salary and pay roll

2.1.2.2 Rangarajan Committee Report

After the above settlement the other landmark was the appointment of the 'Committee on Mechanization in the Banking Industry' under the chairmanship of Dr.C.Rangarajan, Deputy Governor of RBI (1984). The major recommendations of the committee were as follows:(reproduced from the report)

1. Mechanization should cover all branch transactions and activities at Regional and Head Office.
2. Branch level mechanization to be based on two model of mechanization.
   a. Model I – Installation of astandalone electronic ledger posting machine, with attached memory modules. The main purpose will be to maintain general ledger and enter transactions. The system also works out interest calculations and preparing statement of accounts for the customers.

b.   Model II – Large capacity microprocessor based system to be installed. Besides performing the above mentioned functions of the TBA, this machine will do additional functions of printing returns and statements for the branch operations.

3.   Pilot implementation of any one of model in selected branches of the banks.

4.   The zonal office to be the centre for receiving data from branches and conducting data editing and data cleaning. For this zonal office should be equipped with microprocessor based system and offline data entry machines.

5.   The computer system in the head office should be main frame system with online enquiry terminals. The main activities to be computerized are processing of statutory and other statistical returns, reconciliation of inter branch transaction cash and investment management, payrole, provident fund accounting and personal inventory.

6.   Mechanization should be implemented, in two stages. The first stage should cover three years from 1985 to 1987 and stage two should cover two years from 1988 to 1989.

2.2   Technology Adoption Phases of Indian Banking Industry

Information Technology (IT) has basically been used for communication and connectivity and business process re-engineering. IT facilitates sophisticated product development, better market infrastructure,

implementation of reliable techniques for control of risks, and helps the financial intermediaries to reach geographically distant and diversified markets (Sharma, 2009). Till 1980 there was no major computerization effort, banks like SBI was using electro mechanical machines which were electrical or small machines used for posting ledger transactions. The software packages for banking application in India had their beginnings in early 1980. This set phase for computerization and automation (Mishra 2001).Different phases can be seen in the table 2.1.

Table 2.1: Phases of Technology Adoption by Indian Banks

1970-1980	1980-1985	1985-1990	1989 -2000	2000-2010	2010- onwards
Manual					
Manual	**Electro Mechanical LPM**				
Manual	Electro Mechanical LPM	**Advance Ledger Posting Machine**			
Manual	Electro Mechanical LPM	Advance Ledger Posting Machine	**Total Branch Automation**		
Manual	Electro Mechanical LPM	Advance Ledger Posting Machine	Total Branch Automation	**Core Banking Solution**	
Manual		Advance Ledger Posting Machine	Total Branch Automation	Core Banking Solution	
					Core Banking Solution

2.2.1 Advanced Ledger Posting Machine (1985)

ALPM is a standalone electronic ledger posting machines with attached memory modules to do ledger posting functions at different counters or a single counter. The data was stored in the single machine. The focus here was mainly to computerize front end operations. Even though banks started installing ALPM, there was no major computerization of the back end activities. Housekeeping was in a mess. The only benefit was that the ledger balances need not be manually calculated. However the pace of automation was very slow due to lack of infrastructure facilities, lack of skilled manpower, and opposition from trade union. To quote the words of former RBI governor Dr. Subbararoo,

"during the initial days of IT implementation at Reserve Bank, systems had to be smuggled into the office when the world was sleeping."(extracted from the key note address on May 18th 2009 at IDRBT)

2.2.2 Total Branch Automation (1990)

The second wave in computerization started by late 1980's, after the second Rangarajan Committee report in 1989.Banks went in for total branch automation.This automated both the front-end and back-end operations within the same branch. Architecturally, some TBA wascentralized solutions with a powerful central server maintaining the database, with multiple terminals.Others went in for distributed processing with multiple PCs as nodes linked on a LAN. The Platforms used ranged from simple UNIX-C to powerful RDBMS such as Oracle etc.

The technology behind TBA was:

- At each branch there was a server

- Necessary nodes were connected to the server

- A copy of the TBA program was brought to the branch from HO in CD and loaded to the server

- The database of the branch was also loaded in the server

- The transactions were entered in the respective nods

- The staff dealing with respect operations was in the position to view the relevant screen and input data

- The data gets updated in the server

- At the end of the day all activities of the node would be closed.

- The system administrator would perform the day end operations.

- This would enable closing of the accounts for the branch for that day, which includes preparation of cash book, list of transactions, journal, trial balance and the ledger.

- The day end transactions were copied to a CD or Floppy and sent to the HO for consolidation and record keeping

- A person was designated as System administrator

- He was also the data base administrator and network administrator.

- Duties of the system administrator include – creation of users for the respective application, perform the day end operations.

- The concerned person was reporting to the branch manager

With the introduction of TBA the tedious work of maintaining manual records and tallying was avoided.All day books that were necessary along with the totals will be available soon after the closing of the transactions.Processing of data in HO was simplified since all data was available in the system.Reconciliation was made faster since data was available faster. But as far as customers were concerned they could not feel any advantage since they had to wait for long time to get their transactions done.

Shortfalls of TBA Project

- Local implementation of software -Different branches of the same bank had different versions of TBA package.

- Lack of good infrastructure facilities

- Software and hardware crunch

- Whenever some changes required to be made in the master data like interest rate change, branches had to wait for the master floppy to reach from HO

- The floppy was loaded by the branch manager with help of the system administrator. This led to problems like changes are not implemented in the way expected or wrong floppy loaded.

- Branch managers were usually busy with operations and performance rather than paying attention to the technology. Hence necessary procedures to ensure that the correct data was uploaded were not strictly adhered to

- As EOD can be done only after consolidation, creation of suspense accounts became a practice in branches.

- The introduction of TBA did not cut away jobs that failed to add value to a business process. The only job that the clerks do not have to do is to arrive at a reduced balance after debiting the customer's account.

- The machine spews out perfect printouts at the end of the day eliminating the need to balance books, but that was in no consolation to the customers, who failed to understand the recurring delays despite introduction of computers.

2.2.3 Core Banking Solution

The third wave in computerization started with the Liberalization Privatization and Globalization policy in 1991. Deregulation and privatization attracted foreign banks with state of the art technology to our country. Moreover the era marked technological revolution.The customers were becoming more techsavvy. The Indian Banks were finding it difficult to hold on and retain customers with the existing computerization. Early 2000 marked the age of Core Banking Solutions.Next section details the CBS adoption by Indian Banks.

2.3   Core Banking Solution

With the LPG policy many new foreign banks entered India with state of the art technology. There was also technological revolution happening with many IT companies coming up with banking software solutions. Appendix A shows the CBS provided by different firms.

Core banking solutions (CBS) act as the epicenter for all systems running in a bank, and it forms the technological platform of the bank. CBS is a set of robust software components designed to meet the challenges of today's banking market.IT empower banks to transform their business,

leveraging agile new generation technologies. With the advancement of technology, core systems tend to cover more and more functionalities, providing the bank with an integrated solution for most of its operations in varied business lines. A core banking system resides in the heart of a bank's data centre and provides a central operational database of customers' assets and liabilities. It enables a 360-degree view of a customer's relationship with the bank.

Core Banking Solution has been classified into different levels on the basis of functionality available for addressing needs of various business lines. Figure 2.1 shows the application levels of CBS.

Traditional Systems –Basic CBS which has customer information maintenance, which maintains all the information about the customer, general ledger and transaction posting.

Matured Systems - Systems from Level 3 onwards can be classified as mature systems, which offer a moderate spread of functionality required to run a medium sized bank efficiently.

Advanced Systems - Systems falling in level 4 and beyond can be classified as more advanced system – primarily aimed at large banks operating in multiple business-lines and offering a large gamut of products and services to its customers.

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
					Accounting Standards Regulations
				STP Delivery Chanells	STP Delivery Channells
			Delivery Channels CRM	Delivery Channels CRM	Delivery Channels CRM
		Report Writing Trade Finance Multi currency Handling	Report Writing Trade Finance Multi currency Handling	Report Writing Trade Finance Multi currency Handling	Report Writing Trade Finance Multi currency Handling
	Loan Deposit	Loan Deposit	Loan Deposit	Loan Deposit	Loan Deposit
CIM GLM Transaction	CIM GLM Transaction	CIM GLM Transaction	CIM GLM Transaction	CIM GLM Transaction	CIM GLM Transaction

Figure 2.1: Application Levels of Core Banking Solutions
(Abbrevations asper the list of abbrevations)

2.3.1 Architecture behind Core Banking Solutions

In CBS all the servers, central database server that store that data of the bank, central application server that runs core banking solution, other servers like ATM server, internet server, web server are centrally located, in central data centre of the bank. All the branches are connected to the data centerthrough a leased line or any other network connectivity with security and redundancy. The figure 2.2 depicts the technology and connectivity details in the implementation of CBS.
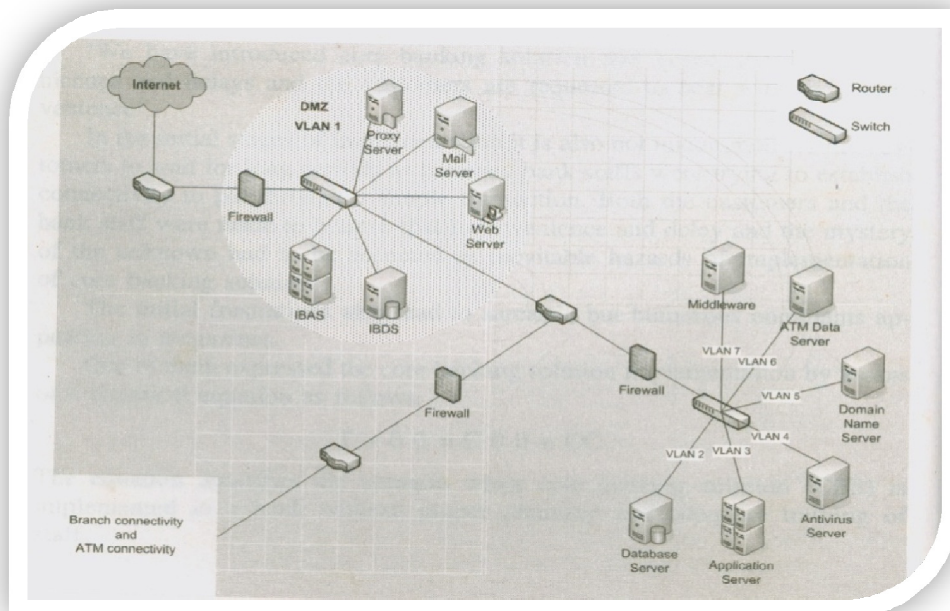
Source: Revathy et.al.(2011): Core Banking Solution

Figure 2.2: Core Banking Solution Architecture

Most of the servers are placed behind a firewall and protected from unauthorized access. All the servers are not in the same Local Area Network. They are segregated using the concept of virtual local area network which has its own built in security. The application server hosts the core banking

application. It is a powerful and robust system that performs all the core banking operations. In the branches, only a client version of the application that merely collects data from the user and performs basic validations is installed. The application server receives data from all the client machines installed in the branches and performs necessary operations and updates the database.

2.3.2 Core Banking Solution Implementation Strategies

The implementation strategies followed by banks mainly depends on its size of operations and most importantly, the vendor's comfort level and experience with the adopted strategy. Analysts broadly classify implementation into three areas

- Big Bang - The entire bank moves onto the new platform at same time

- Regional Migration - In this approach the bank works on geographical patterns – moving different regions one by one onto the new platform

- Line of Business - In this approach the bank moves different lines of business slowly on the new platform.

- Parallel runs - Here, the banks runs its old system parallel alongside the new one

2.3.3 Key Core Banking Solution Implementation Activities

Working paper on core banking implementation by Satchidananda et al. points out the key implementation activities as:

Current System Study- In order to ascertain the finer aspects of the bank's business, a current system study is usually done at the customer site. At the end of the current system study, a detailed document of the gaps needs to be prepared and submitted to the customer. Objective of current system study is to understand Bank's existing business practice.

Business Process Re-engineering- This process enables the bank to re-look at its age old practices and try to adapt to new methodology in order to bring in efficiencies in the system.

Business Process Definition:The objective of this process is to map the business processes closely to the system. This is where generally the chart of accounts, GL structures etc, product definitions are crystallized.

Data Migration:Data Migration is a very critical activity in the Implementation process. This basically means transferring of the data from the old system to the new system seamlessly with the least possible disruptions in the day-to-day business of the bank.

System Integration Testing: System integration is a systematic approach to build the complete software structure along with the interfaces as specified in the design from unit-tested (individually tested) modules. While doing system integration testing, tests are conducted to find defects associated with interfacing. The purpose here is to ensure than all modules which may be customized to meet the bank's requirement work in a complete unison in an integrated scenario.

UAT: User Acceptance Testing is a functionality test (to validate the software product against the requirements specification by testing the entire system. It

tries to show discrepancies between a product's attributes and the requirement).

Pilot Implementation: This can be either Big Bang (centralized Bank) or implementing one branch or identified set of pilot branches and then rollover of branches (De-centralised Bank).

2.3.4 Core Banking Solution Implementation Challenges

The challenges a bank tends to face during implementation are numerous including technical challenges and business challenges. But more than the technical challenges it is the business challenges which have more impact on the organization. Studies of failed Core Banking Projects points out the following as the major challenges for any CBS implementation project.

ProlongedProject: The implementation project on an average takes place anywhere between 6 months to a year depending, on the degree of customization required. If the vendor has in place good implementation processes, the implementation time can be reduced. Generally a few branches are chosen and networked under the new system, and once all the issues are settled, it will be slowly extended to other branches of the bank. This process is called 'going live'. This is reported to have taken up to nine years.

Business Process Re-engineering:BPR basically implies that the current processes used to perform a function are inefficient. With the implementation of CBS the processes have to be aligned with the 'best of the breed processes' that comes along with the CBS. Hence BPR means review of current processes. It might be possible that a process can be scrapped altogether, combined with another process and make it a single process, replacing an

entire process with a new process. All of this necessitates that the bank revisits each and every process, identify the bottlenecks and prepare for a change. Invariably implementation of CBS is accompanied by BPR and the banks must be ready for this change.

Data Migration: Porting of legacy data to the new system. Since data is very crucial and secretive to a bank it is very important that the data is migrated from the current system successfully into the new system. Care has to be taken in porting. Before the implementation the bank might share some of its data with the implementation partner for testing purposes.

Top management Commitment: It is another aspect crucial for a successful implementation. The top management should be very committed and positive to the project. It should field its best employees from IT and business into the project and they should stay till the project is completed. Another important aspect from an Indian perspective is the management should also allay any employee fears about retrenchment. All the concerned employees must be informed and well trained to accept the new system.

Ownership: Most of the bankers felt that core banking implementation is the project of the IT department. Technology department of most banks were not fully developed, this forced the management to depend on the external consultants for CBS implementation. There was always conflict between the bank IT team and the consultants.

Delay in Finalizing the User Requirements: There was a lot of delay from the bank side in finalizing the user requirements; this was mostly because of the inability of the banks to distinguish between "wish list" and "must-haves."

Resistance to Change: The banking staff's preference for existing processes and their reluctance to adopt newer, out-of-the-box functionality processes from new solutions was a common problem in all the banks. Resistance to change was mainly because the branch users were mostly not involved in the system development stage. The banks also did not have proper change management procedures in place.

Expectation Management: Stake holders at different levels have different expectations from the implementation of CBS.

Ambiguous Roles and Responsibilities: Change in the project management team at the bank level, during the project lifecycle; this often results in inadequate knowledge transfer, which in turn results in requirements and key issues not being addressed properly.

Coordination and Communication:Many core banking transformation programs face challenges midway through the project due to lack of coordination and lapses in communication between the vendor and the bank project management teams.

Documentation:No proper documentation on the implementation process and the people involved. Lack of historical information on geographical customizations made on the legacy core systems, resulting in the existence of multiple versions of the legacy system.

2.3.5 Implications of Core Banking Solutions

The advanced technology infrastructure supporting the core banking solution and high standard of business functionalities provides financial institutes a competitive advantage

- Better CRM through robust operational customer database and customer administration

- A customer belongs to the bank –Anywhere banking facilities

- Improved customer service and cost savings

- Flexible financial products

- Reduction of human errors

- Multi-currency operations

- 24/7 , 365,banking activities

- Anywhere banking facilities

- MIS for compliance, risk management and profitability analysis

- Rationalize process infrastructure which in turn leads to cost reduction and increased operational resilience

- Extend data structures to support banks specific needs and reduce maintenance and upgrading cost.

2.4 Motivation for the Research

The last few years have witnessed an explosion of Information Technology (IT) based initiatives which have brought about a sea change in the banking sector of the country. The Reserve Bank has been at the forefront of IT initiatives with broad directions outlined by its IT Vision Documents. The latest in this series is the Information Technology Vision Document, 2011-2017 which aims at providing a road map towards a transformation which is knowledge based and which has Information as its focal point. The vision document states that.

In today's technologically advanced environment, Core Banking Solution (CBS), does not remain an edge anymore, but has become the basic prerequisite for any bank. Building on this, banks need to move on to adapting higher technology in order to provide better products, upgrade their risk management systems, improved MIS, regulatory reporting, Knowledge management , financial inclusion and relationship management.

This shows that banks to remain competitive should package their products and services and deliver them through convenient, user-friendly channels. Only by integrating people, processes, and technology across business lines, banks will be able to forge a portfolio of virtual banking services based on the proclivities of specific customer market segments.Technology is indeed a differentiator not only in terms of competitive advantage, but also in terms of administrative and back end process. But due to rapid technology deployment in Indian Banking sector, the "haves "and "have-nots"gap is all set to narrow quickly. Any new technology or technology enabled process can act as a differentiator or a competitive advantage for some levelof time. After that time technology still has to be adopted as a necessity.

Extracts from the key note address of Dr. Subbararoo, former Governor,RBI on May 2009 at IDRBT:

> *"Differentiation is attained not achieved just through technology. It is gained in the way technology is selected, implemented and utilized.*
> *No doubt deployment of IT offers ample rewards, but these rewards can be claimed only by organizations which successfully address the alignment of IT with the organization. Globally, after technology adoption, 90 per cent of the banking staff is involved in "front office"*

jobs of enhancing customer base and ensuring customer loyalty. Only 10 per cent of the banking staff is involved in "back office" jobs. The situation in India even after the adoption of CBS is exactly the reverse. A large part of our back office staff is still heavily involved in the preparation and submission of various returns and it is seen as the ICT system's failure, either in design or its implementation and usage".

In the study by Ward (1995) they state that an in-depth understanding of the specific issues related to IT implementation is essential for the establishment of appropriate principles and effective approaches with regard to the management of information system in an organization. Each individual issue is important in its own context as well as producing multiple impacts which affect the organization and implementation of IT within it. Subsequently effective management of IT across the board can only take place when more comprehensive understanding of the myriad of issues is achieved. This study tries to look at the implementation activities carried out by four major banks in India, the challenges they face and the factors helped banks to overcome the challenges and implement the CBS. By doing so the researcher tries to build a holistic model incorporating factors for a successful IT implementation.

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Chapter - 3

LITERATURE REVIEW

Contents	3.1	**Review Process and Classification Frame Work**
	3.2	**IT : General Background Literature**
	3.3	**Review of ITImplementation Process Literature**
	3.4	**Review of IT ImplementationFactorStudies**
	3.5	**Review of IT Adoption Studies in Banking**
	3.6	**Gaps from Review of Literature**

Information Technology (IT) is the bedrock for national survival and development in a rapidly changingglobal environment, and challenges us to device bold and courageous initiatives to address a host of vitalsocio-economic issues such as reliable infrastructure and other essential issues of capacity building. Theimpact of IT on individuals, organization and society is changing everything. The present extent of technological revolution that the world is witnessing as IT has become the vehicle or majorengine of the information age which has reduced the world to a global village.The modern economic environment which is dominated by globalization, hyper-competition, and knowledge and information revolution has revolutionized the way business is conducted (Pavic et al., 2007). This new technological epoch is apparent through the intensified investment in computer-processing and data preparation appliance in the manufacturing and service industry and telecommunications infrastructure, and its widespread usage in government agencies, educational organizations, and more recently, in the households.

3.1 Review Process and Classification Frame Work

An extensive literature search was carried out primarily to understand the concept of Information technology, the definitions and applications. This mandatesthe inclusion of Management Information System books and academic journals. Major databases searched were done in ProQuest, Jstore, IEEE Xplorer, EBSCOB, Google Scholar, RBI website, websites of banks, core banking vendor websites and IDRBT website. The main search was based on the descriptor "Information technology adoption and implementation" and "factors affecting IT adoption and implementation".

The research articles were classified into four main theme groups. Table 3.1 shows the classification framework for literature review.

Table 3.1: Classification Frame Work for Literature Review

Main Theme	Sub Theme Identified	No.of Papers	Books	Others
General IT	• Concept • Delineating –IT • Delineating – IT implementation • IT applications	15	4	
IT implementation – Process	• Implementation process • Implementation Adoption and Diffusion	25	4	
IT implementation - Factor	• Implementation issues • Implementation success - factors • Research Methodology employed	40		2
Studies in IT adoption in Banking	• Technology adoption studies in banking • Core Banking Studies • Research Methodology employed	8	2	5
TOTAL		88	10	7

3.2 IT: General Background Literature

Marchand (1985) identified four stages of the evolution of MIS. He speaks about objectives, types of applications and management styles which represent the corresponding era. The first era of data processing was viewed as the era when the main focus was on improving the efficiency of business through automation of basic information process. There was little relationship of management to technology. The second era – of MIS, focused on the improvement of the managerial effectiveness by satisfying wide spread information needs.Managers at all levels came to realize the power of information technology. Business schools and organizations focused on developing management frameworks that would bring together disparate systems and produce MIS perspective across the whole organization.

The third era was that of the strategic information system approach, which makes use of the strategic management techniques in their models and focuses on structure, strategy, systems, style, skills, and shared values. The fourth era consists of networking of the whole organization. The table 3.2 shows the stages of IS development.

Table 3.2: The Stages of Information System Development

1950 – 1960	Data Processing (Electronic data processing, Transaction processing System)
1960 – 1970	Management reporting (MIS)
1970 – 1980	Decision Support (DSS)
1980 – 1990	Strategic and end user support (Executive information system, Expert system)
1990 – 2000	Enterprise and internetworking (internet, intranet etc)

Source: Compiled from MIS text books

3.2.1 DelineatingInformation Technology

Information Technology (IT) is concerned with technology to treat information. The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications are its main fields. The term in its modern sense first appeared in a 1958 article published in the *Harvard Business Review*, in which authors Leavitt and Whistler commented that "the new technology does not yet have a single established name. We shall call it information technology (IT)." (Pavic et al, 2007) Some of the modern and emerging fields of information technology are next generation web technologies, bioinformatics, cloud computing, global information systems, large scale knowledge bases, etc. Advancements are mainly driven in the field of computer science.

Techopedia explains Information Technology (IT**):** Information technology refers to the acquisition, processing, storage and dissemination of all types of information using computer technology and telecommunication systems. Technology includes all maters 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 and 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 products.

Carr and Smeltzer (2002) defined IT as the use of automated purchasing systems, supplier links through electronic data interchange (EDI), and computer-to-computer links with key suppliers and finally information systems.

According to Attaran(2003) Information technology is capabilities offered to organizations by computers, software applications, and telecommunications to deliver data, information and knowledge to individuals and processes.

The term Information Technology is a broad based term used generally to describe the techniques and technologies,methods and applications which support activities involving the creation, storage, manipulation andcommunication of information (Principally computing electronics and communications) together withtheir related methods, management and applications.The technologies, which are elements of IT, are identified as follows:

- Information Machine e.g. Computers.
- Media Communication for example Radio and Television.
- Telecommunication technologies and equipment e.g. satellite, fibre optics cables, facsimilemachines.

Others are video and other electronic media forms which have been developed so that their functions canbe integrated into single IT systems. Example of some top Information Communication Technologiesinclude: video

conferencing, Internet Technology, digital subscriber line (DSL), Extra-Nets, speechrecognition, Internet Chat, Biometrics, electronic books, Avatars, intra-nets, private networks, remoteconnectivity.

However the most popular aspect of IT is the Internet. Although there is no generally accepteddefinition of the Internet, most industry commentators would agree upon a description of the Internet as a "network of networks" or "an ocean of resources waiting to be extracted". It is therefore a communicationnetwork among computers, which is based around three key technologies:

- Packet-switching: Packet switching is a protocol used in dividing messages into packets (messages orfragments of messages) before they are sent. Each packet is then transmitted individually and can evenfollow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message.

- Client-Server Technology: A distributed computer system technology that allows a computer to accessandutilize the services available on another computer.

- Transmission Control Protocol/Internet Protocol:This is a set of software protocols that establishes themethod with which data is transmitted over the Internet between two computers regardless of their make, type or Operating System. Telecommunication infrastructure in particular has become the driving force ofIT; it has linked various IT elements together to provide a converging platform for these elements.

Theconvergence of the various elements of IT has enhanced development in all spheres of human endeavour

3.2.2 DelineatingInformation Technology Implementation

Tech target describes implementation as "Implementation is the carrying out, execution, or practice of a plan, a method, or any design for doing something. As such, implementation is the action that must follow any preliminary thinking in order for something to actually happen. In an information technology context, implementation encompasses all the processes involved in getting new software or hardware operating properly in its environment, including installation, configuration, running, testing, and making necessary changes". According to Klein and Sorra, (1996) "Implementation is a critical gateway between the decision to adopt innovation and the routine use of the innovation within an organization. For implementation to be a success, the application should be no longer perceived as something new, and the "targeted employees use a given innovation consistently and well".

The Klein and Sorra (1996) article deals with innovation implementation in general, but it seems that information technology implementation from strategic information systems plans is covered by their definition of an innovation: "a technology or a practice used for the first time by members of the organization, whether or not other organizations have used it previously"

Rhodes (1985) used the following definition of implementation of new technologies: We use the word "implementation" to include awider range of activities than is generally meantby the term. In general, the term

implementationhas usually been taken to relate to the process ofputting policy intentions – "decisions" - into action.In the case of new technologies, the relevantactivities may include: the acquisition of newequipment, consumables and so on; the undertakingof associated construction work - increasing floorloading, installing services etc.; equipmentinstallation; consultation; training; cost control;commissioning; and handover. The activitiesinvolved can be highly complex, depending uponthe nature of the project, and can involve highlevels of uncertainty. We divide the implementationprocess into four phases: an initiating phase whichembraces the initial stimuli for technologicalchange and the many elements of thedecision-forming processes such as thedevelopment and assessment of policy alternatives;a planning phase; the application phase; and aconsolidation phase which is concerned with fullcompletion of the many elements of a project andwith the stimulation and formalization of thepost-application phase".

3.3   Review of IT Implementation Process Literature

There was only limited literature related to the topic process of IT implementation in organizations. MIS books, mainly speak about the technical process of implementation.

Hussain(1995) in his book described the system development life cycle as follows
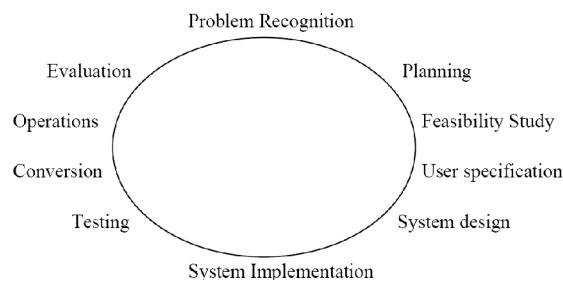
According to O'Brien (2008) the system implementation stages include hardware and software development, testing of programs and procedures, conversion of data resource and a variety of conversion alternatives. It also involves the education and training of end users and specialists who will operate the new system. The stages of IT implementation according to O'Brien are:

- Acquisition
- Software Development
- Data Conversion
- Training
- Testing
- Documentation

The above literature mainly looks at the technical side during the implementation process. They do not deal with many of the organizational and personal factors which can affect the implementation of a system and its subsequent use.

There is another group of researchers who looked upon the implementation process as a change process for the entire organization. The earliest study was that of Lewin (1952).

Lewin (1952), talks about three stages of organizational change unfreeze – freeze- refreeze. Unfreeze help members of an organization to free themselves from the patterns of behaviour and mind set prior to change, freeze helps in learning new behaviour patterns and refreeze is confirming the behaviour patterns. The Lewin's view on the change process made many

researchers recognize "system implementation as a change process and system designers as a change agents" as noted by Ginzberg (1979).

Kolb and Frohman(1970) see the implementation as a change process. The stages of IT implementation process suggested by them are:

1) Scouting - Assessing needs and abilities.

2) Entry - Developing initial statement of problems, goals, and objectives; developing commitment and trust; establishing "felt need" for change.

3) Diagnosis- Gathering data to define problem; assessing available resources.

4) Planning- Defining specific operational objectives; examining alternative solutions and their impacts; developing an implementation plan.

5) Action- Implementing the preferred solution; responding to changes, unanticipated consequences.

6) Evaluation- Assessing how well objectives were met; deciding to evolve or terminate.

7) Termination- Confirming new behaviour patterns; completing transfer of responsibility to users.

Kwon and Zmud (1987) based on the Lewin's change model developed a six stage model for technology implementation. According to them the implementation process is generally treated as a special case of the process of management of innovation and organizational change. The stages suggested by Kwon and Zmud are:

Stage 1: Initiation- Where a thorough analysis of the organization internal and external setting is made, which uncovers a problem or opportunity for technology adoption.

Stage 2: Adoption - Rational and political negotiations ensuring organizational backing for implementation of the IT application.

Stage 3: Adaptation - The process and practices of the organization is reviewed and changed to match the new technology adopted.

Stage 4:Acceptance - The end user starts to use technology

Stage 5: Routinization - Usage of IT application is encouraged as a normal activity

Stage 6: Infusion - Increase Organizational effectiveness with the routine use of the new technology.

In this research the researcher have adopted this model of Kwon and Zmud as the base for implementation stages.

Another stream of research involved the development of theories and models that are more oriented towards the content of IS implementation and use. This research stream produced an assortment of factors that seems to influence IS acceptance and utilization through study of IS Success, IS Effectiveness and User Satisfaction (Bailey and Pearson, 1983; Delone and McLean, 1992; Seddon, 1997; Moore and Benbasat, 1991). In addition, a number of models and theories of individual acceptance have been developed. These models provide an important theoretical foundation for studying how various users, and technological and environmental influences, can predict,

explain and determine the use of IS. However, due to its rich content and various research approaches taken, this part of the IS research has been challenging to describe (Benbasat and Zmud, 1999). The accepted theories and models of individual information system acceptance are as follows

Davis (1989) proposed a model called Technology Acceptance Model, whichhelps to predict the user intention to accept information system. The main constructs which he propounded was Perceived Usefulness, that is how the new technology will be useful, Perceived ease of use is the degree to which a person believes that using a particular system would be free from effort affects the attitude towards using a new technology which in turn affects the behavioural intention to use and actual use of a system.

Joshi (1991) proposed a model of 'Users Perspective to Change'. The model is based upon equity theory, which is a well-established and widely used theory in social sciences. Users employ three levels of analysis in evaluating the change introduced by an implementation. At the first level of analysis, a user is viewed as assessing a change in terms of the gain or loss in his or her equity status. At the second level of analysis, the user is viewed as comparing his or her relative outcomes with that of the organization. Finally, at the third level of analysis, the user is viewed as comparing his or her relative out-comes with that of other users in the reference group. Users who evaluate the change to be un-favourable in terms of inequity or loss of equity are likely to be distressed by the change and resist it. The E-l model provides a useful framework of analysis, for improving our understanding of users' assessment of a change. Managers will find the model useful for overcoming resistance to change during implementation.

Rogers (1983) proposed 'Innovation Diffusion Theory', which postulates the category of adopters as innovators, early adopters, early majority, late majority and laggards. The three types of innovation decision as optional innovation decision, collective innovation decision and authority innovation decision. The five stages of innovation adoption process are knowledge – persuasion – decision – implementation – confirmation.

Goodhue and Thompson (1995) proposed a model 'Task Technology Fit Model', where he used task technology fit construct ad a measure of IS success. He argues that the users give evaluations based not only on inherent system characteristics, but also on the extent to which that system meets their task needs and individual abilities.

3.4. Review of IT Implementation Factor Studies

Factor research has identified various elements of the organizations internal and external environment that are likely to lead to a successful implementation, the end result is a fragmented summary of disparate factors.Kelin and Sorra (1996) state that to know what issues should be raised and resolved throughout implementation process, would allow for better control over the outcome of IS implementation, thus increasing odds of success of the innovation. Thus this section tries to identify various issues in IT implementation and the factors which helped to overcome these issues.It can be seen that major studies in factor research started from the year 1981 onwards. Till 1981 major focus was on the process of IT implementation. From 1980 scholars, Michael.J.Ginzberg, Markus, Kwon and Zmudstarted research on the factors affecting different stages of the IT implementation process. The major studies in factor research in the ascending order of the year of the study are discussed below.

Zmud and Cox (1979) identified four factors which lead to a success in IT implementation. The factors are (1) the user assuming overall responsibility for implementation, (2) the active involvement of all affected organizational members, (3) a thorough and continuing education program, and (4) establishing mutual trust among participants so that a free exchange of ideas is possible.

The study on factors started mainly from the work of Ginzberg. The three articles published by him in the year 1979 and in 1981, were found to be basis for many of the later studies in factors affecting IT implementation in organizations.

The article by Ginsberg (1981a) 'Early Diagnosis of MIS Implementation Failure: Promising Results and Unanswered Questions', reports on a longitudinal study of user expectations as predictors of project success or failure. The results strongly suggest that users who hold realistic expectations prior to implementation are more satisfied with the system and use it more than users whose pre-implementation expectations are unrealistic.

In the same year Ginzberg (1981b) published another article, Key Recurrent Issues in the MIS Implementation Process, This article attempts to identify generic implementation issues - those issues which arise at many process stages. An empirical analysis identified six such issues, and suggested that three of them were quite important for differentiating between successful and unsuccessful MIS implementations. The six issues identified were extent of project definition and planning, organization commitment to the project, breadth analysis, user responsibility for system, commitment to change, user ownership of system.

Markus (1983a, 1983b)examined the use of a production planning and profit analysis system in two manufacturing plants. Her study showed that the plant which accepted the new system showed higher degree of user participation than the plant which rejected it. Markus proposed a distribution of power model to explain the different reaction to a system. The case study showed that resistance to a new technology can be attributed to internal political issues and the power associated with them.

Kwon and Zmud (1987) identified five major con-textual factors which impact processes and products associated with the six stage model of IT implementation process developed by them. These factors relate to characteristics of the user community (job tenure, education, resistance to change), characteristics of the organization (specialization, centralization, formalization), characteristics of the technology being adopted (complexity), characteristics of the task to which the technology is being applied (task uncertainty, autonomy and responsibility of person performing the task, task variety), and characteristics of the organizational environment (uncertainty, interorganizational dependence).

Baronas and Louis (1988) talks about the importance of user involvement and implementation team skill in the success of an IT implementation. They noted that the implementation of a new system is likely to represent a threat to the user's perception of their control over the work they do. This will lead to user resistance to any changes related to the new system. They suggested that users should be involved right from the start so that their inhibitions can be removed. They also talk about the implementation team composition. The implementation team should comprise of members with the right skill set and knowledge sets within interpersonal, computer system and

organizational areas. The skill and experience of the implementation team as well as the ability to build strong relationship between the user ad the provider of new system is a significant factor in success or failure of implementation.

Walton (1989) in his book mention five aspects that must be part of any IT development and deployment process, they are: priority attention and commitment of resources, the process must be extended one, the process must be inclusive, organizational value must be an integral part of the guiding factor, technological and organizational aspect must develop in conjunction and parallel with IT requirements.

Hiltz and Johnson (1990) Reviewing what exposure to various technologies the users had in the past, and how confident they are in their computer capabilities, can help define what additional computing support or computer training should be provided. They also pointed out that knowing the users' attitude toward computers and innovations can give an extra key to successful implementation as it would help to recognize how users will feel about the new system

Nelson (1990) in his article 'Individual adjustment to information driven technologies: A critical review', represents a comprehensive approach incorporating organizational, work group, and job factors that affect individual adjustment. The range of individual adjustment indicators should be broadened to include facets of satisfaction, organizational commitment, job involvement, collaboration among workers and worker performance.

Beath (1991) in his article supporting the IT champion states that the presence of the project champion has a positive effect on the implementation

success. The champion can be an opinion leader and change agent, who inspires others to adopt innovation and accept change.

Orlikowski (1992) the main observation made by him is that workflow patterns, work procedures, routines, reward systems, control and coordination mechanisms affects the end users ability and motivation to successfully adopt and use IS innovations. The institutional structure needs to be shaped in ways that facilitate an appropriate use of technology to accomplish work. The actions that can be undertaken to ensure successful implementations are: instituting new structures, new performance control systems, new coordination mechanisms, and changes to performance goals.

Weill (1992), in his study on a firms investment in IT and a firms performance proposed a conversion effectiveness model, who defined it as a measurementof the "quality of the firm-wide managementand commitment to IT" that affects the level offirm performance generated from ITinvestment. Weill assessed the impact of fourfactors: top management commitment, usersatisfaction, internal political turbulence, and IT experience. However, the study does not examine whichcharacteristics would actually lead to higher satisfaction and lower turbulence. Theprocesses and underlying components ofconversion effectiveness are left as an open issue.

Hartwick and Barki (1994a, 1994b) made a distinction between user participation and user involvement. They suggest that the term "user participation" be used instead of "user involvement" when describing users behaviour, and activities that are performed during the system development process. The term "user involvement" is used to refer to a psychological state of the individual, which is defined as the importance and personal relevance of a system to a user.

William and Thompson (1996) field survey was conducted to determine key organizational factors that facilitate and/or inhibit the development of strategic applications of information technology (IT) in business firms. A comprehensive list of potential facilitators and inhibitors for the strategic use of information technology was derived from past research and used as the basis for collecting data from 121 firms. These data were factor-analyzed to determine the key underlying dimensions of facilitators and inhibitors. The results suggest that innovative needs, competitive position, environment, economies of scale, and top management guidance are the most important facilitators, while the lack of IT drivers, the lack of economies of scale, and the lack of innovative needs are the most important inhibitors.

Agarwal and Prasad (1998) in the article 'The antecedents and consequences of user perceptions in information technology adoption',emphasises the importance of personal innovations in the adoption of technology. They pointed out that when users are given an opportunity to be innovative, they are more involved in the technology adoption.

Essex et. al. (1998) talks about the types of resources that are common to support implementation effort are personnel, equipment, time, and implementer's skills. However, the project must not only have sufficient resources but also the quality of the resources needs to be adequate to assure that the needs of implementation effort are met. The quality of resources that put forward implementation such as technical support, assistance, quality of staff highly correlates with the user satisfaction during the implementation.

Beaumaster (1999) have identified the following IT development and deployment Process Issues by conducting a survey of 280 respondents in the

small and medium sized local governments in the state of Virginia. From the survey he listed the following as the most problematic issues in any IT implementation project.

Issue Type	IT Planning	IT procurement	IT Implementation
Leadership Issues			
	Inter departmental Coordination		Inter departmental Coordination
	Individual support	Individual support	Individual support
	Organizational support	Organizational support	Organizational support
	Time frames and scheduling		Time frames and scheduling
Management process Issues			
	No strategic formal plan	No strategic formal plan	No strategic formal plan
	Fiscal/Budget Issues	Fiscal/Budget Issues	Fiscal/Budget Issues
	Lack of a planning model		
	Organizational Directives	Organizational Directives	Organizational Directives
	Written procedures/ Guidlines	Written procedures/ Guidlines	Written procedures/ Guidelines
Organizational environment Issues			
	Organizational Culture	Organizational Culture	Organizational Culture
	Politics internal/external	Politics internal/external	Politics internal/external
	Rapidly changing technology		Rapidly changing technology
	Contracts		
Technical system issues			
	Existing systems		Existing systems
	Standardization issues		Standardization issues
			Compatibility issues
Personal issues			
	Organizational IT Expertise		Organizational IT Expertise
	Individual It expertise		Individual It expertise
	Internal leadership		Internal leadership
	Personal issues		Personal issues
			Adequate staffing
			Resistance to change
			Trainning

The study address a number of dilemmas that are ingrained in IT implementation and management.

Premkumar and Roberts (1999) in their study suggest that it is imperative that management should consider the appropriate application for their firms when deciding whether or not to adopt new IT. These considerations are the size of the business, their employees' knowledge of IT and the amount of information that the organization has.

Rai et al., (2002) looked at the information quality attributes of an information system. The most extensively studied attributes of Information Quality are content, accuracy and format. The other attributes pointed out were flexibility, access, security and integration of information.

Sharma and Yetton (2003) examined the role of management support on implementation success in undertaking actions to reshape institutional context and their findings showed that in high task interdependence context – when several people take part in performing a task – management support have a significant impact on implementation success.

Klein and Knight (2005) in their work states that organizations fail to realize the expected benefits of innovations that they adopt. A key reason is not innovation failure hut implementation failure. They identified six key factors for innovation implementation success they are: package of implementation policies and practices that an organization establishes, organizational climate, manager support, availability of financial resources, learning orientation and managerial patience.

Gichoya (2005) Factors Affecting the Successful Implementation of ICT Projects in Government A descriptive framework for categorizing key factors in ICT implementation in government illustrated with references to the literature is proposed. The input variables are categorized into factors for success (drivers and enablers), and factors for failure (barriers and inhibitors). The output variables are categorized into organizational and technological benefits. Finally, an action for success is proposed. This action includes suggestions for increasing the impact of factors for success while reducing the impact of factors for failure and use of available good practice.

Suratida and Settapong (2005) the first step in the IT implementation process is the determination of the company's strategic intention. The company should translate business strategy into clear IT directions. The consensus between business and IT managers is important to know where company demand is going and what IT can do to help.

Namchul and Edington (2007) in their study 'An Integrative framework for contextual factors affecting information technology implementation', expands Weill's conversion effectiveness model to develop a framework integrating the various enterprise-level contextual factors affecting IT implementation. It also discusses relationships among contextual factors and cross-border issues in the global outsourcing environment. This holistic interpretation of individual factors is an initial step toward understanding the complexities of corporate environments and their effects on IT implementation success. The framework can provide companies with a useful tool to evaluate their current environment, determine its strengths and weaknesses, and assess how these will affect IT implementation. The contextual factors are Path

Dependencies, Project Management, Organizational Management Structure, IT Competency, Techno-Political Culture and Complementary Investments.

3.5   Review of IT Adoption Studies in Banking

While reviewing the banking literature on technology adoption and implementation it became evident that almost all studies focus on the technology acceptance side either by the banking staff or the acceptance of technology products by the customers. No major studies were seen in the implementation side or the factor studies. Some of the important studies in the financial sector are given below.

In his study, Markus (1983)documented the introduction of a financial information system (FIS) for the "Golden Triangle Corporation" (GTC). This system computerized, automated, and standardized most of the financial reporting function of GTC. Its main thrust, however, was perceived by its users as removing the autonomous financial accounting of individual departments to the corporate accounting department in their account, Markus details the resistance that ensued.

Clemons and Weber (1990) documented how various disagreements and mis-understandings became part of the history and management of a major IT restructuring at National Westminster Bank (U.K.). For example, they showed how the Business Case Team, which was formed of senior management to provide a business justification to the bank's board for the large technology investment, clearly saw that the IT project in itself would not yield a competitive edge. This was because their data showed that other banks were making the same investments. This was noted in their final report. However, they succumbed to the bank norm which was to justify projects in

terms of traditional payback period analysis. As another example from the National Westminster study, a third-party contractor was brought in to determine user requirements and manage the project. When the consultants appeared they discovered what neither they nor National Westminster suspected: everyone, especially the consultants, assumed the bank knew what it wanted. In fact, when they went to the users they found neither consistency nor a sensible set of requirements. In addition, the consultants' group was brought in when National Westminster's business needs and strategic plans were not yet set As a result, the consultants developed IT strategies somewhat independently of the business needs.

Satchidanandaet al(2006) inthe working paper on the assessment of Core Banking Solutions provides an assessment of CBS. They also provide generic guidance for its implementation. We identify the risks implementation and the methods for mitigating those risks. We also outline the main benefits accruing from the CBS and the emerging trends. The paper sets out the features of the leading Indian CBS software. The project implementation risks identified by them are

- Lack of Ownership of issues
- Lack of Scope / Requirement clarity
- Ability of the Core Team to take decisions
- Expectation Management – Stake holders at different levels have different expectations
- Ambiguous Roles and Responsibilities
- Resistance to Change – People, Processes, Procedures
- Poor Quality of Data
- Delay in procurement of visa, work permit

- Scope Creep/Scope Change
- Lack of Top Management commitment
- Delay in finalization of requirements and process definition for all the operations
- Delay in freezing and sign-off of customization and interface requirements

From the year 2008 onwards there are a large number of studies in the acceptance of technology area. The acceptance studies mainly focus on the acceptance of IT products like internet banking, mobile banking by the customers and its effect on the profitability of the banks. Some of the major studies are given below.

Tarafdar and Monideepa (2007) the paper describes the evolution of the use of information technology (IT) at National Banking Services, one of the oldest banks in India. It describes the bank's response to economic liberalization and the resulting initiatives for IT adoption. It highlights the influence of organizational readiness on IT adoption. In particular, it describes the negative influence on IT adoption of conditions such as the lack of top management support, skeptical end-user attitudes about the benefits of IT, and resistance from employee unions. The case ends with a description of the changing role of IT in the banking industry in India and the challenges confronting the bank.

Prakash and Malik (2008) studied the factors that affect the adoption of Internetbanking in India. It also highlights the major services of I-banking in India. A quantitative survey in the Northern region was done. The study showed that Internetaccessibility, awareness, attitudes towards change, proper guidance to operateInternet banking services, securityconcerns, trust on bank,

and problem attitude of the bank staffs were the major factors which helped in adoption of internet banking.

Sharma (2009) an endeavour has been made to judge how the banking business and practices have changed with the introduction of electronic channels. The trend towards electronic delivery of banking products and services is occurring partly as a result of consumer global context. The Internet has enhanced the customer's expectations, who are demanding more products and services at a lower price. Moreover, new competition from private and foreign sector banks have put the profitability of even the established brick-and-mortar banks under pressure. Yet, very few banks have been successful in developing effective strategies for fully exploiting the opportunities offered by the technology.

Agbolade (2011) 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.A similar study was carried out in India in the same year by Namita Rajput, which showed the same result, that all SCBs have shown a significant and improving trend in their performance due to the adoption of IT.

Tater et al. (2011) explores the perception of Indian customers towards the use of technologies with respect to such factors as convenience, privacy, security, ease of use, real time accessibility, and accurate record of varied transaction that enable customer's adoption of Banking Technology. Other factors such as slow transfer speed, technical failure, frauds and unawareness among customers that make hindrance in adoption, are also tested. The results show that demographic variables such as gender, age, qualification and income play a positive role in adoption of banking technology. All the banks are using information technology as a strategic vehicle to stay competitive against other players. There is no significant difference between adoption rates of banking technologies by the customers of different private banks. The paper also shows that banking technology helps in increasing customer satisfaction, customer loyalty, improvised growth, and performance of the banks.

Fulane et al (2012) in their paper seeks to identify the criticalfactors for implementing ERP systems and thedifficulties of implementation in two banks inMozambique. For this purpose a qualitative studywas conducted in two banks, using semi structuredinterviews. The motivators for the implementationwere identified: external factors (such as regulatorychanges) and internal factors (such as problems ofintegration of internal systems and inflexiblereporting). The main difficulties mentioned were lackof coordination at the level of information technology, lack of resources and skills and lack of understandingby users.

The main banking industry documents which helped in shaping the study are:

Reserve bank of India -IT Vision Document 2008-2010

Reserve bank of India -IT Vision Document 2011-2017

IDRBT – Organizational Structure for IT in the Indian Banking Sector.

Study Conducted by Cognizant in 2013 on failed Core Banking Projects discuss the importance of selecting the right core banking solution, the challenges involved in its implementation and the importance of skilfully managing a failed implementation. They point out the main reasons for CBS project failures as

- Inappropriate product selection
- Inability of vendors to deliver
- Limited capability of project group
- Limited capability of integrators
- Lack of well thought out plan
- Lack of Top Management support

3.6 Gaps from Review of Literature

From the review of literature the following gaps were identified by the researcher.

Implementation Process Research- The studies related to implementation process literature list out the stages of implementation, but lacks in clarity of the factors in each stage. Many researchers have studies the implementation stages in parts or in some variations. A comprehensive study of all the stages and the factors in different stages is still lacking.

Information technology adoption and diffusion research - The research in this field has led to development of various individual acceptances of technology models. The main issue is that these models look at only the factors for individual factors. It does not present a holistic picture of all organizational, external and any other factors which are important for a successful information technology implementation.

Factor research - While factor research which looks into various factors affecting successful IT implementation, has provided a great deal of information, there is a gap when it comes to integrating these factors into an holistic model. Much of the research looks at individual factors in a specific environment, without exploring the relationship among the factors and how the factors can be applied to other enterprises. The factor researches have led to a fragmented summary of disparate factors.

Studies in IT Adoption inBanking Research -Most research have been carried out on the individual acceptance of technology products like internet, core banking, mobile banking. Lack of research in implementation process or challenges. Only few studies carried out by IT vendors.

In summary the review of literature has led to a clear problem formulation, creation of data base on the factors contributing to the success of IT implementation in organizations and an evaluation of different research methods employed.

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Chapter - 4

RESEARCH METHODOLOGY

Contents	**4.1**	**Research Setting**
	4.2	**Research Strategy**
	4.3	**Stages of Research**
	4.4	**Case Study Method**

*The primary objective of this study is to build a holistic model integrating different stages of technology implementation process and the factors affecting the stage wise outcome, based on the experiences of CBS implementation carried out in Indian banks.To achieve this objective the study focuses to answer two main questions 1) **what** factorscontribute to the success of information technology adoption and implementation and 2) **how**thefactors identified affect CBS implementation. In order to get a better understanding of the complex process of implementation, the entire process was seen as a combination of five stages, each of which involves a separate set of internal factors and process. Each stage is necessary for the success of the following one yet each en-capsules its own important process. This chapter provides an over view of the research strategy and the stages of research used to conduct the research and derive the data necessary to answer the research questionsmentioned above.*

4.1 Research Setting

The thrust area of the study is the Core Banking Implementation project. The reason for choosing the core banking project is explained in chapter 2. Over the past few years, we have seen core banking system rollouts happening in thousands of branches across the country – withbanks grappling with the challenges of implementation and rollout. However, thesechallenges have been gradually overcome, with appropriate amounts of innovation in process and technology. Thus an investigation into the implementation process helps the researcher to answer the research questions. Four banks from different banking sectors (Public, Private, Old generation and New generation banks) were selected for the study. The reason for this was to ensure coverage of the different types of banks. The individual banks were chosen based on the criteria of their willingness to participate in the study. The case selection method and the individual respondent selection are detailed later in this chapter.

4.2 Research Strategy

This study is descriptive in nature, and makes use of qualitative research techniques to explain how different factors contributed to the success of core banking implementation from the real life experience of the experts involved in the core banking implementation project. Travers (2001) states that descriptive research describes the nature of a situation as it exists at the time of the study and to explore the causes of particular phenomena. The study tries to answer, 'WHAT' factors contribute to the successfuladoption and implementation of information technology in organizations and advances to describe 'HOW' the factors identified affect the stage wise outcome of the CBS implementation process. The first question acted as the base for the

study, the nucleus being the second question how.The strategy of inquiry used to answer the first question was, expert interview, banking industry scan and literature review. The strategy of inquiry used to answer the question HOW is the popular qualitative method - Case Study Method. Case Study is a strategy of inquiry in which the researcher explores in depth a program, event, activity, process or one or more individuals. Cases are bound by time and activity, and the researchers collect detailed information using a variety of data collection procedures over a sustained period of time (Stake 1995).The figure 4.1 depicts the research techniques used to answer the research questions and the outcome of the research.
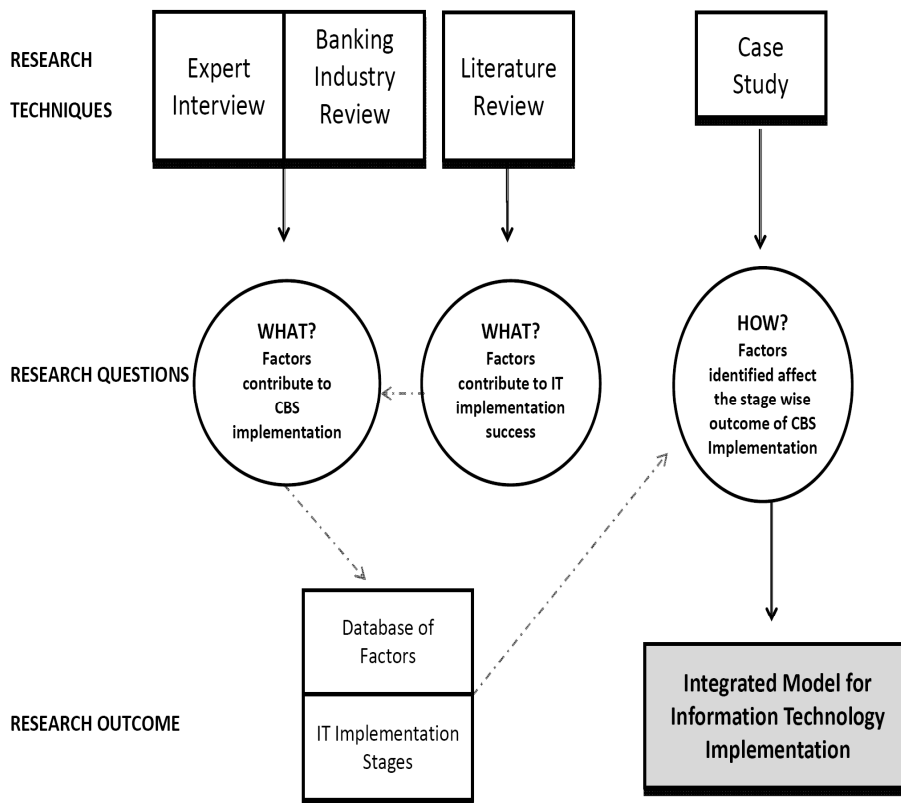
Figure 4.1: Block Diagram Depicting the Research Strategies Employed

4.3 Stages of Research

The research was conductedin threestages as shown in table 4.1. The first two stages aim at identifying the factors which contribute to the success of IT implementation and formed the basis of the research. The third stage describes how the factors affect IT implementation in real life situation.

Table 4.1: Stages of Research

Stage 1	Stage 2	Stage 3
Identification of factors contributing to successful IT implementation.	**Consolidation and Delineating** of the factors identified	**Case Study** individual case analysis and cross case synthesis

4.3.1 Stage 1: Factor Identification

This stage includes Expert Interview, Banking Industry Review and Literature Review. The main aim of the stage was to confirm the problem identified by the researcher, to get an idea of the IT adoption by the banking sector and the factors which contributed for the successful implementation of CBS.

4.3.1.1 Expert Interview

The study begins with a semi structured interview with the banking experts. The main intention of the interview was to understand the latest information technology implementation activities in the banking industry, the implementation process, and people involved in the process, and to familiarize the technical and banking terminologies used. A total of eight experts in the banking sector were interviewed. The participants were selected based on

convenience and degree of IT integration of the bank. Although the sample was not large, it provided opportunity to build contacts, refine the list of target banks for the study and get an idea of the IT implementation process. The respondents were contacted through cold calls. After the initial contact the researcher sent a mail outlining the nature of study and the participants involved.Most of the interview was conducted by visit to the respondent sites. The interview revealed that Core Banking Implementation was the largest IT project undertaken by the banking sector. In the words of a banking expert

"core banking project was a herculean project both in terms of time and money. None of the banks were prepared for such a large project, but was forced by the pressure of completion and the pressure from central vigilance commission to clean up the data and data reporting. Somehow all the banks managed to implement the project but the benefits derived are not the same. Though the most technology driven bank and we use the same core banking solution, we are still considered as old generation bank. There are a lot of organizational and individual factors which are pulling us from exploring the technology".

The expert interview also revealed that the bankers were not the only persons involved in the CBS implementation project, there are other stakeholders like IT vendors, IT consultants, trade unions, staff in different departments of the bank. These people worked on the project from different locations and at different time spans. The researcher then included IT vendors and Consultants in the expert interview to get an idea of the issues surrounding the CBS implementation project and the factors that helped to overcome the issues. The table 4.2 shows the respondents for the expert interview.

Table 4.2: Expert Interview Respondents

Sl.no	Respondent	No.
1	Branch Manager	3
2	IT department managers	2
3	Clerical Staff	3
4	IT consultants	1
5	Core Banking Vendor	2

The main points that the researcher inferred from the expert interview

- CBS project was a herculean project in terms of time and cost.

- Banks did not have the time to wait for their existing system to scale up to meet the regulatory requirements and the competition faced from the foreign banks.

- Banks were at different level of technology adoption or different types of technology running parallel with the manual process. (Manual, ALPM,TBA).

- Banks did not have a benchmark for the implementation of CBS.

- Banks did not follow a well-structured implementation process.

- CBS was a prolonged project spreading over 3 -9 years from the date of inception.

- People from different hierarchical levels were involved in the CBS project.

- A large number of stake holders like IT vendors. IT consultants, trade unions, regulatory authorities, staff in different department and customers were involved in the project.

- The geographical location of the stake holders to the project was different.

- Groups of people were working at different components of the project at different time periods.

- Many factors like Organizational, Technological, Individual, Project and External played a major role in the successful CBS implementation.

Appendix B shows expert interview protocol and findings. From the expert interview the researcher could understand that the banks did not follow a well-structured implementation process. The expert interview also confirmed the problem statement that knowledge management for CBS project was not systematically done. Since a structured process was missing the researcher couldn't get a full command of the different issues and the factors mentioned by the experts.

4.3.1.2 Banking Industry Review

The findings from the expert interview led the researcher to search for the literature pertaining to the banking industry. Literature right from 1983 when mechanization and computerization of the banking industry started was reviewed by the researcher. The main purpose of the banking industry literature review was to identify the various technology adopted by banks, the process included, rules and regulations governing the implementation, people involved and to look whether any standard procedure for implementation of IT was mentioned. The additional outcome of the review were details about technological adoption of the banking industry, the drivers for the technological adoptions, the problems faced, rules and regulations governing the technology adoption and the factors that lead to a successful adoption and implementation of information technology. The detailed review of the technology adoption phases of the banking industry is given in chapter 2. The industry review did not reveal much about the implementation process but the

researcher got a picture of the main issues in CBS implementation and the factors for overcoming the issues.

4.3.1.3 Literature Review

The literature review was also conducted in parallel with the expert interview and the industry scan. The literature review helped not only to identify the factors contributing to the successful IT implementation in organizations, but also to understand the underlying theories behind the relation of the factors involved with the successful implementation of information technology were identified. The literature review helped the researcher in identifying different implementation process followed by the organizations.The literature review was also aimed at developing operational definitions for the factors. The literature review is detailed in chapter 3.

4.3.1.4 Outcome of Stage I

The outcomes of stage I are a) Identification of IT implementation stages, b) Database of factors. This stage also provided the background information to develop basic set of definitions and concepts which were reviewed and updated in the later stages.

a)   IT Implementation Stages

It was evident from the expert interview that, the banks did not follow a structured process of CBS implementation. They followed a trial and error method or left the implementation process completely to the IT consultants. Review of the industry literature also revealed that banking regulatory authorities also did not give a structured implementation process. Authorities mainly had the time schedule for the implementation of various technologies but not the implementation process. In order to get commands of the many

issues surrounding the problems of CBS implementation and to identify the factors which helped to overcome those issues, this study based on the literature review breaks down the implementation into different stages. These stages are adopted from the six-stage model of IT implementation by Kwon and Zmud (1987).Appendix C shows the six stage model as described by Kwon and Zmud. From the six stage model the researcher adopted only five stages based on the operational definition of implementation given by the researcher, which states implementation as *all activities in different stages between- the decision to adopt a Core Banking Solution and the routine use of the Core Banking Solution in the bank*. The stages adopted are:

Initiation – Adoption – Adaptation – Acceptance –Routinization

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The rationales for selection of the stages:

a) IT implementation ends successfully only after all benefits are realized and organization effectiveness increases as a consequence of using it (Rogers, 1995). Kwon andZmud (1987) IT implementation stages support this view by containing a sequence of stages from initiation to routiniztion.

b) Though there is evidence that sequential stage models of technology diffusion may not depict actual implementation processes, recent work suggests that such models may be more appropriate for technologies which are borrowed or adapted rather than custom made (Pelz, 1983).

c) In addition, if the stages are thought of as activities, some of which may occur in parallel, such a model can encompass the variety of IT applications and IT implementation processes observed in most organizations.

b)   Data Base of Factors

The most crucial portion of stage one involved the creation of a data base which showed all those factors which contributed for the success of IT implementation in organizations. Data base was originally designed to accommodate the information derived from expert interview. Another large portion of the data derived for this database was made up of the pertinent literature of IT and industry review. A brief description of the factors was included in the data base and was updated throughout the process of the study. This data base served, throughout the course of study, not only as an evaluation tool, but also as a continuous working foundation. The database was created in MS Excel. In the original format the database identified approximately 62factors as being critical to IT implementation in organizations. Appendix D shows the data base of the factors with the factor descriptions.

4.3.2 Stage II: Consolidation and Delineating Factors

The second stage provided a key bridge between the initial gathering of general information about the factors and the final description of the most important factors which contributed for the success of IT implementation.

4.3.2.1 Revaluation of the Database of Factor

The database developed in stage one was mailed to the experts for reconfirmation. The experts were asked to express their opinion regarding the

level of importance of the factor and to confirm the factor description given by the researcher. This was to create a shared meaning for the factors identified. Descriptions given for the factors in the database by the experts were entered in the database for content analysis and review. Based on this revaluation of the factor database was done by the researcher.

4.3.2.2 Consolidation of the Database of Factors

The study of the entire factors identified was difficult. The database of factors had to be consolidated for the purpose of the study. On the return of the database sent to the experts,the researcher with the help of two bankingexperts did a content analysis of the database, the main purpose was to look for factors which came under the same category, or had same shared meanings, and these factors were clubbed together. The outcome of the content analysis was a list of **Thirty Four** factors which were found to be importantfor the successful implementation of information technology in an organization.

4.3.2.3 Delineating Factors

Operational definitions were developed for the thirty four factors identified, based on the literature review. The thirty four factors identified with their operational definition and their sources are given in the table 4.3.

Table 4.3:Operational Definition of the Factors

	Factor	Definition	Source
1	Path Dependencies	The stage of technology adoption the organization was before implementing core banking solution and the satisfaction level of the users with that stage.	Namchul and Edington (2007)
2	Organizational Power Affiliations	The formal and informal power affiliations in the form of staff union, social group, department wise groups, which influence the decision to adopt a technology and the people to be involved.	Markus (1983a, 1983b) Weill (1992)
3	Organizational Strategies and Goals	Need analysis and goal setting with a clear definition of the business strategies for which the IT is deployed in an organization.	Surathida and Settapong (2005)
4	Organizational Size	Business size definable by turnover and/or number of employees which can influence the resource availability and decide on software capability.	Premkumar and Roberts(1999)
5	Attitude Towards Innovation and Changes	How users feel about the existing system and the new system to be implemented.	Hiltz and Johnson (1990)
6	Collaboration	The way in which the employees within the department and among the departments interact with each other.	Zmud and Cox (1979) Kwon and Zmud (1987)
7	Computer Literacy	Exposure to various technologies the users had in the past, and how confident they are in their computer capabilities.	Hiltz and Johnson, (1990)
8	Task Nature	Level of autonomy, control over work quality, and responsibility for the outcome.	Nelson (1990)
9	Rules and Regulations	The availability of standard rules and regulations and procedures for the	Expert Opinion

		implementation of the new system. And the support received from the regulatory authority.	
10	Industry leadership	The level of leadership the organization enjoys in the industry.	Expert Opinion
11	Technological Advancements	Alignment of the technological developments with the organizational strategies.	Expert Opinion
12	User Involvement	The importance and personal relevance of the new system introduced to a user.	Hartwick and Barki (1994) Markus(1983a, b)
13	User Participation	User participation in the decision making process, and ownership of the results of the tasks necessary for the implementation to succeed.	Hartwick and Barki (1994)
14	Commitment to the Project	Actions taken by the top management to assure that the new system is a good one, and also provides a solution to the organization's problem by ways of proper communication and coordination with various departments involved. Proper resource allocation and appointment of project champion.	Ginsberg (1981) Weill (1992)
15	Project Champion	A person who takes the ownership of the project who markets the project within the company. Initiate the organizational change need for implementation.	Beath(1991)
16	Resource Allocation	Resource refers to the personnel, equipment, time, money and implementer's skills employed for the IT implementation.	Essex (1998)
17	Commitment to Change	Willingness to make changes to behaviour, procedures, structure and any other factors that are necessary for the system to work. This applies both to the management and	Ginsberg (1981)

		the users	
18	Service level Documentation,	The ability and suitability of the vendor to meet the requirements for the proposed service. Well defined and enforceable Service Level Agreements (SLAs) with the vendor. Documented, accepted procedure which governs service expectations and obligations.	RBI IT Vision document 2008
19	Request for Proposal	Clearly defined and documented user requirements for the assessment of the vendor	Expert Opinion
20	Business Continuity Plan	Prior arrangements and procedures that enable an organization to respond to an event in such a manner that critical business functions can continue within planned levels of disruption. It relates to the human, technological and business related aspects and is properly documented.	RBI IT Vision document 2010
21	Maintenance	The monitoring, evaluating and modifying of operational business systems to make desirable necessary improvements	Hussain&Hussain (1995)
22	Contract Termination	Confirming new behaviours patterns and completing transfer of responsibility to users	Hussain&Hussain (1995)
23	Documentation	Recording and communicationof detailed system specifications, user access and security controls including procedures for end users and technical staff.	James O'Brien (2008)
24	Organizational and Technical infrastructure	Organizational hierarchical structure and the technical infrastructure available at the time of IT implementation.	Expert Opinion
25	Extend of Planning	Usually in the form of a written, comprehensive document organizations strategies and priorities, allocating limited	Ginzberg (1981) Beaumaster (1999)

		resources, time schedules for implementation, role of project team and ways to measure the progress.	
26	Implementation Team	Skill-sets and knowledge-sets of the project team within interpersonal, computer systems, and organizational areas.	Baronas and Louis, (1988)
27	Business process Re-engineering	The changes in workflow patterns, work procedures, routines, reward systems, brought in the organization for better adaption of technology.	Orlikowski (1992) Attaran (2003)
28	Institutional Structure Re-engineering	Restructuring the key aspects of control and coordination mechanisms for quick decision making and faster implementation	Orlikowski (1992)
29	Training and Education	Training on technical aspect, work flows, why the particular system is being introduced and how the project will affect them both during and after its implementation	Zmud and Cox (1979)
30	Task Technology Fit	The degree to which the stakeholder believes that using particular system has enhanced his or her job performance, or his or her group's or organization's performance.	Goodhue (1995) Seddon (1997)
31	Relative Advantage	How advantages is the new system over the old one.	Benbasat, (1999) Rogers(1995)
32	Ease of Use	Ease of use as a degree to which potential adopters view usage of target technology to be relatively free of effort.	Davis (1989) Moore and Benbasat (1991)
33	Information Quality	Content, accuracy, flexibility, access, security and integration of the information received from the new system.	Rai (2002)
34	Tenure	The number of years of service with the organization.	Kwon and Zmud (1987)

4.3.3 Stage 3: Case Study

The third stage was carried out using a qualitative research method that has been well accepted in business and social research – The Case Research Method. Since this stage is the nucleus of the research, it is given as a separate section. This section details the rationale for using the case study method, the case selection process, and the stages followed in the case study and the data collection methods.

4.4   The Case Study Method

According to Yin (1994)

"A case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident".

The case study method allows investigator to retain holistic and meaningful characteristics of real life events such as individual life cycles, organizational and managerial process, neighborhood change, international relations and maturation of industries.

4.4.1 Why Case Study Method

Among social sciences, case study has been used to contribute to knowledge about individual, group, and organizational, social, political and related phenomenon. It has been a common research strategy in psychology, sociology, political science, social work, business and community planning (Yin 2003). Researchers also started using Case Study as an important research inquiry strategy in the field of Information System research (Klein and Myers, 1999). It has been shown to be relevant to situations where understanding the relations between information related technologies and

organizational contexts are important, (Orlikowski and Baroudi, 1991) and where the focus is on understanding the dynamics present in single settings.

Yin (2003) states that though the broad objectives of exploration, description or explanation can be ascribed to most methods there may be overlap. It is important to know why a method should be chosen and this is best described by the presence or absence of three pre conditions as described below:

a) Type of research question – Hendrick, Bickman and Rog (1993) cited in Yin (2003), that research question can be broadly classified into 'who', 'what', 'where', 'how'and 'why'. Yin (2003) states that how and why questions point to the use of case studies as research strategies. This is because an emphasis is on the operational links that needs to be traced over time, rather than recording just frequencies or incidents.

b) Extent of control over behavioural events

c) Degree of focus on contemporary as opposed to historical events – contemporary events which cannot be manipulated need to be studied by this method.

Benbasat and Zmud (1999) suggested that the use of case study is appropriate in information services for 1) studying information service in the natural setting; 2) answering questions that lead to understanding of the complexity of the process taking place; 3) to study previously little studied area. Therefore, the use of case strategy in this study is justified because the focus of the study is to understand and describe what are the factors which

contributed for the success of CBS implementation and how the factors affect the implementation process, which is only possible in the real life context where boundaries between IT system and the context of implementation are quite complex. The main case studies in the field of information technology were done byMc Kenney and James (1995) using a series of case studies to examine how organizations use IT to transform industry. Whiston (1991) analyzed six cases to develop best practices with integration of information services and manufacturing. Beaumaster (1999) conducted a study on the issues effecting IT development and deployment by developing a database of the issues. This was adopted by the researcher in her study.

4.4.2 Case Design for the Study

In case study there are four possible designs available. They are single case holistic design, single case embedded case design, multiple case holistic designs and multiple case embedded design.Yin (2003) distinguishes between holistic case studies and embedded case studies.

- Holistic case design is used when the case is studied in its totality. It is more appropriate where the theoretical framework supporting the study is itself holistic in nature or there are no logical sub units to the case. In holistic case study a single case may be selected or multiple cases can be selected.

- Embedded case studies are used when multiple units of analysis are studied within the case. The case may be a single case or multiple cases. The figure 4.2shows the holistic case study and embedded case study research design.
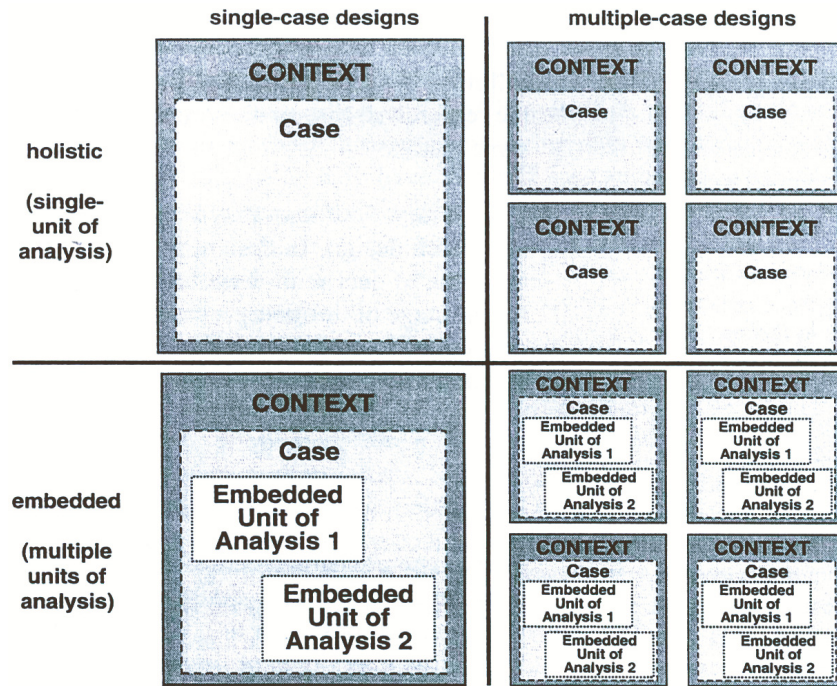
Source : Yin (2003) Case Study Research Design and Methods

Figure 4.2: Case Study Design

The researcher have selected holistic multiple case study method. The Indian banks who have implemented core banking solution were considered as the single unit of analysis. According to Yin (2003) each individual case study consists of a whole study, in which convergent evidence is sought regarding facts and conclusion of the case. For each case study, individual case reports and multiple case results must be reported. A complete picture is obtained if each case individually demonstrates an agreement or disagreement to the theoretical propositions.

4.4.3 Case Selection Method

The population of the study is the Indian banks who have implemented core banking solution. The researcher has used judgmental sampling method

to select individual cases and snow ball sampling methods for the selection of individual respondents. The following sections will explain procedure for the selection of sample cases, unit of analysis, contact protocol, problems with accessing the sample.

a)   Selection of Cases

In technology related area case may be anything that is a contemporary technological phenomenon in the real life setting. The study of the entire technology adoption in the real life setting is a time consuming process and extremely challenging, as a result researchers tend to focus on some aspect or aspects of the technology adoption by an organization or units of the organization .Alternatively the unit of analysis can include individuals, a group of people, a process, a product, a role in the organization, a technology and so on. Researchers make a distinction between a case and the unit or units of analysis within the case.

When it came to the selection of the number of cases Yin's replication logic rather than sampling logic was applied. The concept of replication logic is tha,t to consider multiple cases as one would consider multiple experiments.

According to Yin (1994)

"each case must be carefully selected so that it either (a) predicts a similar result or (b) produces contrasting results but for predictable reasons.

The researcher selected the cases based on three categorizations,

Ownership of the banks **-** The Reserve bank of India has categorized banks based on their ownership. (a) Public Sector Banks: These are owned and controlled by the government. These types of banks have much stronger centralized control and rigid rules and regulations. In India, the nationalized

banks and the regional rural banks come under this category (b) Private Sector Banks: These banks are owned by the private individuals or corporations and not by the government or co-operative societies. They have a quicker and effective decision making team. Their rules and systems are not as rigid as the public sector banks. In India the private sector banks are divided into Old Generation private Sector banks and new generation Private sector Banks. (c) Cooperative Banks: Cooperative banks are operated on the cooperative lines. In India, cooperative credit institutions are organized under the cooperative society's law and play an important role in meeting financial needs of the people in the rural areas.

Bank Size – the banks were selected on the basis of their size in terms of (a) total number of branches operating under the bank and (b) total number of the bank staff. Based on this the banks were categorized into large, medium and small banks.

Level of Technology Adoption – the banks were also looked at the level they were in technology adoption. This level was selected based on the categorization of IDRBT the technological research wing of the Reserve bank of India. The categorization depended on the level of core banking application portfolio optimization, alternative delivery channels , use of MIS, CRM, ERM, service oriented architecture, outsourcing and green IT. Based on this the banks were categorized into high, average and low level of technology adoption and implementation.

The researcher targeted four banks which fall into the following categorization. The researcher first listed out the banks in public sector, nationalized sector, old generation private sector and new generation private sector banks. Cooperative banks were not included in the sample as they were

not governed by the RBI. A bank from each category was selected. The access to the banks for collecting data was a major problem encountered during the research. The selection was mainly on the contacts known to the researcher. Four Banks were selected, theses banks were categorized into large medium and small banks and then on the level of technology adoption.

Individual Participants – within the four cases individual participants were selected. The individual participants were selected to fill up a pre interview response form, followed by an in depth interview. The sampling technique used for the purpose is judgmental and snow ball sampling. The researcher first contacted the information technology department head of the four banks. Based on the reference of the IT head the individual participants were selected. The researcher tried to include participants from the different context of technology implementation. There were many contact problems like large employee base. All of the participating banks had more than 3000employees, locating the sub groups of eligible participants were difficult. The individuals who were referred by the IT heads were transferred and were working in different branches or were retired from banking services. When located many participants indicated that they did not believe that they were the appropriate participants. These issues prevented the researcher from gaining the full target sample.

Final Sample – The final sample consist of four cases, Pre interview response were administered to thirty two individuals. The in-depthinterview was conducted with the core banking project heads of the four cases and the persons who were mentioned important by the IT department head.Thetable 4.4 shows the final sample selected for the study.

Table 4.4:Final Sample of the Respondents for the Study

Characteristics	Bank A	Bank B	Bank C	Bank D
Bank Classification	Public	Nationalised	Old Pvt.Bank	New Pvt.Bank
Level of technology adoption	High	Medium	Medium	High
Bank size	Large	Medium	Medium	Large
PIRF participants Top management	2	2	3	1
IT Department	3	3	3	3
Branch users	3	3	3	3
In-depth Interview	3	3	3	3

4.4.4 Data Collection Method

The case studies composed of qualitative data collected through a Pre Interview Response Form, In-depth Interviews and secondary evidence, which helped to develop case profiles. The use of the qualitative data should not be viewed as the limitation of the study. Gummesson (1991) points out that "an important advantage with the case study research is the opportunity for holistic view of a process. The detailed observations entailed in the case study method enable to study many aspects, examine them in relation to each other, and view the process within its total environment". The factor database acted as the working base for the development of data collection tools.

4.4.4.1 Pre Interview Response Form

In this section we discuss the Pre Interview Response Form (PIRF) used for data collection. This involves the rationale for using the PIRF and the development stages of the PIRF. The analysis and the findings of the PIRF are discussed in detail in chapter 5.

Rationale for Using PIRF

The PIRF gathered some amount of quantitative data about the factors identified, from each bank prior to the in-depth interviews. Having participants to complete questionnaires prior to interviews allowed the researcher to not only have a quantitative assessment of their views and experience with implementation process, but to better structure the interview process and follow-up questions. Since the database of factors identified thirty four main factors, the number of questions that the interviewees would have to answer during the interview would be difficult to manage within the interview time frame. Therefore, having an insight into participant opinion on whether the factors identified contributed to implementation process and the importance of the factor in the implementation process prior to the interview would allow for better utilization of the interview time.

The PIRF Development Stages

The development of the PIRF went through different stages. The operational definition developed in stage II of the study helped to have a better understanding of the factors and for the development of PIRF for data collection procedure.

The PIRF mainly contained mainly three sections. 1) looks at whether many of the factors identified adhere to in the implementation process in the respective bank, 2) identifies the level of importance of the factor in the implementation process, 3) identifies the stages which the factor influence based on the perception of the respondents. Survey of the literature helped to identify a pool of questions relating to some of the factors identified. All questions were modified to make the items meaningful to the particular IT implementation context.

The next stage included the identification of the respondents for the PIRF. The available literature and discussion with the experts showed the main people from the banks who were involved in the CBS project were management representatives, IT department representatives and branch users. A number of questions that were aimed at capturing opinions about similar concepts were tailored to suit different participants mentioned above. This led to the development of three version of the PIRF; each capturing data from the three sections of participants.Appendix E shows the protocol used for data collection through PIRF The instrument was pre tested among the banking academicians. A total of four PIRF from each set was given for review. Based on the feedback certain terms were modified for better understanding.

The respondents were first contacted through telephone. Once the consent to participate was received the PIRF was mailed to the respondents. All the thirty two PIRF were received back. Four of these forms were not completed, the researcher had to contact back the respondents and complete the form through telephonic interview. Since the number of respondents were small the PIRF were not subjected to any statistical calculation. Only percentage calculation of each question was done and numeric value assigned to each factor. The detailed data analysis process is discussed in chapter V.

4.4.4.2 In- depth Interview

This section describes the in-depth interview protocol used by the researcher for conducting the In-depth interview. This involved the information gathering process undertaken and the coding of the interviews. The analysis of the interview and the findings are discussed in chapter V.

Rationale for the In-depth Interview

The objective of the research is to develop a model of factors for successful information technology implementation. The researcher identified the factors from previous research, now the task is to identify the role of the factors in the implementation stages and the relationship between the factors. The PIRF helps the researcher to understand whether the factors were prevalent during the implementation context in their organizations and the importance of factors in the implementation process. Now an in depth understanding of each factor and why it is considered important and the stage wise discrimination of factors based on their impact on the stage outcome is required. The in- depth interview technique provided the participants with an opportunity for expressing their views and feedback more clearly. Given the nature of this research, it also appeared appropriate to allow participants to suggest other variables or factors and their relationship that might be important for information technology adoption and implementation success. As Rubin and Rubin and Rubin (1995) explain, " if you impose on (the interviewees) what you think is important , you might miss important insights about the subject you are investigating and you may substitute your ill- formed views of the field of their experience and knowledgeable one." Thus the in-depth interview provided the interviewees an opportunity to actively participate in the theory building process. This approach generated some interesting data and provided much of the basis for the model proposed.

In-depth Interview Protocol

The interview protocol has five distinct components: 1) an introduction, 2) gathering data on the relation of the factors to each other and to the implementation process, 3) gathering data to establish the importance of

factors identified in stage I of the study and in the result of the PIRF, 4)Identifying additional factors, 5) closing of the interview.

Introduction: before the interview started the respondents were handed over a confidentiality letter stating the confidentiality of the interview.A warming up section of introduction of the researcher and the purpose of conducting such a research was detailed. Next the researcher asked the interviewee questions like the job profile, number of years in service, new technological developments and based on the response the researcher asked additional probing questions.

Relationship of the factors: taking the factor database as the working base, the researcher asked about how each factor contributed to CBS implementation project, their relationship with other factors and what difficulty the bank faced due to the absence of that factor.

Importance of the factors: based on the ranking of the factors in the PIRF, the respondents were asked why they made such a ranking. All the details were noted by the researcher in his interview notebook. This was later transcript and coded and analyses as detailed in next chapter.

Additional factors: at this stage the respondents were not asked specific questions but asked to detail about all those factors they considered important for the IT implementation process.

Closing: interview concluded with the researcher thanking participants for their time and participation and reminder that they will receive a copy of the interview transcript and the final findings.

4.4.4.3 Secondary Data

Data were also collected from the written organizational documentation, internal meeting notes, internal e-mail correspondences and other relevant documents. The opportunity to employ multiple data collection strategies (questionnaire, interview, secondary-source data) aided in the process of triangulation(Eisenhardt, 1989; Yin, 1994), thus enhancing the validity of the case findings.

4.4.5 Cases Analysis – Qualitative Data Analysis Method

The process of data analysis involves making sense out of text and image data. It involves preparing the data for analysis, conducting different analysis, moving deeper and deeper into understanding of data, representing the data and making interpretations from it (Creswell, 2003). The various steps followed in qualitative data analysis are:

a) Organize and Prepare – this stage involves preparing the data for analysis, which includes transcribing interviews, typing field notes and sorting and arranging the data into different types depending on the source of information.

b) Reading Through – this involves reading through the interview transcripts over and over again, to obtain a general sense of the information, and its overall meaning. The researcher starts wring notes in general thoughts about the data at this stage.

c) Coding – in this stage a detail analysis of the data and coding happens. Coding is the process of organizing the material into chunks or segments of text before bringing meaning to information (Cresswall 2003). It involves taking the data gathered during the data collection,

segmenting sentences into categoriesand labelling those categories with a term, often a term based in the actual language of the participant.

d) Description – using the coding process to generate detail description of the setting or people as well as categories or themes for analysis. This helps in developing themes or categories for research.

e) Theme Representation – decide on how the theme will be represented in the qualitative narrative. It can be as a process model (as in grounded theory), advance a drawing of the specific research site (as in ethnography), or convey descriptive information about each participant (as in case studies)

f) Interpretation –making interpretation or meaning of the data. The interpretation could be researchers personal interpretation based on researchers experience or it could also be a meaning derived from a comparison of the findings with information gleaned from the literature or theories.

4.4.6 Procedure followed for Case Study

4.4.6.1 Case Study Protocol development

Detailed description of the phenomenon understudy was obtained by the development of a case study protocol to aid in collecting the relevant data. The PIRF and the in depth - interviews with individual case study firms were conducted with the help of the protocol which had a format of question for each of the factors identified.

4.4.6.2 Coding of Factors

Development of case study database from analysis of the PIRF and in-depth interview transcripts was done next. This was carried out through quantitative interpretation of the PIRF and the interview data by the use of qualitative data analysis techniques. This included the process like tagging or coding the data or relevant phases or statements related to particular factors. Aspects that may have an effect on these factors are also coded. Detailed write up of each case was done which formed a part of the case study database.

4.4.6.3 Individual Case Analysis

The apriori codes and the emergent codes were analyzed for each case study, drawing from the PIRF analysis and interview transcripts; this was called individual case analysis. Categorization of these codes was done next. This was done to pool together specific lines or phrases in the interview data that contributed to or referred to related areas. The specific interviews from which the information was obtained is also mentioned by the interview code. The apriori codes and emergent code categories were isolated. Once the categories were isolated and analyzed a detailed description of individual cases were developed based on these categories.

4.4.6.4 Cross Case Synthesis

The next step was the analysis of the four cases in tandem through a cross case synthesis. The cross case synthesis was done to supplement the findings from the individual case analysis and increase the reliability of the study, as suggested by Yin(2003) and Eisenhardt (1989) . The data generated under each factor for each of the caseswere evaluated in the form of data array to examine the similarities or the difference between the cases. The aim of data synthesis was to enable a literal replication, the true objective of case study

research. In the absence of similar or complementary evidence a theoretical replication was called for.

4.4.6.5 Inference from Cross Case Synthesis

The cross case analysis was again strengthen by inference building. Inputs from literature were used to provideplausible explanation of specific case outcomes and the findings werestrengthened when all these cases showed similar case outcomes.

By conducting the research in a structured method as detailed in this chapter the researcherensures the validity and the reliability of the research undertaken.

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Chapter - 5
CASE DATA ANALYSIS: INDIVIDUAL CASE ANALYSIS

Contents	5.1	**Process of Case Data Analysis**
	5.2	**Structure of Case Reporting**
	5.3	**Individual Case Analysis : Case A**
	5.4	**Individual Case Analysis : Case B**
	5.5	**Individual Case Analysis : Case C**
	5.6	**Individual Case Analysis : Case D**

According to Yin(2003) 'data analysis consists of examining, categorizing, tabulating, testing or otherwise combining the quantitative and the qualitative evidence to address the initial proposition of the study'. He also stress that any study should frame the analysis based on the audience of the study. Unlike statistical analysis, there are few fixed formulas or a cookbook recipe to guide the researcher in a qualitative data analysis. Instead much depends on researchers own style of rigorous thinking, along with sufficient presentation of evidence and careful consideration of alternative interpretations. Analysis of qualitative research is characterized by having analysis carried out in parallel with the data collection. This is necessary since analysis can reveal the need for collecting additional data. This is one reason why systematic analytic methods are needed for a qualitative research.

5.1 Process of Case Data Analysis

The primary objective of the study is to build a holistic model for successful IT implementation in organizations, based on the experiences of CBS implementation carried out by Indian banks and the existing literature on IT adoption and implementation. The study collected the data through PIRF, In-depth interview and secondary evidence. The following sections will detail the process by which data collected is analyzed and reported.

5.1.1 Pre Interview Response Form Analysis

A total of 32 respondents in three categories (Branch User, Top Management and IT representative) responded to the PIRF. The individual response of the PIRF was entered in the excel sheet. The quantitative measurements were limited to simple percentage calculations. The PIRF focused to collect data on three aspects. First it looked whether some of the factorsidentified in the stage I of the study were present in the case during the CBS implementation process. The statements relating to this and the response of the three categories of respondents are shown in the analysis section of the respective factor under each case. The response shows the respondents agreement or disagreement to the given statement. Agreement is marked as 'A' and disagreement as 'DA'. Those statements which are not applicable to particular category of respondents were marked as 'NA'. The results arediscussed under each factor because certain response shows disagreement among the respondents. Second the PIRF measured the importance of the given factor in a three point scale with response of least important, medium important and highly important with quantitative measures 1,2,3 respectively. The third part the PIRF

asked the respondent to mark the stage in which they feel the respective factor falls. The second and third part was limited to percentage calculation and the results are shown in Chapter 6.

5.1.2 In-Depth Interview Analysis.

As detailed in chapter 4 an in-depth interview was conducted for each case separately. Each interview lasted between 1 to 2 hours. Some of the interviews weredone in multiple sessions. Around three respondents were interviewed for each case. Due to the secretive nature of the banking sector, the interview notes were taken down by the researcher. Recoding of the interview was not permitted. The name of the bank or the interviews is not disclosed. The banks are coded as Case A, B, C and D. The interviewees were coded and the interview transcript is shown under each code. The following steps were followed by the researcher to analyze the data takendown.

5.1.2.1 Development of Interview Transcripts

The rough notes taken down at the time of the interview were transformed into interview transcripts. This included the questions asked and the answers provided by the respondent. Additional questions developed from the answers provided to the initial questions were also noted down after the initial main question. Sometimes descriptions of some key areas that were important for the particular case were recorded as reported account. It included an account of the conversation with the respondent. The transcript is a description of the reality as the way the respondent sees it. Certain responses are quoted in the exact words of the respondent. This does not bring any impression or understanding or

analysis of the researcher of the respondents answer. It conveys respondent's perspective not researcher's.

5.1.2.2 Interpretation of the Interview Transcripts

The next step was to interpret the interview transcripts. Interpretation of the transcript is carried out through a process of 'collecting, noticing and thinking' as described by Seidel (1998). Data analysis as described by him is an iterative process. Hence the steps followed at this stage was to read the interview transcripts line by line over and over again, notice any gaps, collect the additional data required, translating the raw data into some meaningful words used in research.

5.1.2.3 Coding of the Interview Transcript

At this stage each line is analyzed for meaning and data is divided into meaningful unit which was explored in the stage I of the study. The meaningful units are then coded.Coding refers to the process by which the researcher marks segments of data with symbols, descriptive words or category names. This is also called labeling by some researchers. When a meaningful segment of text is identified or isolated, a code should be assigned to it. The end result of this exercise will be that all data will be coded with particular idea or concept.

The method of constant comparison developed by Glaser and Strauses(1967) was used to examine the transcripts. This means that the researcher examine each sentence in the transcript and decide whether – to discard, discount, narrow down, expand, split, join or transfer.

5.1.2.3.1 Types of Codes

As a result of the coding process,data with similar characteristics are placed in the same category or class. A code can be in the form of single code or with sub codes. Coding can be done prior to data analysis or developed during the process of data analysis. Based on this codes are grouped into following categories.

Apriori Codes: These are categories or coding systems which are developed before examining the data. These are codes which are developed based on the basis of the theoretical foundation of the research. These are codes which represent the areas or aspects of the theory. As the case study research is routed in grounded theory there are a set of prior codes also known as seed codes which will record evidence of the same as reveled by the transcripts.

Inductive Codes: Are developed or formed as the data is examined, or read. Specific areas or domains emerge which have a bearing on the outcome or which influence the factors. This becomes inductive or emergent codes.

Co – occurring Codes: Are codes which completely or partially overlap. This means that same lines or segments of text have more than one code attached tothem. The sentences may reflect different viewpoints or aspects of two codes, so have to be mentioned under both the codes.

Facesheet Code: Applies to the overall transcript that is being studied. This means that the document speaks about a particular area or the study.

5.1.2.4 Identification of Codes for the Case Data.

The stage I and II of the study had identified thirty four factors which were found to be important for the success of IT implementation. The thirty four factors were assigned codes. Appendix F shows the apriori codes assigned. This was to ensure that the readings of the cases be quickly followed by the identification of tags, or relevant sentences or phrases that referred to those codes. While reading through the interview transcripts the researcher looked for sentences or remarks which fell under these codes. These sentences were furtherread and analyzed to see whether there are any co-occurring codes.

As the researcher read through the interview transcripts a list of codes emerged, which had an influence on the implementation process. The list of emergent codes which were identified and isolated during the course of the study were as follows:

- Expectation Management

- Ownership Creation

- Help Centre

- Coordination and Communication

- Vendor Selection

- Trilability

- Online Help

- Shared Vision

- Business Line Involvement

- System Integrator

- Hybrid Managers

5.1.2.5 Development of Research Memos

Memoing is an integral part of case study analysis, where the researcher encodes or records reflexive notes about what is being studied. The researchers have to maintain memos when they wants to record what they are learning or when they have ideas or insights about statements or incidents that transcribed during the interview.

5.2   Structure of Case Study Report

According to Yin (2003) in a qualitative research, it is always good to summarize what has to be found in a report consisting of different sections. This is referred to as developing a case description. This study involves an in-depth study of four banks. The names of the bank and the interviews are kept confidential due to the confidentiality nature of the banking industry. The case descriptions are done in two parts:

5.2.1 Individual Case Analysis:

Here each case is analyzed separately. Each case is discussed on the basis of the aprioricodes identified, which then leads to the discussion of emergent codes. Under each apriori code, the PIRF results, in-depth interview results and secondary evidence are discussed as separate sections. The structure is as follows:

- Case Background

- Discussion of Apriori Codes

- o   Secondary Evidence Discussed

- o   PIRF Results

- o   In-depth interview Analysis

- •   Discussion of Emergent Codes

- •   Case Highlights

5.2.2   **Cross Case Synthesis**:

Here the four cases are synthesized in different stages of IT implementation process identified in stage I of the study. This is done by developing a data array of the five stages of IT implementation identified in stage I of the study. This stage is followed by a detailed discussion of each stage by drawing support from the existing literature. Due to the magnitude of the content the cross case synthesis and discussions are given as a separate chapter.

The next section is the individual case analysis. The analysis of case A starts from the next page.

5.3   Individual Case Analysis: Case A

5.3.1 Background of Case A

The largest and oldest Public Sector Bank in India, with, 16,333 branches spreading across the country and 43,515 ATM as of financial year 2014 with 2500 card holders per ATM. The Bank undertook a massive computerization effort in the 1990s to automate all of its branches by implementing a highly customized version of Kindle Banking Systems 'Bankmaster' core banking system. However, because of the bank's historic use of local processing and the lack of reliable telecommunications in some areas, it deployed a distributed system with operations located at each branch. Although the computerization improved the efficiency and accuracy of the branches, the local implementation restricted customers' use to their local branches and inhibited the introduction of new banking products and centralization of operations functions.The bank was losing its market share to private-sector banks that hadimplemented more modern centralized core processing systems.To remain competitive with its private-sector counterparts, in 2002, the bank began the largestimplementation of a centralized core system ever undertaken in the banking industry. The bank followed an assembly line approach to convert the branches with a batch of 50 branches converting to CBS. The bank could convert all its branches by 2009, which was a record period for conversion of such a large bank.The new core banking system has allowed the bank to redesignprocesses. It established 400 regional processing centers for all metro and urban branches that have assumed functions previously performed in the individual branches. The bank recently reported that business per employee increased by 250% over the last five years.The bank has achieved its goal of offering its full range

of products and services to its rural branches. It delivers economic growth to the rural areas and offers financial inclusion for all of India's citizens. The bank has reversed the trend of customer attrition and is now gaining new market share.Completion of the core conversion project has also allowed the bank to undertake several new initiatives to further improve service and support future growth. This achievement is evident in the awards and recognitions the bank has received. In the last five years the bank has received awards for: best use of mobile technology, best use of technology in financial inclusion, best use of technology for e-learning and training, best customer management, best use of technology in business interface and best use of technology in payment systems.

5.3.2 Discussion of the Apriori Codes

In the following sections, analysis and discussion of the apriori codes identified during the stage II followed by the emergent codes developed during analysis are done. There were eight respondents to the PIRF, three each in branch user and IT representative category and two in top management category. Three in-depth interviews were conducted for the case. The designation, code and the date of interview is given in table 5.1.

Table 5.1: In- depth Interview Respondents with Date and Codes

Case A		
Designation	**Code Assigned**	**Date of Interview**
Manager (Information Technology)	IDIA1	01/08/2013, 02/08/2013
General Manager (Information Technology)	IDIA2	02/08/2013
Assistant Manager (Branch)	IDIA3	27/08/2013

5.3.2.1 Path Dependencies

This factor represents the stage of technology adoption the bank was in before CBS implementation and the satisfaction of the users at that stage.

Secondary Evidence

The banks massive computerization effort started in 1990 by implementing a highly customized version of Kindle Banking Systems' Bankmaster core banking system. Even though it was a technologically advanced system at the time the automation package was restricted to automation of each branch by itself. The lack of networking and telecommunication facilities also led to local processing of the data. Hence it was more of a Total Branch Automation (TBA) rather than a core banking solution.

PIRF Result

The PIRF analysis showed a contradicting response among the three categories of respondents. When respondents were asked about the satisfaction level with the old system all the three userrespondents showed satisfaction with the old system but the IT and Management representatives showed dissatisfaction.

Table 5.2: Satisfaction with the Old System Used

Statement	User			IT Representative			Top Management	
I was satisfied with old system	A	A	A	DA	DA	DA	DA	DA

The In-depth Interview Analysis of IDIA1

The inefficiency of the old system was a major reason for the decision to purchase a new CBS. The main difficulties of the old system as pointed out were:

- Each branch had local installation of the software which led to disparity in the data

- Old data was not entered in the system

- Integration of data coming from the branches was difficult

- Although the computerization improved the efficiency and accuracy of the branches, the local implementation restricted customers' use to their local branches.

- Inhibited the introduction of new banking products and centralization of operations functions.

The In-depth Interview Analysis ofIDIA2

The top management was also facing difficulty with the old system. The management was under the pressure from the regulatory authorities to adhere to the reporting standards as set by the Central Vigilance Commission. To quote:

"the IT implementation started in 1990 was more of a TBA package. And each zone was divided for local implementation of the software. The local implementation of the prevented the bank from easily gaining a single view of corporate accounts, and management lacked readily available information needed for decision making and strategic planning. Moreover there was also pressure from the central vigilance commission for the data cleaning and MIS reporting"

Though the top management and the IT staff were not satisfied with the old system, the users showed satisfaction with the system. The contradicting results of the PIRF were explained as follows:

"with almost 10 years of implementing the TBA package our staff took great pride in executing complex transactions on local in-branch systems. They had a feeling of ownership of the system they used and had overcome the inhibition to use computer. This practice led us to doubt that the employees would effectively use the new system."

Identification of the attitude of the users with the old system helped the management to plan aggressive education programs. The top management identified business level heads to educate the users about the benefits of the new CBS.

Memo – The discussions shows that the inability of the old TBA system to meet the MIS requirements, new product development and data cleaning led to the adoption of new CBS. There was a lack of shared vision between the management and the users and a greater incentive or motivation was required by the management for motivating the users to switch to the new system

5.3.2.2 Organizational Power Affiliations

The factor identifies the formal and informal power affiliations which influence the decision to adopt technology and the people involved.

The In-depth Interview Analysis of IDIA2

Since the bank falls under the category of Public Sector banks, there was a strong presence of labour unions. Almost all the staff are members of the labour unions. Each grade in the bank had their own union, i.e. Clerks had their union and officers had their union. Both the unions had a strong influence on the decisions of the management. Clerical staff union showed a strong opposition right from the beginning of the computerization process. Two main points raised by them were- the fear of loss of job and the fear of loss of allowances for the clerical staff. The following strategy was used by the management:

- Met the representatives from the labour union before the CBS implementation started and agreed upon the terms and conditions of the role of the staff.

- Periodic meeting with the staff representatives for the update on the implementation process.

- Fixation of allowances based on the use of the computers.

The In-depth Interview Analysis ofIDIA3

Two main industry level agreements reached between the labour union and the management really helped in the smooth implementation of the CBS. The agreements were: Bipartite agreement between the labour union and the management on the job security and the salary and allowances. Second was the agreement to involve the representative of the labour union in CBS package purchase and the purchase of other hardware and software components. Once this agreement was reached and

documented there was no major opposition from the labour union. Top management played a major role in the settlement of the labour union issues. The labour union had a strong influence in the decision to adopt the new CBS; if it was not handled smoothly the implementation project would have failed.

Memo – the organization had strong power affiliations. The unions have a strong say in the decisions made by the management and played an important role in adoption of CBS. The skill of the top management in handling the opposition of the labour union helped in the smooth adoption of CBS.

5.3.2.3. Organizational Strategies and Goals

The factor shows the goals and business strategies which the organization tends to achieve with the deployment of IT

PIRF Results

The PIRF looked for whether the bank undertook a need analysis process for the adoption of new technology. All the eight respondents agreed that the bank had done a need analysis before the adoption of the new CBS.

Table 5.3: Need Analysis for NewCBS System

Statement	User			IT Representative			Top Management	
Needs assessment was done before deciding to adopt CBS	A	A	A	A	A	A	A	A

Secondary data

The main Organizational strategy for the adoption of CBS as identified from the bank documents are:

- The delivery of new product capabilities to all customers, including those in rural areas

- The unification of processes across the bank to realize operational efficiencies and improve customer service

- Provision of a single customer view of all accounts

- The ability to merge the affiliate banks

- Support for all existing products

- Reduced customer wait times in branches

- Reversal of the customer attrition trend

The In-depth Interview Analysis ofIDIA2

In 1990 when the bank went for massive computerization there was no need assessment process undertaken by the bank. The only aim of the bank was to technologically upgrade itself. But with no need assessment and goal setting the implementation was a failure due to reasons like local processing, lack of telecommunication facilities. The local implementation failed in data integration and new product development. In 2002 bank appointed IT consultant KPMG for developing an IT strategy for the bank. This was a turning point in the banks history. With the suggestions from the consultant the bank went in for the adoption and implementation of CBS.

5.3.2.4 Organizational Size

The factor shows the organizations business size definable by business volume, number of employees or number of branches which can

influence the decision on software capabilities and the resource availability.

The In-depth Interview Analysis of IDIA1

The most important challenge the bank faced while deciding on the technology to adopt was size of the organization, customer base and data processing.

- Size of the bank – 14,600 branches
- Customer base – 140 million accounts
- Data Processing – 75 million accounts daily

The bank failed to assess the large data volume it had to handle. After two years of implementation trial there were constant system failures and break downs. Bank had to completely give up with that product. Then the bank appointed an agency to study the requirements and a report was submitted. The new CBS was assessed mainly in its ability to handle the size of the organization.

The In-depth Interview Analysis ofIDIA2

The large size of the organization acted as an important measure for the adoption of the CBS package. Lack of proper assessment of the size of the organization and the volume of transaction led to the adoption of a basic CBS system at first, this system had to be discarded and a much advanced system was adopted. The large number of branches spread across the country was the major reason why the bank went for in a phase implementation of the CBS project, this led to delay in project completion.

Memo –The size of the organization influenced in assessing the core capabilities of the banking software and also in drawing the

implementation approach. The bank followed a batch approach with 50 branches converting in a batch.

5.3.2.5 Attitudetowards Innovation and Changes

This factor shows the attitude of the stake holders of the organization towards the new technology to be adopted and the related changes in the organization and the work process.

PIRF Results

The PIRF looked for the attitude of the users, top management and the IT representative towards technology innovations and the CBS to be adopted. The result showed that all the three categories had a positive attitude towards technology, but the users had a negative attitude towards the CBS. The users also showed negative response for change.

Table 5.4: Attitude towards Innovation and Changes

Statement	User			IT Representative			Top Management	
Information System and services are important for my performance at my job	A	A	A	A	A	A	A	A
Before implementation of CBS, I was sure it will provide solution to all the problems	DA	DA	DA	A	A	DA	A	A
I was ready to make changes in my work routines and process which was necessary for the new system implementation	DA	A	DA	A	A	A	A	A

The In-depth Interview Analysis of IDIA3

The branch staff had a positive attitude towards computers and they felt the need for computerization of the activities. But what they couldn't understand was why the bank going in for a new CBS implementation. The main reason for this was the staff of the bank was in service for more than twenty years, they had been so used to the age old practices it was difficult for them to change. The management had to take in an extra an extra initiative like meeting the business heads personally and educate them the need for the implementation of new CBS system. The management positive attitude towards new system helped in smooth implementation of the CBS. The management was ready to make work and process flow changes to meet the challenge of CBS implementation.

The In-depth Interview Analysis ofIDIA2

The workers had a positive attitude towards computers but they didn't feel the necessity for upgrading into new system, the workers were satisfied with their work process and they were not ready for any changes. Though the work group characteristics were not favorable for the adoption of the new CBS, the assessment of the user attitude at the initiation stage helped the management to plan the remedial measures in the next stages of IT implementation.

Memo – the user satisfaction with the old system led to the negative attitude towards CBS adoption. The long tenure with the bank led to difficulties in change management.

5.3.2.6 Collaboration

The factor shows the way in which the stakeholders to the implementation project interact with each other.

In depth Interview Analysis of IDIA3

The branches were following a centralized approach before the implementation of CBS. When a customer walked into a branch all activities right from customer creation, account opening and transactions were done in the parent branch itself. The collaboration between branches or between branches and departments were low. The major fear of the branch staff was that with the implementation of CBS, the customer of the branch will no longer be the customer of that branch, CBS will lead to a more centralized approach but at the bank level, for branches most of the operations will be de centralized. The branch staff had a feeling that with the implementation of CBS they have to depend on other departments or branches more for their daily activities. The need of integrating the customer data with other departments like marketing, planning etc was not felt necessary by the branch users, this led to many conflict between the branch managers.

Memo - coordination between the departments was absent. This led to lack of coordination among the stake holders to the project. The presence of business integrator led to the coordinated activities among the departments.

5.3.2.7 Computer Literacy

The factor looks at the exposure to various technologies the users had in past and confidence with their computer capabilities.

PIRF Results

The PIRF looked for the qualification of the respondents and the experience in the banking software. The response showed that the users had only minimal diploma qualification. One user did not have any computer qualification. The IT staff was either MCA or B.Tec. The top management took diploma qualifications.

Table 5.5: Computer Literacy

	User			IT Representative			Top Management	
Basic Computer Qualification	M.S office	NA	M.S office	B.Tec	MCA	B.Tec	MCA	MS. Office
Experience in banking solutions	2	1	1	5	4	3	1	2

In depth Interview Analysis of IDIA2

The technical department of the bank was not fully developed. There were not more than twenty technical staff; other staff was basic bankers who were internally trained to help in the technology department. The bank first appointed experienced and skilled staff in the IT department and strengthen the department. Many of them were encouraged to take advanced computer certification. The branch staff was encouraged to do basic computer certification programs. With the recruitment drive initiated by the banking sector for past few years, have shown that banks started employing more and more skilled manpower. Most of the new entrants have some basic computer qualification.

Memo - lack of experience with the computer system was one which hindered the adaptation of the new system and not the decision to adopt the new system.

5.3.2.8 Task Nature

The factor shows the level of autonomy, control and responsibility over the work outcome of the users.

In depth Interview Analysis of IDIA2

A larger weighing factor that have accounted for difficulties in adopting the new CBS system by staff members was the fact that many have been working in the bank for a very long time. Since the staff was used to the task responsibilities that they had for years, they were prone to resist any new additional tasks that were required to perform to use new CBS. To quote:

"If you looked at the different factors in the bank, the people that were most resistant and were not comfortable with the process changes are those who were there the longest time. That bank does not have lot of turnover. Some of the staff who adapted very quickly to new CBS are staff that are fairly new either to the bank or just out of the course .So I think their adaptability was not due to inexperience with computers it was really due to the fact that they became comfortable in their role as doing just one piece."

Memo - Task content was identified as the factor negatively affecting the decision to implement the new system.

5.3.2.9 Rules and Regulations

The factor looked at the availability of standard rules and regulations and support from the regulatory authorities for the IT implementation.

In depth Interview Analysis of IDIA2

Banking industry is ruled by the rules and regulations of its central bank, the rules and regulations set up by the central bank have a great influence on the adoption of CBS. Though RBI gave directives to all public sector banks to adopt CBS there were no specific guidelines for implementation or system valuation procedures. The IT act 2000 was used as a basis for the security aspect of IT. It was only after the establishment of IDRBT research started in the field of banking technology and banks started getting proper guidelines for the implementation of banking solutions.

The In-depth Interview Analysis ofIDIA1

Lack of proper implementation guidelines from the regulatory authorities led the banks to depend on IT consultants for guiding them in the implementation process. Most of the implementation activities were a trial and error method. The two IT Vision documents published by the RBI threw some light on the adoption of banking technology.

5.3.2.10 Industry Leadership

The level of leadership the organization enjoys or the level of leadership the organization wants to achieve with the adoption of the new IT.

Secondary Data

The largest and oldest Public Sector Bank in India, with, 16333 branches spreading across the country, 43,515 ATM as of financial year 2014 and 2500 card holders per ATM. Before CBS implementation it was losing its customers to new generation banks with state of the art technology. With the implementation the bank was able to regain its position.

In-depth Interview Analysis of IDIA2

The bank was the largest and oldest bank in India, but it was losing market share to private-sector banks that had implemented more modern centralized core processing systems by 1990. The advantages in products and efficiency of the private-sector banks became increasing evident in late 1990s when the bank lost existing customers and could not attract the rapidly growing middle market in India. In fact, this technology-savvy market segment viewed the public-sector banks as technology laggards that could not meet their banking needs. As a result the bank went in for the largest CBS implementation project of the country. The bank being the largest bank in the country was financially strong to undertake such a huge project. The bank couldreverse the trend of customer attrition and gaining new market share.Completion of the core conversion project has also allowed the bank to undertake several new initiatives to further improve service and support future growth and thus maintain the leadership position.

5.3.2.11 Technological Advancements

The factor looks at the ability of the organization to recognize the technological advancements and adopting it for business growth.

In depth Interview Analysis of IDIA1

The success of the bank was that it was able to identify the banking technology advancements taking place. The bank was among the first to adopt the CBS. Though initially the management did not recognize the need for technology up gradation, later the management felt the need for constant up gradation. A research team was formed under the leadership of General Manager IT, who constantly looked into any new technological changes happening. To quote:

"Ours is bank where technology and business are inter related, new technology drives us to look for new business avenues and new business avenues lead us to look for latest technology".

5.3.2.12 User Involvement

The factor looks into the importance and personal relevance assigned to the new system introduced by the system user

PIRF Results

The PIRF shows how the user and the IT representative felt about the new system. The user did not feel that the new CBS was important to them. The IT representative felt that the new system was important.

Table 5.6: User Involvement

Statement	User			IT Representative			Top Management	
I was interested and excited about the new CBS system	DA	DA	DA	A	A	A	NA	
The users were interested and excited about the new CBS system	NA			DA	A	DA	DA	DA

In depth Interview Analysis of IDIA2

The users were not so keen about the adoption of new CBS project. They were contented with the old system they were using they didn't feel the need to upgrade to a new system. The lack of personal relevance to the new system inhibited them from involving in the specifications of system requirements. The users felt that CBS is a software project of the technology department and involves the purchase and implementation of the software. Low user involvement led to low user participation. Low user involvement also led to initial inhibition from the users to use the core banking fully. It is only after educating the users and the support provided by the management that the users became confident in using the system.

5.3.2.13   User Participation

The factor shows the user participation in the decision making process, and ownership of the results of the task necessary for the implementation to be smooth.

PIRF Results

The PIRF shows the participation of the users in system specification. The result showed that the users did not participate in the system specification part. But when the same question was asked to the IT representative and the management their response was that users participated.

Table 5.7: User Participation

Statement	User			IT Representative			Top Management	
I was involved in the system specification	DA	DA	DA	A	A	A	A	A

In-depth Interview Analysis of IDIA1

Since the user involvement was less and they had many doubts about the new system. The users by them self was reluctant to be participate in the system development and implementation procedures. To quote:

'the users were anxious more than excited about the new system. They felt that the new system will be more complex and will bring drastic change in their work procedures. The top management had to talk with the regional managers about the new system and formed a committee for the CBS implementation which involved users from different branches. The management also had to announce some incentives for the uses who participation in suggestions".

The following steps were initiated by the management for making the users participate in the implementation process:

- They were made aware of the festers of the CBS
- Suggestions were invited by the management.
- Branch personnel were responsible for data scrubbing and cleaning of their customer information on the existing system.
- Inefficiencies of the old system and suggestions to improve it were taken from the users.

Memo – users as such were reluctant to be involved in the CBS implementation project. Management had to take up initiatives to involve the users. The size of the bank inhibited the complete participation. Only those users which the management thought needs participation were involved. This is why there is a contrasting answer in the PIRF.

5.3.2.14   Commitment to the Project

The factor looks at all those activities or actions undertaken by the management to make the IT implementation smooth and error free.

PIRF Results

The PIRF showed the commitment of the management and the IT staff. The result showed that the Management and IT staff was very much committed to the CBS project.

Table 5.8: Commitment to the Project

Statement	User			IT Representative			Top Management	
Top management viewed the CBS system important to organizations goals	A	A	A	A	A	A	NA	
When there was difficulties in the implementation process management tried hard to find the correct solution	A	A	A	A	A	A	NA	
When there were difficulties while implementing the new system, IT staff tried hard to find right solution	A	A	A	NA			A	A

In depth Interview Analysis of IDIA3

The project was driven by the chairman of itself, who met every month with the information technology (IT) and the business sector heads. The chairmanmonitored the overall status and ensured that sufficient resources were allocated to the project. IT vendor senior managers were thoroughly committed to the project as well and periodically met with the bank chairman to review the project status. The regional business line heads were made responsible for the success of conversion of their respective branches and reported the status to the chairman. Thus, the business heads' objectives were aligned with those of the project team.The management had made a priority listing for the allocation of the resources.

The In-depth Interview Analysis ofIDIA2

The users were at first very apprehensive towards the implementation of CBS. It was the commitment of the top management which helped in overcoming the apprehension and gain the commitment of the users and the IT staff towards the project. The main activities undertaken by the management was:

- Educating the regional business heads about the need for the implementation of CBS. The business heads were then made responsible for the implementation of their region

- Establishing a structured communication channel in the form of intra mails, by which the lower level stake holders to the project could directly communicate with the top management

- Setting up an implementation team involving representatives from branches, departments and project group.

- Setting up a business process re-engineering team to re-engineer the existing process

- A resource allocation chart for the conversion
- Time scheduling the project
- Review of the project and corrective actions if necessary at fixed time periods.

5.3.2.15 Project Champion

The factor looks for the presence of a person who takes the ownership of the project and markets the project within the organization.

In depth Interview Analysis of IDIA3

Strong leadership qualities were displayed by the top management especially the Chairman. To quote:

"the greatest challenge of adopting the new CBS was it should be able to handle the large volume of data. But the greatest challenge faced within the organization is the cleaning of the data. There were loads of raw data. The organization needed a strong leadership front to clear the data and make the conversion smooth."

The Chairman itself took up the responsibilities of the project champion. The Chairman would meet every month with the information technology (IT) and the business sector heads. The chairman monitored the overall status and ensured that sufficient resources were allocated to the project. IT software Vendor senior managers were thoroughly committed to the project as well and periodically met with the chairman to review the project status."

The In-depth Interview Analysis ofIDIA1

The Chairman itself was the project champion for the CBS project. The success of implementation can be attributed to the role of General Manager IT. GM (IT) acted as a business integrator. That means he acted as a link between the basic banking people and the IT staff, linking the business needs to the system. The presence of the system integrator acted as a catalyst for the implementation of CBS

5.3.2.16   Resource Allocation

The factor includes personnel, equipment, time, money, skill set employed for the implementation

PIRF Result

The PIRF result showed that there was no priority setting or a structured plan for the allocation of the resources.

Table 5.9: Resource Allocation

Statement	IT Representative			Top Management	
The bank undertook a priority setting of the project	DA	DA	DA	DA	DA
Plan was developed for the allocation of various resources according to the priority	DA	DA	DA	DA	DA

In depth Interview Analysis of IDIA2

The bank lacked skilled person for the implementation of the CBS, so they had to depend on the external IT consultants for the implementation. But the main problem faced was in proper allocation of the available skilled person in the project. The CBS was customized to

meet the process and flows of the bank, so almost all the staff was placed in the development and customization of the CBS. The project implementation was getting delayed due to the massive customization. This led to cost and time over runs. Prioritizing the phases of implementation and allocation of resources would have helped the bank to complete the project in time and within the fixed budget.

5.3.2.17 Commitment to Change

The factor looked at the management willingness to make changes to behavior, procedure, structure and other factors that are necessary for the adoption of the new system.

PIRF Results

The result showed that the management was aware of the changes that could happen with the implementation of the new system. The management was ready to make changes to the existing routines and was very supportive in change management.

Table 5.10: Commitment to Change

Statement	User			IT Representative		
Management realize the complexity of changes that would result as a consequence of the new system implementation	A	A	A	A	A	A
Top management was very effective in supporting changes in existing routines and processes that were critical to the new system implementation	A	A	A	A	A	A

In-depth Interview Analysis of IDIA3

The top management realized the need for change in the organization. This was a driving force for the commitment from the IT staff and the branch users. The IT staff was also committed to the project. The management made changes in the authority structure so that communication can be easy and approvals can be fast. A business process initiative was undertaken by the management. A major highlight was the introduction of intranet facility for the communication of the changes and the training and education provided to the lower level staff.

The In-depth Interview Analysis ofIDIA2

The top management realized the need for changes in procedures, the first initiative was the change in the reporting structures. The members in the CBS implementation team which included branch managers, IT representatives, branch users, department representatives were made to report directly to the Chairman who was the project champion. An intranet facility was provided for this purpose. This helped in fast decision making and approvals .The staff members were given training in implementing changes to their daily routine.

The In-depth Interview Analysis ofIDIA1

The technical staff was the ones most affected by the changes. They had to work overtime or on holidays for the data updating and conversion, so that daily business would not get interpreted. The IT staff gave training to selected staff members on the data cleaning and data migration techniques. They were made responsible for the conversion of their branch. The support received from the top management was very effective.

5.3.2.18 Service Level Documentation

The factor includes documented, accepted procedure which governs service expectations and obligations.

In depth Interview Analysis of IDIA2

The greatest problem with the implementation of the CBS was the third party vendor management. There were a large number of vendors involved with the CBS implementation. There were hardware vendors, software vendors and consultants. Hardware vendors were different for different regions. At first it was a real problem in defining the duties. The IT consultants along with the Chairman and the legal department of the bank drafted a well-defined service level document. The document also looked into the existing laws related to the third party contract. It was a well-defined document. The document helped the vendors and the bank to understand their roles and responsibilities. The document avoided many role conflicts which would otherwise have delayed the implementation.

The In-depth Interview Analysis ofIDIA1

The service level document helped the IT department staff to know what role the vendor would assume and what their limits are. It also gave guidelines on the limits of the vendor. The IT department staff initially had some problems with the vendors and consultants. They felt that they have been sidelined and the implementation was the responsibility of the third parties.

5.3.2.19 Request for Proposal

The factor shows clearly defined and documented user requirements for the assessment of the vendor.

In-depth Interview Analysis of IDIA2

The most important factor the success of the CBS adoption was the well-defined RFP that the bank came up.Recognizing the need for large-scale centralized systems expertise bank sought proposals from anumber of vendor consortiums that were headed by the leading systems integrators. From theseproposals, the bank narrowed down the potential solutions to vendor consortiums led by IBM andTCS. The TCS group included Hewlett-Packard, Australia-based Financial Network Services(FNS), and China Systems (for trade finance).Although the bankfavoured the real-time processing architecture of FNS's BaNCS system over that of theIBM consortium's memo post/batch update architecture, the bank had several concerns about theTCS consortium proposal. They included the small size and relatively weak financial strength ofFNS (TCS would eventually purchase FNS in 2005) and the ability of the UNIX-based system tomeet the scalability requirements of the bank. Therefore, it was agreed that TCS would beresponsible for the required systems modifications and on-going software maintenance.Additionally, scalability tests were performed at HP's lab in Germany to verify that the system wascapable of meeting the bank's scalability requirements. These tests demonstrated the capability ofTCSBaNCS to support the processing requirements of 75 million accounts and 19 million daily. All this was possible only because the bank management involved all the stakeholders to the CBS in drawing a detailed RFP.

5.3.2.20 Business Continuity Plan

The factor shows prior arrangements and procedures that enable an organization to respond to an event in such a manner that critical business functions can continue within planned levels of disruption.

The In-depth Interview Analysis ofIDIA2

A board approved BCP was developed later to ensure business continuity, redemption and recovery of critical business process after a disruption or disaster such as fire, natural calamities and system failures.

The main objectives of the BCP were:
- Minimize financial loss
- Continue to serve customers
- Mitigate adverse impact on the image of the bank
- Continue to comply with applicable laws and regulations.

Business impact analysis and risk assessment need to be performed as a prelude to developing an effective BCP. Though it does not directly affect the implementation process it is necessary for undisrupted use of the system, so BCP has to be included in the implementation process.

5.3.2.21 Maintenance

The factor looks at the monitoring, evaluating and modifying of operational business systems to make desirable necessary improvements.

In-depth Interview Analysis of IDIA1

The maintenance of the system was an herculean task. It was decided that the software vendor will be responsible for the ongoing maintenance of the system. The bank entered into annual maintenance

contract with the hardware vendor for the maintenance of the systems and lease lines. This helped the bank to keep the system down time to low as possible. All the branches were given the contact number of the concerned vendors.

5.3.2.22 Contract Termination

Confirming new behaviors patterns and completing transfer of responsibility to users.

In-depth Interview Analysis of IDIA2

This is a very important factor in the success of CBS implementation. Once the software vendor handed over the CBS to the bank the first thing was to give the access rights on the basis of 'need to know and need to do'. The complete ownership of the CBS was transferred to the IT department CBS team. The team developed an access and security policy for the CBS. The IT department was given the right to make modifications to the CBS and give access rights with the approval of General Manager (IT). Each branch has been assigned users depending on the amount of slip entry in the branches. The userid and password was assigned from the IT department.

5.3.2.23 Documentation

Recording and communication of detailed system specifications, user access and security controls including procedures for end users and technical staff.

In-depth Interview Analysis of IDIA2

The main problem faced during the implementation process was the lack of structured documentation process. There was no document

related to implementation plan, system specifications, data center management, access management and security controls. Even the branches did not have a manual for their daily operations. All what the banks had is the banking manuals. After some critical incidents in the bank, the chairman appointed a committee to draw up manuals for

- System specifications

- Data centre operations

- Security procedures

- Access and control

The In-depth Interview Analysis ofIDIA1

The main problem pointed out by the branch staff is that they did not have any online or offline manuals which help them in system use. All the time they had to call up the IT department for clearing their doubts. This led to customer servicing delay and reluctance to use major features of the CBS. The IT department also did not have a structured documentation on the customization done to the system. The customization was people centric. So when software up gradations came the IT staff found it very difficult.

5.3.2.24 Organizational and Technical Infrastructure

The factor looks at the organizations hierarchical structure and the technical infrastructure available at the time of IT implementation.

In depth Interview Analysis of IDIA1

The bank being an old public sector bank, the organizational structure was very rigid. There was hierarchy of authority to be followed for every decision. This was the main delaying fact for the quick decision making needed in the implementation of CBS. The geographical diversity

of the bank added to the problem. A request was sanctioned only after months. The sanction had to be published in the form of a circular. The technical infrastructure was also not very supportive for the CBS implementation. The bank had only limited connectivity. Being a public sector bank, the bank had many rural branches which didn't even have proper electricity. So networking all the branches in the initial stage was not possible. This delayed the completion of CBS implementation.

Memo – the existing organizational structure was not at all flexible. This led to delay in many process and acted as barrier for CBS adoption.

5.3.2.25 Extend of Planning

A written , comprehensive document organizations strategies and priorities, allocating limited resources, time schedules for implementation, role of project team and ways to measure the progress.

In-depth Interview Analysis of IDIA3

The process of groundwork preparation started very actively. To prepare the branch users for system implementation, the IT representative had a number of meetings with the management where they have built templates together based on current forms used in the Bank. The IT representative had a number of meetings with the IT GM who was also the project champion, to learn about the bank operations and get his ideas on how to implement the new CBS system.

The In-depth Interview Analysis ofIDIA1

The main plans were:

- Time schedule for the project
- Resource allocation plan

- Exception handling plans
- Budget plans
- Communication and reporting plans
- Project review plan

5.3.2.26 Implementation Team

The factor looks at the skill-sets and knowledge-sets of the project team within interpersonal, computer systems, and organizational areas

In-depth Interview Analysis of IDIA2

The core banking team consisted of the bank's managing director of IT acting as team head and 75 businessand IT people selected by the bank.TCS also staffed the project with approximately 300 IT professionals trained on the BaNCSsystem. Importantly, the banks business people were viewed not just as contributors to a key project but as future bank leaders. This team reported to the chairman and was empowered with all decision-making authority. The implementation team members were encouraged to do certification courses which helped them in implementation of CBS.

5.3.2.27 Business Process Re-engineering

The factor looks at the changes in workflow patterns, work procedures, routines, reward systems, control and coordination mechanisms brought in the organization for better adaption of technology.

In-depth Interview Analysis of IDIA1

The process and procedures were to be re-engineered according to the new system but the straight reverse was happening. The system was re-engineered according to the age old practices of the organization. So even though CBS was implemented the bank never became paper less.The

bank had appointed a BPR committee to study the process and workflow, some of the recommendations were accepted but major were rejected.

5.3.2.28 Institutional Structure Re engineering

Restructuring of the organizational authority level for quick decision making and faster implementation

In-depth Interview Analysis of IDIA2

Being an old organization it had a very rigid organizational structure. This acted as a barrier to quick decision making, smooth process flows. The chairman understood that the rigid structure had to be made flexible. But the sudden change in the organization structure was not possible. A parallel structure was formed with less hierarchy level for the implementation purpose.

5.3.2.29 Training and Education

Training on technical aspect, work flows, why the particular system is being introduced and how the project will affect them both during and after its implementation.

PIRF Result

The result showed that the users were satisfied with the training they received. They were also well educated about the project.

Table 5.11: Training and Education

Statement	User		
The training I received was sufficient for the CBS use	A	A	A
I had a full understanding of the implementation process that I need to go through before implementation	A	A	A

In depth Interview Analysis of IDIA2

The bank used its network of 58 training centers across India to train employees on the new system. TCS personnel first educated approximately 100 bank professional trainers, who then trained 100,000 bank employees at the centers; the remaining employees were trained at their respective job sites. This led to a faster adoption of the CBS.

Memo – the training and education was taken as two separate factors. The education was about the project and training was in the software.

5.3.2.30 Task Technology Fit

The factor looks at the degree to which the stakeholder believes that using particular system has enhanced his or her job performance, or his or her group's or organization's performance.

PIRF Result

The result shows that the users did not feel that CBS fully met their task needs.

Table 5.12: Task Technology Fit

Statement	User		
CBS is compatible with all aspects of my work routines	DA	A	A
CBS fits well with our banks way of doing things	DA	DA	DA
CBS made my work environment less stressful	DA	A	A

In depth Interview Analysis of IDIA2

When the branch users first started using the new system, they felt that they had to enter more data. The users also pointed out that they had

to visit many screens in which they do not have to enter anything. The customer information form and the screen to enter the data in CBS were entirely different. The IT department did an exercise of re working on the basic screen and customizes it into the needs of the branch users. The new workflows helped the user to service the customer faster.

In depth Interview Analysis of IDIA1

For entering the customer data the user had to visit ten screens, in which they had to enter data only in six. Many of the fields were not required. After the reworking only in customer data entry the number of key strokes went down to 62 from 98. This was an advantage for the users. But the main problem faced by the IT department was to manage the expectations of the customers. The customers thought that CBS was the solution for all the branch problems.

5.3.2.31 Relative Advantage

The factor looks at how advantages is the new system over the old one.

PIRF Result

The result showed that using the CBS was more advantageous than their old system.

Table 5.13: Relative Advantage

Statement	User		
Using the CBS enables me to accomplish tasks more quickly	A	A	A
Using the CBS improves the quality of work I do	A	A	A
Using the CBS makes it easier to do my job	A	A	A

In depth Interview Analysis of IDIA3

As the users started using the CBS they found it more advantageous than the old TBA system. The CBS provided the branch with a single window view of the customer account. There were 300 reports available in the CBS. Many of the statutory reports which the branch had to send to regional office or head office could be downloaded at the centers. Quick decisions were possible for many of the branch problems. Since all the processing was done in the system, the customer service time drastically changed. The turnaround time for customer creation and account opening came down to ten minute from fifteen to twenty minutes. So was the case with all other branch process.

5.3.2.32 Ease of Use

The factor looks at the degree to which potential adopters view usage of target technology to be relatively free of effort.

In depth Interview Analysis of IDIA3

The new system was easy to use. This was made possible by the hands on training received by the branch staff. Most of the staff got an opportunity to do trial entries before the system went live. The only problem faced was there was no online help available when new modules were to be explored. The user had to contact the IT department and wait for their instruction.

5.3.2.33 Information Quality

Content, accuracy, flexibility, access, security and integration of the information received from the new system.

PIRF Results

The result showed that the users were satisfied with the information quality of the CBS.

Table 5.14: User satisfaction with Information Quality

Statement	User		
The access to the new system is easy and convenient	A	A	A
The new system is flexible to changes and adjustments that result from new conditions,demands, or circumstances at my work	A	A	A
The new system does not overloads me with more data than it seems I can possibly use	A	A	A
The new system provides output that is complete and accurate	A	A	A
The new system does not have errors that I have to work around	A	A	A
The new system has the ability to integrate data with other information systems I use	A	A	A

In depth Interview Analysis of IDIA3

The satisfaction with the quality of output of the new CBS led to the active use of the system. Therequests from customers weretaken as input for the creation of more reports. The customers of the branch were also satisfied with the quality of reports received from the branches. NPA recovery became easier with the data available in CBS.

5.3.2.34 Tenure

The factor looks at the branch usersnumber of years of service with the organization

In depth Interview Analysis of IDIA2

Tenure played a very important role in the adoption of CBS. The more the number of years the more the users becomes contented with their task nature and process flows. It was very difficult for the old staff to make changes in their work process. But with the new recruitment drive of the bank the average age of the staff fell from 45 to 32. New staff was more enthusiastic in adoption of CBS.

5.3.3 Discussion of Emergent Codes

Two codes which emerged during the in depth interview were shared vision and the presence of the business integrator. Shared vision refers that the organization should have same goals while implementing the new system. The vision of the management and the users must not differ. The difference in goals will lead to resistance to the adoption of the system. Business integrator is the one who can create the shared vision in the organization.

5.3.4 Case Highlights

The highlights for the Case A are as follows:

- The internal factor of organization strategy and the external factors of change in rules and regulations, technology availability, and competition in industry acted as the drivers for the adoption of CBS.

- The user factors such as satisfaction with the old system, long tenure, task content, lack of coordination with other departments, lack of computer skill acted as barrier to CBS adoption and implementation.

- The strong organizational political affiliation, rigid organizational structure and the large size of the organization also acted as barrier for CBS adoption and implementation.

- The power and leadership displayed by the management, the integration of IT strategy and business strategy, the management commitment to the project and change, was the strength of the case.

- Management support and education helped in overcoming most of the barriers.

- Extensive planning and the skill and empowerment of the project team, re-structuring of the business process, institutional re-structuring, and well developed contract with the third party vendors helped in completion of the project before time.

- The quality of the product purchased and hands on training provided helped the user acceptance of the system.

- The regular maintenance, the ownership creation, and the business continuity plan helped in keeping the system downtime low and increase usage of the system.

The analysis of case A showed that even though there were many user and organizational barriers, the vision and strong leadership shown by the management in identifying these barriers and taking corrective measures helped in the successful implementation of core banking solution.

5.4 Individual case Analysis: Case B

5.4.1 Background of the Case

A medium sized nationalized bank with 3700 branches. The only bank to use an in house banking solution when all the banks went in for outsourced solutions. By the year 2011 the bank software could notcope up with the business volume. The bank decided to purchase the solution of the IT firm Infosys. The bank had appointed Ernest & Young for the implementation plan .the target is to complete the project by the year 2016.

5.4.2 Discussion of the Apriori Codes

In the following sections analysis and discussion of the PIRF results, in depth interview transcripts and secondary data is done. Apriori codes identified during the stage II of the research are discussed first followed by the emergent codes developed during analysis. The PIRF results, in depth interview transcripts and secondary data are discussed as separate sections inside each factor. The table 5.15 shows the code and designation of the in depth interview respondents.

Table 5.15: In- depth Interview Respondents with Date and Codes

Case B		
Designation	**Code Assigned**	**Date of Interview**
Chief Manager (Information Technology)	IDIB1	15/01/2014
Chief General Manager (Information Technology)	IDIB2	15/01/2014
Clerk (Branch)	IDIB3	01/02/2014

5.4.2.1 Path Dependencies

PIRF Result

The two categories of respondents, the branch users and the management were unsatisfied with the old system. The IT representative was satisfied with the old system.

Table 5.16: Satisfaction with the Old System Used

Statement	User			IT Representative			Top Management	
I was satisfied with Old System	DA	DA	DA	A	A	A	DA	DA

The In-depth Interview Analysis of IDIB1

The inefficiency of the old system was a major reason for the decision to purchase a new CBS. The main difficulties of the old system as pointed out were:

- As business grew they system couldn't handle the large volume of data processing
- Maintenance was becoming a costly affair
- The system downtime was increasing
- The connectivity between the branches was low; this led to difficulty in data integration.
- System development was not taking place as the IT staff were busy with maintenance.

The In-depth Interview Analysis of IDIB2

The management as well as the users started facing problems with the in house CBS. The management could not meet most of the regulatory demands. The reporting standards were not met. There were growing

customer complaints. The system down time was increasing. The technical team was finding it hard to maintain the system, large volume of data could not be handled, and batch processing was in a mess. But the technical team was positive about building the in house system.

Memo -The old system also acted as a barrier in the integration of the new system. The bank had to discard the old system completely, the data had to be cleaned and migrated to the new CBS system. This led to the delay in project implementation.

5.4.2.2 Organizational Power Affiliations
The In-depth Interview Analysis of IDIB2

Since the bank falls under the category of nationalized banks, there was a strong presence of various labour unions. The clerical union was the strongest. It was mainly to avoid a liaison with the labour union that management decided to build an in house solution. Though the bank had strong presence of labour union, they did not influence the adoption of a new technology.

Memo - The organization had strong power affiliations. The unions have a strong say in the decisions made by the management and played an important role in adoption of CBS. But they did not have any influence on the decision to adopt the new system.

5.4.2.3 Organizational Strategies and Goals
PIRF Results

The PIRF looked for whether the bank undertook a need analysis process for the adoption of new technology. The branch users said there

was no need analysis adopted but the management and IT representative said the need analysis was done.

Table 5.17: Need Analysis for NewCBS System

Statement	User			IT Representative			Top Management	
Needs assessment was done before deciding to adopt CBS	DA	DA	DA	A	A	A	A	A

The In-depth Interview Analysis ofIDIB2

Till 2009 the was using its own in build CBS, at that time the main aim of the bank was a technical up gradation. The technical up gradation was handled as a project of the IT department.The bank did not have a long term technical strategy or a link between the technical and business strategy. Both business goals and technical goals were independent of each other. But when the in house system became a failure it was reflecting in the business side. The profits showed a decline and the customer attrition was increasing. The management then realized the need for a revision of their strategy.

When asked about the contrast in the response of the users, the response was all the users were not aware of the changing environment. They were mostly concerned about their daily work routines.

Memo -The bank have appointed the IT consultant Ernest & Young for a need analysis and come up with IT strategy for the bank.

5.4.2.4 Organizational Size

The In-depth Interview Analysis of IDIB2

The large size of the organization acted as an important measure for the adoption of the CBS package. Lack of proper assessment of the size of the organization and the volume of transaction led to the development of an in house CBS system at first, this system had to be discarded and a much advanced system was adopted. The large number of branches spread across the country was the major reason why the bank went for in a phase implementation of the CBS project; this led to delay in project completion.

5.4.2.5 Attitude Towards Innovation and Changes

PIRF Results

The PIRF looked for the attitude of the users, top management and the IT representative towards technology Innovations and the CBS to be adopted. The result showed that all the three categories had a positive attitude towards technology and but showed a negative attitude towards the new system.

Table 5.18: Attitude towards Innovation and Changes

Statement	User			IT Representative			Top Management	
Information System and services are important for my performance at my job	A	A	A	A	A	A	A	A
Before implementation of CBS, I was sure it will provide solution to all the problems	DA	A	DA	DA	DA	A	A	A
I was ready to make changes in my work routines and process which was necessary for the new system implementation	DA	DA	DA	DA	DA	A	A	A

The In-depth Interview Analysis of IDIB3

The users were unsatisfied with the old system. The branch users are the people who deal with the customers directly. They had to face a great deal of complaint from the customers. The processing time for even small request ranged from 20 minutes to one hour. So when the bank decided to adopt a new system the users showed great enthusiasm and had a positive feeling that the new system will solve the problems they now face.

The In-depth Interview Analysis of IDIB1

The management was not sure of the new system. They had decided to implement new system due to the dissatisfaction with the old system. The management thought CBS implementation was an initiative of the IT department. Banking business was separated from this initiative.

5.4.2.6 Collaboration

In depth Interview Analysis of IDIB1

To quote the words:

"the collaboration with the branch staff and the IT department was very low, they looked upon us only as people who does the maintenance. So when it came to work hand in hand with the implementation project it was very difficult to convince the staff.'

There was always conflict between the IT department and the branch staff. Data cleaning was a major huddle which the IT staff faced. Most of the branches have incorrect or insufficient data. When asked for data cleaning before migration the staff found it to be a burden for them. The compatibility between the IT staff and the IT consultants also was very low.

5.4.2.7 Computer Literacy

PIRF Results

The PIRF looked for the qualification of the respondents and the experience in the banking software. Most of the respondents did not have any basic computer qualification, but the experience of the respondents in the banking solution was more than any case.

Table 5.19: Computer Literacy

	User			IT Representative			Top Management	
Basic Computer Qualification	M.S office	NA	NA	B.Tec	BCA	B.Tec	M.S.Office	Office automation
Experience in banking solutions	5	3	4	3	2	3	3	2

In depth Interview Analysis of IDIB1

An additional reason for delay in implementing the new CBS system was insufficient computer skill of the users. Though the users were using the computer for a long time, they did not know functions beyond their daily routine job. They were also not confident in using a new system. To quote:

"Many of them [clerical staff] were not computer savvy, even though the staff had software experience, the teller and the other staff had their book keeping process running parallel with the CBS, I am not really sure that they were really interested in implementing the new system."

Though the computer literacy of the staff didn't so much affect the decision to adopt the technology it affected the training and education of the staff and the use of the new system.

5.4.2.8 Task Nature
In depth Interview Analysis of IDIB3

From the very beginning the CBS implementation faced serious challenge. First the organization work nature was not assessed fully to develop the CBS requirements. The bank have not moved hundred percent to core banking solution, there are still some manual branches. So when a branch does a transaction, one leg of the transaction will have to be processed by the manual branch, this led to difficulties in performing a task. There was no clear indication given about the changes in the work flow patterns.

5.4.2.9 Rules and Regulations
In depth Interview Analysis of IDIB2

The main advantage of the bank was that it went in for CBS only very late, by then RBI had set up the IT research center at Hyderabad. The bank could take the help of IDRBT for the implementation process. The RBI also came up with more structured set of rules for IT adoption by banks. Thus the rules and regulations helped in a better adoption of CBS.

5.4.2.10 Industry Leadership
In-depth Interview Analysis of IDIB2

The bank was one of the largest nationalized bank. The bank never faced a threat from competition till deregulation started. The bank always maintained the competitive position in the nationalized banking

sector. Once the new gen banks entered the market with state of the art technology the bank started losing its customers. The bank adopted technology in early 1990 just to survive in the market. But by the year 2005 the bank realized that even survival was not possible with the type of technology they are using. Hence the bank went in for a more advanced system of CBS.

5.4.2.11 Technological Advancements

In depth Interview Analysis of IDIB2

The failure of the bank was that it could not keep in pace with the technological advancements taking place. The bank had islands of applications for each process. For example the bank has a system for human resource activities another for customer transactions, loan processing etc. Most of the systems run on different platforms. Data integration and reporting was a problem. Moreover the IT staff had to spend a considerable time in compiling reports from these systems.

5.4.2.12   User Involvement

PIRF Results

The PIRF shows how the user and the IT representative felt about the new system. The users felt that the new system was important. But the IT representative had their inhibitions.

Table 5.20: User Involvement

Statement	User			IT Representative			Top Management	
I was interested and excited about the new CBS system	A	A	A	DA	DA	DA	NA	
The users were interested and excited about the new CBS system	NA			A	A	A	A	A

In depth Interview Analysis of IDIB2

The users felt that the new system was very important for their work. This was because the old system could not meet their work expectations. The IT staff was a little apprehensive about the system. this was they did not want to lose the system they build and work on the software purchased from outside IT vendor. Moreover the IT department had a feeling that they lose their power and control in the organization.

5.4.2.13 User Participation

PIRF Results

The PIRF shows the participation of the users in system specification. The result showed that the users did not participate in the system specification part.

Table 5.21: User Participation

Statement	User			IT Representative			Top Management	
I was involved in the system specification	DA	DA	DA	DA	DA	DA	DA	DA

In-depth Interview Analysis of IDIB3

No strategies were established to foster user participation. The management and the IT staff participated in the system development but the users were not involved. No activities were offered to the users where they could develop belief that the new system was important, personally relevant and positive for the organization. The users thought that their feedback was of no value to the organization. Though the users were interested in the system, they thought it was the responsibility of the IT department.

5.4.2.14 Commitment to the Project

PIRF Results

The PIRF showed the commitment of the management was low but a positive response to the commitment of the IT staff.

Table 5.22: Commitment to the Project

Statement	User			IT Representative			Top Management	
Top management viewed the CBS system important to organizations goals	A	DA	A	A	DA	DA	NA	
When there was difficulties in the implementation process management tried hard to find the correct solution	DA	DA	DA	A	DA	DA	NA	
When there were difficulties while implementing the new system, IT staff tried hard to find right solution	DA	DA	DA	NA			A	A

In depth Interview Analysis of IDIB3

Management did not realize the level of commitment required for the project. To quote:

"most of the time the management just left it up to the IT department. When there were problems we had to call up the IT department and because they were all busy with implementation, we could never get a proper support".

The In-depth Interview Analysis of IDIB2

The commitment level of the IT staff and the users were very low. Though users were excited about the new system, they were so busy with their daily activities that they couldn't find much time for the new system inputs. The IT staff thought that the CBS implementation project was the responsibility of the vendor.

5.4.2.15 Project Champion

In depth Interview Analysis of IDIB1

The implementation project lacked a project champion. The General Manager IT was made responsible for the project implementation. He was not supported by the management. So major focus was on the technical implementation of the CBS. There was a lack of a business integrator in the organization who would integrate the business goals with the project. Even the departments had no role in the project implementation. To quote:

"it is important to have a champion who has expertise in using the new technology and believe it can work. He also needto encourage and lead the project".

5.4.2.16 Resource Allocation

PIRF Result

The PIRF result showed that there was no priority setting or a structured plan for the allocation of the resources.

Table 5.23: Resource Allocation

Statement	IT Representative			Top Management	
The bank undertook a priority setting of the project	DA	DA	DA	DA	DA
Plan was developed for the allocation of various resources according to the priority	DA	DA	DA	DA	DA

In depth Interview Analysis of IDIB2

The bank lacked skilled person for the implementation of the CBS. But the management did not take the help of the external consultants. The IT staff was burdened with the task of data migration and conversion. The resources were not potentially used. Moreover huge customization had to be done to the product purchased. Most of the resources like IT staff skill, time and money were spend on the customization part. This led to resource crunch in the later stages of the implementation process.

5.4.2.17   Commitment to Change

PIRF Result

The result showed that the management was aware of the changes that could happen with the implementation of the new system. But the management was not ready to make changes to the existing routines.

Table 5.24: Commitment to Change

Statement	User			IT Representative		
Management realize the complexity of changes that would result as a consequence of the new system implementation	A	A	A	A	A	A
Top management was very effective in supporting changes in existing routines and processes that were critical to the new system implementation	DA	DA	DA	DA	DA	DA

In-depth Interview Analysis of IDIB1

The top management realized the need for change in the organization. But their involvement was limited to the kick of meeting. The management support dissolved right after the decision to adopt the system. When the time came for the actual implementation and getting started with the new system the management took a back step. The management was also against breaking the authority line for quick decision making.

5.4.2.18 Service Level Documentation

In depth Interview Analysis of IDIB2

The greatest problem with the implementation of the CBS was the third party vendor management. Till then bank did not have any major agreement with the vendors. The service level documents were not properly drafted. The IT department was not competent to draft a proper

document. This lacking led to many loopholes in the service agreements. The vendors failed to takethe responsibility of any failure in the system.

5.4.2.19   Request for Proposal
In-depth Interview Analysis of IDIB2

The lack of user participation led to ill-defined RFP. The bank settled with a basic CBS provided by the IT vendors. The major concern of the bank was the financial aspect of the product rather than the product features. Many of the modules of the basic product were not purchased. When it came to purchase of the user license to the product, the bank went in for limited number. This later created the problem that all the branch staff could not use the system.

5.4.2.20   Business Continuity Plan

The factor could not be assed as the bank did not have any formal business continuity plan.

5.4.2.21 Maintenance

The bank is still on its CBS project. The now the bank is more concerned about the daily routine work of the system and data migration activities.

5.4.2.22   Contract Termination

Since the CBS implementation is still an ongoing project , the interview did not reveal much about the contract termination part.

5.4.2.23   Documentation

In-depth Interview Analysis of IDIB2

No proper documentation is available in the organization. All the time the users had to call up the IT department for clearing their doubts. This led to customer servicing delay and reluctance to use major features of the CBS. The IT department also did not have a structured documentation on the customization done to the system. The customization was people centric. So when software up gradations came the IT staff found it very difficult.

5.4.2.24   Organizational and Technical Infrastructure

In depth Interview Analysis of IDIB1

The bank being an old nationalized bank, the organizational structure was very rigid. There was hierarchy of authority to be followed for every decision. This was the main delaying fact for the quick decision making needed in the implementation of CBS. The geographical diversity of the bank added to the problem. A request was sanctioned only after months. The sanction had to be published in the form of a circular. The technical infrastructure was also not very supportive for the CBS implementation. The bank had only limited connectivity.

5.4.2.25   Extend of Planning.

In-depth Interview Analysis of IDIB1

To implement any change of this scope takes not just one person but a group. However, the approach to preparing the implementation plan was not carried out as a team initiative. Not one meeting took place where everyone involved in the implementation, or at least one representative from each group, was present to discuss the implementation details. To quote:

"the users were not involved in preparing the implementation plan, it was the IT representative and head of the project who created the overall strategy for CBS implementation".

The users were not involved in the planning process. IT department took the suggestions from the top management and worked out. The budget allocation and the time schedules were decided by the top management. There was always conflict between the top management and the IT staff on the budgeting and the time schedule. The IT representative felt that the top officials could not understand most of the technical aspect; they were only concerned about the business aspect.

It is important to involve everyone in the planning process before CBS implementation as well as during the implementation. Regular monthly meetings were scheduled. Unfortunately users rarely participated in those voluntary meetings. Many said that the time was not that convenient. Therefore, an opportunity to discuss and strategize how organization needs will be addresses during implementation, whether users need additional computer training, resource allocation etc. was not possible. All preparation unexpectedly became a responsibility of the IT representative. The planning process was not thorough. Weaknesses were not addressed prior to the implementation, users and management was not involved in the preparation. Therefore, the unforeseen circumstances had to be addressed during the CBS implementation and that created a stressful situation for the management.

5.4.2.26 Implementation Team

In-depth Interview Analysis of IDIB2

The core banking team consisted of the bank's General Manager of IT acting as team head and 20 business and IT people selected by the bank. The software vendor staff was also involved in the project. But the size of the implementation team is so small that they could not focus on all the aspects of implementation. The implementation team also lacked proper skill set. The team composed mostly of bankers with few technical staff.

5.4.2.27 Business Process Re-engineering

In-depth Interview Analysis of IDIB1

No major BPR activity was conducted by the bank. The work process still involved the age old practices of book keeping. The teller did multi task by first entering the transaction in the system and then in the cash book. The worst part was the bank sent the circulars in hard copy even after sending them to branches through intranet.

5.4.2.28 Institutional Structure Re engineering

In-depth Interview Analysis of IDIB2

Being an old organization a sudden restricting of the organization was not possible. The rigid structure of authority, process flows made the implementation delayed. The decisions were pending in many desk, the workflows were very time consuming.

5.4.2.29 Training and Education

PIRF Result

The result showed that the users were not satisfied with the training and education they received.

Table 5.25: Training and Education

Statement	User		
The training I received was sufficient for the CBS use	DA	DA	A
I had a full understanding of the implementation process that I need to go through before implementation	DA	A	DA

In depth Interview Analysis of IDIB2

The bank used its network of 28 regional training centers across India to train employees on the new system. only one representative from each category in the branch was send for training. He came back and trained rest of the branch. So the success of training depended on the branch representative. The many branches could not spare their staff for training as they were overloaded with their daily routine work.

5.4.2.30   Task Technology Fit

PIRF Result

The result shows that the users did not feel that CBS fully met their task needs.

Table 5.26: Task Technology Fit

Statement	User		
CBS is compatible with all aspects of my work routines	DA	DA	A
CBS fits well with our banks way of doing things	DA	DA	DA
CBS made my work environments less stressful	DA	DA	DA

In depth Interview Analysis of IDIB2

The staff felt that the system compatibility was less. They had to depend on the IT department for many of the reports and transactions. The staff felt that the system is not compatible since over the years the bank have developed a system of working and with the implementation of the CBS it was customized to the organizational process. More over the CBS implementation was not complete and the work flows were in a mess. All this led to a dissatisfaction of the CBS

5.4.2.31   Relative Advantage

PIRF Result

The result showed that using the CBS was more advantageous than their old system.

Table 5.27: Relative Advantage

Statement	User		
Using the CBS enables me to accomplish tasks more quickly	DA	DA	A
Using the CBS improves the quality of work I do	A	A	A
Using the CBS makes it easier to do my job	DA	DA	DA

In depth Interview Analysis of IDIB3

The user felt that they had to do more data entry in the new CBS system than in the old system. There were many additional templates which capture a large amount of information. The users agreed that the new CBS had much good quality reports and process, but the data entry was a time consuming process.

5.4.2.32 Ease of Use

In depth Interview Analysis of IDIB3

The new system was not so easy to use. Though it looked easy there were many templates which needed additional data. The routines required to use the new system was not established. The lack of hands on training was a problem. Another problem faced was there was no online help available when new modules were to be explored. The user had to contact the IT department and wait for their instruction.

5.4.2.33 Information Quality

PIRF Results

The result showed that the users were satisfied with the information quality of the CBS.

Table 5.28: User satisfaction with Information Quality

Statement	User		
The access to the new system is easy and convenient	A	A	A
The new system is flexible to changes and adjustments that result from new conditions,demands, or circumstances at my work	A	A	A
The new system does not overloads me with more data than it seems I can possibly use	A	A	A
The new system provides output that is complete and accurate	A	A	A
The new system does not have errors that I have to work around	A	A	A
The new system has the ability to integrate data with other information systems I use	A	A	A

In depth Interview Analysis of IDIB3

Though the users were not fully satisfied with the new system, they felt that the quality of the information received from the system is high. They could now easily get reports which earlier they have to compile from

different system. The time required for the reporting procedures came down drastically.

5.4.2.34 Tenure

In depth Interview Analysis of IDIB2

Tenure did not play an important role in the adoption of the CBS. Since the old system did not satisfy the staff in all generations they users were ready to accept the changes.

5.4.3   Case Highlights

The highlights of the case:

- An example of a poorly integrated technology

- All the factors acted as barriers

- The management was not confident about the project; this led to demoralise of the rest of the stake holders.

- IT strategy and business strategy was two different aspect.

- IT implementation was considered as the project of the IT department.

- The bank did not face any threat from the banks within its sector, so did not feel the need to implement a new system.

The case analysis showed that the lack of management support and commitment was the major reason for the poor adoption of CBS.

5.5 Individual Case Analysis: Case C

5.5.1 Background of the Case

One of the old generation bank in the private sector with 831 branches and 1280 ATMs spread across the country. The bank had embarked upon a massive technology up gradation drive by introduction of a Centralized Core banking solution. For this a modern Data Center has been set connecting all branches with all the Departments at Head Office, all Regional Offices, and the Treasury Department at Mumbai. This robust network facilitates anywhere banking, Networked ATMs, Internet Banking, Mobile Banking, Global debit cum ATM card operations, Online trading, online shopping etc. The project was launched with a target of connecting the 200 odd branches in two phases by March 2004. Towards this endeavor, the bank has concluded a technology partnership with M/s Infosys Technologies Ltd for Finacle, the Core Banking Solution, M/s HCL Infosystems Ltd. for Network Integration and M/s WIPRO for Data Centre set up and Maintenance. The project was formally launched on January17, 2001.

Per se bank has achieved 100% Core Banking Solutions by 24th March, 2007.Further to strengthen the ATM reach and global acceptability Bank has introduced Master Card Global Debit- cum- ATM card, which can be used at ATMs and merchandise all over the world. The aim of the Bank is to offer the latest technology driven value added services to the customers without compromising the banks motto - Blending Tradition with Technology .The Bank has won the prestigious Banking Technology Excellence Award-(tenth edition-2014) for 'Best IT TEAM' from IDRBT, the technical arm of Reserve Bank of India**.**

5.5.2 Discussion of the Apriori Codes

In the following sections analysis and discussion of the apriori codes identified during the stage II followed by the emergent codes developed during analysis are done. There were nine respondents to the PIRF, three in each category of respondents. Three in-depth interviews were conducted for the case. The designation, code and the date of interview is given table 5.29.

Table 5.29: In-depth Interview Respondents with Date and Codes

Case C		
Designation	**Code Assigned**	**Date of Interview**
Chief Manager (Information Technology Division)	IDIC1	05/01/2013, 03/06/2014, 11/02/2015
General Manager (Administration)	IDIC2	04/06/2013
Clerk (Branch)	IDIC3	09/12/2014

5.5.2.1 Path Dependencies

Secondary Dataevidence

The banks massive computerization effort started in late 1990 by implementing customized version of total branch automation. The bank began to face difficulties with the package as; the TBA package purchased for different regions was from different vendors. This made data consolidation an issue. Though the individual branch users were satisfied with the package at the central level data integration was becoming a problem.

PIRF Result

The branch users and the IT representatives were satisfied with the system, but the top management was unsatisfied.

Table 5.30: Satisfaction with the Old System Used

Statement	User			IT Representative			Top Management		
I was satisfied with Old System	A	A	A	A	A	A	DA	A	DA

The In-depth Interview Analysis of IDIC1

It was not the dissatisfaction with the system that led the bank to adopt the new system. The main aim was to take the advantages of the technological advancements in the market. The banks management realized that the core competency of the bank is not to scale up the existing package to meet all the regulatory requirements but to get a customized software package. Hence to technologically upgrade itself and to meet the regulatory requirements the bank went in for CBS.

The In-depth Interview Analysis of IDIC2

The management started facing problems with the TBA. The management found that they had to spend considerable time waiting for data from the branches, compile them and then derive information out of it. Most of the times the regional office compiled the data from the branches and forward to head office, there were delay in data compilation and also at times some errors occurred. They needed a single window for MIS. The bank had to face warnings from the regulatory authorities for reporting error.

5.5.2.2 Organizational Power Affiliations

The In-depth Interview Analysis of IDIC2

Since the bank falls under the category of old generation private bank there was presence of labour union. The union was not strong enough to influence the decision of the bank. The clerical union showed some resistance to complete automation of the banks. The management was so strong and supportive that they involved the representatives from the labour union in the decision making process.

5.5.2.3 Organizational Strategies and Goals

PIRF Results

The PIRF looked for whether the bank undertook a need analysis process for the adoption of new technology. All the nine respondents disagreed with the statement.

Table 5.31: Need Analysis for NewCBS System

Statement	User			IT Representative			Top Management		
Needs assessment was done before deciding to adopt CBS	DA	DA	DA	DA	DA	DA	DA	DA	DA

The In-depth Interview Analysis

IDIC2

At the time of adoption of CBS in 2001, the bank had not conducted any need analysis. The only aim was technically upgrade the bank. The core banking project was running behind time. In the year 2004 there was a change in the top management. New chairman man assumed

office. This was a turning point in the CBS implementation project. The Chairman integrated the technology strategy into business strategy. The new strategy of the bank was to be the generation next bank. A complete need analysis was conducted. That area where technology was lagging was identified. To quote:

"the new management was so proactive that as soon as they took over the office the first thing they did was to appoint an IT consultant to study and develop a technology plan for the bank".

5.5.2.4 Organizational Size

The In-depth Interview Analysis of IDIC2

The bank was a medium size bank. The small size of the bank helped in fast connectivity for the implementation of the CBS. The bank went in for parallel implementation strategy. The bank chose few branches in each zone and started conversion at the same time. The conversion kicked off at Saturday night after day end at the branch and would be completed by Sunday evening. This helped in uninterrupted business in the branches. Since the volume of data was low this was possible. But the bank lacked skilled manpower for the implementation. The shortage of employees in the branches also had a negative effect on the user participation.

5.5.2.5 Attitude Towards Innovation and Changes

PIRF Results

The PIRF looked for the attitude of the users, top management and the IT representative towards technology Innovations and the CBS to be adopted. The result showed that all three categories had a positive attitude.

Table 5.32: Attitude towards Innovation and Changes

Statement	User			IT Representative			Top Management		
Information System and services are important for my performance at my job	A	A	A	A	A	A	A	A	DA
Before implementation of CBS, I was sure it will provide solution to all the problems	A	DA	DA	A	A	A	A	DA	A
I was ready to make changes in my work routines and process which was necessary for the new system implementation	A	DA	DA	A	A	A	A	DA	

The In-depth Interview Analysis of IDIC3

The branch staff had a positive attitude towards computers and they felt the need for computerization of the activities. But when it came to the implementation of CBS they had some apprehension. This was because in the initial stages of the project implementation the users were not educated about the project. The implementation was a mess and the systems down time increased. All this led the user to doubt the new system implementation. With the new chairman in office there was a drastic change in the attitude of the users. To quote:

"our chairman had a doctorate degree in human psychology, so he knew how to handle people. All the apprehensions of the users were over after they met the chairman".

5.5.2.6 Collaboration

In depth Interview Analysis of IDIC2

The bank followed a strict transfer policy. The bank looked into the fact that the employees had experience in all the different departments of the bank. This was helpful in building collaboration among the employees in the bank. The experience in different departments helped the employees to get the feel of work done by that department. Hence the bank had good coordination among the employees. When the CBS project was initiated this culture helped the bank to coordinate various departments. The more important factor was the IT consultants appointed by the bank made it a point that they visited all departments, and regional offices to meet the staff and get their inputs. Each department was made aware of their role in the implementation process. This led to avoid stakeholder conflict and the bank as a whole moved towards the new CBS adoption.

5.5.2.7 Computer Literacy

PIRF Results

The PIRF looked for the qualification of the respondents and the experience in the banking software. Most of the respondents did not have any basic computer qualification

Table 5.33: Computer Literacy

	User			IT Representative			Top Management		
Basic Computer Qualification	M.S office	NIL	M.S office	MCA	BCA	BCA	M.S. Office	MCA	Nil
Experience in banking solutions	1	nil	1	2	1	1	1	1	1

In depth Interview Analysis of IDIC1

The users and were not much proficient in computer usage. The IT department staff had basic qualification but lacked the experience in the banking software area. The top management also lacked the technical skill and the experience, but the new management was very positive and supportive. They helped in increasing the technical skill of the staff. The following measures were adopted by the top management.

- Encouraged branch staff to take short term computer courses. Work routines were adjusted for this.

- Encouraged the IT staff to take certification courses. Conducted evening classes of certification course.

- Send the IT staff to the core banking solution vendor site to get a hands on experience in the software.

- IT staff were also send to other banks where the core banking had already been employed.

Memo – An important fact was that, the bank believed that in the new era all the staff members will have some amount of computer literacy, it is important to develop the technical skill of the staff.

5.5.2.8 Task Nature
In depth Interview Analysis of IDIC2

The bank was into a total change phase. The management strategy was to make the bank into a generation next banking shedding its old bank image. There was a change in the bank logo, products; work nature even buildings were changed during the implementation process. The workers were exposed to new work patterns and the age old routines were discarded. A business process re-engineering initiative was done by the bank to define and structure new task nature. Since the branch staff had a

positive attitude and with great support from the management, the change process was smooth.

5.5.2.9 Rules and Regulations
In depth Interview Analysis of IDIC2

The bank being an old scheduled bank in private sector, the norms of the industry was very much applicable to the bank. The bank went for CBS adoption mainly because of the directive from the RBI to upgrade into core banking platform.

5.5.2.10   Industry Leadership
In-depth Interview Analysis of IDIC2

The bank was more like a regional player. With the new management and change in strategy the bank wanted to make its presence felt nationally. CBS was seen as an aid to this. The bank made strategy to

- Increase the branch numbers
- Offer new technology products
- Increase the number of ATM facilities
- Provide online banking facilities

By changing the image the bank wanted to attract more new generation customers.

5.5.2.11   Technological Advancements
In depth Interview Analysis of IDIC1

To quote:

The best thing about our bank was that we could recognize the advancements in banking technology. When the best banking solutions were adopted by big banks, we also joined them. We were called the black horse in the run for CBS implementation'.

The bank could realize that the development of the banking solutions was not the core business of the bank IT staff. So they went in for advanced products offered by the vendors.

5.5.2.12   User Involvement

PIRF Results

The PIRF shows that the users were interested in the new system.

Table 5.34: User Involvement

Statement	User			IT Representative			Top Management		
I was interested and excited about the new CBS system	A	A	A	A	A	A	NA		
The users were interested and excited about the new CBS system	NA			A	A	A	A	A	A

In depth Interview Analysis of IDIC2

The users were interested in the system. To quote:

Whenever I would go to different regions for meetings, the entire branch staff would ask about the new CBS system. I was surprised at their enthusiasm and interest to know".

The branch staff had an initial inhibition about the CBS project. This was overcome by the new management by personally meeting the regional heads and the branch heads, educating them about the project and the benefits. The collaboration among the employees led to a growing interest in the system to be employed.

5.5.2.13 User Participation

PIRF Results

The PIRF shows the participation of the users in system specification. The result showed that the users did participate in the system specification part.

Table 5.35: User Participation

Statement	User			IT Representative			Top Management		
I was involved in the system specification	A	A	DA	A	A	A	A	A	A

In-depth Interview Analysis of IDIC3

The new management established many strategies to foster user participation. The initiatives taken up by the management were:

- Region wise meetings were held where representatives from the branches met and discussed the problems in work flows and customer management. The meetings also brain stormed for the solutions.

- Branch users were asked to send their suggestions to CBS implementation team about the requirements of the new system

- The requirements were compiled to form a requirements document

5.5.2.14 Commitment to the Project

PIRF Results

The PIRF showed the commitment of the management and IT staff was very high.

Table 5.36: Commitment to the Project

Statement	User			IT Representative			Top Management		
Top management viewed the CBS system important to organizations goals	A	A	A	A	A	A	NA		
When there was difficulties in the implementation process management tried hard to find the correct solution	A	A	A	A	A	A	NA		
When there were difficulties while implementing the new system, IT staff tried hard to find right solution	A	A	A	NA			A	A	A

In depth Interview Analysis of IDIC3

The commitment of the management to the CBS implementation system was seen as the winning factor of the success of CBS adoption in the bank. The chairman himself was monitoring the progress of the implementation project. Financially the bank had some constraints but the dedicated manpower was made possible by the management. The IT department staff were also very much committed to the project. The representatives of the IT department were sent to each regional office and they worked from there till the conversion was over.

The In-depth Interview Analysis of IDIA2

At the initial stages the users were apprehensive towards the success of the CBS implementation project. But with the change in the management and their commitment towards the project the users became

more committed and confident. The only barrier was the financial crunch of the bank. But the management made it a point that the project does not get delayed because of this. The management routed funds from different sources. Small teams of technical staff were employed in each region for the conversion. The chairman made himself available 24/7 for any escalations or solutions. The commitment of the top management boosted the commitment level of other stake holders.

5.5.2.15 Project Champion

In depth Interview Analysis of IDIC1

The Chief General Manager acted as the project champion. He was made the head of the implementation project. The CGM had 30 years' experience in the bank and knew most of the staff by their names. This helped him to market the product better among the staff members. The project champion was given full authority to make decision for the CBS implementation. All the business heads supported and respected the champion.

5.5.2.16   Resource Allocation

PIRF Result

The PIRF result showed that there was priority setting and plan for the allocation of the resources.

Table 5.37: Resource Allocation

Statement	IT Representative			Top Management		
The bank undertook a priority setting of the project	A	DA	A	A	A	A
Plan was developed for the allocation of various resources according to the priority	A	A	A	A	A	A

In depth Interview Analysis of IDIC2

The chief general manager, who was the project head, first identified skilled and competent staff from different departments of the bank to be included in the CBS project. Different teams such as implementation team, BPR team, and documentation team were set up by the project head. Many fresh recruits with technical skill were taken for the project. Financially the bank was not strong. This led to some delays in project implementation. A detailed plan was set up for the implementation. The prioritization was as follows.

- Data cleaning and coding
- Network connectivity
- Up gradation of the hardware system
- Testing
- Conversion of the priority branches

A clear conversion idea and the dedicated resources for each activity led to smooth conversion.

5.5.2.17 Commitment to Change

PIRF Result

The result showed that the management was aware of the changes that could happen with the implementation of the new system and was ready to make changes to the existing routines.

Table 5.38: Commitment to Change

Statement	User			IT Representative		
Management realize the complexity of changes that would result as a consequence of the new system implementation	A	A	A	A	A	A
Top management was very effective in supporting changes in existing routines and processes that were critical to the new system implementation	DA	DA	DA	DA	DA	DA

In-depth Interview Analysis of IDIC1

The top management realized the need for change in the organization. The change was in totality a revamp of the organization. The management approach was which led the organization to cope with this drastic change. The management drafted a complete document on the change in the work process and was given to each region. The main change management drives were:

- The business head in each region was called in for a three day workshop on the need for the bank to change itself.

- A logo design and caption competition was conducted among the staff members. This was to involve them in the change process.

- Existing work routines were analyzed and necessary change initiated.

- A BPR team was constituted for the process re-engineering.

- The chairman acted as change agent.

- The authority structure was made more flatter.

5.5.2.18 Service Level Documentation

In depth Interview Analysis of IDIA2

There were some problems in drafting a proper service level document. The change in management in between the project led to changes in the contract and services of the vendor. This led to some confusion between the vendors and the management. The authority level and the responsibility of the IT consultants were not fixed; this led to some difference of opinion between the IT staff and the consultants in the initial stages.

5.5.2.19   Request for Proposal

In-depth Interview Analysis of IDIC2

The user participation strategy followed by the management led to the development of a well-defined RFP. The RFP was made the basis for the evaluation of the core banking vendor. Though the bank faced financial crunch it did not affect the purchase of the best in breed solution. The solution was bought but some of the modules were not purchased and the number of licenses was less. This led to problems later in the use of the CBS in the branches.

5.5.2.20   Business Continuity Plan

The In-depth Interview Analysis of IDIC2

It was only in the year 2013 the bank came up with a business continuity plan. The bank had a data center in Cochin and a disaster

management center in Bangalore. But a structured plan for risk management and disaster recovery was developed only lately. The business continuity plan covered areas relating to natural disaster recovery, machine down time recovery, risk assessment and recovery plan and security features.

5.5.2.21   Maintenance
In-depth Interview Analysis of IDIC1

Once the project was complete the product was handed over to the IT team. The main problem faced by the team was that the product was customized heavily. So when the product was rolled out in branches many additional problems came up. The IT staff was fully devoted in solving the problems. So a regular maintenance plan was not reached. The morale of the staff began to go down as they felt that they were only contacted for problem solving. The IT staff did not have time to come up with a formal maintenance plan. They solved the problems as and when they came up. The management then decided to go in for annual maintenance contract with the vendors which relieved the pressure from the IT staff.

5.5.2.22   Contract Termination
In-depth Interview Analysis of IDIC1

The CBS was completed by 2007, but it took three more years for the complete transfer of the ownership of the product to the bank. These years were very crucial because the branch staff contacted the IT department for solutions, but many of the modules were still handled by the software vendor. This led to delays in problems solving. The IT staff did not feel that they system belonged to them. There was unrest between the IT department of the bank and the core banking vendor staff about who should make certain corrections in the system. But once the

ownership was transferred the users were more confident to use the system.

5.5.2.23 Documentation

In-depth Interview Analysis of IDIC1

- A structured documentation process was followed by the bank. The major documentation process was as follows:
- All the changes made to the core produced were recorded with date and the name of the person who made the change.
- A detailed user manual was drafter.
- A product manual with its features and sanctioning authority was drafted.
- Exception management policy was also drafted.

Memo – the documentation was verified by an officer who was made in charge. A documentation committee was also formed to draft documents.

5.5.2.24 Organizational and Technical Infrastructure
In depth Interview Analysis of IDIC1

The technical and structural infrastructure of the bank went a drastic change with the implementation of the CBS. The bank had undertaken massive change management and organizational restructuring process. Blending tradition with technology was the motto of the bank. The restructuring process led to the smooth implementation process

5.5.2.25   Extend of Planning.

In-depth Interview Analysis of IDIC1

The bank came up with three types of plans:

- Strategic – this plan included the change in the vision, mission and goals of the bank. The IT strategy and the merging of the IT strategy into the business strategy.

- Operational – the strategy and goals was converted into operational plan. This included plan for each business unit and branches for the activities to be done. Resource allocation plan. Time scheduling for the project. Communication plan. Exception handling. Reporting and regular check on the implementation process.

- Tactical – the operational plan was broken down to daily activity plans.

The systematic planning procedure followed by the bank helped in the completion of the project on time. The bank also got many recognition from the authorities for the planned implementation.

5.5.2.26   Implementation Team

In-depth Interview Analysis of IDIC2

The success of the core banking implementation project was the strength of the implementation team. The core team headed by the chief general manager consisted of the IT consultants, representative of the core banking vendor, hardware vendors, the technical team of the bank, department representatives, branch users and the customer representatives. This core team was supported by many sub teams like BPR team, documentation team, marketing team, business and product development team. There were also business analysts employed by the bank. The role of

the business analysis was to test the customized CBS before live implementation and look for exceptions. The improved technical competency, the authority given to the implementation team, the hands on training received by the implementation team all led to a highly skilled team for implementation.

5.5.2.27 Business Process Re-engineering
In-depth Interview Analysis of IDIC1

Once the core banking project was completed in 2007 the IT consultants were given the task of business process reengineering. The consultants and the bank representatives formed a BPR team. For two years the consultants studied the process and came up with alternatives for manual process. The aim of the bank management was to make the bank a paperless organization. The BPR team also re-engineered the CBS product. Many functions in the product needed additional data and additional screens to be visited, this was taking longer time, the BPR team compared the manual task with the system task and necessary changes were initiated.

5.5.2.28 Institutional Structure Re engineering
In-depth Interview Analysis of IDIC2

The outlook of the bank changed with the implementation of the core banking product. The authority structures became more flat, processes were centralized. The clerical level staff was promoted to office level and the clerical entry was limited. Cashiers became tellers with the facility of posting the transactions. Any counter service facility were provided to the customers.

5.5.2.29   Training and Education

PIRF Result

The result showed that the users were satisfied with the training they received. They were also well educated about the project.

Table 5.39: Training and Education

Statement	User		
The training I received was sufficient for the CBS use	A	A	A
I had a full understanding of the implementation process that I need to go through before implementation	A	A	A

In depth Interview Analysis of IDIC2

The bank used its central training center at the head office to train the branch users. The staff was called in batches of 50 for the training. The officers and the clerical staff were given training in their respective areas. The technical staff also conducted training in the regional offices. Hence within two years of inception most of the staff had hands on training in the product.

5.5.2.30   Task Technology Fit

PIRF Result

The result shows that the users did not feel that CBS fully met their task needs.

Table 5.40: Task Technology Fit

Statement	User		
CBS is compatible with all aspects of my work routines	DA	DA	A
CBS fits well with our banks way of doing things	A	DA	DA
CBS made my work environment less stressful	A	DA	DA

In depth Interview Analysis of IDIC2

The expectation of the staff from the CBS was very high. So at first the staff did not feel that the system was very compactable. They felt that they had to do more data entry in the system. Due to lack of financial resource the bank did not purchase many modules of the CBS. The licensing was limited; this was a major barrier in the use of the CBS. Though the branch staff had computer systems, they could not log into CBS since each branch was given only three or four user log in.

Memo – though the implementation went in smoothly when it came to the system acceptance side there were many barriers.

5.5.2.31   Relative Advantage

PIRF Result

The result showed that using the CBS was more advantageous than their old system.

Table 5.41: Relative Advantage

Statement	User		
Using the CBS enables me to accomplish tasks more quickly	DA	DA	A
Using the CBS improves the quality of work I do	A	A	A
Using the CBS makes it easier to do my job	A	A	DA

In depth Interview Analysis of IDIC3

The users were satisfied with the quality of the output of the CBS. Many of the jobs were made easy. The EMI calculation for the loan, the interest calculation for pre-term closure of deposits was made easy by the system. The bank was able to deal in foreign currency transaction. But the problem was that all the users did was not able to log into the system.

5.5.2.32 Ease of Use

In depth Interview Analysis of IDIC3

The hands on training facility received by the user helped in user confidence to use the new system. The BPR led to simpler workflows of the CBS system. The workflows matched to the primary data collecting sources like application forms, standing instruction forms.

5.5.2.33 Information Quality

PIRF Results

The result showed that the users were satisfied with the information quality of the CBS.

Table 5.42: User satisfaction with Information Quality

Statement	User		
The access to the new system is easy and convenient	A	A	A
The new system is flexible to changes and adjustments that result from new conditions, demands, or circumstances at my work	A	A	A
The new system does not overloads me with more data than it seems I can possibly use	A	A	A
The new system provides output that is complete and accurate	A	A	A
The new system does not have errors that I have to work around	A	A	A
The new system has the ability to integrate data with other information systems I use	A	A	A

In depth Interview Analysis ofIDIC3

The satisfaction with the quality of output of the new CBS was seen in the use of the system by the branch user .Of the 300 reports available in the system, the branch users only used 50 at the initial years, but with passage of time the average raised to 190. Many of the reporting facilities were made easy.

5.5.2.34   Tenure

In depth Interview Analysis of IDIC2

Tenure did not play a very important role in shaping the attitude of the people. The new and old generation people accepted the system and used it fully. To quote:

"I was surprised to find that in many branches it was the old generation staff who taught the new recruits how to use the new system".

Since the bank went in for drastic change in task routines and adopted a change management policy, the staff was in a mindset to adopt new task process.

5.5.3. Discussion of Emergent Codes

The factors which emerged during the in depth interview was expectation management which was found to be very important for the system satisfaction by the user. The next one was ownership creation; this factor will help in using the system fully for the achievement of the task. The last one is the involvement of the business line managers in the project; this will ensure the corporation from all departments.

5.5.4 Case Highlights

The highlight for the Case C is as follows:

- The top management and the IT staff support and commitment was the major strength and facilitator for the implementation project.

- The commitment of the top management was the major source in gaining the commitment of the users and the vendors.

- The user education program led to better communication and understanding of the goals for the adoption of the CBS.

- The change in the top management in the middle of the project.implementation acted as a catalyst for the implementation.

- Extensive planning was strength in fast implementation.

- Major barriers faced were the financial resource crunch. The limited number of licence and the purchase of the basic modules led acted as a barrier in the acceptance and use of the system.

- The management change created some problems in service level agreements with the vendors as a new service level document had to be drafter.

The analysis of case C shows that with strong management, technically skilled implementation team and extensive planning the implementation was smooth. The resource crunch acted as barrier in the system acceptance and usage stage.

5.6   Individual case Analysis: Case D

5.6.1   Background of the Case

Established in 1994, the bank is today the second largest bank in India and among the top 150 in the world. In less than a decade, the bank has become a universal bank offering a well-diversified portfolio of financial services. It currently has assets of over USD 79 billion, and provides services through a network of about 950 branches, 3300 ATMs and a 3200-seat call center (as of 2007).The hallmark of this exponential growth is bank's unwavering focus on technology. Within two years of its inception by 1997 bank went in for core banking solution. By 2000 the bank could achieve hundred percentage project completions. The bank is considered as the most techsavybank. The awards and recognitions received include best use of technology for fraud prevention NPA management, best use of technology in training, best use of digitals and channel technology and the latest being the best technology bank in the year 2015.

5.6.2 Discussion of the Apriori Codes

In the following sections analysis and discussion of the apriori codes identified during the stage II followed by the emergent codes developed during analysis are done. There were seven respondents to the PIRF, three each in branch user and IT representative category and one in top management category. Three in-depth interviews were conducted for the case. The designation, code and the date of interview is given intable 5.43.

Table 5.43: In-depth Interview Respondents with Date and Codes

Case D		
Designation	**Code Assigned**	**Date of Interview**
Officer (Information Technology)	IDID1	8/04/2013 9/04/2013
Vice President (Operations)	IDID2	8/04/2013
Officer (Branch)	IDID3	04/05/2013

5.6.2.1 Path Dependencies

This factor was not applicable as the bank went in for CBS within two years of its inception. The staff started using the Core banking solution. Hence they were not able to comment about the old system.

5.6.2.2 Organizational Power Affiliations

The In-depth Interview Analysis of IDID2

Since the bank falls in the new generation private sector banks, there were no labour unions. The power affiliations were nil. The organization has a flatter authority relationship. This led to much of a equal distribution of power among the staff. The CBS product also had a maker checker concept. This distinguished the maker of the transaction from the checker. So the officer still had the control over the transactions.

Memo – some of the staff were members in the new generation banks association. The association was not strong enough to influence the decisions of the bank.

5.6.2.3 Organizational Strategies and Goals

PIRF Results

The PIRF looked for whether the bank undertook a need analysis process for the adoption of new technology. All the seven respondents disagreed with the statement.

Table 5.44: Need Analysis for NewCBS System

Statement	User			IT Representative			Top Management
Needs assessment was done before deciding to adopt CBS	A	A	A	A	A	A	A

The In-depth Interview Analysis of IDID2

The bank was the second largest bank in the country. On the need assessment it was found that bank did not have the major share of the rural market. The strategy for the CBS adoption was:

- Penetration into the rural market
- Customer accusation
- To keep pace with the technological developments
- Meet the regulatory requirements

5.6.2.4 Organizational Size

The In-depth Interview Analysis of IDID2

The large size of the organization was based on the business volumes and the customer base. The number of branches was limited to 175. The software need to have the capacity to do large volume of transactions. The bank had only small branch network, the bank made its presence felt by the large number of ATM s throughout the country. The small branch size led to faster implementation.

5.6.2.5 Attitude Towards Innovation and Changes

PIRF Results

The result showed that the staff had a positive response.

Table 5.45: Attitude towards Innovation and Changes

Statement	User			IT Representative			Top Management	
Information System and services are important for my performance at my job	A	A	A	A	A	A	A	A
Before implementation of CBS, I was sure it will provide solution to all the problems	NA	NA	NA	NA	NA	NA	NA	NA
I was ready to make changes in my work routines and process which was necessary for the new system implementation	A	A	A	A	A	A	A	A

The In-depth Interview Analysis of IDID3

The branch staff had a positive attitude towards computers and they felt the need for computerization of the activities. This was mainly because that majority of the staff was in the age group of 25-32. The young generation employees have a positive attitude and change was part of their work culture. To quote:

"I don't think new generation staff has a negative attitude towards technology. Technology is a part of their life now. And about the attitude towards changes, new generation staff needs change in their task and workflows, they are more interested in challenging jobs, if they are made to work in the same routine way, they get bored and will look for job change".

5.6.2.6 Collaboration

In depth Interview Analysis of IDID1

To quote:

> *"Ours is a flat organization most of the employees work in unison so collaboration was not a problem for any project initiative".*

The project was mainly handled by the IT department of the bank. The software vendors had their employees placed in the banks IT department. The employees of different employees were comfortable to work with their bank staff rather than outside consultants.

5.6.2.7 Computer Literacy

PIRF Results

The PIRF looked for the qualification of the respondents and the experience in the banking software. All the respondents had the basic computer qualification, but their experience in the banking software was low.

Table 5.46: Computer Literacy

	User			IT Representative			Top Management	
Basic Computer Qualification	M.S office	BCA	Computer Diploma	B.Tec	B.Tec	B.Tec	M.S.Office	B.Tec
Experience in banking solutions	1	2	1	2	1	1	2	1

In depth Interview Analysis of IDID1

It is not the computer literacy which was important as most of the staff were computer literate. It was the system skill which was found to be important. Most of the employees were used to working in the systems, so

system usage was not new for them. Even though the experience with the banking software is low, the experience in using the computer system made the users confident with the CBS. The technical skill of the bank staff was high.

5.6.2.8 Task Nature

In depth Interview Analysis of IDID2

The bank being a new generation bank, system streamlining and task restructuring was a continuous process. The management realized the importance of stream lining the task with the system. Task innovations were a routine procedure. The alignment of the task with the system usage influenced the system acceptance

5.6.2.9 Rules and Regulations

In depth Interview Analysis of IDID2

Since the banking industry is governed by the rules and regulations of the RBI, the rules and regulations form an important part in the decision to adopt a new system. The technology was looked upon as an aid to meet the changing regulations,

5.6.2.10   Industry Leadership

In-depth Interview Analysis of IDID2

The bank was the largest private sector bank in India, but it was losing market share to other new generation banks. The need analysis pointed out that the bank lacked its presence in the rural market. In order to acquire customer in the bottom of the period and be the market leader the new CBS was implemented. The bank being the largest bank in the country was financially strong to undertake such a huge project.

Completion of the core conversion project has also allowed the bank to undertake several new initiatives to further improve service and support future growth and thus maintain the leadership position.

5.6.2.11   Technological Advancements
In depth Interview Analysis of IDID1

The success of the bank was that it was able to identify the banking technology advancements taking place. The bank was among the first to adopt the CBS. the bank is also seen as technology innovator, as the major technology advancements was brought in by the bank.A research team was formed under the leadership of General Manager IT, who constantly looked into any new technological changes happening. To quote:

"ours is bank where technology and business are inter related, new technology drives us to look for new business avenues and new business avenues lead us to look for latest technology".

5.6.2.12 User Involvement

The importance and personal relevance of the new system introduced to a user

PIRF Results

The PIRF shows how the user and the IT representative felt about the new system. Both felt that the new CBS was important to them.

Table 5.47: User Involvement

Statement	User			IT Representative			Top Management
I was interested and excited about the new CBS system	A	A	A	A	A	A	NA
The users were interested and excited about the new CBS system	NA			A	A	A	A

In depth Interview Analysis of IDID2

Most of the branch staff with the bank now started the carrier with the CBS in place. The staff being new generation employees has a positive attitude towards the software system and is aware that the core competency lies in the application of technology in the bank.

5.6.2.13 User Participation

PIRF Results

The PIRF shows the participation of the users in system specification. The result showed that the users did participate in the system specification part.

Table 5.48: User Participation

Statement	User			IT Representative			Top Management
I was involved in the system specification	A	A	A	A	A	A	A

In-depth Interview Analysis of IDID3

The management saw the branch staff not as the users of the system, but as an important stake holder of the CBS project. The management realized that the product is ultimately used by the branch staff and they are the one who needs to be involved in system specification. User participation in system specification is a normal activity in the bank. Each staff can report to the technical division the lacking of the present system and the need for up gradation.

5.6.2.14   Commitment to the project

PIRF Results

The PIRF showed the commitment of management and IT staff was high.

Table 5.49: Commitment to the Project

Statement	User		IT Representative			
Top management viewed the CBS system important to organizations goals	A	A	A	A	A	A
When there was difficulties in the implementation process management tried hard to find the correct solution	A	A	A	A	A	A
When there were difficulties while implementing the new system, IT staff tried hard to find right solution	A	A	A	NA		

In depth Interview Analysis of IDID3

Management realize the level of commitment required for the project. To quote:

"our top officials were very tech savvy people. They not only realized the importance of the technology but used it in their day to day activities".

Every implementation project or up gradation had the full support of the top management. Escalations and exception handling were done as the top priority.

5.6.2.15 Project Champion

In depth Interview Analysis of IDID1

There was presence of business integrators who acted as a link between the system expert and the branch users. When asked about the project champion, the answer was:

"We had many project champions; all the business line managers were made the champions of the project. Their combined effort made the implementation successful".

5.6.2.16   Resource allocation

PIRF Result

The PIRF result showed that there was priority setting for the allocation of the resources.

Table 5.50: Resource Allocation

Statement	IT Representative			Top Management
The bank undertook a priority setting of the project	A	A	A	A
Plan was developed for the allocation of various resources according to the priority	A	A	A	A

In depth Interview Analysis of IDID2

The bank had all the potential resource for the implementation. The budget was done, manpower resources were developed, hardware and software components were purchased and the project was running on a priority basis. There were constant check on the performance of the resources and the replenishment of the resources was made whenever necessary.

5.6.2.17 Commitment to Change
PIRF Result

The result showed that the management was aware of the changes that could happen with the implementation of the new system.

Table 5.51: Commitment to Change

Statement	User			IT Representative		
Management realize the complexity of changes that would result as a consequence of the new system implementation	A	A	A	A	A	A
Top management was very effective in supporting changes in existing routines and processes that were critical to the new system implementation	A	A	A	A	A	A

In-depth Interview Analysis of IDID1

The top management realized the need for change in the organization. They acted as the backbone for the entire project. The management did not have a major effort in making change management as the users were ready to accept the changes associated with their work routines.

5.6.2.18 Service Level Documentation

In depth Interview Analysis of IDID2

The bank had well drafted service level agreement. A committee was formed which included the top officials, the users, the representatives from purchase, legal and planning department. They together drafted the service level agreements. The agreement acted as the base for defining the roles and responsibilities of the vendors. The well drafted document influenced the commitment level of the vendor.

5.6.2.19 Request for Proposal

In-depth Interview Analysis of IDID2

The request for proposal acted as the base for analyzing the capabilities of the core banking solution. This document also acted as the basis for the customization of the product. To quote:

"the software could not meet all the requirements mentioned in our detailed RFP. So we selected a product that met eighty percent. The rest was in build to the product by our technical team with the help of the vendor team. Though we used a purchased software the final product looked like a product developed by our bank".

5.6.2.20 Business Continuity Plan

In-depth Interview Analysis of IDID2

The bank had the best business continuity plan in place. The process of developing the plan included:

- A through risk analysis was done.

- Risk was divided into different category as natural disaster, manmade disaster, and security risk.

- Detailed plan was developed to mitigate the risk or the loss from the risk.

5.6.2.21 Maintenance

In-depth Interview Analysis of IDID1

Maintenance contract was given to the respective vendors. The bank entered into annual maintenance contract with the vendors. The Office in IT was made the charge for monitoring the maintenance of the branches. He has to ensure that the vendor does the hardware and software maintenance, implant security features on the time period mentioned in the contract. This policy helped in the unobstructed use of the CBS system.

5.6.2.22 Contract Termination

In-depth Interview Analysis of IDID1

The vendor staff was working within the bank. The core product was customized and developed by the IT vendor staff and the bank technical staff together. The ownership of the product was mainly in the hands of the bank IT department, so there was no formal contract termination. The vendor support staffs still continue with the bank for the system up gradations and version changes. Since the IT staff was fully involved in the development of the basic product to the highly sophisticated product they had a sense of ownership of the product.

5.6.2.23 Documentation

In-depth Interview Analysis of IDID1

Structured documentation process was followed by the bank. The bank maintains online templates for recording the changes made to the software, who made the changes and on what date. There are also well

drafted documents for system usage, product information, sanctioning levels, exception handling and reporting.

5.6.2.24 Organizational and Technical Infrastructure
In depth Interview Analysis of IDID1

The bank was just two years old when the management decided to go for CBS implementation. The bank made it their priority to upgrade their technical base for the implementation of the system. Lease line connectivity, WAN connectivity were upgraded for the connectivity of the branches, new hardware systems were purchased. The organizational structure was made flatter for quick decision making.

5.6.2.25 Extend of Planning.
In-depth Interview Analysis of IDID2

The bank had a planning committee involving the representatives from different departments. The project plan development was a tedious task. But the management wanted a foolproof plan for the implementation. The plan acted as the blue print for the implementation. The core plan included many sub plans as :

- Resource allocation plan

- Time scheduling

- Communication

- Exception handling

- Reporting

5.6.2.26   Implementation Team
In-depth Interview Analysis of IDID2

The core banking team consisted of the bank's General Manager of IT acting as team head and 10 business heads and 15 IT people selected by the bank. The software vendor staff was also involved in the project. The bank had a separate technical entity which develops banking solutions. The help from that entity was also taken for the implementation process. The skill of the implementation team can be seen in development of a highly sophisticated CBS product.The bank also developed hybrid managers that are managers who handled the technical aspect as well as the business aspect.

5.6.2.27   Business Process Re-engineering
In-depth Interview Analysis of IDID1

As the bank adopted the CBS at the early stage itself, no much BPR was required. Many processes were developed after the implementation of CBS.

5.6.2.28   Institutional Structure Re engineering
In-depth Interview Analysis of IDID2

As seen above the bank had given emphasis in restructuring the technical and institutional structure.

5.6.2.29   Training and Education
PIRF Result

The result showed that the users were satisfied with the training they received. They were also well educated about the project.

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Table 5.52: Training and Education

Statement	User		
The training I received was sufficient for the CBS use	A	A	A
I had a full understanding of the implementation process that I need to go through before implementation	A	A	A

In depth Interview Analysis of IDID2

The bank first and foremost developed a training matrix. The training matrix showed what training to be given to what category of users. For example the clerical staff had to be trained in all data entry functions, management in mostly the use of MIS. Based on the training matrix training were provided. Another important measure was after the training the users had to do an online test, if they cleared that test they were given one man day as a bonus. The system trial ability and the incentive received boosted the system usage by the users.

5.6.2.30 Task Technology Fit

PIRF Result

The result shows that the users felt that CBS fully met their task needs.

Table 5.53: Task Technology Fit

Statement	User		
CBS is compatible with all aspects of my work routines	A	A	A
CBS fits well with our banks way of doing things	A	A	A
CBS made my work environment less stressful	A	A	A

In depth Interview Analysis of IDID3

The task technology fit was high. This was mainly because the task was developed around the CBS functionalities. And the CBS was customized to meet the task needs. IT was a two way process.

5.6.2.31 Relative Advantage

Since all the staff with the bank now started their carrier with CBS this factor does not apply.

5.6.2.32 Ease of Use

In depth Interview Analysis of IDID3

The system usage was easy and convenient as it is compatible with the task of the users. Online and offline help was available for any clarification or help.

5.6.2.33 Information Quality

PIRF Results

The result showed that the users were satisfied with the information quality of the CBS.

Table 5.54: User satisfaction with Information Quality

Statement	User		
The access to the new system is easy and convenient	A	A	A
The new system is flexible to changes and adjustments that result from new conditions,demands, or circumstances at my work	A	A	A
The new system does not overloads me with more data than it seems I can possibly use	A	A	A
The new system provides output that is complete and accurate	A	A	A
The new system does not have errors that I have to work around	A	A	A
The new system has the ability to integrate data with other information systems I use	A	A	A

In depth Interview Analysis of IDID3

The satisfaction with the quality of output of the new CBS led to the active use of the system. The request from customers was taken as input for the creation of more reports. The customers of the branch were also satisfied with the quality of reports received from the branches. NPA recovery became easier with the data available in CBS.

5.6.2.34   Tenure

In depth Interview Analysis of IDID2

Tenure did not play an important role in the adoption of the CBS most of the employees were recruited during the implementation process. They did not have any task content which inhibited them from the changes in CBS adoption and the usage of the system.

5.6.3   Discussion of Emergent Codes

The emergent codes were the development of Hybrid managers and the online and offline help centre. They hybrid managers are seen as a must for the organizations today. The banks expect the managers to be an expert not only in banking but also in technical skill and marketing. The help centre was pointed out as a basic requirement for the smooth flow of the branch operations.

5.6.4   Case Highlights

The case highlights were as follows:

- The bank had all the positive factors for a successful adoption and implementation of CBS.
- The IT vision of the bank and the strategic alignment of IT and business strategy led to a successful implementation.

- The resource availability and the size acted as facilitators for implementation.

- The industry leadership position helped the bank to have an advantage over the core banking vendor.

- The restricting of technical and organizational structure boosted the implementation process.

The case analysis shows that the case is the best example for a successful adoption of core banking solution.

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Chapter - 6

CASE DATA ANALYSIS: CROSS CASE SYNTHESIS AND DISCUSSION

	6.1	**Cross Case Synthesis**
	6.2	**Synthesis of PIRF Results**
	6.3	**Data Array of Initiation Stage**
Contents	6.4	**Data Array of Adoption Stage**
	6.5	**Data Array of Adaptation Stage**
	6.6	**Data Array of Acceptance Stage**
	6.7	**Data Array of Routinization Stage**
	6.8	**Discussion of the Implementation Stages**

6.1   Cross Case Synthesis

The cross case synthesis is specifically applicable to the analysis of multi cases. The cross case synthesis can be performed whether the individual case studies have previously been conducted as independent research or as part of the same study (Yin, 2003). In the study the research have done a cross case synthesis of the PIRF form to identify the factors in different stages of implementation and the level of importance of the factors. This is followed by cross case synthesis in the form of data array of each stage of implementation.

6.2 Synthesis of PIRF Results

6.2.1 Level of Importance of the Factors in the Implementation Process

The table 6.1 shows the level of importance of the factors identified in the stage II of the study. There were 32 respondents from four cases. The respondents were asked to mark the factors on a three level scale of importance attached to each factor, the levels being high, medium and low. For each factor the level which showed the highest percentage of response was taken as the level of importance for that factor. Some factors showed tie between the two levels, such factors were assigned the level of importance based on the feedback from the in-depth interview.

Table 6.1: Level of Importance of the Factors in the Implementation Process

	Factor	Level of Importance	Percentage of respondents
1	Path Dependencies	High	62.50
2	Organizational Power Affiliations	High/Medium	50.00
3	Organizational Strategies and Goals	High	100.00
4	Organizational Size	High/Medium	50.00
5	Attitude Towards Innovation and Changes	High	78.13
6	Collaboration	Medium	46.88
7	Computer Literacy	Medium	62.50
8	Task Nature	Medium	56.25
9	Rules and Regulations	High	71.88
10	Industry leadership	High	40.63
11	Technological Advancements	High	46.88
12	User Involvement	High	93.75

|	Factor	Level of Importance	Percentage of respondents
13	User Participation	High	100.00
14	Commitment to the Project	High	100.00
15	Project Champion	High	100.00
16	Resource Allocation	High	100.00
17	Commitment to Change	High	87.50
18	Service level Documentation,	Medium	46.88
19	Request for Proposal	Medium	62.50
20	Business Continuity Plan	High	56.25
21	Maintenance	High	78.13
22	Contract Termination	Medium	46.88
23	Documentation	Medium	71.88
24	Organizational and technical infrastructure	Low	37.50
25	Extend of Planning	High	100.00
26	Implementation Team	High	100.00
27	Business process Re-engineering	High	81.25
28	Institutional Structure Re-engineering	Medium	46.88
29	Training and Education	High	100.00
30	Task Technology Fit	High	87.50
31	Relative Advantage	High	71.88
32	Ease of Use	High	100.00
33	Information Quality	High	100.00
34	Tenure	low	46.88
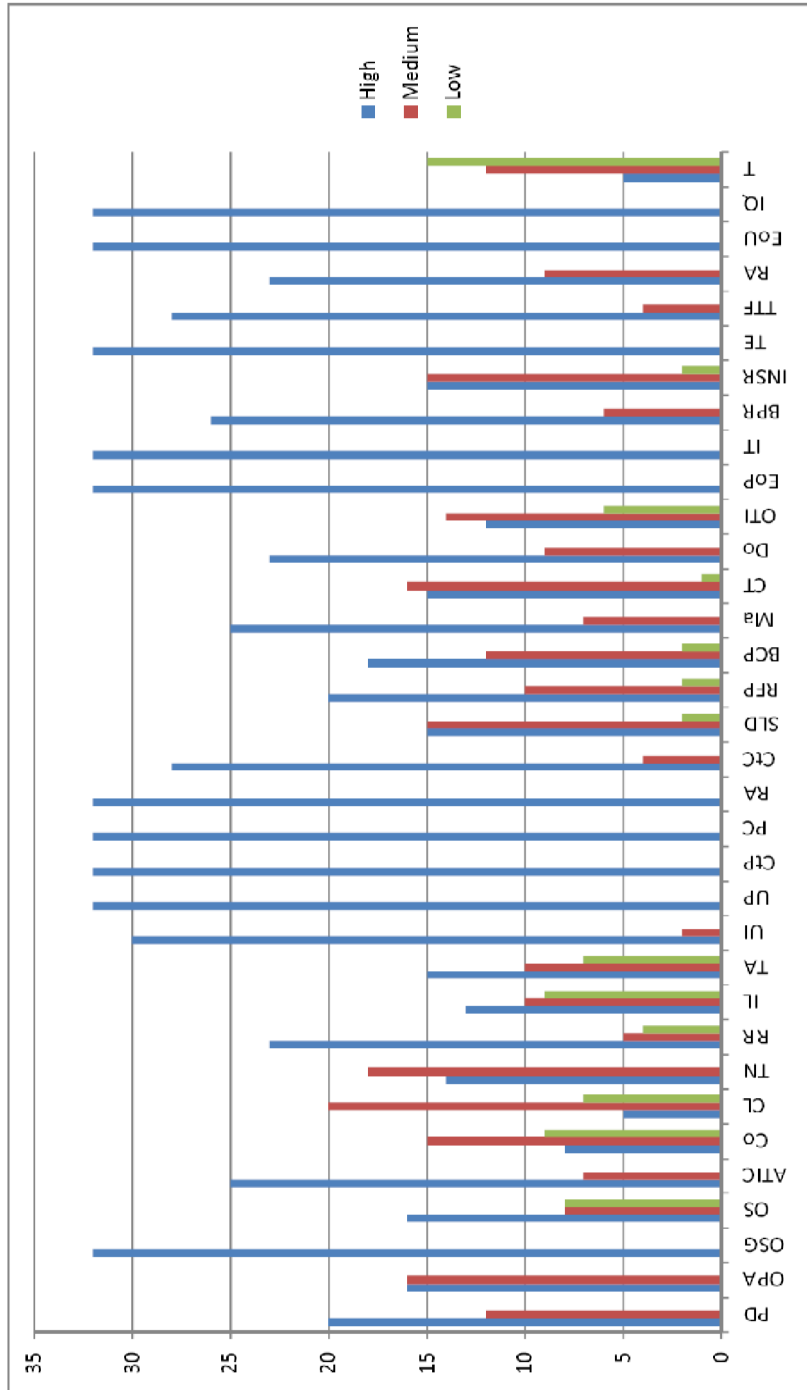
Figure 6.1: Level of Importance of the Factors in the Implementation Process

6.2.2. Implementation Stages and Corresponding Factors

The table 6.2 shows the PIRF result of the stages and the factors corresponding to each stage. The PIRF respondents were asked to mark the stages they feel the factor influence the most. The frequency of a factor falling in a stage was calculated.

Table 6.2 : Stages of Implementation with Corresponding Factors

Stages	Factors
Initiation	Path dependencies, Organization power affiliations, Organizational strategies and goals, Organizational size, Attitude towards innovation and changes, Rules and Regulations, Industry leadership, Technological advancements
Adoption	Collaboration, User involvement, user participation, Commitment to the project, Commitment to changes, Project Champion, Service level documentation, Request for proposal, Tenure.
Adaptation	Computer Literacy, Task nature, Resource allocation, Organizational and technical infrastructure, extend of planning, Implementation team, Business process re-engineering, Institutional structure re-engineering, Training and education
Acceptance	Ease of use, Task-technology fit, Relative advantage, information quality
Routinization	Documentation, Business Continuity plan, Maintenance, Contract termination,
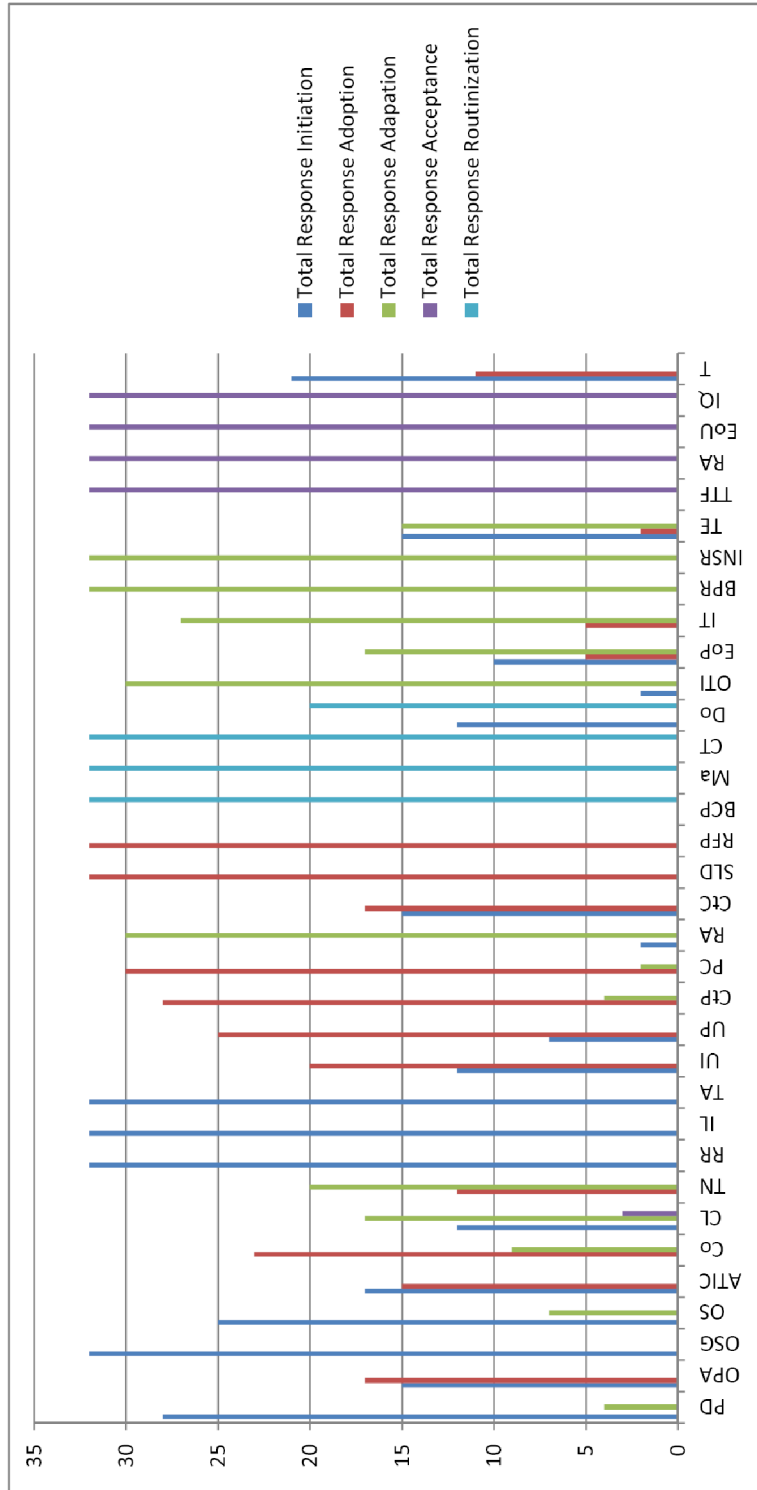
Figure 6.2: Stages of Implementation with Corresponding Factors

6.3 Data Array of Initiation Stage

In this section the researcher have synthesised the result from individual cases. The data synthesis is shown as data array of each factor in their corresponding stages. This is followed by the interpretation of the factors..

Path Dependencies	Case A: the inability of the old system was a major reason for the bank to shift to CBS Case B: inability of the old system to meet the transaction processing of the bank. Case C: went for CBS due to the regulatory pressure Case D: went for CBS to take advantage of the available banking technology
Interpretation	Incapability of the old system directly affected the decision to adopt CBS Users satisfaction with the old system affected the user involvement in stage 2 The level of importance : High
Organization Power Affiliations	Case A: employees had strong affiliation to union. Influenced the decision making of the bank. The management was able to handle the opposition by involving them in the CBS decision process Case B: employees affiliated to the union. Management did not handle the union but went for an in-house system development Case C: power affiliations were not strong Case D: did not have the presence of any power affiliations.

Interpretation	Do not directly affect the decision to adopt new CBS Affected the decision of people involved in the project in stage 3 Strong management leadership avoided the opposition from different power affiliations. The level of importance: Medium
Organizational Strategies and Goals	Case A: the integration of IT strategy and business strategy led to the adoption of CBS. The goals were communicated to the stakeholders. Case B: business strategy and IT strategy was different. The IT implementation was a project of the IT department. Users were not aware of the goals and strategy. Case C: used the technology advancements to re-design the strategy of the organization for business development. Case D: integration of the technological and business strategy for the development of business market.
	Directly affected the adoption of the CBS. In some banks the adoption of CBS led to change in business strategy. Level of importance: High

Organizational Size	Case A: the size of the organization was a major barrier for the adoption of the CBS. The improper assessment of the size led to the failure of CBS implementation. The size also determined the implementation approach to be adopted. Case B: size did not affect the adoption decision. Acted as a barrier in implementation approach. Case C: the medium size led to the fast implementation. Case D: the skill size available reduced the dependency on the external consultants.
Interpretation	Did not directly affect the CBS adoption decision. But affected the implementation approach and planning. The internal availability of skilled manpower was positively affecting the implementation process. The level of importance: High
Attitude towards Innovation and Changes	Case A: the stakeholders had a positive attitude towards innovation. But the task content led them resistant to changes associated with the technology. Case B: the stake holders had a positive feeling towards innovation. But was not confident about adopting new CBS. Management did not formulate any strategy to bring a change in the attitude of the stake holders as they too were not confident. Case C: the stake holders had a positive attitude. Case D: the attitude of the stake holders was positive.

Interpretation	Do not directly affect the decision to adopt new CBS. The importance of the factor is reducing as the new generation employees have a positive attitude towards innovation and change. Level of importance: Medium
Rules and Regulations	Case A: had to adhere to the industry rules and regulations. Case B: the rules and regulation acted as a catalyst for the implementation of CBS Case C: regulations played an important role in the adoption of the CBS. Case D: guided the implementation process, but did not directly affect the decision.
Interpretation	Directly affected the CBS adoption decision and acted as a guide for the implementation process Level of importance: High
Industry Leadership	Case A: adopted the CBS to maintain the leadership position. Case B: position of the bank did not have any effect on the decision to adopt CBS at first as there was no competition from the same sector. But later losing customers to new generation banks made the management re think. Case C: adopted CBS to penetrate into the market by attracting new customers.

	Case D: adopted CBS to penetrate into rural markets and maintain the leadership position.
Interpretation	Directly affected the CBS adoption decision Level of importance: High.
Technological Advancements	Case A: the availability of the highly integrated banking solution directly affected the decision to adopt that technology. Case B: did not keep a watch on the technological advancements, went in for in – house CBS development. Case C: the advancement in technology led to the adoption decision. Case D: kept in pace with the technological advancements. The bank is known as the highest integrator of the banking technology.
Interpretation	The advancement in technology directly affected the decision to adopt CBS. It also affected the pace in which implementation is carried out. Level of importance: High

6.4 Data Array of Adoption Stage

Collaboration	Case A: due to the wide spread and the large number of employees the collaboration among the departments was less. Each branch worked as an independent unit. Management had to take measures to build in collaboration. Case B: collaboration was less. Affected the

	commitment level of the stake holders
	Case C: management transfer policy had led to greater collaboration among the staff. Helped in smooth implementation.
	Case D: had a collaborative culture.
Interpretation	Do not directly affect the decision to adopt new CBS
	Influenced commitment of departments and create a shared vision
	The level of importance : High
User Involvement	Case A: the user did not feel the importance of the new system. Affected the user participation
	Case B: user did not feel the importance of the new system. Users were reluctant to participate
	Case C: users were very much interested and excited about the CBS
	Case D: users were interested
Interpretation	Do not directly influence the commitment level
	Influenced the user participation in same stage
	The level of importance : High
User Participation	Case A: users did not participate voluntarily. the management support and education influenced the users
	Case B: user participation was less. Management did not take and actions to make user participation.
	Case C: users participated fully. The management has structured strategy for making the users

	participate
	Case D: bank has structured procedure of user participation.
Interpretation	Directly influenced the commitment level of user. The support of the management was found to be crucial in influencing the user participation. Level of importance: High
Commitment to the Project	Case A: the management had strong commitment level this led to gain a positive commitment of the stake holders to the project Case B: the management had low commitment level; this affected the commitment level of the stake holders. Case C: the commitment level was high Case D: the commitment level was high
Interpretation	Directly affected the commitment level of the stake holders to the project Level of importance: High
Commitment to Change	Case A: management was fully aware of the changes associated with the CBS implementation and initiated change management process. Case B: the management did not have a clear idea of the change management process. This led to breakdowns in system Case C: the management had a clear picture of the change management process. It was an organizational wide change management.

	Case D: Change management team was present in the bank.
Interpretation	Directly affected the commitment level of the stake holders to the project Level of importance: High
Project Champion	Case A: The chairman acted as the project champion. Was more of a business integrator. Case B: there was no presence of a project champion. There was a dispute about the project head. Case C: the chief general manger acted as a project champion. Case D: there was a strong presence of the technology and business integrator. Acted as the link between technical staff and the users.
Interpretation	Had an big influence on gaining the commitment of the stake holder Level of importance: High
Service Level Agreements	Case A: influenced the commitment of the stake holders, as there was laid down rules regarding the roles and responsibilities of the vendors. Case B: had a poor service level agreements, led to project delay due to conflict in roles. Case C: the change in management led to change in service level agreements. This led to confusion among the external stake holders. Case D: a well drafted service level agreement led

	to higher commitment level of the stake holders.
Interpretation	Directly influenced the commitment level of the hardware vendors and IT consultants Level of importance: High.
Request for Proposal	Case A: the user involvement and participation led to drafting a clear request for proposal. These helped in assessing the software vendor and select the vendor competent to the project. Case B: no proper request for proposal was drafted. The software vendor was selected on the basis of the suggestion from the IT consultant and mainly on cost factor Case C: a clearly drafted RFP. This helped in assessing the vendor and gaining the commitment level Case D: a clearly drafted RFP
Interpretation	Do not directly affect the commitment level of the stakeholder. But is important to select the vendor and product that match the organization needs. Level of importance: High
Tenure	Case A: tenure had an influence on the commitment of the user to change Case B: tenure had an influence on the commitment level of the users Case C: tenure did not have any effect on the implementation process Case D: bank had more of fresh recruits
Interpretation	The factor did not show much influence on the implementation process. Level of importance: Low

6.5 Data Array of Adaptation Stage

Computer Literature	Case A: the branch users were low in computer competency. Case B: the user's computer literacy low Case C: the users got encouragement from the management for taking up computer courses Case D: the users were proficient in computer usage
Interpretation	Affected the level of training offered by the organization. The importance of the factor is declining as new generation is proficient in computer usage. Now more importance is attached to technical skill. The level of importance : Low
Task Nature	Case A: task content had a negative influence in the attitude of the users. Case B: the bank was not able to address the change in task Case C: the management assessed the change in task and responsibilities. Case D: task responsibilities were structured.
Interpretation	Do not directly affect the organizational readiness. Affected the BPR exercise. It also influenced the task technology fit factor in user acceptance stage. The level of importance : Medium

Resource Management	Case A: had a resource allocation plan, but could not stick to it since heavy customization of the product was done Case B: no prioritization of resource allocation was done Case C: prioritized the project resource allocation Case D: ample resource was available for the implementation
Interpretation	the need for an effective resource allocation plan is required for smooth implementation Level of importance: High
Organizational technical Infrastructure	Case A: was not favourable for the implementation Case B: was not favourable for the implementation Case C: was not favourable for the implementation Case D: was favourable for the implementation
Interpretation	Affect the institutional re-structuring process in the same stage. Level of importance: Medium
Extend of Planning	Case A: Extensive tactical and operational plan helped in the smooth flow of the project. A proper communication plan was also present. Case B: lack of plan led to confusion Case C: presence of a strategic plan and the breakdown of the plan into daily tactical plan Bank D: structured planning process.

Interpretation	Directly affected the organizational readiness for implementation and the regular monitoring of the process. Level of importance: High
Implementation Team	Case A: strong implementation team Case B: team was small to cater all the needs Case C:strong implementation team Case D: strong implementation team
Interpretation	Directly showed the organization readiness for the implementation process Level of importance: High
Business Process Reengineering	Case A: has a BPR process Case B: did not conduct a BPR process Case C: have an in house BPR team working to make bank paperless Case D: process are streamlined
Interpretation	Directly showed the organization readiness for the implementation process Level of importance: High.
Institutional Structure Re engineering	Case A: the hierarchy levels were re-engineered. Case B: no structure re-engineering happened Case C: there was structure re-engineering. The organization became more flatter Case D: the bank had infrastructure conducive for technology adoption.
Interpretation	This factor is influenced by the organizational and technical infrastructure available.

Training and Education	Case A: advance training was given.
	Case B: minimal training facility
	Case C: training was given to all the staff
	Case D: bank had a training matrix on the basis of which training happens.
Interpretation	Training is found to be important at this stage. But education was found to be important in the initial stages to influence the user's attitude.

6.6 Data Array of Acceptance Stage

Ease of Use	Case A: the branch users found the system difficult to use. But with customization they found it easy
	Case B: the system was not found to be easy mainly because all the branches have not migrated to CBS
	Case C: the hands on training received made the system usage easy
	Case D: system was made user friendly
Interpretation	Affected the system usage by the users
	The level of importance : High
Information Quality	Case A: the information quality was high. Reporting was made easy.
	Case B: information quality was low due to lack of data integration
	Case C: the information quality was found to be high

	Case D: the information quality was high
Interpretation	Directly affected the system acceptance and usage. The level of importance : High
Task technology Fit	Case A: after massive customization they system fitted to the organization task Case B: lack of task technology fit Case C: system helped in accomplishment of the task fast Case D: turnaround time was fixed for each task with the technology implementation
Interpretation	Directly affected the user acceptance of the new CBS Level of importance: High
Relative Advantage	Case A: was found to be more advantageous than old system Case B: is not in a state to assess the relative advantage Case C: was found to be more advantageous than old system Case D: no comparison, as bank went in for CBS implementation within two years of its inspection
Interpretation	Directly affected the user acceptance of the new CBS Considered more important that task technology fit Level of importance: High

6.7 Data Array of Routinization Stage

Documentation	Case A: formal documentation procedure not followed Case B: have not started the documentation process because all the branches have not migrated to CBS Case C: structured documentation process Case D: structured documentation process
Interpretation	Affected the system usage by the users since it provides directions for use and avoid depending on the IT department. The level of importance : High
Business Continuity Plan	Case A: have a formal BCP Case B: project still on Case C: entering into the structuring of BCP Case D: have a formal plan
Interpretation	does not directly affected the system usage , but keeps the system running in the organization The level of importance : High
Maintenance	Case A: maintenance contract given to the vendor Case B: project still going on. Case C: more time spend on error rectification than in maintenance Case D: bank have its own maintenance team
Interpretation	Directly affected the usage of the system by avoiding system down time.

	Level of importance: High
Contract Termination	Case A: a formal contract termination did not happen Case B: implementation still going on Case C: the transfer of ownership happened only after three years Case D: contract termination happened immediately as the technical staff of the bank were skilled to handle the project
Interpretation	Do not directly affect the use of the new system Influenced the ownership of the CBS by the IT department Level of importance: High

6.8. Discussion of the Stages

The following section deals with the discussion of the factors found to be important for the implementation to be successful. The discussion is done in accordance to the sages in IT implementation process. The researcher has taken the support from existing literature evidence to support the findings of the case analysis.

6.8.1. Stage I – Initiation

The outcome of the stage I is the decision to adopt a new technology in an organization. In this stage the drivers are identified for IT implementation and the priority is set. By doing so the implementer will ensure that there will be a strong match between the IT application and its possible application in the organization. The study looked for those factors which affected the decision for the adoption of a new technology.

As Markus (2000) points out, today's technological decisions are affected by past technology decisions, which may either limit or increase the range of current choices. If the new technology is vastly different and requires extensive retraining and restructured workflows, the cost/benefit ratio must be carefully considered prior to implementation. The researcher feels that every organization should assess where they stand before embarking any new Information technology. From the analysis we could see that, the case D, where the CBS project was implemented within two years of its inspection did not face major problems as there were no old systems which had to be re worked or discarded completely. The bank could enter all the data to the new CBS system without wasting resource on data cleaning and migration. The analysis of Case A showed that the greater the satisfaction with the old system the more resistance shown by the users to adopt a new system. Here the top management has to engage in more aggressive change management process to make the users accept the new system. Hence the study points out that the factor ***path dependency*** is considered as the first important variable, which directly affects the decision to adopt a new technology. The factor also affects the top management method of change management adopted.

Nelson (1990) points out that there are no organizations that would possess identical organizational environments, simply because they would have different people working for them. The organizational environment can be defined through organizational politics, Institutional leadership, confidence of employees with their management, the reward systems, and organization size and goals. On the basis of case analysis, though the organizations political affiliations played a role, the in depth

interview analysis showed that it was more of an industry specific factor. In case D which was a new generation bank the factor did not exist. But in all other cases the factor influenced not the decision to adopt a new technology but the user attitude towards the adoption of the technology and the user commitment to the project. As Markus (1983) points out that the resistance to new technology can be attributed to internal political issues and the power associated with them. The analysis also showed that in the cases where there was a strong management leadership the power affiliation did not matter much. In the organization with strong management leadership the users were more confident about the implementation process and showed a positive attitude towards technology. Hence another factor considered important for the decision to adopt a new technology was ***management leadership***.

Another important factor which directly affects the decision to adopt a new technology was is the ***size of the organization***. In the analysis of case A, B and C we can see that, the bank went in for new CBS when the existing system couldn't handle the volume of transactions and huge customer base. It was evident from the case A analysis that at first the bank did not asses its size and went for a basic CBS implementation which had to be discarded within two years.

It is evident from the analysis that the banks went in for CBS adoption due to the increase in competition from new generation banks with state of the art technology and from regulatory pressures. In case A and Case C we could see that the CBS implementation was successful because the banks converted the pressure into goals to be achieved and a long term business-IT strategy was developed. The adoption and

implementation of the CBS was in accordance to the strategy formulated. Many scholarly works point out that the integration of the technology strategy and the business strategy will help in development and adoption of those systems which will be fully utilized by the organization. Hence the ***organizations strategy and goals*** play a major role in deciding to adopt a new technology. A clearly communicated strategy helped the stakeholders to involve more in the implementation process.

Laudon and Laudon, (2007) refers to a situation called market-pull where there is a social need where IT is developed to satisfy this need. Often, the market-pull adopters are the innovators or first movers in the market. The analysis of Case D shows that they are the market leaders for the adoption of technology and uses the technology to maintain the leadership position. The first mover advantage helps the organization to face the competition the industry by attracting more customers. The analysis of case A showed that they too adopted the technology to maintain the leadership position. The decision on to be a industry leader or to be a survival firm affects the decision to adopt a new technology. Thus ***industry leadership position*** is also a major factor that influences the decision to adopt a technology.

Once the internal characteristics are identified the organization should now look at the external environment of the organization.

The external environment involves the ***rules and regulations*** regarding the adoption and implementation of Information technology. All the cases showed that the change in the rules and regulations were the major factor which led to the decision to adopt a new technology.

Next the organization should also look at the ***advancements made in the Information technology.*** The case analysis showed that a major reason for the banks to go in for CBS adoption was the banking solution market was well developed and there were many IT software vendors with banking solutions and competitive price. Technology-push describes an innovation that is well developed and the market, under the pressure of this advanced technology, is required to absorb it. The in depth interview revel banks which didn't adopt the latest technology available were the low integrators of technology. The case B is a typical example for this condition.

In summary, during the initiation stage, an organization identifies an opportunity for change and evaluates specific IS solution to engage in. However no commitment from either potential users or the IS department is made during initiation stage.

The factors found to be important at this stage are:
- Path dependencies
- Management leadership
- Organization size
- Organization strategy and goals
- Rules and regulations
- Industry leadership
- Technology advancement

6.8.2. Stage 2: Adoption

The main intent of the adoption stage is to gain the commitment of the stake holders and ensure organizational backing for

implementation of IT application. The expert interview revealed that the main stake holders for the CBS implementation were: the IT staff, external vendor and consultants and the branch users. This stage looked at all those factors which influenced the stake holder commitment to the project.

If groups are collaborative in the way they interact, it is easy to encourage innovative behaviour among them (Nelson 1990). The case analysis showed that lack of collaboration among the stakeholders of the project led to conflicts and project delays. Hence ***collaboration*** among the stakeholders is considered as an important factor for gaining the commitment for the project.

Hartwick and Barki (1994) noted that users should be involved right from the system design stage, lack of user involvement in defining the system specifications will most likely to lead to implementation that does not satisfy needs. The case analysis showed that ***user participation*** is integral in the implementation process that it is almost plays the role of catalyst in the implementation reaction. Implementation of the new technology often poses a threat to the users sense of control because of the change that implementation brings. However, by getting users to participate in the decision making process, and building ownership by making users accountable for results on the tasks necessary for the implementation to succeed, may lessen user's feeling of uncertainty.

The case analysis showed that user participation does not happen on its own; management plays a critical role in facilitating and influencing user's participation in the implementation. Top management

support one of the critical factors in success, it is a critical factor in every stage of the implementation lifecycle, from initiation to infusion (Somers and Nelson 2001).The case analysis confirms this finding. The analysis also revealed that the factor is more important in stage two of the implementation process where the user's commitment to the project and change can be influenced by the support it receives from the top management. The IT staff dedication is also influenced by the top management support. When there were conflict between the IT staff and the external consultants the support from the top management helped in resolving it. One of the important components of the support is the education about the implementation project, the change in role and responsibilities of the stakeholders and the change in workflows. This will avoid the project uncertainty of the stake holders and help in gaining commitment for the project. Hence ***management support and education*** is one of the important factors in gaining stake holder commitment.

The case analysis led to the conclusion that the management that can ensure sufficient resources to the implementation effort, that is willing to accept risks, and that acts as a change agent to create more conducting environment through encouraging and promoting the new technology is associated with greater CBS implementation success. The lack of management commitment can become a serious barrier that can hinder a successful outcome of IS implementation (Ginsberg, 1981).Both commitment to the project and commitment to the change require attention from management and users. Securing management commitment and support right after the decision is made to proceed with the change is the objective of the adoption phase. It is logical to do this earlier in the implementation process, because management that is not

committed and does not believe that system is good one will do a poor job of securing necessary resources to satisfy the implementation demand. The commitment involves the allocation of necessary resources, making changes in the work process and helping and educating the stake holders about the changes in the organization. Hence ***management commitment to the project and change*** is an integral part to gain stake holder commitment.

An important stake holder in the implementation project is the IT department staff. Development of the skill and competency of the IT people was found to be an important factor to gain their commitment. It is seen from the analysis that when the IT staff was given the ownership of the project they had more enthusiasm to work on it. The cases where the IT consultants took the leadership the IT staff took a backbench. The commitment of the IT staff was necessary in the routinization stage too. When the ownership of the CBS software was transferred to the bank. Hence ***IT department skill and competency development*** was found to be an important factor at this stage.

One more factor that was shown to have a positive effect on gaining the stake holder commitment is ***project champion presence***. A champion is an individual in the organization that has a previous experience with the technology; possesses a great level of confidence in the new system and its potential benefits; and is enthusiastic about the technology and change it represents (Beath, 1991).

The third level of commitment necessary for the smooth implementation is the commitment of the third parties involved in the

implementation. The third parties may be directly or indirectly involved in the implementation process. The main people identified were the software and hard ware vendors and the IT consultants. It was shown that a well-defined request for proposal helped the banks to identified competent software vendor. This also helped in fixing the commitment level of the software vendor to the project. Another important factor was the service level agreement reached with the vendor and the consultants. The *request for proposal and the service level document* was important in gaining the commitment of the third parties towards the implementation of the project.

To increase the odds of successful implementation, it is crucial to gain early support from key participants of the project. The factors which helped in this were identifies as:

- Collaboration
- User participation
- Management support and education
- Management commitment to the project and changes
- Project champion
- IT department skill and competency
- Service level agreement
- Request for proposal

6.8.3. Stage 3: Adaptation

The next stage of the implementation progression is adaptation. During this phase, organizational procedures are revised and new business processes are introduced. Therefore, current practices need to be well understood and new ones need to be structured in a way that will

exploit the full potential of the new technology. The emphasis of this stage is on preparing the organization and its users for the use of the new system. The outcome of this phase will be the organizational readiness for the project implementation.

Characteristics of the task that include the level of autonomy, control over work quality, and responsibility for the outcome, would give better guidance toward what job changes may occur due to the new IS implementation, and would help managers to prepare users for changes as well as anticipate possible source of resistance later in the implementation (Nelson, 1990). The case analysis showed that task content was a major inhibitor for the adoption of the technology. The assessment of the *task nature* and confirming it with the changes required with the new technology is an important factor.

Having a project plan will decrease project uncertainty (Nidumolu, 1995) by assessing organizational needs, system fit into work practices, training requirements, evaluation criteria and specifying the roles of project team members. "The more thorough the planning effort, the less likely are unforeseen circumstances which could endanger the project" (Ginzberg, 1981b). Developing a comprehensive implement tation plan with strategies and tactics helps to direct and utilize user participation and management support to the fullest potential. The important plans that came out as analysis of the cases proceeded was : strategic plan, strategic plan is a process which creates a product, usually in the form of a written , comprehensive , long –term strategy for determining the priorities, allocating limited resources and ways to measure the progress" (Gorden, 1993). Operational Plan, which has

resource allocation plan, time scheduling, project evaluation method etc. It is not only important to have a proper plan another important factor is to have proper communication of the plan to the various departments and coordinating the activities. Thus ***extensive planning*** is required for making the implementation successful. The plan should include resource allocation, time scheduling, budgeting, reporting plans.

To carry out the implementation plan, an implementation team should be comprised of members with the right skill-sets and knowledge-sets within the interpersonal, computer systems, and organizational areas (Baronas and Louis, 1988). The analysis of the cases showed that the skills and experience of the implementation team as well as ability to build strong relationship between the user and the provider of the new CBS represents a significant factor in the success of failure of an implementation effort. The members of the team also influence the success of the project. The more the team had representation from different departs the more effective was the team in implementation. Thus ***project team skill and composition*** is considered as another important factor.

Another factor that plays an important role in new system implementation is ***user training.*** The analysis showed that careful planning and implementation of a training program may facilitate acceptance of the system by users. Training influences system usage by building confidence in the new system use, thus increasing users' satisfaction. Thus training makes the user confident for the implementation process and in later usage of the system when it goes live. The case analysis showed that training is important at this stage but

education about the new implementation should be received at the adoption phase to gain stake holder commitment.

Another factor that is important to consider is whether the user will have a chance to experiment with the new system before committing to its use. ***Trailability*** has been generally considered positively related to innovation (Rogers, 1983; Rogers, 1995). The case analysis confirms this finding. Having an option for trying out the new system offline for a period of time gave the potential user an opportunity to become familiar and proficient with it without worrying that it may cause downtimes at work. It was pointed out that trialability of a system is important in reducing risk and uncertainty about the expected consequences of using the innovation.

The introduction of a new IS can lead to changes in already established organizational routines and, consequently, routines themselves can be a source of resistance to organizational change (Edmondson et. al., 2001). The main observation made in many previous research is that the institutional context - key aspects of which are workflow patterns, work procedures, routines, reward systems, control and coordination mechanisms - affects the end users' ability and motivation to successfully adopt and use IS innovations. The case analysis showed that a proper business process re-engineering leads to better use of the system and reduce system downtime. Organizational structure needs to be shaped in ways that facilitate an appropriate use of technology to accomplish work. The actions that can be undertaken to ensure successful implementations are: instituting new structures, new performance control systems, new coordination mechanisms, and

changes to performance goals. ***Process re-engineering and structure re-engineering*** was found to be important for successful implementation. The factors found to be important at this stage are:

- Task nature
- Extensive planning
- Project team skill
- Training
- Trialability
- Business process and institutional structure re-engineering

6.8.4. Stage 4: Acceptance

After all preparation for the IS implementation is done, organizational members are induced to commit to the new IS application. By starting to use technology for the first time, users evaluate its characteristics, how it affects their performance, and ultimately makes decisions about whether to continue its use (Copper and Zmud, 1990). It is during the acceptance stage when users really begin to use the new system, gain more concrete knowledge about the system, become more experienced with it, and start to recognize what value it can add. Therefore, during the acceptance stage users will assess the characteristics of the technology and decide whether it fulfills their expectations.

Goodhue (1995) studied user evaluation of the IS through applying the ***task technology fit*** construct as a measure of IS success. He argued that users give evaluations based not only on inherent system characteristics, but also on the extent to which that system meets their task needs and their individual abilities. Usually users with different task

needs and abilities might give different evaluations to the same system (Goodhue, 1995). The study also confirmed this view. In all the cases expect case D, the core product had to be heavily customized to meet the task nature and process flows. This in turn increased the user satisfaction with the system.

Relative Advantage has been one of the innovation characteristics that were shown to have an effect on individual's opinion of the innovation prior to adoption and effect on the rate at which innovation is adopted (Moore and Benbasat, 1991; Rogers, 1995). The case analysis showed that while using the new system, users evaluate it based on how well the system's features meet their task demands more than the old system in which they were working. They develop a perception of what benefits they can realize from its use, and as a result, users' beliefs about how useful and advantageous the system shaped their level of satisfaction.

Since banking industry is dependent on information more than any industry, the user satisfaction heavily depends on the information quality and the system quality. The information quality is measured using the characteristics of clarity of content, accuracy, error free, user interface and MIS for better CRM and risk mitigation. The system quality is measured by the ease of use of the system. Moore and Benbasat (1991) defined ease of use as a degree to which potential adopters view usage of target technology to be relatively free of effort. The case analysis showed that the CBS product was of high quality with large number of reports. The user inhibition on the security angle of the CBS. expect from case B all, other banks had their security standards. The only problem the users in case A, B, and C faced was that there was no

online help or manual for the use of the system, this delayed in the use of new features of the product. Case D was a pioneer in providing on line and offline help to the users. This led to effective use of the CBS by bank D. Hence ***information and system quality*** is an important factor for the users to accept the system.

The facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Tompson et al., 1991). However, the previous studies show that the effect of facilitating conditions on usage was found to be only significant when examined in conjunction with the moderating effects of the user age and experience. But on the analysis of the cases the researcher noted that in banks where the management provided support and facilities for implementation, the implementation was a smooth process. Hence the researcher decided to add this factor.

Expectation management was considered as a major factor influencing the user satisfaction with the CBS. The case analysis showed that with the implementation of CBS the users thought all the work will be done by the system. The inability of the system to take care of some of the task like locker management, lead to dissatisfaction among the users.

The acceptance of the new system in an organization is dependent on:
- Task technology fit
- Relative advantage
- Ease of use
- Information quality
- Facilitating conditions
- Expectation management

6.8.5. Stage 5: Routinization

At this stage the usage of IT application is encouraged as a normal activity. The organizations governance systems are adjusted to account for the IT application, the It application is no longer perceived as something out of ordinary. All system and procedures and exception handling are in place. The maintenance and the support teams are set up. Not much literature is available for this stage of IT implementation.

The case analysis showed that an important factor at this stage was ***documentation.*** James O'Brien (2008) describes documentation as recording and finalizing of detailed system specifications, including usage manual for end users and IS personnel's, authority structure, and procedures and policies for the use of the new system in the organization. Case analysis showed that expect case D, all others were poor in the documentation process. All process was people oriented, so when people change the process was disturbed. Proper documentation makes the bank activities more process oriented than people oriented. This will help in undisrupted use of the new system.

The next important factor is ***maintenance.*** This can be defined as the monitoring, evaluating and modifying of operational business systems to make desirable necessary improvements. The case analysis showed that entering into annual maintenance contract with the vendors helped in the regular maintenance and un-interpreted work flow.

Termination of contract or transfer of ownership means confirming new behaviours patterns and completing transfer of responsibility to users. The case analysis showed that the IT department

staff was reluctant to take the ownership of the CBS product as the transfer of the ownership was not complete. Some of the modules in the product were still handled by the vendor. Whenever any changes had to be made to the module or any problem arises the vendor had to be contacted. Hence the transfer of ownership is an important factor in the system usage stage.

For uninterrupted use of the CBS by the branch users it is very important that they are provided with ***online and offline help*** facility. The establishment of the 24 hour help desk by banks improved the usage of the system.

The most important factor for the continuous use of the system was the existence of a backup plan. The ***business continuity plan*** helped the banks to assess the risk and make plans to overcome them. But only bank A and bank D had a plan developed.

The factors found to be important at this stage are:
- Documentation
- Maintenance
- Help desk
- Business continuity plan
- Ownership creation

The cross case synthesis and the following discussion shows that there are thirty one factors which are considered important for the implementation process. Many of the factors may be important in one or more stages, but the researcher have discussed it on the stages which the case analysis proved it to be important.

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Chapter - 7

RESEARCH FINDINGS, RECOMMENDATION AND CONCLUSION

Contents	7.1	**Findings of the Study**
	7.2	**Model Proposed**
	7.3	**Limitation of the Study**
	7.4	**Scope for Further Research**
	7.5	**Conclusion**

Implementation is a critical gateway between the decision to adopt innovation and the routine use of the innovation within an organization (Klein and Sorra, 1996). For implementation to be a success, the application should be no longer perceived as something new, and the "targeted employees use a given innovation consistently and well" (Klein and Sorra, 1996). To understand what are the important steps that take place during this critical gateway, and to know what issues should be raised and resolved throughout implementation process, would allow for better control over the outcome of IS implementation, thus increasing odds of success of the technological innovation.

7.1 Findings of the Study

The major findings from the study are listed below:

- The studies align with the Kwon and Zmud (1987) model, which looks at implementation of IT as a process of organization change. The study outcome showed that all the banks underwent a complete change process with the implementation of CBS.

- Based on the study the stages of CBS implementation is modified as:
  - **Decision** to adopt a new technology
  - **Gaining Commitment** of stake holders to the project
  - **Organizational readiness** for the project implementation
  - **User acceptance** of the new system
  - **Routine use** of the system

- The factors which helped the banks to break the growth model proposed by Richard Nolan for technology adoption and implement CBS are management leadership, management support and education, management commitment to change and project, IT department skill and empowerment, presence of project champion, extensive planning and training facilities

- The decision to adopt a new technology was directly affect by the:
  - Inefficiency of the old system used by the organization
  - Change in organization strategy and goals
  - Change in organization size
  - Change in existing rules and regulations
  - Industry leadership the organization enjoys

- o Technology advancement
- o Top management initiative

- The main stake holders to the technology project were found to be:
    - o Management
    - o Users of the technology
    - o IT department
    - o Hardware and software vendors
    - o IT consultants

- The factors affecting the commitment of the stake holders to the project are:
    - o Management support and education
    - o Collaboration among the stakeholders
    - o User participation in the project right from the need analysis stage
    - o Management commitment to change and the project
    - o Presence of a project champion or business integrator
    - o Well-developed service level agreements and request for proposal
    - o Skill development and empowerment of the IT department.

- The factors which affect the organizational readiness for the actual implementation of the technology are:
    - o Defining the changes/new task nature due to the adoption of a new technology
    - o Extensive planning including strategic, operation, tactical and communication plans

- o The implementation team skill and composition
- o Business process and structural re-engineering in accordance with the new technology
- o Training
- o Offline trialability

- The factors affecting the user satisfaction and the acceptance of the new technology are
  - o Task technology fit
  - o Relative advantage of using the technology
  - o The information quality in form of content quality, accuracy, error free information
  - o System quality by way of ease of use and security
  - o Facilitating conditions of technology infrastructure
  - o Expectation management

- The factors which affect the routine use of the technology which determines the success of implementation are:
  - o Transfer of the ownership of the system to the users
  - o Structured documentation process
  - o Regular maintenance of the system to avoid system down time
  - o Online and offline help centre
  - o Business continuity plan.
- The factors which were found to be least important are:
  - o Computer literacy- even though in the beginning of core banking implementation this was an issue at present the employees have basic computer literacy so this is not a relevant factor.

o Tenure – most banks have recruited young and skilled officers, who have no inhibitions in adopting new process and procedures.

o Attitude towards innovation –compared to the old generation staff in the banking sector the new generation staff is always ready to accept changes and innovations. It has become more a part of their work culture.

7.2   Model Proposed

Based on the above findings the researcher proposes a holistic model for information technology implementation by organizations. The model can act as a blue print for the organizations for adoption and implementation of any new technology. This model will also help the organizations to evaluate the organizational internal and external factors which affect the IT implementation process and determine its strength and weakness to take necessary control mechanisms for the successful implementation of technology.
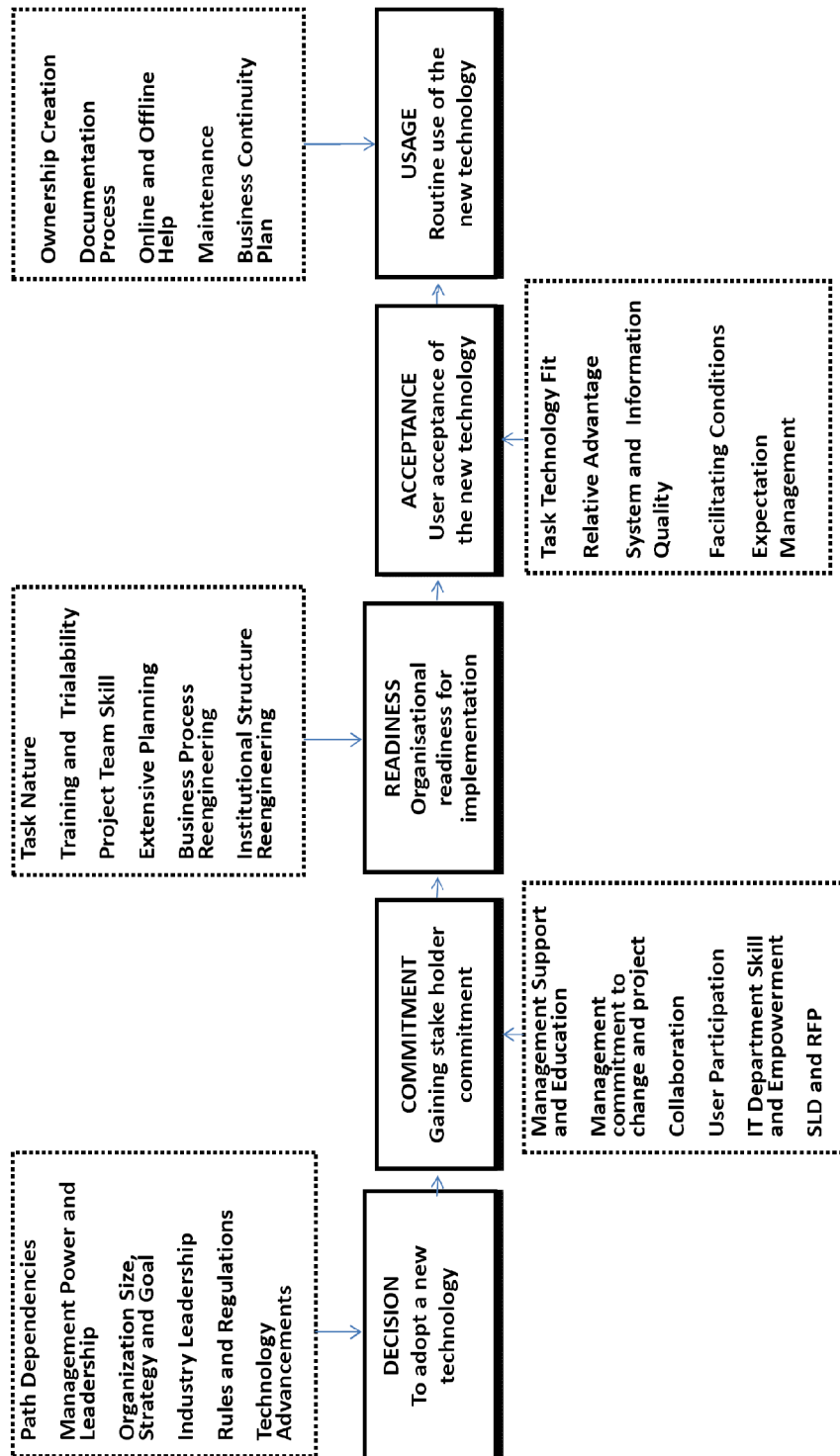
Fig: 7.1: Integrated Model of IT implementation Stages with Factors Affecting Each Stage.

7.3   Limitations of the Study

General case study limitations apply to this study too. Specific limitations of the study is, research was done in CBS implementation framework, but when it comes to study of IT implementation of other level or in other industry, many of the factors of this study may not be significant. Since the case study was conducted only in four banks the problem of generalization of the findings to other sectors occurs. The case analysis was done by collecting data through expert interview, PIRF, in-depth interview and secondary source. This was to reduce bias of the reporting person. However such bias could remain to some extent in the study as the size of the respondents is limited.

7.4   Scope for Further Research

Further research can address the limitations mentioned in the study. Since the study was limited to core banking implementation in Indian banks, further studies can test the model in other industry with other types of IT. Researchers can further develop the study to include the infusion stage and study the outcome of successful implementation of IT in an organization. The model proposed in the study can act as the base model to empirically test the relationship of the factors to the stages of implementation and among the factor identified in different stages. Researchers can also further aggregate the factors as user related factors, management related factors, project related factors, organizational factors and external factors and test their impact on the IT implementation process.

7.5   Conclusion

The area of IT adoption and implementation is extremely problematic and complex. Whenever a technology implementation fails, the blame often falls on the technology adopted. In many implementation failure studies it is noted that technology is not solely responsible for the failure various other factors internal and external to the organization contribute to the failure of such projects. Technology implementation is a process which involves all the individuals in an organization right from the top management to clerical staff. In addition it requires extensive planning and dedicated resources ranging from human to fiscal.

This study utilized the five stages of Kwon and Zmud (1987) six stage model to get an understanding of the implementation process. The experiences of the core banking implementation project carried out in the banks were studied in detail to develop an understanding of the multitude of problems underlying the IT implementation process and the factors which helped in overcoming the issues for a successful CBS implementation. The factors were viewed individually in order to better ascertain the singular impact of each factor on the implementation stages.

The models proposed based on the findings in the study will help the organization, especially service sector organizations to address the implementation process in a systematic way. In essence the model provides an alternative to re-inventing the wheel every time an implementation project is undertaken.

The study was very challenging and an enlightening experience for the researcher. Though the researcher had three year experience in the

CBS implementation project, the research opened up new dimensions of understanding the implementation process and the associated organizational change. Hearing the CBS implementation experience right from the mouth of the experts involved was indeed a unique experience. The challenge thrown to the researcher was in collecting the data from the geographically diverse respondents and to bring their experiences to a holistic model.

The researcher hopes that the findings reported in the study shed some light on the implementation process and the model proposed can be used as a base model for further studies.

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REFERENCES

Adamson, I. (2003). Extending the new technology acceptance model to measure the end user information systems satisfaction in a mandatory environment: A bank's treasury.*Technology Analysis and Strategic Management*, 15(4), 441-455.

Agarwal, R., and Prasad, J. (1997).The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies.*Decision Sciences*, 28, 557-582.

Agarwal, R., and Prasad, J. (1998). The Antecedents and Consequents of User Perceptions in Information Technology Adoption. *Decision Support Systems*, 22(1), 15–29.

Agbolade, O. K., andOladejo, K. S. (2011). Information and Communication Technology and banks profitability in Nigeria.*Australian Journal of Business and Management Research*, 1(4), 102-107.

Alabar, T. T. (2012). Electronic Banking Services and Customer Satisfaction in the Nigerian Banking Industry.*International Journal of Business and Management Tomorrow*, 2(3), 1-8.

Anderson, M. C., Banker, R.D. and Ravindran, S. (2006). Value Implication of Investments in Information Technology.*Management Science*, 52(9), 1359-1376.

Armstrong, C.P., and Sambamurthy, V. (1996). Information technology assimilation in firms: the influence of senior leadership and IT infrastructures. *Information Systems Research,* 10(4), 304–327.

Attaran, Mohsen. (2003). Information technology and businessprocessredesign.*Business Process Management Journal*, 9 (4),440 – 458.

Bailey, J.E., and Pearson, S.W. (1983).Development of a Tool for Measuring and Analyzing Computer User Satisfaction.*Management Science*, 29(5), 530-545.

Barki, H., and Huff, S.L. (1990, May).Implementing Decision Support Systems: Correlates of User Satisfaction and System Usage.*INFOR (Canada)*, 28(2), 89-101.

Barney, J., Mata, F. J., and Fuerst, W. L. (1995). Information technology and sustainable competitive advantage: a resource based analysis. *Management Information Systems Quarterly* 19 (4), 487–505.

Baronas, A.M., and Louis, M.R. (1988).Restoring a Sense of Control during Implementation: How User Involvement Leads to System Acceptance.*Management Information Systems Quarterly,* 12(1), 111–123.

Bessant, J., and Francis, D. (2005).Targeting innovation and implications for capability development.*Technovation*, 25(3), 171-183.

Bassellier, G., and Benbasat,I. (2004). Business competency of Information technology professionals.*Management Information Systems quarterly*, 28(4), 673-694.

Bassellier, G., and Benbasat,I. (2003, December) .The Influence of Business Managers' IT Competence on Championing IT. *Information Systems Research*, 14(4), 317-336.

Beath, C.M. (1991). Supporting the Information Technology Champion.*Management Information Systems Quarterly*, 15(2), 355-372.

Beaumaster, S. (1999).*Information Technology Implementation Issues: An Analysis.* Dissertation submitted to Virginia Polytechnic Institute and State University. Retrieved from https://theses.lib.vt.edu/theses, December 3,2010.

Benbasat, I., and Zmud, R.W. (1999).Empirical Research in Information Systems: The Practice of Relevance.*Management Information Systems Quarterly*, 23(1), 3-16.

Benbasat, I., Dexter,A.S., and Chwelos, P. (2001). Empirical Test of an EDI Adoption Model. *Information Systems Research* 12(3), 304-321.

Carr, A., and Smeltzer, L.R. (2002, August). The relationship Between Information Technology Use and Buyer- Supplier Relationships: An Exploratory Analysis of the Buying Firms' Perspective. *IEEE Transactions on Engineering Management*, 49 (3), 293-304.

Clemons, E.K., and Weber, B. (1990), London's Big Bang: A Case Study of Information Technology, Competitive Impact, and Organizational Change, Journal of Management Information Systems, 6 (4), 41 – 60

Creswell, J.W (2003). Research Design: Qualitative, quantitative and mixed methods approaches, II edition, Thousand Oaks. CA: Sage

Cooper, D. S. (2008).*Business Research Methods: 10 th ed. Boston*: McGraw- Hill/Irwin.

Cooper, R.B., and Zmud, R.W. (1990).Information Technology Implementation Research: A Technology Diffusion Approach. *Management Science,* 36(2), 123–139.

Daft R. L., and Lengel, R.H. (1986).Organizational information requirements, media richness and structural design.*Management Science*, 32(5), 554-571.

Daft R. L. (1980). The Evolution of Organizational Analysis in ASQ: 1959-1979. *Administrative Science Quarterly*, 25,623-636.

Davenport. T.H. (1994). Saving IT's soul: human-centered information management. *Harvard Business Review*, 119-131.

Davenport, T. H. (1998). Putting the enterprise into the Enterprise System .*Harvard Business Review,* 76(4) ,121-131.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *Management Information Systems Quarterly* 13(3), 319–340.

Davis, F.D., Bagozzi, R.A. and Warshaw, P.R.   (1989a). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Psychology* 22, 1111–1132.

Davis, F.D., Bagozzi, R.A. and Warshaw, P.R. (1989b). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35, 982–1003.

DeLone, W. H. and McLean, E. R. (1992).Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research*, 3, 60-95.

Dierckx, M.A.F., and Stroeken , J. H. M. (1999, February). Information Technology and Innovation in Small and Medium-Sized Enterprises.*Technological Forecasting and Social Change*, 60(2), 149-166.

Doll, W. J., and Torkzadeh, G. (1988).The Measurement of End-User Computing Satisfaction.*Management Information Systems Quarterly*, 12(2), 259-274.

Dutton, J. E., and Dewar , R.D. (1986). The Adoption of Radical and Incremental Innovations: An Empirical Analysis. *Management Science*, 32(11), 1422-1433.

Earl, M.J., and Feeny, D. F. (1994) .Is Your CIO Adding Value?. Sloan *Management Review* 35(3), 11-20.

Edmondson, A. C., Bohmer , R.M. and Pisano, Gary, P.   (2001). Disrupted routines: Team learning and new technology

implementation in hospitals. *Administrative Science Quarterly*, 46(4): 685.

Ein-Dor, P., and Segev, E.(1978) .Organizational context and the success of management information systems, *Management Science*, 24(10), 1067-1077.

Ein-Dor, P. and Segev, E.   (1982). Organizational Context and MIS Structure: Some Empirical Evidence. *Management Information Systems Quarterly* 5(3), 55–68.

Eisenhardt, K.M. (1989). Building theories from Case study Research.*Academy of Management Review*, 14 (4), 532 – 540.

Essex, P.A., Magal,S.R., and Masteller, D.E. (1998). Determinants of information center success. Journal of *Management Information Systems*, 15(2), 95–117.

Ettlie, John E. (1980). Adequacy of stage models for decisions on adoption of innovation.*Psychological Reports*, 46, 991-995.doi: 10.2466/pr0.1980.46.3.991

Ewusi-Mensah. (1991**).** On information systems project abandonment: an exploratory study of organizational practices,*Management Information Systems Quarterly, 5*(1), 1991 , 67-68.

Farhat, H. (e.d) (1988). Computerization and Mechanization in Indian Banks, Deep & Deep Publications.

Fulane, A., Alturas, B. (2012). Critical Factors in ERP Implementation Projects in two Mozambican banks7th Iberian Conference on Information Systems and Technologies, At Madrid, Spain.

Gichoya, D. (2005). Factors Affecting the Successful Implementation of ICT Projects in Government.*The Electronic Journal of e-Government*, 3(4), 175-184.Retrieved from www.ejeg.com.

Ginzberg, M.J. (1979). Behavioral science- Finding an Adequate measure of OR/ MS Effectiveness. *Interfaces*, 8(3), 57-63.

Ginzberg, M.J. (1981a). Early Diagnosis of MIS Implementation Failure: Promising Results and Unanswered Questions. *Management Science*, 27(4), 459–478.

Ginzberg, M.J. (1981b). Key Recurrent Issues in the MIS Implementation Process.*Management Information Systems Quarterly*, 5(2), 47–60.

Goodhue, D.L., and Thompson, R. L.(1995) .Task-technology Fit and Individual Performance.*Management Information Systems Quarterly*, 19(2), 213–236.

Gordon, Gerald L . (1993). *Startegicplaning for local government* Washington D C : Internationl City Managerment Association.

Gottschalk, P. (1999). Implementation Predictors of Strategic Information Systems Plans. *Information and Management* 36, 77-91.

Guimaraes. T., Yoon, Y., and Clevenson , A. (1996). Factors important to expert systems success: A field test. *Information & Management* 30(3), 119-131.

Gummesson, Evert. (1991) .*Qualitative Methods in Management Research*. Newbury Park, CA: Sage Publications.

Hartwick, J. and Barki, H. (1994a). Explaining the Role of User Participation in Information System Use. *Management Science* 40(4), 440–465.

Hartwick, J. and Barki, H. (1994b). Measuring user participation, user involvement, and user attitude. *Management Information Systems Quarterly*, 18 (1), 59–82.

Hiltz, S.R., and Johnson, K. (1990).User Satisfaction with Computer-Mediated Communication Systems.*Management Science* 36(6), 739–764.

Hong. K.K. and Y.G. Kim.(2002).The Critical Success Factors for ERP Implementation: an Organizational Fit Perspective. *Information and Management*, 40(1), 25-40.

Hunton, J.E., and Price, K. H.(1997). Effects of the User Participation Process and Task Meaningfulness on Key Information System Outcomes.*Management Science*, 43(6), 797–812.

Hussain, H. (1995). *Information Systems* –Analysis.Design and Implementation. New Delhi : Tata McGraw- Hill publishing Company Limited.

Iacovou ,C. L., Dexter, A.S., and Benbasat, I. (1995). Electronic Data Interchange and Small Organisations: Adoption and Impact of Technology. *Management Information Systems Quarterly*, 19 (4): 465-485.

Ikechukwu, G. (2000). *Enhancing the Performance of Banking Operations through Appropriate Information Technology in Nigeria Banking Industry. Ibadan*: Spectrum Books.63-78.

Ives, B., and Olson, M. (1984 L). User Involvement and MIS Success: A Review of Research. *Management Science*, 30(5), 586–603.

Ives, B. O., Olson, M.H. , and Baroudi, J.J. (1984). The Information system as a competitive weapon . *Communications of the ACM*, 27(12), 1193-1201.

Jarvenpaa, S.L., and Ives, B. (1991). Executive Involvement and Participation in the Management of Information Technology.*Management Information Systems Quarterly,* 15(2), 205–227.

Johnson. (1998). *Corruption and the Unofficial Economy*.Unpublishedmanuscript.World Bank, Washington, DC.

Joshi, K. (1991). A Model of Users Perspective on Change – The Case of Information-System Technology Implementation.*Management Information Systems Quarterly* 15(2), 229-242.

Joshi, D. K., and Lauer, D.T.W. (1998). Impact of information technology on users' work environment: A case of computer aided design (CAD) system implementation. *Information & Management*, 34(6), 349-360. http://dx.doi.org/10.1016/S0378-7206(98)00069-X.

Karahanna, E., Straub, D.W., and Chervany, N.L. (1999). Information technology adoption across time: A cross-sectional comparison of

pre-adoption and post-adoption beliefs. *Management Information Systems Quarterly*, 23, 183-213.

Keil, M. (1995).Pulling the Plug: Software Project Management and the Problem of Project Escalation.*Management Information Systems Quarterly*, 19(4), 421-447.

Khalifa.M., and Verner, J.M. (2000). Drivers for software development method usage. *IEEE Transactions on Engineering Management*, 47(3), 360-369.

King, William R. and Teo, Thompson S H. (1996). Key dimensions of facilitators and inhibitors for the strategic use of information technology. *Journal of Management Information Systems*; (12:4), 35.

Klein, K.J., and Sorra J.S. (1996). The challenge of innovation implementation. *Academy of Management Review,* 21, 1055–1080.

Klein, H. K., and Myers, M.D.(1999). A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems.*Management Information System Quarterly:Special Issue on Intensive Research*, 23(1), 67-93.

Klein, K.J., and Knight, A.P. (2005). Innovation Implementation: Overcoming the Challenge. *Current Directions in Psychological Science*, Vol. 14, No. 5, pp. 243-246

Kohli, Rajiv. and Sherer, S. A. (2002). Measuring Payoff of Information Technology Investments: Research Issues and Guidelines.*Communications of AIS*, 9(14), 241-268.

Kolb, D. A., and Frohman, A.L. (1970).An Organization Development Approach to Consulting.*Sloan Management Review*, 12(1), 51–65.

Kwon, T. H. and Zmud, R.W. (1987). Unifying the Fragmented Models of Information Systems Implementation," in R.J. Boland and R. Hirschheim (Eds.), *Critical Issues in Information Systems Research*, John Wiley, Chichester, England, 227-251.

Laudon, K., and Laudon, J. (2007), Essentials of Business Information Systems, 7th ed.Prentice-Hall, Englewood Cliffs, NJ.

Lewin, K. (1952). Group Decision and Social Change.(N. a. Hartley, Ed.)*Readings in Social Psychology*, 459-473.

Liao, Z. and Cheung, M.T. (2001). Internet-based e-shopping and consumer attitudes: an empirical study. *Information & Management* (38).299-306

Lin, F., and Rohm. C. E. T. (2009). Managers' and end-users' concerns on innovation implementation. *Business Process Management Journal*, 15(4), 527-547.

Lucas, H.C. (1978). Empirical Evidence for a Descriptive Model of Implementation.*Management Information Systems Quarterly*, 2(2), 27-42.

Majchrzak, A.Rice, R. E., Ba, S., Malhotra, A.and King , Nelson. (2000). Technology adaptation: The case of a computer-supported inters organizational virtual team. *Management Information Systems Quarterly*, 24(4), 569–600.

Mann, R.I., and Watson, H. J. (1984).A Contingency Model for User Involvement in DSS Development.*Management Information Systems Quarterly* 8 (1), 27–38.

Marble, R.P. (2003). A System Implementation Study: Management Commitment to Project Management. *Information and Management*, 41, 111-123.

Marchand, Donald A. (1985). Information management: strategies and tools in transition. *Information Management Review* 1, 27-37.

Markus, M.L. (1983a). Implementation politics – top management support and User involvement systems.*Objective solutions*, 1(4), 203-215.

Markus, M.L. (1983b). Power, politics, and MIS implementation.*Communications of the ACM*, 26(6), 23–33.

Markus, M.L. (2000). The Enterprise system experience from adoption to success.*Framing the domains of IT Research*.173, 173-201.

McFarlan.F. andMcKenny, J. (1983) .*Corporate Information Management: The issues facing senior management.* Irwin, US.

McKeen, J.D., Guimares, T. and Wetherbe, J. C. (1994). The Relationship between User Satisfaction and User Participation: An Investigation

of Four Contingency Factors. *Management Information Systems Quarterly*, 18(4), 427–451.

Mc Kenney, and James,L. (1995) *Waves of change: Business evolution through Information technology*, Cambridge. MA: Hardvard Business School Press.

McLean, Ephraim R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research*, 3(1), 60-88.

Mishra A. K (2001).*Bankin*g *Sector reforms in India* in Subhash (ed) Emerging issues in Financial sector, Arichant publishing home.

Montazemi, A.R. (1988). Factors Affecting Information Satisfaction in the Context of the Small Business Environment.*Management Information Systems Quarterly*, 13(2), 239–256.

Moore, G.C., and Benbasat, I. (1991).Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research,* 2(3), 192–222.

Namchul, S., and Edington, B. H.(2007) An Integrative Framework for Contextual Factors Affecting Information Technology Implementation, *Journal of Information Technology Theory and Application (JITTA),* 8:4, 21-38.

Nelson, R. C., and Cheney, P.H. (1987). Training End-Users: An Exploratory Study. *Management Information Systems Quarterly*, 11(4), 547–559.

Nelson, Debra. (1990). "Individual Adjustment to Information-Driven Technologies: A Critical Review," *Management Information System Quarterly*, (14: 1).

Nidumolu, S. (1995). The effect of coordination and uncertainty on software project performance: Residual performance risk as an intervening variable. *Information System Research*, 6(3), 191-219.

Nolan,R.L., and Koot, W.J.D (1994) : *Nolan stages Theory Today: A framework for senior and IT management to manage information technology* : Business and IT Strategy. Retrieved from https://www.os3.nl/_media/20062007/courses/icp/nolan_stages_theory.pdf, March 5, 2013.

Noyes, J. M., Starr, A.F. and Frankish, C.R. (1996). User involvement in the early stages of the development of an aircraft warning system.*Behaviour& Information Technology*, 15(2), 67-75.

O'Brien, J. A. (2008). *Introduction to Information Systems* (12 ed.): Tata McGraw Publishing Company Limited.

Obasan, KehindeAgbolade, O.K., (2011) Information and Communication Technology and Banks Profitability in Nigeria.*Australian Journal of Business and Management Research.*1(4), 102-107.

Orlikowski, W. J. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization science*, 3(3), 398-427.

Orlikowski, W. J., and Baroudi, J.J. (1991). Studying Information Technology in Organizations:Research Approaches and Assumptions. *Information Systems Research*, 2, 1-28.

Pavic, S., Koh, S.C.L., Simpson, M., and Padmore, J. (2007). Could e-business create a competitive advantage in UK SMEs? *Benchmarking*, 14(3), 320-351.

Pelz, Donald C. (1983). Use of Information Channels in Urban Innovations.*Science Communication,*5(1), 3-25 .

Prakash, A., and Malik, P.(2008) Empirical Study of Internet Banking in India**,** *CURIE*, vol 8, no.3

Premkumar, G. and Roberts, M. (1999), "Adoption of new information technologies in rural small businesses", *Omega*, 27 (4), 467-84.

Purvis R.L., Sambamurthy, V. andZmud, R.W. (2001). The assimilation of knowledge platforms in organizations: an empirical investigation. *Organization Science*, 12, 117-135.

Rai, A., Lang, S. S., and Welker, R. B. (2002). Assessing the validity of IS success models: an empirical test and theoretical analysis. *Information Systems Research* ,13(1), 50–59.

Rajput, N., and Gupta, M. (2011). Impact Of IT On Indian Commercial Banking Industry: DEA Analysis. *Global Journal of Enterprise Information System*, 3(1),17-31.

Reich, B., Benbasat, I.(2000). Factors that influence the social dimension of alignment between business and information technology objectives.*Management Information Systems quarterly*, 24(1), 81-113.

Revathy,M.S., Ramanan,P.K., Chandrasekhar,R. (2011). *Core Banking Solution: Evaluation of Security and Controls*.PHI Learning.

Rhodes. E.D. (1985).Implementing New Technologies: Choice, Decision and Change in Manufacturing. *Administrative Science Quarterly*, 32(3) , 477-479.

Rockart, J., Earl, M. and Ross, J. (1996). Eight Imperatives for the New IT Organization.*Sloan Management Review*, 38(1), 43-55.

Rogers, E. M. (1983). *Diffusion of Innovations* (3 ed.). New York: The Free Press.

Rogers, E.M. (1995). The Origins and Development of the Diffusion of Innovations Paradigm as an Example of Scientific Growth.*Science Communication*, 16 (3), 242-273.

Ross, J.W.*,* Beath, C.M. and Goodhue, D. (1996). Develop long-term competitiveness through IT assets. *Sloan Management Review*, 38,31-45.

Rubin, H.J and Rubin. (1995) Qualitative Interviewing: The art of hearing data. Thousand oaks, CA: Sage Publications.

Ryan, S.D. (2000). Considering Social Subsystem Costs and Benefits in Information Technology Investment Decisions: A View from the Field on Anticipated Payoffs. *Journal of Management Information Systems*, 16(4), 11-40.

Sambamurthy, V., and Zmud, R.W. (1992).*Managing IT for Success: The Empowering Business Partnership*. Financial Executives Research Foundation, New Jersey.

Seddon, P.B. (1997). A Respecification and Extension of the Delone and McLean Model of IS Success. *Information Systems Research*, 8(3), 240-253.

Seddon, P.B., Staples, D.S., Patnayakuni, R., and Bowtell, M.J. (1999). The Dimensions of Information Systems Success. *Communications of the Association of Information Systems,* 2 (20), 74-81.

Seidel, J. (1998) Qualitative Data Analysis. The EthnographV[5.] Retrieved from http://www.qualisresearch.com. March 18, 2013,

Sharma, R., Yetton, P. (2003). The Contingent effects of management support and task interdependence on successful information system implementation: *Management Information Systems Quarterly*, 27(4), 533-555.

Sharma, D. (2009). India's Leapfrogging Steps from Bricks-and-Mortar to Virtual Banking: Prospects and Perils.*The IUP journal of management research*, 46 (8), 3.

Sherer, Susan A., Baron, A. and Kohli, R. (2003).IT Investment Payoff and Complementary Changes: A Case Study in Managing Organizational Change at Cisco Systems. *Information Systems Frontiers*, 5(3), 321-333.

Sriram, R.M., Ramanan,P.K., and Chandrasekhar, R. (2011). *Core Banking Solution: Evaluation of Security and Controls*. PHI Learning Private limited.

Southard, P.B. and Siau, K. (2004).A survey of online e-banking retail initiatives.*Communications of the ACM*, 47(10), 99–102.

Suratida, R. and Settapong, M. (2005). Information technology implementation by applying NIE - SDLC model: the case study on an organization in Thailand.Engineering Management Conference Proceedings.*IEEE International* . 11-13.

Stake, R. (1995).*The Art of Case Study Researh*. Thousand Oaks CA: Sage.

Swanson. (1974). Information retrieval as a trial and error process *Library Quarterly*, 47(2), 128-148.

Tallon, Paul P., and Kraemer, K.L. (2003). Investigating the Relationship between Strategic Alignment and IT Business Value: The Discovery of a Paradox. *Creating Business Value with Information Technology: Challenges and Solutions,* 1-22.

Tarafdar, Monideepa; Vaidya, Sanjiv D. (2007). Information Technology Adoption and the Role of Organizational Readiness: The Case of an Indian Bank. Journal of Cases on Information Technology 9 (3), 27-49.

Tater, B.*,* Tanwar, M., and Murari, K.(2011). Customer Adoption of Banking Technology in Private Banks of India.*The International Journal of Banking and Finance*, 8 (3), 73-88.

Taylor, S., and Todd, P.A (1995).Understanding Information Technology Usage: A Test of Competing Models.*Information system research* 6(2) , 144- 176.

Taylor, S., and Todd, P.A (1995b).Assessing IT usage: The Role of Prior Experience.*Management Information Systems Quarterly* 19(4), 561–570.

Travers, M. (2001).Qualitative Research through Case Studies, London.Sage Publications.

Tompson , R.L., Higgins, C.A., and Howell, J. M. (1991). Personal Computing Toward a Conceptual Model of Utilization. *Management Information Systems Quarterly*, 15(1).125-143.

Torkzadeh G., and Dwyer, D.J. (1994). A Path Analytic study of Determinants of information systems usage.*Omega, International Journal Management science*. 22(4), 339-348.

Tornatzky, Louis G., and Klein, K. J. (1982). Innovation Characteristics and Innovation adoption implementation: A Meta- Analysis of Findings. *IEEE Transactions on Engineering Management*, 29(1), 28-43.

Turner, J.C., Hogg, M.A., Oakes, P.J., and Smith, P. (1984). Failure and defeat as determinants of group cohesiveness. *British Journal of Social Psychology*, 23(2), 97-111.

Venkatesh, V. M., Morris, M.G., Davis, G.B., and Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View. *Management Information Systems Quarterly*, 27(3), 425-478.

Walton, Richard,.E. (1989) *Up and Running: Integrating Information technology and Organization*. Boston, M.A: Harvard Business school Press.

Ward, John. (1995). Principles of *Information Systems Management*: Thomson Learning.

Webster, J., and *Martocchio*, J. J. (1992). Microcomputer Playfulness: Development of a Measure with Workplace Implications. *Management Information Systems Quarterly*, 16(2), 201-226.

Weill, P. (1992). The Relationship between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector. *Information Systems Research*, 3(4), 307-333.

Weill, P., and Olson, M.H. (1989, March). Managing Investment in Information Technology: Mini Case Examples and Implications.*Management Information Systems Quarterly*, 12(1), 3-17. 5, IInd edition, Thousand Oaks: Sage.

Whiston, T.G. (1991) Management and Organizational integration, London: Springer- verlag.

William, K., and Thompson, S. H (1996). Key dimensions of facilitators and inhibitors for the strategic use of information technology. *Journal of Management Information Systems*; 112(4), 35.

Yin, R.K. (1994). Case Study research: Design and Methods. Applied Social Research Methods Series 5, II edition, Thousand Oaks: Sage Publications.

Yin, R.K. (2003). Case Study research: Design and Methods. Applied Social Research Methods Series 5, III edition, Thousand Oaks: Sage Publications.

Zmud, R.W., and Cox, J.F. (1979). The Implemenation Process: A Change Approach. *Management Information Systems Quarterly*, 3(2), 35-43.

Other References

Ernest and Young – *Technology in banking: Insight and Foresight*. Retrieved fromhttp:/ /www.slideshare.net/ rocknrohit/ technologyinbanking insight and forsightidrbt-ey-report, December 14, 2013.

Nolan Six Stage Model (1979): Retrieved from www.ecomputernotes/ mis/information-and-system-concepts/nolans six stage model.

Reserve Bank of India: www.rbi.org.in/scripts/statistics.aspx, April 11, 2012.

Reserve Bank of India Publications: www.rbi.org.in/scripts/publications. Accessed during the period December 2009 to January 2015.

1. Report of the Committee on Mechanization of Banking Industry under the Chairmanship of Dr. C.Rangarajan Committee, former Deputy Governer, reserve Bank of India (1984).

2. Report of the Committee on Mechanization of Banking Industry under the Chairmanship of Dr. C.Rangarajan Committee, former Deputy Governer, reserve Bank of India(1988).

3. Harnessing technology to bank the Unbanked. Talk by Dr. Subbarao, former Governer of RBI on May 18, 2009 at IDRBT, Hyderabad.

4. Information technology and banking – A continuing agenda. Key note address by Dr. Subbarao, former Governer of RBI on May 18, 2009 at IDRBT, Hyderabad.

5. Financial Sector IT Vision Document, 2007-2010

6. Financial Sector IT Vision Document, 2010-2015

Satchidananda, S.S., Sanat, Rao., and Rahul,W. (2006) *Assessment of Core Banking Solutions,* submitted to Institute of Banking and Technology, CBIT-IIITB, working paper, 2006-8.Retrieved from http://docshare01.docshare.tips/files. July 19, 2011.

The Economic Times Banking Technology Conclave: *Banking on Technology India, 2010.* Retrieved from https://kpmg.de/ doc/ banking_on_technology -India.pdf. June 22, 2013.

Techopedia: www.techopedia.com/it-terms/i, January 15, 2014.

Techtarget: http://whatis.techtarget.com/definitions/I, January15, 2014.

Working Group on IT Governance: *Organizational Structure for IT in the Indian Banking sector*, IT Governance series.IDRBT. May 2010. Retrieved from www.idrbt.ac.in/bestpractices.html, January 28, 2012.

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APPENDICES

Appendix A

Core Banking Solution Providers and their Products

No.	COMPANY	PRODUCT
1	Oracle Financial Services Software (formerly i-flex Solutions)	Flexcube; Microbanker; Finware
2	TEMENOS	T24; T24 for Microfinance and Community Banking (MCB) formerly eMerge; GLOBUS; TEMENOS CoreBanking (TCB)
3	Infosys Technologies	Finacle
4	FIS | Fidelity National Information Services (FNIS)	Corebank, FIS Alltel Systematics, Sanchez Profile, Horizon ACBS (Advanced Commercial Banking System), Kordoba, ALLprofits, MiSER, BancPac, Metavante
5	TCS FS – Tata Consultancy Services Financial Solutions – formerly FNS	BaNCS – TCS BaNCS (formerly FNS Bancs – Financial Network Services B@NCS-24)
6	Misys	BankFusion Universal Banking, Equation, BankFusion Equation, Equation Islamic Banking, Midas Plus, BankFusion Midas (Bankmaster)
7	Fiserv	ICBS (International) | Signature by Fiserv,

		– Fiserv CBS (US); Basys/Metabank; Catapult; Premier; Acumen
8	Sungard Ambit	Ambit EBS (Enterprise Banking Suite) core banking – Retail banking, Corporate banking (formerly System Access Symbols)
9	SAP	SAP for Banking, Corebanking; SAP R/3
10	DataproInc	DataproeIBS (e-IBS) CORE
11	Silverlake Axis	Silverlake – SIBS, Silverlake Integrated Islamic Banking System (SIIBS)
12	Jack Henry & Associates	Jack Henry Banking – SilverLake; CIF 20/20; Core Director for US market
13	Open Solutions Inc (OSI)	TCBS/TCCUS: DNA platform | TCBS – The Complete Banking Solution, TotalPlus (outsourced) core banking, TCCUS – The Complete Credit Union Solution
14	3i Infotech	KASTLE
15	SAB	SAB AT universal banking system (formerly SAB2i) and Samic private banking
16	Polaris	Intellect Suite – OrbiOne, BankWare; BankNow
17	Olympic ERI Bancaire	Olympic

18	Callatay&Wouters	Thaler
19	InfrasoftTech	OMNIEnterprise
20	Path Solutions	iMAL
21	Delta	Delta-Bank
22	Neptune Software	Rubikon universal core banking system (Java platform – new 2008), Orbit microfinance retail banking, Equinox
23	Cobiscorp | Cobis Systems Corporation (Macosa SA, MicroBanx Systems merged)	COBIS Core Banking | COBIS UBS (universal banking solution)
24	Nucleus Software	*FinnOne*
25	ICS -International Computer Systems	ICS *BANKS*
26	Computer Sciences Corporation (CSC)	Hogan, CSC/IBS, Celeriti, K3000
27	Avaloq	Avaloq Banking System
28	Harland Financial Solutions	PhoenixEFE
29	CGI Group	RFS core banking + HORIZON CRM, Loan Origination (LOS), DMS

30	TCS FS – Tata Consultancy Services Financial Solutions – formerly TKS-Teknosoft	TCS BaNCS private banking, QUARTZ core financial platform, Quartz Securities, Quartz Payments, e-Portfolio
31	TOP Systems	TOPAZ Banking, TOPAZ Microfinance, TOPAZ Trace
32	BML Istisharat	ICBS
33	ITS – International Turnkey Systems	ETHIX total banking solution | ITS Core Banking Solution (Phoenix for ME), ITS Islamic Banking Solution
34	DataVision Software	Data Mate Core Banking (India) – Micro Mate microfinance, cooperative banking
35	ASI – Arango Software International	ABANKS (AB@NKS) core banking
36	BankVision Software	Core BankVision
37	Mindmill	BankMill
38	HCL Infosystems	HCL BancMate CBS core banking solution
39	Infopro	ICBA, eICBA
40	Promosoft Financial	Banka core banking, eBanka internet banking

Appendix B

Expert Interview Protocols and Findings

Contact Protocol

Once the consent of the participant was received over phone a e-mail was sent to them outlining the nature of the study. The mail had the following condense.

Dear (Name),

I spoke to you over the phone regarding my research work in IT adoption by the banking sector. Thank you for agreeing to participate in my study.

The main purpose of my visit is to get an understanding of the IT adoption and implementation process in banking sector, the people involved and the factors which contributed for the success of IT implementation. Your response will help me to form a basis for the study and structure my research. All responses will be kept confidential. No identification of the bank or the participants will be included in the study.

Regards,

Interview Protocol

On the start of the interview, the participants were briefed on the nature and the purpose of the interview. They were informed about their rights, including the right to not to answer a question. The interview Protocol contained three sections. The first section asked about the general IT adopted by the bank. This section included questions like:

- Could you briefly describe the various stages of IT adoption taken place in your bank.

- Did the bank follow any structured implementation process? If so briefly mention the process

- Who are the people involved in the implementation of technology in your bank?

- Have you been a part of the implementation activities in your bank?

- Which are the regulatory authorities which govern the technology aspect in banking?

The second section consists of more specific questions about core banking solution implementation. The questions asked were like:

- When did the core banking implementation project start and how long did it take to complete the project?

- What was the procedure for implementation of CBS?

- What were the challenges faced?

- What factors internal and external to you bank helped in the implementation of CBS?

The third set of questions focused on organizational characteristics

- What drived your organization for a CBS implementation?
- Was there a conducive environment for the adoption of CBS in your organization?
- At what level of IT adoption where your organization when it decided to go for CBS implementation?

While interviewing the IT consultants and IT vendors the questions were modified accordingly.

Findings from the expert interview

The finding from the expert interview revel that CBS implementation was the biggest IT project undertaken by the bank till then. Banks were not ready for the implementation of CBS but the important driver was the pressure from the regulatory authority, RBI IT Vision which gave a dead line for the banks to convert to CBS platform and the Central Vigilance Commission which gave dead line for the cleaning up of historic data and data reporting. Other catylact factors were the entry of foreign banks with state of the art technology and the tech savvy new generation customers. Though RBI gave deadline for the implementation of CBS, until the establishment of IDRBT in 1996, there was no major authority for the development and deployment of technology in the banking sector. The IT implementation was mainly governed by the IT act than RBI guidelines.

It was evident from the interview that all banks depended on the IT consultants for the implementation of the CBS. From the words of a Bank Manager,

> *"our IT department at the time of CBS implementation was not fully developed. There were only around 10 IT staff; others were general bankers who helped in the department. Most of the terminologies used by the core banking vendors were new to most of us. We had to depend on the consultants fully".*

Another problem evident from the interview was that even a small size bank had more than 200 branches spreading across the country, so the implementation project could not be operated from a single point; there was small group of project team members operating in different parts of the country, local vendors also had to be involved. The banks followed a centralized decision making so there were delays in decision making. the interview also reveled that there were many factors which delayed the implementation process. To quote a banker,

> *"Huge amount of money is spending on upgrading the technology to latest core banking solution, but the branch staff is not aware of most of the functions of the core banking solution. Many modules are still to be opened. Though the most technology driven bank and we use the same core banking solution, we are still considered as old generation bank. There are a lot of organizational and individual factors which are pulling us from exploring the technology".*

Words of a Core banking Vendor:

> " *we provide core banking software which meet the international standards', but most of the banks want it to be customized to their existing practices. Customization was an herculean task and when the final product came out it seemed as if each bank had its own core banking solution. Organizational culture and the top management were very hard to be convinced."*

When asked about the learning experience from the CBS implementation project, most of the respondents said that the project was implemented in a trial and error basis. The error rectification in an area was not same as that in other. Moreover the project team members changed so a single handling of the project was absent. In addition there was not a structure procedure for the implementation of the CBS, the entire process was people oriented than process oriented.

Appendix C

Six Stage Model of Information Technology

Implementation Proposed by Kwon and Zmud (1987)

	Stage	Description	Outcome
1	Initiation	Uncovers a problem or an opportunity for improvement.	A match is found between the IT solution and its application in the organization
2	Adoption	Rational and political negotiations ensuring organizational backing for implementation of the IT application.	Strong Organizational backing
3	Adaptation	The process and practices of the organization is reviewed and changed to match the new technology adopted	Complete Business Process re-engineering
4	Acceptance	The end user starts to use technology	Task-technology fit is achieved
5	Routinization	Usage of IT application is encouraged as a normal activity	IT application is no longer perceived as something out of ordinary
6	Infusion	Increase Organizational effectiveness	Performance measures

Appendix D

Database of Factors

S.No	Factor	Description
1	Leadership and Expertise	The technical competency of the management described as the ability of the Management to ask right questions at the right time.
2	Business Leaders	Involvement of different sections of business managers in implementation process.
3	Project Leader	Presence of the project leader who takes the responsibility of the project.
4	Leadership and Development	Presence of charismatic leadership
5	Organization size	Availability of resources within the organization
6	Leadership and Support	Support of Top Management
7	System re-structuring	By-passing intermediaries for fast decision making

8	Process re-structuring	Hierarchy of information transfer
9	Planning	forming implementation team
10	Leadership and Personnel	Identifying functional heads/project leaders
11	Organizational Objectives	Strategic, tactical and operational objectives
12	Technological plan	Detail plan about the technology to be adopted and skill set required
13	System Design	Applying high level design and detailed design subject to user acceptance, building prototype, testing interface, writing and testing
14	Rapidity of Technological Change	Ability of the organization to keep track of the technical changes and incorporate it to the business strategy.
15	Planning	Resource allocation plan.
16	User Need Analysis	Tracing requirements and prioritising. Combine customer input analysis and come up with a detailed RFP
17	Strategic Plan	The organization long term business intentions

18	Organizational Enviournment	Detailed understanding of the organization culture, strategies and goals
19	Scheduling	Time and resource allocation for implementation
20	System Standards	adhering to the information system quality standards
21	Planning and integration	Integration of system plan and business plan
22	Path dependencies	Previous IT applications
23	Written Guidelines and Procedures	Existing standard procedures
24	Legal and Mandates	banking regulations, IT regulations and contracting regulations
25	Power Affiliations	influence o of trade unions
26	Attitude of the management	How well the management takes in the changes
27	Environmental Factors	competition

28	Global Environment	The global banking and technical environment
29	Organization Management Structure	Role of CEO, CIO. Commitment level and leadership
30	Organizational Culture	Deep understanding of culture and sub culture of the organization
31	Organizational Domain	The sector in which the organization falls.
32	Skill	Refers to interpersonal skill and computer skill of the project team
33	Political Environment	Regulatory authorities support received
34	External People Performance	The performance of external consultants and hardware and software vendors
35	Implementation Approach	Setting of realistic milestones and delivery dates and minimal customization
36	Staffing	Number of people in the project
37	User commitment	refers to the involvement of the user in the implementation project

38	Coordination	Cross division work, data aggregation , avoiding duplication of work
39	Responsibility	user assuming overall responsibility of implementation
40	Collaboration	how well the workers in each department coordinate with each other
41	Top Management Education	Communicating the need for a new IT to the users
42	User satisfaction	satisfaction of the user with the new system
43	Competitive Position	The ability of the organization to be the first mover
44	Expectation Management	To set realistic expectations
45	Customization	How well the new system meets the existing procedures
46	Change Management	All strategies used by the management to make possible a smooth transition
47	Ownership	The sense of ownership of the new system
48	Documentation	maintaining proper and complete documents

49	Ease of Use	how well the system supports the task
50	Contracting	vendors selection and service agreements
51	Security	Meeting the security standards
52	Compatibility	Task-technology fit
53	Communication	Different communication channels
54	Innovation Characteristics	Perceived usefulness, ease of use, reliability, security
55	Facilitating Conditions	All those factors which help in smooth implementation like government support, management support etc
56	Management Commitment	Management commitment to the project
57	IT skill - Management	Top management technical competency
58	IT skill User	User technical skill and confidence to use new system

59	User Attitude towards Change	Positive or Negative attitude of the user
60	Complimentary Investments	Investments in training, education, change management
61	Business Process re-engineering	Re-engineering of business process to meet the new system
62	Technical Infrastructure	Availability of standard technical structures

Appendix E

Pre Interview Response Form Documents

This appendix contains exhibits and tables related to the pre interview response form. Exhibit E-1 Contains covering letter for PIRF. Exhibit E-2, E-3 and E-4 contains PIRF for branch user, management and IT representatives.

Exhibit E-1

Covering Letter for Pre Interview Response Form

My name is Ayana Johny. I am Doctoral candidate at the School of Management Studies, Cochin University of Science & Technology under the guidance of Dr.M.Bhasi, professor SMS, CUSAT.

I spoke to you recently over the phone regarding my research in Information Technology in banking at The Cochin University of Science & Technology. Thank You for agreeing to participate in this study. Your involvement is voluntary and you may withdraw at any time, however your participation is highly valued and appreciated and constitutes an important part of this research.

I am conducting this study among four major banks in India. Representatives from branch, management and Information technology department at each bank will participate. The goal of the study is to identify what factors contribute to the success of Information Technology implementation in organizations and to understand how the factors identified affected the success CBS implementation project.

Attached to this letter you will find a brief questionnaire, the list of factors identified with its description, the stages of information technology implementation process with its description. All this is designed to make the most effective use of the time you are contributing to this research. The questionnaire should take approximately 15 minutes for you to complete. Please answer all questions to the best of your ability; however you may skip questions you do not want to answer. Once you have

completed the form please return it in the enclosed pre address stamped envelope.

Confidentiality Note - All responses will be confidential. No identifying information on the banks or study participants will be included in the final materials published as part of this research. Once the data has been collected any personally identifiable information will either be discarded or masked to ensure the confidentiality of response

If you have any questions regarding the research project or this questionnaire please do not hesitate to call me at my number …………………. Or email me at ayanjohny@gmail.com.

Once again I thank you for your contribution to my research.

Regards,

Exhibit E-2

Pre Interview Response Form for the Branch Users
of the Core Banking Solution

Your response will be kept anonymous. Only the researcher scholar will see the individual results. Only group summaries will be reported in the research thesis.

<u>Guidelines</u>

1. This is an opinion survey of the various steps followed by your organization during information technology procurement and implementation project.

2. Here Information technology project refers to the core banking project undertaken by your organization.

3. Please read the instructions given for each question and mark response accordingly.

<u>Personal Information</u>

Name :   Designation:

Department: Organization:

1. Total number of years with the present organization

    Less than 1 year ☐   1Year -5Year ☐

    5Year -10Year ☐   Above 10 Years ☐

2. Basic computer qualification:------------------ ----------------------------

3. Number of years as experienced computer user

   Less than 1 year ☐   1Year -5Year ☐

   5Year -10Year ☐   Above 10 Years☐

4. Experience with the banking solutions

   Less than 1 year ☐   1Year -5Year ☐

   5Year -10Year ☐   Above 10 Years☐

5. Please indicate your agreement or disagreement, with each of the statement below by putting a Tick mark ☑

Statements	Agree	Disagree
1. The old system I was using fits well with my way of doing things	◯	◯
2. I was satisfied with the old system	◯	◯
3. Information systems and services are an important and valuable aid to me in the performance at my job	◯	◯
4. Before implementation started, I was sure that the new system would provide solutions to the problems the organization faces	◯	◯
5. I was willing to make necessary changes in my work routines that were important for the implementation of CBS	◯	◯

Statements	Agree	Disagree
6. I was interested and excited about the new CBS	◯	◯
7. I took an active part in helping Computer Systems staff to define the new system requirements and functionality	◯	◯
8. Top Management took an active role in the implementation of the CBS	◯	◯
9. Top Management was aware of the benefits of the new system	◯	◯
10. Management realized the complexities of change that would result as the new system is implemented	◯	◯
11. The level of training I received in the system was sufficient to understand the systems functional and technical features	◯	◯
12. I was well aware of the implementation process I would need to go through before implementation of the project	◯	◯
13. Using the new system is compatible with all aspects of my work routines	◯	◯
14. Use of new system made my work more easy	◯	◯
15. When difficulties faced management tried hard to find right solutions	◯	◯

Statements	Agree	Disagree
16. There was a single person responsible for the CBS implementation project	◯	◯
17. You are solely responsible for the work you do	◯	◯
18. Your rewards depend on the output of your work	◯	◯
19. The information received from the new system is accurate	◯	◯
20. The new system does not overload me with data	◯	◯
21. I have to spend more time to retrieve data in the new system	◯	◯
22. System downtime are less compared to the old system	◯	◯
23. On line user manual is available for the CBS	◯	◯
24. IT help desk is available for technical problem redress	◯	◯

6. Please rate on a scale of 1-5, the factors given below based on their importance in the CBS implementation process. 1 - being least important factor and 7 - being most important factor.(The factor description is attached with this PIRF)

Factors		Rating					
Path Dependencies	1	2	3	4	5	6	7
Organizational Power Affiliations	1	2	3	4	5	6	7
Organizational Strategies and Goals	1	2	3	4	5	6	7
Organizational Size	1	2	3	4	5	6	7
Attitude Towards Innovation and Changes	1	2	3	4	5	6	7
Collaboration	1	2	3	4	5	6	7
Computer Literacy	1	2	3	4	5	6	7
Task Nature	1	2	3	4	5	6	7
Rules and Regulations	1	2	3	4	5	6	7
Industry leadership	1	2	3	4	5	6	7
Technological Advancements	1	2	3	4	5	6	7
User Involvement	1	2	3	4	5	6	7
User Participation	1	2	3	4	5	6	7

Commitment to the Project	1	2	3	4	5	6	7
Project Champion	1	2	3	4	5	6	7
Resource Allocation	1	2	3	4	5	6	7
Commitment to Change	1	2	3	4	5	6	7
Service level Documentation,	1	2	3	4	5	6	7
Request for Proposal	1	2	3	4	5	6	
Business Continuity Plan	1	2	3	4	5	6	7
Maintenance	1	2	3	4	5	6	7
Contract Termination	1	2	3	4	5	6	7
Documentation	1	2	3	4	5	6	7
Organizational and technical infrastructure	1	2	3	4	5	6	7
Extend of Planning	1	2	3	4	5	6	7
Implementation Team	1	2	3	4	5	6	7
Business process Re-engineering	1	2	3	4	5	6	7
Institutional Structure Re-engineering	1	2	3	4	5	6	7
Training and Education	1	2	3	4	5	6	7
Task Technology Fit	1	2	3	4	5	6	7
Relative Advantage	1	2	3	4	5	6	7

Ease of Use	1	2	3	4	5	6	7
Information Quality	1	2	3	4	5	6	7
Tenure	1	2	3	4	5	6	7

7. Please indicate against each factor the stages of IT implementation which it influence the most.(The stages and its description is attached with the PIRF)

1. Path Dependencies…………
……

2. Organizational Power Affiliations………………

3. Organizational Strategies and Goals…………………
……

4. Organizational Size………………

5. Attitude Towards Innovation and Changes………………
……

6. Collaboration……………

7. Computer Literacy………………
…….

8. Task Nature……………………

9. Rules and Regulations……………
……

10. Industry Leadership………………

11. Technological Advancements………
….

12. User Involvement……………

13. User Participation…………
………

14. Commitment to Project…………..

15. Project Champion……………
………

16. Resource Allocation……………..

17. Commitment to Change………………
…

18. Service Level Document……………

19. Request for Proposal………………

20. Business Continuity Plan……………

21. Maintenance…………
…

22. Contract Termination………………..

23. Documentation………
…

24. Organizational and Technical Infrastructure…………………

25. Extend of Planning………………
.

26. Implementation Team………………

27. Business Process Re-engineering……………

28. Institutional Structure Re-engineering……………………..

29. Training and Education……………

30. Task-technology Fit………………...

31. Relative advantage……………

32. Ease of Use…………………………..

33. Information Quality………………
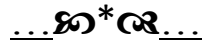
34. Tenure……………………………….

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Exhibit E-3

Pre Interview Response Form for the Management Representatives

Your response will be kept anonymous. Only the researcher scholar will see the individual results. Only group summaries will be reported in the research thesis.

Guidelines

1. This is an opinion survey of the various steps followed by your organization during information technology procurement and implementation project

2. Here Information technology project refers to the core banking project undertaken by your organization

3. Please read the instructions given for each question and mark response accordingly.

Personal Information

Name :   Designation:

Department: Organization:

1. Total number of years with the present organization

    Less than 1 year ☐   1Year -5Year ☐

    5Year -10Year   ☐   Above 10 Years ☐

2. Basic computer qualification:---

3. Experience with the banking solutions

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4. What kind of Information Technology was your organization making use of before CBS was implemented. ……………………………………………………………......

5. Mention the drivers which led your organization for CBS adoption…………………………………………………………

6. Please indicate your agreement or disagreement, with each of the statement below by putting a Tick mark ☑ .

Statements	Agree	Disagree
1. The old system I was using fits well with my way of doing things	◯	◯
2. I was satisfied with the old system	◯	◯
3. Your organization had undertaken a need analysis and goal setting process before CBS implementation	◯	◯
4. Information systems and services are an important and valuable aid to me in the performance at my job	◯	◯
5. Before implementation started, I was sure that the new system would provide solutions to the problems the organization faces	◯	◯

6. I was willing to make necessary changes in my work routines that were important for the implementation of CBS   ○   ○

7. Branch Users were interested and excited about the new CBS system   ○   ○

8. The Branch Users took an active part in helping to define the new system requirements and functionality   ○   ○

9. Management viewed the new system as being important to Organizations long-term goal   ○   ○

10. Changes in work routines were an important consideration for the use of the new system   ○   ○

11. Management was aware of the drastic changes that would happen during the process of implementation   ○   ○

12. The organization had a project head for CBS implementation project   ○   ○

13. The Project Head was responsible for coordinating various department for the implementation process   ○   ○

14. The project team composed of highly skilled members from your organization   ○   ○

15. The project team had representation from all departments 　　⭕　　⭕

16. Your organization made use of external consultants for implementation process 　　⭕　　⭕

17. The bank under took a project priority setting for resource allocation 　　⭕　　⭕

18. When there were difficulties while implementing the new system, IT staff tried hard to find the right solution 　　⭕　　⭕

Exhibit E-4

Pre Interview Response Form for the Information Technology Department Representative

Your response will be kept anonymous. Only the researcher scholar will see the individual results. Only group summaries will be reported in the research thesis.

<u>Guidelines</u>

1. This is an opinion survey of the various steps followed by your organization during information technology procurement and implementation project

2. Here Information technology project refers to the core banking project undertaken by your organization

3. Please read the instructions given for each question and mark response accordingly.

<u>Personal Information</u>

Name :   Designation:

Department: Organization:

1. Total number of years with the present organization

   Less than 1 year ☐   1Year -5Year ☐

   5Year -10Year ☐   Above 10 Years ☐

2. Basic computer qualification:---

3. Experience with the banking solutions

    ----

4. Please indicate your agreement or disagreement, with each of the statement below by putting a Tick mark ☑

Statements	Agree	Disagree
1. The old system I was using fits well with my way of doing things	◯	◯
2. I was satisfied with the old system	◯	◯
3. Information systems and services are an important and valuable aid to me in the performance at my job	◯	◯
4. Before implementation started, I was sure that the new system would provide solutions to the problems the organization faces	◯	◯
5. I was willing to make necessary changes in my work routines that were important for the implementation of CBS	◯	◯
6. The user was interested and excited about the new CBS	◯	◯
7. The users took an active part in helping Computer Systems staff to define the new system requirements and functionality	◯	◯

8. Top Management took an active role in the implementation of the CBS ◯ ◯

9. Top Management was aware of the benefits of the new system ◯ ◯

10. Management realized the complexities of change that would result as the new system is implemented ◯ ◯

11. When difficulties faced management tried hard to find right solutions ◯ ◯

12. There was a single person responsible for the CBS implementation project ◯ ◯

Appendix F

Paper Publication

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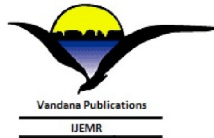
An Integrated Model of Factors Affecting Information Technology Implementation Success in Organizations

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ABSTRACT

The impact of Information Technology on individuals, organization and society is changing everything. The extent of technological revolution that the world is presently witnessing is that Information Technology has become the vehicle or major engine of the information age which has reduce the world to a global village. This new technological epoch is apparent through the intensified investment in computer-processing and data preparation appliance in the manufacturing and service industry and telecommunications infrastructure, and its widespread usage in government agencies, educational organizations, and, more recently, in the households. Owing to these technological progressions, the implementation and application of Information Technology is a significant driving force behind many socioeconomic changes. The Implementation and the subsequent use of IT is a process of interrelated steps, slipping at any of the implementation stages may actually increase inefficiency, ineffectiveness and promote a number of uncertainties. This paper tries to identify different factors which help for a successful IT implementation in organizations. Merging the factors so identified into IT implementation stages the author tries to develop a framework for successful Information technology implementation. Extensive review of literature and expert advice has been sought in developing the framework which we hope to get fee back on publication. The outcome of the study will be a model which helps organizations to understand which are the critical factors for a successful Information technology Implementation and the relation between these factors.

Keywords---- Information Technology , Implementation, Implementation Stages, Information technology Innovation, Information technology adoption and diffusion

I.   INTRODUCTION

Present day most of the organizations rely heavily on Information and communication technology. Information and Communication Technology directly affects how managers decide, how they plan and what products and services are offered in the industry. Information Technology has strategic significance. In an information rich economy, a company can use information technology to reduce cost, upgrade product quality, improve customer service, or even integrate customers operations with its own operations, thus assuring repeated business[1]. Thus in an organization successful implementation of Information Technology can lead to cost reduction, quality of service delivery, improved decision making, transparency, increased efficiency, improved access to information and other technological benefits such as cheaper and efficient and access to large storage capacities within larger and more advanced computers. The Implementation and the subsequent use of IT is a process of interrelated steps, slipping at any of the implementation stages may actually increase inefficiency, ineffectiveness and promote a number of uncertainties. A new technology project typically entails a great deal of cooperation among various divisions, departments, and employees within the enterprise. The technical aspect of implementation is only one component of a chain of events between initial investment and final evaluation. During that time, a wide range of factors, both internal and external to the organizational environment, react with implementation processes and will ultimately become part of the output value of the original technology investment.

In this paper the author looks at Information Technology as an innovation concept. The theories of IT innovation adaptation and diffusion were identified (Table 1). Then literature was reviewed to identify factors important for Information technology implementation (Table 2). Then the author proceeded to look at the implementation process literature (Table 3). Merging the factor research, the information technology adoption and diffusion research and the process research streams and applying a combined vision to the study of IS implementation a comprehensive

framework of factors for a successful Information technology implementation was developed.

II.   METHODOLOGY

The comprehensive frame work for factors affecting Information Technology implementation success was developed through the following stages.

Stage I: The author conducted an extensive literature review of the concept of Information technology, technology implementation and factors affecting the successful Information Technology implementation. The outcome was that the innovation concept of technology and implementation was adopted to be studied and a complete database of factors affecting technology implementation and adoption was developed.

Stage II: This factor database was given for review to the subject experts to and a comprehensive list of factors which was important for the study and their shared meanings were developed.

Stage III: further literature survey was conducted to identify relationship between the variables and assigns factors to the particular implementation stage and to investigate what impact they possess during the particular implementation stage on the IS implementation outcome

III.   PREVIOUS STUDIES

Information Technology (IT) is concerned with technology to treat information. The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications are its main fields. The term in its modern sense first appeared in a 1958 article published in the *Harvard Business Review*, in which authors Leavitt and Whistler commented that "the new technology does not yet have a single established name. We shall call it information technology (IT)." Most of the former studies of application

and adoption of Information Technology in organization looks technology as an innovation concept. - The Klein and Sorra [12] article defines technology innovation as, "a technology or a practice used for the first time by members of the organization, whether or not other organizations have used it previously". So taking the innovation concept of technology, Information technology implementation can be described as "Implementation is a critical gateway between the decision to adopt innovation and the routine use of the innovation within an organization. For implementation to be a success, the application should be no longer perceived as something new, and the "targeted employees use a given innovation consistently and well" [12]. To understand what are the important steps that take place during this critical gateway, and to know what issues should be raised and resolved throughout implementation process, would allow for better control over the outcome of IS implementation, thus increasing odds of success of the innovation. The main studies in this field is categorized as follows, 1) Information technology adoption and diffusion Literature 2) Literature related to Implementation Factors 3) Implementation process literature.

   a)   Information technology adoption and diffusion literature – The IT innovation field is concerned with understanding the factors that facilitate or inhibit the adoption and diffusion of IT in an organization. These adopters can be individual, organizational or groups of inter related firms. This research stream produced an assortment of factors that seem to influence IS acceptance and utilization. In addition, a number of models and theories of individual acceptance have been developed. These models provide an important theoretical foundation for studying how various users, and technological and environmental influences, can predict, explain and determine the use of IS. The table below shows the theories related to IT adoption and diffusion.

Table 1
Models and Theories on Individual IS Acceptance

Model	Author	Description
Theory of Reasoned Action	Azjen 1975	Explains individual's intention to adopt technology
Theory of Planned Behavior	Azjen 1975	Is used to predict intention and behavior of individual acceptance and usage of technology
Technology Acceptance Model	Davis 1989	Helps to predict user intention to accept IS
Motivational Model	Davis 1992	Has been used to study the nature of

		motivation that explains user behavior towards technology
Innovation Diffusion Theory	Rogers 1995	Postulates that characteristics of adopters and innovation have an influence on the spread of innovation
Task Technology Fit Model	Goodhue 1995	Showed that success of adopting technology may be explained by compatibility of its characteristics with the characteristics of the task

b) Implementation factor Literature – factor research has identified various elements of the organizations internal and external enviouenment factors that are likely to lead to a successful implementation. The author conducted a literature review of the factors as early as 1980's to 2000.

The end result is a fragmented summary of disparate factors. The important and most repetitive factors from the given studies and those factors which the researcher found to be important for the present study is given below.

Table 2
Comprehensive table of the factors identified

Sl. No	Factor	Historical Reseach
1	Path Dependencies	Weill (1992), Markus (2000), Tallon and Kraemer (2003)
2	Organizational climate	Markus (1981), Markus and Bjorn-Anderson (1987), Weill and Olson (1989), Nelson (2001)
3	IT expertise	Weill and Olson (1989), Armstrong and Sambamurthy (1996), Weill (1992), Rockart, Earl, and Ross 1996 , Sambamurthy and Zmud(1992) Somers and Nelson (2001), Bassellier, Benbasat, and Reich (2003)
4	Interdepartment coordination	Earl and Feeney (1994), Reich and Benbasat 2000
5	Communication	Daft and Langel (19860
6	User involvement	Hatwrick and barki (1994)
7	User participation	Barki and Huff (1990); McKeen, Guimaraes, and Wetherbe (1994); Hatwrick and barki (1994)Noyes , Starr and Frankish (1996)
8	Commitment to change	Ginzberg (1981)
9	Project champion	Beath (1991); Somers and Nelson (2001)
10	Top management support and commitment	Ginzberg (1981); Kwon and Zmud(1987), Jarvenpaa and Ives (1991); Weill (1992); Senn (2003); Somers and Nelson (2001) ,
11	Specific plan	Ginberg(1981)
12	Change management	Kwon and Zmud (1987); Ryan and Harrison (2000);Castle and Sir (2001); Kohli and Sherer (2002), Sherer,Kohli, and Baron (2003)
13	Training	Ginzberg (1981); Kleintop, Blau, andCurrall (1994)Davenport (1998), Somers and Nelson (2001)
14	End user Satisfaction	Bailey and Pearson (1983), Doll and Torkzadech (1988), Weill (1992), Adamson and Shine (2003)
15	Business process re designs	Rockart, Earl, and Ross (1996), Clemons and Row (1988)

16	External enviournments	Seddon, Staples, Patnayakuni, and Bowtell (1998)
17	Dedicated resources	Somers and Nelson (2001)
18	Commitment to change	Ginzberg (1981)
19	Compatibility –Task fit	Moore and Benbasat (1991), Goodjue (1995)
20	Personal innovations	Agarwal and Prasad (1998)
21	Trialability	Rogers (1994)

c. Implementation process Literature – implementation process literature looks at the various stages an organization goes through for the implementation of any new technology. Earlier studies looked at these stages as a process of change for the entire organization. The management information Literature looks at implementation stages purely from the technical angle.

Among the most prominent models that look at implementation as a process of change are Lewin .Kolb and Frohman,Kwon and Zmud Joshi [15, 13, 14,8]. The prominent studies in the field of MIS literature was done by Hussain & Hussain and James A.O'Brien [6,7]. The table below shows the major implementation process stages.

Table 3
The Implementation Stages

Sl.No	Implementation Process	Implementation Stages	Authors
1	Organizational Change Model	Unfreez- Change – Refreez	Lewin (1952),
2	Six Stage Model	Initiation Adoption Adaption Acceptance _ Routinization – Infusion	Kwon and Zmud (1987)
3.	MIS Model	Programming - Hardware selection - Data base organization - System orientation and training - Preparation of procedures and documents - Completion of organizational adjustments.	Hussain & Hussain (1995)
4	MIS Model	Acquisition – Software development – data Conversion – Training – testing - Documentation	James A.O'Brien (2008)

IV. RESEARCH GAPS AND OBJECTIVES

We have seen above the different studies relating to information technology implementation. But the historical studies have the following gaps. The technology adoption and diffusion literature has led to development of various individual acceptances of technology models. The main issue is that these models look at only the factors for individual factors. Factor research looks at individual factors in a specific enviournment, without exploring the relationship among the factors and how the factors can be applied to other enterprises. Implementation process research list out the stages of implementation, but lacks in clarity of the factors in each stage. Hence the objective is to combine all theses researches a develop framework for

understanding and controlling the factors for successful IT implementation.

V. MODEL DEVELOPMENT

Merging the factor research , the information technology adoption and diffusion research and the process research streams and applying a combined vision to study the IS implementation permits to address broad issues that an IS implementation process might have and allows for consideration of more specific factors that are crucial throughout the course of implementation. The six-stage model of IT implementation developed by Kwon and Zmud [14] was selected to serve as a foundation because it allows to comprehensively exploring the process of IS implementation. The table below shows the six stage model.

Table 4
Six Stage Model of Implementation

	Stage	Description	Outcome
1	Initiation	A thorough analysis of organizations internal and external setting is made. Uncovers a problem or an opportunity for improvement.	A match is found between the IT solution and its application in the organization
2	Adoption	Rational and political negotiations ensuring organizational backing for implementation of the IT application.	Strong Organizational backing
3	Adaptation	The process and practices of the organization is reviewed and changed to match the new technology adopted	Complete Business Process re-engineering
4	Acceptance	The end user starts to use technology	Task-technology fit is achieved
5	Routinization	Usage of IT application is encouraged as a normal activity	IT application is no longer perceived as something out of ordinary
6	Infusion	Increase Organizational effectiveness	Performance measures

a. **Stage I – Initiation**
The first variable in this stage is *Path dependencies*. Weil's [20] conversion model talks about *Path dependencies*, it means that technology decisions are not made solely in response to the current business environment. Today's decisions are affected by past technology decisions, which may either limit or increase the range of current choices. The author feels that every organization should assess where they stand before embarking any new Information technology. Second important variable is *Organizational climate*. Organizational climate can be defined through organizational politics, Institutional leadership, confidence of employees with their management, the reward systems, and organization size and goals [18]. There are no organizations that would possess identical organizational environments, simply because they would have different people working for them. In fact resistance to new technology can be attributed to internal political issues and the power associated with them [16,17].If the organization's context, such as social or political culture, is not compatible with the design features of the new technology; it will be difficult to gain end user support. Thus, a deeper understanding of an organization's climate would aid in shaping the right implementation plan and creating a conductive environment for implementation. Once the organizational characteristics are understood an investigation to the user characteristics or *work group characteristics* will help to plan implementation which best suit the work group. The work group characteristics are taken from the work of [18,14], Which can be seen as, collaboration among workers it was shown that if groups are collaborative in the way they interact, it is easier to encourage innovative behavior among them [18], job tenure [18], computer literacy level of the workers [14]. Reviewing what exposure to various technologies the users

had in the past, and how confident they are in their computer capabilities, can help define what additional computing support or computer training should be provided [23] Also, knowing the *users' attitude toward computers and innovations* can give an extra key to successful implementation as it would help to recognize how users will feel about the new system [19,23].Careful consideration of the current *job characteristics* [18] or as [14] name it *characteristics of the task* that include the *level of autonomy*, control over work quality, and responsibility for the outcome, would give better guidance toward what job changes may occur due to the new IS implementation, and would help managers to prepare users for changes as well as anticipate possible source of resistance later in the implementation [18]. In summary, during the initiation stage, an organization identifies an opportunity for change and evaluates specific IS solution to engage in. However no commitment from either potential users or the IS department is made during initiation stage.

b. **Stage 2 - Adoption**
To increase the odds of successful implementation, it is crucial to gain early support from key participants including potential IS users and their management. Research suggests that *user involvement and management support* increases user IS acceptance [16,17,24,25]. Baronas and Louis [24] noted that implementation of a new system is likely to represent a threat to user's perceptions of how much control they have over their work. They propose that developers and those who implement the system should involve users in the implementation process. The strength of participation-satisfaction relationship was investigated by[26] looking at the effects of four contingency factors - task complexity, system complexity, user influence, and user developer communication. It was concluded that the more the task is

unstructured or ambiguous, and the more complex the system, the more essential the user's participation is in user satisfaction and consequently to system success [26]. Therefore, placing *user involvement* and *user participation* into the adoption phase of the implementation model helps in establishing strategies that would first seize user involvement and then transform it into active user participation throughout implementation process, thus ensure full backing for implementation from those who might potentially resist the project.

User participation does not happen on its own; management plays a critical role in facilitating and influencing user's participation in the implementation [27]. Previous studies have recognized *management support* as one of the key reoccurring factors affecting system success [5,8,14,20]. Management that can ensure sufficient resources to the implementation effort, that is willing to accept risks, and that acts as a change agent to create more conducting environment through encouraging and promoting IS use,is associated with greater system success. Another concern is *commitment to the change*. An organization where its members are unwilling to accommodate to the change is unlikely to have a successful implementation [5]. Both commitment to the project and commitment to the change require attention from management and users. Commitment to change can be obtained by proper *communication and inter department co ordination* of the need for new system adoption and its impact on the task of the workers. If proper communication is not maintained it will lead to two factors, uncertainty – where information is not available and equivocality   an ambiguous situation that is subjected to multiple interpretations. They say that this can be avoided through face to face meetings or any optimal form of communication. The *allocation of sufficient resources* has been cited as affecting IS success [28]. Whether a particular project has enough resources or not is a direct result of how committed and supportive management and the organization are, and therefore an allowance needs to be made for this stage as well. Types of resources that are common to support implementation effort are personnel, equipment, time, money and implementer's skills.Upper management is responsible to assure that properly skilled personnel are available to work on the project for the necessary time periods. They also state that key task such as project management should be held by qualified in – house members and not consultants [18]. It is at this stage that the management should see the skill level of its employees and a decision to appoint external consultants should be taken.

One more factor that was shown to have a positive effect on the implementation success and thus included in the model is *project champion presence*. A champion is an individual in the organization that has a previous experience with the technology; possesses a great level of confidence in the new system and its potential benefits; and is enthusiastic about the technology and change it represents [2]. The champion can be an opinion leader and change agent that inspires others to adopt innovation and accept the change.

c. **Stage 3 - Adaptation**
The emphasis of this stage is on preparing the organization and its users for the use of the new system. This is a time when management commitment to the project, users' involvement and user participation established during the adoption phase, needs to be effectively utilized. To do so, the implementation project should be carefully planned. This stage looks at the following important variables: *extent of project definition and planning* [5] *project uncertainty* [5] and *implementation team composition* [24].

In identifying issues in the IS implementation, Ginsberg [5] demonstrated that *the extent of project definition and planning* are factors that should be viewed as a placing demand on both management and users. Having a project plan will decrease project uncertainty by assessing organizational needs, system fit into work practices, training requirements, evaluation criteria and specifying the roles of project team members. "The more thorough the planning effort, the less likely are unforeseen circumstances which could endanger the project" [5]. To carry out the implementation plan, an *implementation team* should be comprised of members with the right skill-sets and knowledge-sets within the interpersonal, computer systems, and organizational areas [24] The skills and experience of the implementation team as well as ability to build strong relationship between the user and the provider of the new IS represents a significant factor in the success of failure of an implementation effort [24] and thus needs to be added to the model.

With every new technological adaptation there is a period of adjustment and change of a new system within a given organizational setting. The more compatible the innovation with the existing values, past experience, and needs of adopters, the more likely it is to be adopted [14,29,30]. Moore and Benbasat [30] confirmed *compatibility* to be a good predictor of usage behavior.Cooper and Zmud [3] concluded that compatibility is a factor affecting adoption. However, when we look at the adaptation stage, the users start to learn about new technology characteristics and functionalities, they will gain a better understanding of how compatible the technology is with their tasks and workflow content during this stage.

An study [31]suggests that *personal innovativeness* positively moderates the relationship between the perception of compatibility and the decision to adopt an innovation. More innovative individuals may develop stronger intention to use the innovation at the same level of perceived complexity and congruence with work style as a less innovative individual. Thus knowing the level of users' personal innovativeness management

can create a different support structure to motivate those who are less innovative, and utilize those who are more enthusiastic about innovation-as champions for instance. studies also focused on the role of *institutional structure* in successful implementations [32]. The main observation made is that the institutional context - key aspects of which are workflow patterns, work procedures, routines, reward systems, control and coordination mechanisms - affects the end users' ability and motivation to successfully adopt and use IS innovations. The organizational structure needs to be shaped in ways that facilitate an appropriate use of technology to accomplish work. The actions that can be undertaken to ensure successful implementations are: instituting new structures, new performance control systems, new coordination mechanisms, and changes to performance goals [32].

Another factor that plays an important role in new system implementation is *user training and education about new system* /14] Careful planning and implementation of a training program may facilitate acceptance of the system by users. Training influences system usage by building confidence in the new system use, thus increasing users' satisfaction. While preparing for implementation users need to understand why the particular IS is being introduced and how the project will affect them both during and after its implementation. Without such knowledge, ignorance and uncertainty will lead to: project resistance, a lack of participation and eventual disassociation from the IS. Another factor that is important to consider is whether the user will have a chance to experiment with the new system before committing to its use. *Trailability* has been generally considered positively related to innovation [29] Having an option for trying out the new system offline for a period of time can give the potential user an opportunity to become familiar and proficient with it without worrying that it may cause downtimes at work. In summary, the center of adaptation stage is the process of mutual adaptation of technology and organization environment. During this phase the existing institutional context is revised; IS innovation functions and features are evaluated in terms of fit for a particular setting; new systems and support mechanism are established to promote long-term acceptance and usage of the technology; and training programs are designed to satisfy the needs of different groups are carried out. Strong management support and user participation are critical at this stage.

l.   **Stage 4 - Acceptance**

Goodhue [33] studied user evaluation of the IS through applying the *task technology fit* construct as a measure of IS success. He argued that users give evaluations based not only on inherent system characteristics, but also on the extent to which that system meets their task needs and their individual abilities. The value of technology appears to differ depending on the tasks of the user; users view their systems as tools that assist or hinder them in the performance of their tasks [33]. The more closely the system meets users' needs and abilities, the higher the performance level users can reach. Seddon [34] defined "the degree to which the stakeholder believes that using particular system has enhanced his or her job performance, or his or her group's or organization's performance" as a *Perceived Usefulness* [34]. He developed the Perceived Usefulness concept when extending McLean and DeLone (1992) IS Success model, which uses the Individual Impact category as a measure of realized benefits from system use. Seddon [34] model concluded that Perceived Usefulness affects User Satisfaction, which influences expectations about future benefits, thereby influencing IS use..To evaluate the level user satisfaction with the new IS, *System Quality* and *Information Quality* are the most studied dimension in the IS research along which users evaluate IS [34]. Moore and Benbasat [30] defined ease of use as a degree to which potential adopters view usage of target technology to be relatively free of effort. They found it to be a significant predictor of innovation adoption. The more the system was perceived as relatively difficult to understand and use, the less the probability that it would be used. The most extensively studied attributes of *Information Quality* are content, accuracy and format, error less, flexibility, access, security , integration . Implementation of the new technology affects business functions and influences users directly. Due to changes in the job content and uncertainty of the new system target, users may become *resistance to an implemented change*. Markus [16] explained resistance to the IS implementation as a power distribution misfit of IS that can lead to different power and resource allocations. Copper and Zmud [3] also suggested that organizational resistance and lack of technology understanding had more explanatory power of inhibiting new system infusion within its work environment then the task technology fit. Research on individual acceptance of information technology found facilitating conditions to be a direct determinant of usage behavior. *The facilitating conditions* are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system [35].
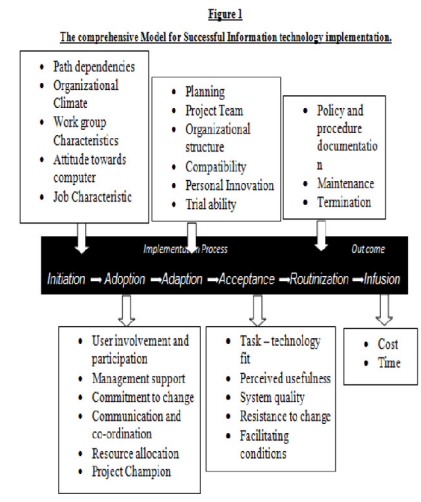
e.   **Stage 5 - Routinization**

The fifth stage in Kwonz and Lewin model is routinization. At this stage the usage of IT application is encouraged as a normal activity. The organizations governance systems are adjusted to account for the IT application, the It application is no longer perceived as something out of ordinary. Not many literature is available for this stage of IT implementation. When we go through the MIS literature the important variable at this stage is *documentation*. James O'Brien [7] describes documentation as recording and finalizing of detailed system specifications, including usage manual for end users and IS personnel's, authority structure, and procedures and policies for the use of the new system in

the organization. The next variable is maintenance. This can be defined as the monitoring, evaluating and modifying of operational business systems to make desirable necessary improvements. The last variable is the termination of contract. According to Hussain & Hussain[6] it means confirming new behaviors patterns and completing transfer of responsibility to users.

f. ***Stage 6 – Infusion***

This stage is seen as the outcome stage of a successful information technology implementation. Increased organizational effectiveness is obtained by using IT application. Successful implementation of IT can lead to cost reduction, quality of service delivery, improved decision making, transparency, increased efficiency, improved access to information and other technological benefits such as cheaper and efficient and access to large storage capacities within larger and more advanced computers. The author feels that the outcome of the IT implementation can be evaluated using two variables *Cost* and *Time*

The figure given below depicts the comprehensive model developed from the above literature.

Figure 1
The comprehensive Model for Successful Information technology implementation.

VI.   CONCLUSION

In this paper ,based on review of the literature and interaction with large number of experts, the author have developed a model to study the factors affecting success of information technology implementation in organizations This model will help researchers to understand information

technology implementation success. It will also pave way to design of tools to measure likely hood of success and to diagonize areas where improvements and risk management is necessary in IT implementation projects. The first level variables under each head are only discussed in this paper, which is a part of the ongoing doctoral work. Second level factors under the first level and items to be used for measurement of factors and sub factors need to be worked out. The model so developed also needs to be tested and validated. However publication at this stage will help other researchers to branch off in different directions of research from this basic model. It will also help the researcher to have a discussion initiated so that the model is enriched.

REFERENCES

[1] Bassellier, G., Benbasat, I. and Reich, B. (2003), "The influence of business managers' IT competence on championing IT", Information Systems Research, Vol. 14 No. 4.
[2] Beath, C.M., "Supporting the Information Technology Champion," MIS Quarterly (15:2),1991 pp.355-372
[3] Cooper, D.R. & Schindler, P.S. "Business Research Methods".New York, NY: Mc Graw Hill, 2008.
[4] Cooper, R.B. & Zmud, R.W. "Information technology implementation research :a technological diffusion approach."Management Science, Vol. 36 No. 2,. pp.123-39.1990
[5] Ginzberg, M.J. "Early Diagnosis of MIS Implementation Failure: Promising Results and Unanswered Questions," Management Science (27:4), 1981a pp.459–478
[6] Hussain & Hussain, "Information Systems – Analysis Design & Implementation", Tata Mc Graw Publishing , 1995.
[7] James A. O'Brien, "Introduction to Information Systems",12th edition, Tata McGraw Publishing Company Limited, 2008
[8] Joshi, K., "A Model of Users Perspective on Change – The Case of Information-System Technology Implementation," MIS Quarterly (15:2), 1991
[9] Joshi, K., and lauer, T. "Impact of Information Technology on Users' Work Environment: A Case of Computer Aided Design (CAD) System Implementation," Information and Management (34), 1998
[10] Keil, M. "Pulling the Plug: Software Project Management and the Problem of Project Escalation," MIS Quarterly (19:4), 1995 pp.421-447.
[11] Klein, H. K. and Myers, M.D. "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," MIS Quarterly, Special Issue on Intensive Research (23:1), 1999, pp.67-93.
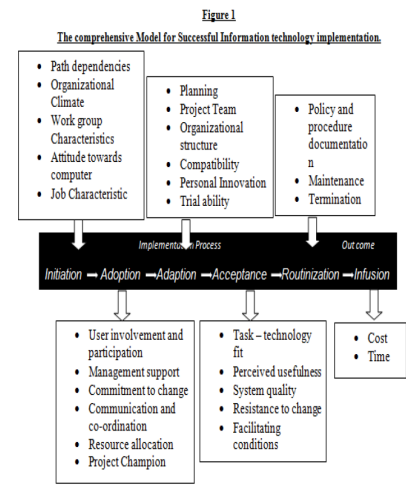[12] Klein, K.J., and Sorra, J.S. "The Challenge of Innovation Implementation," Academy Management Review (21:4), 1996 pp.1055-1080.

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The figure given below depicts the comprehensive model developed from the above literature.

Figure 1

The comprehensive Model for Successful Information technology implementation.

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REFERENCES

[1] Bassellier, G., Benbasat, I. and Reich, B. (2003), "The influence of business managers' IT competence on championing IT", Information Systems Research, Vol. 14 No. 4.

[2] Beath, C.M., "Supporting the Information Technology Champion," MIS Quarterly (15:2),1991 pp.355-372

[3] Cooper, D.R. & Schindler, P.S, "Business Research Methods".New York, NY: Mc Graw Hill, 2008.

[4] Cooper, R.B. & Zmud, R.W. "Information technology implementation research :a technological diffusion approach."Management Science, Vol. 36 No. 2,. pp.123-39.1990

[5] Ginzberg, M.J. "Early Diagnosis of MIS Implementation Failure: Promising Results and Unanswered Questions," Management Science (27:4), 1981a pp.459–478

[6] Hussain & Hussain, "Information Systems – Analysis Design & Implementation", Tata Mc Graw Publishing , 1995.

[7] James A. O'Brien, "Introduction to Information Systems",12th edition, Tata McGraw Publishing Company Limited, 2008

[8] Joshi, K., "A Model of Users Perspective on Change – The Case of Information-System Technology Implementation," MIS Quarterly (15:2), 1991

[9] Joshi, K., and lauer, T. "Impact of Information Technology on Users' Work Environment: A Case of Computer Aided Design (CAD) System Implementation," Information and Management (34), 1998

[10] Keil, M. "Pulling the Plug: Software Project Management and the Problem of Project Escalation," MIS Quarterly (19:4), 1995 pp.421-447.

[11] Klein, H. K. and Myers, M.D. "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," MIS Quarterly, Special Issue on Intensive Research (23:1), 1999, pp.67-93.

[12] Klein, K.J., and Sorra, J.S. "The Challenge of Innovation Implementation," Academy Management Review (21:4), 1996 pp.1055-1080.

BIO DATA

AYANA JOHNY

Education

1. Post Graduate Diploma in Teaching and Research, IGNOU, 69%, 2010.

2. MBA, Finance and Marketing, Rajagiri School of Management, 65%, 2004.

3. B.A. Economics, M.G. University, 80%, 2002.

4. Pre-degree (Commerce), Calicut University, 74%, 1999.

5. SSLC, Kerala State, 86%, 1997.

Professional Experience

1. Assistant Manager, South Indian Bank, 2005 – 2008.

Paper Publication

1. Paper titled "An Integrated Model of Factors Affecting Information Technology Implementation Success in Organizations", in the "International Journal of Engineering and Management Research", Volume-5, Issue-2 of April 2015. ISSN (Online): 2250-0758, ISSN (Print): 2394-6962

Paper Presentations

1. Paper titled 'A study on Factors affecting information technology implementation success, with reference to the banks in India' in the "International conference on Banking and Finance" held at Bharata Mata institute of Management, Kochi, on 26th April 2013.

2. Paper titled 'Building Information technology Infrastructure Flexibility for Business Value Generation with reference to the Banking Industry'. At Eleventh Global conference on Flexible Systems Management at IIMK, Kozhikode Held from 9th to 12th December 2011.

3. Paper titled 'Change Management and Organizational development –In the context of banking Industry' in the "International seminar on Global challenges of emerging India-A Management perspective" at Vivekanandha institute of information and management studies Tiruchengode, Tamil Nadu . Held from 14th to 15th February 2011.

Personal Information

Gender   :   Female

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