

**Critical Success Factors in Selecting & Implementing Core
Banking Systems in Local Commercial Banks in Sri Lanka.**

BY

**Nishantha Hettiarachchi
(2009/MISM/025)**

Submitted in accordance with the requirements for the degree of

Master of Information System Management

at the

University of Colombo

Supervisor: SUMANA JAYASURIYA

Co-Supervisor: CHANNA WEERARATNE

November, 2011

Dedicated to my Parents and Teachers

Declaration

I certify that this dissertation does not incorporate without acknowledgement of any material previously submitted for the Degree or Diploma in any University, and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text

.....

Date

.....

H. C. Nishantha

The undersigned, have supervised the dissertation entitled **Critical Success Factors in Selecting & Implementing Core Banking Systems in Local Commercial Banks in Sri Lanka** presented by **H. C. Nishantha**, a candidate for the degree of Masters in Information Systems Management, and hereby certify that, in my opinion, it is worthy of submission for examination.

.....

Supervisor

Mrs. S.C. Jayasuriya

Librarian

Library, University of Colombo

Colombo, Sri Lanka.

Date:.....

.....

Co-Supervisor

Mr. C. G. Weeraratne, MBA (SriJ), BCS

(UK) CITP, AIB (SL)

Manager,

National Development Bank PLC

Colombo, Sri Lanka.

Date:.....

Table of Content

Acknowledgement	viii
Abstract	ix
List of Figures	xi
List of Tables	xii
Abbreviations	xiv
Operational Definition	xv
1.0 Introduction	
1.1 Conceptual Background	3
1.2 Contextual Background	8
1.3 Problem Statement	11
1.3.1 Current Issues in Local Banks	11
1.3.2 CBS Project Experiences related to Local Banks	14
1.3.3 CBS Project Experiences related to Foreign Banks	15
1.3.4 Refined Problem	16
1.4 Significance of Study	18
1.5 Objective of Study	19
1.6 Limitations of Study	20
1.7 Summary	21
2.0 Literature Review	
2.1 Introduction	22
2.2 Sri Lankan Banking Industry	22
2.3 Commercial Banking Sector	24
2.4 Importance of Banking Industry to Country's Economy	25
2.5 Quantified Contribution of the Industry to the Economy	26
2.6 Use of ICT in Banking Industry	27
2.7 Core Banking Systems	29
2.8 Core Banking System Changes	32
2.9 Benefit of Core Banking Solutions	34
2.9.1 Economic Benefits	35
2.9.2 Performance Benefit	35

2.10	Software Selection	36
2.11	Contract Negotiation and Legal Aspect	40
2.12	Implementation of Core Banking Systems	40
2.12.1	Project Management	42
2.12.2	Project Implementation Best Practices	43
2.13	CSF's of ERP Software Implementation	45
2.14	Causes for Software Implementation Project Failures	47
2.15	Assessment of Case Studies	49
2.16	The New Approach	50
2.17	Summary	50
3	Research Methodology	
3.1	Introduction	51
3.2	Conceptual Framework	51
3.3	Research Design	60
3.4	Research Variables	61
3.5	Formulation of Questionnaire	63
3.6	Quality Standard	64
3.7	Pilot Survey	65
3.8	Population	66
3.9	Sample Section	68
3.10	Data Collection	70
3.11	Data Analysis	71
3.12	Summary	72
4	Data Analysis	
4.1	Introduction	73
4.2	Composition of Study Sample	73
4.2.1	Analysis of Sample Distribution	73
4.2.2	Experience of Respondents	75
4.2.3	Respondents Involvement in CBS Implementations	78

4.2.4	Respondents Awareness of CBS Implementation Failures	80
4.2.5	Factors in Measuring Success of CBS Implementation Project	82
4.2.6	Factors Influencing CBS Selection	85
4.3	Analysis Key Perceptions and Aspect of the Attributes	88
4.3.1	Analysis of Success Factors Related to Organizational Objectives	88
4.3.2	Analysis of Success Factors Related to Evaluation Process	89
4.3.3	Analysis of Success Factors Related to Learning through Experience	90
4.3.4	Analysis of Success Factors Related to Top Management Support	91
4.3.5	Analysis of Success Factors Related to Effective Communications	92
4.3.6	Analysis of Success Factors Related to Use of External Consultants	92
4.3.7	Analysis of Success Factors Related to Project Management	93
4.3.8	Analysis of Success Factors Related to Vendor Commitment	94
4.3.9	Analysis of Success Factors Related to Monitoring	95
4.4	Analysis Success Factors based on Socio-Demographic Attributes	97
4.4.1	Analysis of Success Factors based on Role in CBS Projects	97
4.4.2	Analysis of Success Factors based on Banking Experience of the Respondents	100
4.4.3	Analysis of Success Factors based on CBS Project Experience	102
4.4.4	Analysis of Success Factors based on Awareness of Respondents on CBS Project Failures	105
4.5	Analysis of Success Factors based on Vendor Responses	107
4.6	Analysis of Critical Success Factors Related to Selection Process	109
4.7	Analysis of Critical Success Factors Related to Implementation Process	112
4.8	Summary	115
5	Discussion	
5.1	Introduction	116
5.2	CBS Critical Success Factors	116
5.2.1	Project Success Measurement Criteria	118
5.2.2	Awareness of CBS Project Failures	120
5.2.3	Organizational Objectives	121

Acknowledgement

I take this opportunity to thank my research supervisor, Mrs. Sumana Jayasuriya, Librarian, University of Colombo, for guiding me throughout the research process. Her professionalism and substantial research experience were of great help during the period, which I have been working with the thesis. Without her support and valuable advice, completion of this research would not be possible.

I would like to express my sincere gratitude to Dr. Chaminda Jayasundara, research coordinator and Dr. Ruwan Karunanayake for the valuable advice and guidance given, specifically related to research methodology and statistical analysis, during the research process.

I am indebted to Mr. Channa Weeraratne, my industry co-supervisor for guiding me to complete this research work successfully. I profoundly appreciate his professional support that greatly contributed to the quality of this work, and his compassion and ability to motivate me when necessary.

Special thanks goes to Mr. Sujeewa Dissanayake, Head of IT, NDB Banks for his support, encouragement and valuable comments on my work, which helped greatly in improving the quality of the research.

Last, but not least I would like to express gratitude to my wife, Bimba and my kids, Navodya, Hansini and Chathuni for their sacrifices, patience and understanding shown. Without their unstinted support, completion of the Masters Degree would have been an impossible undertaking.

November 2011

Nishantha Hettiarachchi

Abstract

Sri Lankan Licensed Commercial Banks are constantly investing on modern state-of-the-art technology in order to compete among themselves, compete with global banks, which have local presence, cater ever growing needs of their customers as well as to comply with complex regulatory requirements. Majority of the technology resources acquired by local Licensed Commercial Banks (LCBs) are of foreign origin, for which a vast sum of foreign exchange is spent. Therefore, it is imperative for the Sri Lankan economy as a whole and the individual banks that they succeed in their technology implementations, most importantly Core Banking System (CBS) projects, to achieve the desired organizational objectives and project outcomes.

The main purpose of this study was to identify Critical Success Factors for CBS selection and implementation in Sri Lankan LCBs and to define a framework, which could be used by the LCBs to make their CBS projects successful.

On evaluating some of the software selection and implementation models via a literature survey, the survey-based method was selected to analyze experiences in selection and implementation of CBS in the local LCBs. This was accomplished by identifying success factors related to IT and ERP projects based on literature survey. Through focus group interviews targeting top managers of LCBs additional success factors related to local context were identified while validating the relevance of success factors identified through the literature survey. The survey questionnaire was designed based on the literature and on the information collected through the interviews to collect data.

The survey questionnaire was distributed among 598 individuals identified as sample population across 10 LCBs. Out of the 598 only 320 responded and responses of 244 CBS project experienced respondents were identified for further analysis.

Following noteworthy findings were observed on analysis of survey data. Most of the respondents were of the view that improved efficiency and end user satisfaction was the most important project goal to achieve, related to CBS projects. Timely implementation or implementing within allocated budget, was not considered as important by the respondents.

Corporate Management and IT Departments respectively have been identified as the top most influencing factors in deciding on CBS.

Out of the 23 success factors in the questionnaire, 16 have been identified as Critical Success Factors (CSFs). Out of the 16, six were related to the CBS selection process and 10 were related to the implementation process. There were three CSFs common to both selection and implementation processes. Out of the CSFs related to selection, preparation of proper requirements has been identified as the most critical success factor. In relation to the implementation, vendor support and commitment has been identified as the key factor. Further, the research outcome indicates that approximately 25% of the CBS implementations have failed to meeting the project goals and objectives. When evaluated against the two important project success measurement criteria of implementing within the anticipated period and being within the project budgets, then failure rate would be well above 25%.

Based on the identified CSFs, a framework for CBS projects has been developed and a comprehensive set of guidelines have been proposed for the Sri Lankan LCBs, which could be useful for these banks in their future CBS Projects.

List of Figures

Figure 1.1	Estimate of IT spending by Leading European Banks	4
Figure 2.1	IT Cost as percentages of Total Expenses and Revenue across Industry Sectors	28
Figure 2.2	IT Spending as a percentage of Income across Industry Sectors	29
Figure 2.3	Magic Quadrants for International Retail Core Banking	30
Figure 2.4	High Level Illustration of Core Banking Application	31
Figure 2.5	The ERP Life-cycle Framework	34
Figure 2.6	Software Selections Framework	37
Figure 2.7	Supplier Criteria for Software Selection	38
Figure 2.8	Framework for Bank-in-box Business Transformation	41
Figure 3.1	The Conceptual Framework	52
Figure 3.2	Research Design	60
Figure 3.3	Ideal Sample	68
Figure 4.1	Percentages of Response	75
Figure 4.2	Experience of Respondents	76
Figure 4.3	Respondents Involvement in CBS Implementation Projects	78
Figure 4.4	Awareness of Respondents of CBS Implementation Project Failures	80
Figure 4.5	Awareness of Respondents of Number of CBS Implementation Project Failures	82
Figure 5.1	Core banking System Selection and Implementation Framework for Local Commercial Banks in Sri Lanka	128

List of Tables

Table 1.1	Banking System Drivers and Changes	6
Table 1.2	Core Banking Systems of Domestic Commercial Banks in Sri Lanka	9
Table 2.1	Distribution of Assets and Deposits Liabilities of the Financial System	23
Table 2.2	Banking Industry Tax Payments	27
Table 2.3	ERP Software Implementation Best Practices	44
Table 2.4	ERP Implementation - Critical Success Factors	46
Table 3.1	Success Factors Identified through Literature Review	54
Table 3.2	Success Factors Identified through the Focus Group Interviews	55
Table 3.3	Key Perception Related Success Factors	56
Table 3.4	Research Variables	62
Table 3.5	Likert Scale used in Survey Questionnaire	64
Table 3.6	Target Population	67
Table 3.7	Composition of the Sample Population	69
Table 3.8	Weights Assigned for the Responses	71
Table 4.1	Response Rate of Different Member Category	74
Table 4.2	Analysis of Category of Respondents	75
Table 4.3	Experience of the Respondents	76
Table 4.4	Distribution of Respondents Based on Category and Experience	77
Table 4.5	Respondents Involvement in CBS Implementation Projects	78
Table 4.6	Distribution of Respondents Based on Category and Involvement in CBS Implementation Projects	79
Table 4.7	Awareness of Respondents of Implementation Project Failures	80
Table 4.8	Distribution of Respondents Based on Awareness of CBS Implementation Project Failures	81
Table 4.9	Awareness of Respondents of Number of CBS Implementation Project Failures	82
Table 4.10	Factors in Measuring Success of a CBS Implementation Projects	83
Table 4.11	Factors Influencing CBS Selection	86

Table 4.12	Success Factors related to Organizational Objectives	88
Table 4.13	Success Factors related to Evaluation Process	89
Table 4.14	Success Factors related to Learning through Experience	90
Table 4.15	Success Factors related to Top Management Support	91
Table 4.16	Success Factors related to Effective Communications	92
Table 4.17	Success Factors related to Use of External Consultants	93
Table 4.18	Success Factors related to Project Management	94
Table 4.19	Success Factors related to Vendor Commitment	95
Table 4.20	Success Factors related to Monitoring	96
Table 4.21	Level of Significance of Success Factors with Respondents Role in CBS project	98
Table 4.22	Level of Significance of Success Factors Based on Respondents Banking Experience	101
Table 4.23	Success Factors Mean Values based on Banking Experience	102
Table 4.24	Level of Significance of Success Factors against the CBS Project Experience	103
Table 4.25	Success Factors Mean Values based on Respondents Involvement in CBS projects	104
Table 4.26	Level of Significance of Success Factors Based on Awareness of CBS Project Failures	106
Table 4.27	Success Factors Mean Values based on Respondents Awareness of CBS Project Failures	107
Table 4.28	Analysis of Success Factors with Vendor Perspective	108
Table 4.29	Ranking of Critical Success Factors for CBS Selection Process	109
Table 4.30	Ranking of Critical Success Factors for CBS Implementation Process	112
Table 5.1	Success Factors not identified as CSF's	117

Abbreviations

ATM	Automatic Teller Machines
BPD	Business Process Definition
BPR	Business Process Reengineering
CBS	Core Banking System
CBSL	Central Bank of Sri Lanka
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CTO	Chief Technical Officer
COTS	Commercial, Off-the-Shelf
CSF	Critical Success Factors
ERP	Enterprise Resource Planning
HNB	Hatton National Bank
IBS	International Banking Systems
IT	Information Technology
LCB	Licensed Commercial Banks
LSB	Licensed Specialized Banks
NDB	National Development Bank
PD	Primary Dealers
POC	Proof of Concept
RFC	Registered Finance Company
RFP	Requirement for Proposal
ROI	Return on Investment
SLC	Specialized Leasing Companies
UK	United Kingdom
WWW	World Wide Web

Operational Definition

Critical Success Factors:

Characteristics, conditions, or variables that have a direct and serious impact on the effectiveness, efficiency, and viability for the CBS project success.

Some What Important Success Factors:

Any Success Factor important for the CBS projects but non-critical for the successfully completion of the project.

Socio-Demographic Attributes:

The attributes which may indirectly impact to the project, such as Role, Banking Experience, CBS Project Experience and Awareness of CBS Project Failures.

Chapter 1

Introduction

Over the last decade, majority of the domestic licensed commercial banks (LCBs) have apparently replaced their outdated core banking software with new state of the art core banking solutions, in order to compete in global markets (IBS, 2008). Although Sri Lanka is optimistic of highly skilled software developers, it still lacks professional core banking software solutions with sufficient degree of quality, sophistication and versatility catering to specific requirements of banks. Consequently, majority of Sri Lankan commercial banks (ten out of eleven) use core-banking solutions supplied by foreign software vendors at an enormous cost as described under chapter 2.

The evolution and development of packaged core banking software (CBS) in the form of end-to-end solutions for the business requirements of banks have been a major change in the implementation processes over the last few years (CBS vendor's reports). The average life cycle of an implemented CBS, is around 10 years (Infosys). The core banking software system changes in banks have had mixed results. The need of a fully fledged core banking software system is vital for banks to meet the competitive pressure and provide superior service to their clientele. In this perspective, traditional in-house developed systems have many limitations in meeting the foregoing objective. Such systems which were technology dependent prevented banks from being adaptive and flexible to satisfy the changing market demands (Goolsby, 2008).

The CBS implementation over the past few decades witnessed that many of the early installations were either inflexible or took unacceptably long implementation time due to high level of customizations to meet the specific requirements of each Bank (CBS vendor's reports). However, there had been recent examples of successful core banking implementations among domestic LCBs (eg. HNB - 2010, Sampath Bank - 2008). It is estimated that about 40% of software system implementations have failed globally (Ramkumar, 2004). Majority of CBS implementation projects had either time overrun or budget overruns (Minz, 2006). One of the leading domestic banks, which hurriedly upgraded the existing system with new version of the existing CBS, without resolving the current

issues, had to face manifold difficulties in managing the project. Such problems, ultimately had adverse effects on their business as they were not in a position to meet the expectations of the customers, on time.

Software system implementation failures and problems during implementations have been subject to extensive literature, although high visibility CBS project failures are not very common in large banks. The integration of CBS with other delivery channels would be challenging during the implementation and post implementation periods. The problem of interfacing could occur, especially when banks attempt to customize their CBS. However, with the increased demand for CBS by smaller banks, cost overruns or failures in process design can cause significant problems as these new adapters may have limited resources, experience, or staffing skills to overcome these issues. Banks have found themselves to have been further stretched, when contractors, consultants, and vendors who are domiciled at geographically different locations get involved in such projects due to difficulties in timely coordination and consultations which require dedicated resource management during implementation stage.

The current competitive environment with increasingly demanding customer needs are forcing the banks to reexamine their technology environment, which is required to ensure that their IT strategy is aligned with their business strategy. The CBS replacement is often the most feasible solution to meet this demand. However, replacement of CBS be it for large or small banks, global or regional, is analogous to a heart transplant (Infosys, 2009). This is one of the greatest challenges for any bank, which could either result in the bank leapfrogging to a high degree of differentiation and an enriched customer value proposition, or can create considerable risks for the bank if the transition is not managed properly. A core banking solution, once implemented should be robust, scalable and future-proof and should serve the business interest for at least 10 years (Infosys, 2009).

The pressure for the banks to consider replacing legacy core systems has been increasing as it becomes clear that traditional 'surround' strategies will not work in the current context. (ISB, 2008) The issues and manual intervention with legacy CBS could be overcome by investments in distribution channels, which can deliver the improved agility and cost savings

that the business is looking for. The IT departments within retail banking businesses are finding it increasingly difficult to continue justifying in-house development or to maintain older versions of CBS to meet the organic growth of the bank and technological advancement. (IBS, 2008) In the current era, banks think of growth not only within the home country, but also globally. In addition, regulators have imposed new laws in order to ensure that banks safeguard the banking industry and customer confidence.

The ISB research on core banking shows rapid change in CBS globally, by replacing more than 200 systems annually (ISB, 2008). The annual ISB sales table provides this information related to CBS replacement by each vendor. There is considerable work being accomplished on core banking replacements globally with the active contribution of Sri Lankan banks. Unofficial information indicates that some domestic commercial banks are in various stages of discussion to replace their CBS to meet business demands.

The project success criteria can be defined as meeting the business requirements in a well defined project scope within agreed budget and time frame. (PMBook, 2004)

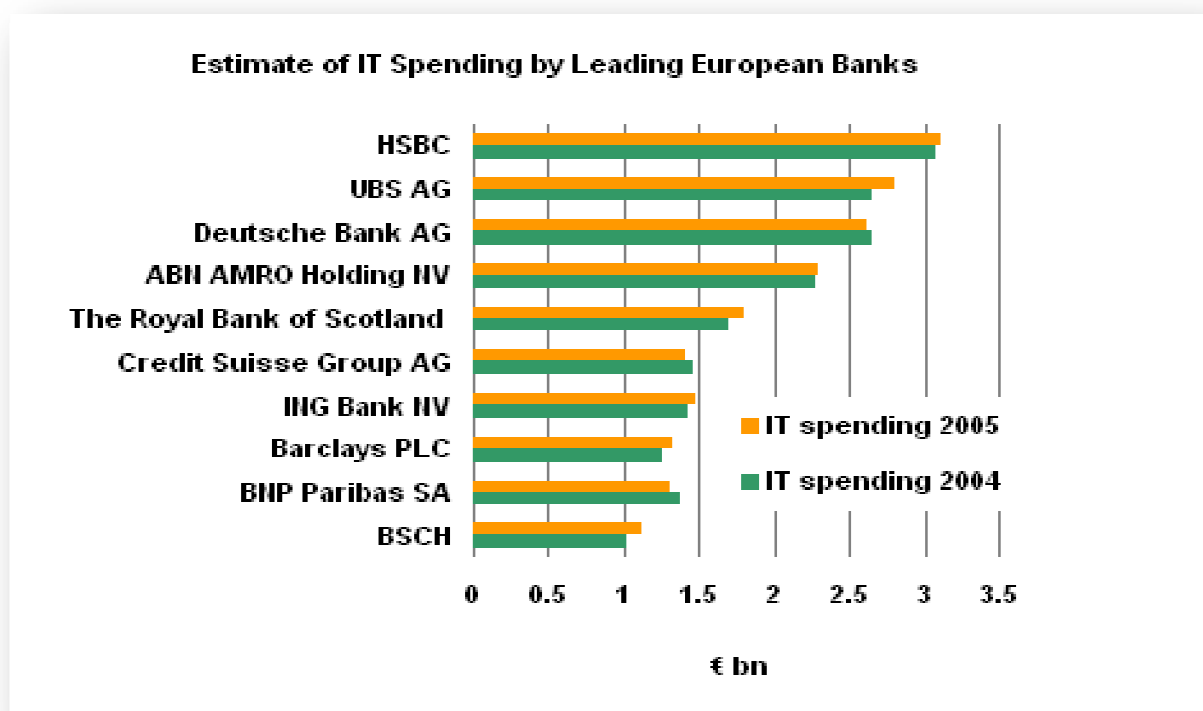
1.1 Conceptual Background

The rapid advancement in Information and Communication Technology (ICT) has had a reflective impact on the banking industry and the wider financial sector over the last two decades (Jayamaha, 2008). It has now become a tool that facilitates banks' organizational structures, business strategies, customer services and other related functions. The banking sector was one of the first to embrace rapid globalization and benefit significantly from IT development within the financial service industry. The technological revolution in banking started in the 1950s, with the installation of the first automated book keeping machines at banks. This was well before the other industries became IT savvy. Automation in banking became widespread over the next few decades as bankers quickly realized that much of their labor-intensive information-handling processes could be automated with the use of computers (Jayamaha, 2008). The first Automated Teller Machine (ATM) is reported to have been introduced in the USA in 1968, and it was only a cash dispenser. The advent of ATMs helped to improve customer convenience and reduce costs, as ATMs were used for

withdrawing funds, accounts inquiries and transferring funds between accounts which would have required face-to-face interaction between bank staff and customers (Jayamaha, 2008).

CBS replacement is one of the most important decisions any bank can take, as it is very specific to a bank's unique business strategy. However, the replacement process is not as straight forward as it may look. Considerably varied views on what defines a CBS and what the successful roadmap in its selection and implementation should look like, have been explained in the following sections.

The Asian Banker Research highlights the critical elements that will ensure a more robust and successful implementation.(Infosys, 2009) The report provides guidelines to help players in defining replacement objectives, strengthening the selection process by analyzing the critical requirements and possible choices of platforms, architecture and functionality. The report explains the implementation and deployment process, both from managerial as well as technical perspective, and identifies the critical success factors and best practices for all phases of a replacement project.



(Source: Pierron 2005)

Figure 1.1 – Estimate of IT Spending by Leading European Banks

It had been noted that financial institutions around the world are using systems that are too obsolete, too slow, and inflexible (Goolsby, 2008). Further many financial services firms having technologies that are nearly 30 years old, are realizing the competitive advantage of modernizing their outdated core systems (Celent 2006). This is further seen in Figure 1.1, which indicates the estimated budgeted figures for 2005 in European banks. HSBC had been the highest IT spender with an estimated budget of over €3 billion (Pierron 2005), UBS with €2.8 billion, followed by Deutsche Bank with €2.6 billion. ABN AMRO was fourth with an estimated €2.28 billion. Figure 1.1 above lists all these values.

IBS Sales League table (IBS, 2008) indicates that global primary universal banking implementations had been more than 200, as of March 2008. The value of these technology transfers would be of many billions of US\$.

Bank's legacy systems are more focused on product-oriented back-office processes instead of customer-oriented processes. They are not adequately geared to meet present business demands. Majority of them perform batch processing instead of online real-time, and straight through processing (STP). They are IT driven and reactive instead of being business driven and proactive. Legacy systems are generally fragmented and do not present an integrated global view (Dortson, 2008).

Table 1.1: Banking System Drivers and Changes

Area	Legacy Solutions	Modern Solutions
Back-office	Product-oriented	Customer-oriented
Front-office	Fragmented/Siloed channels	Integrated channels
Services	Sales/Efficiency-oriented	Customer satisfaction-oriented
Sales	Reactive	Proactive
View (Risk)	Local/Differentiated	Global/Integrated
Operations	Per office	Enterprise-wide
Processing	Batch, many manual actions	Online/Real-time, STP
Architecture	Product/Process-driven	Service/Event-driven
Budget	Decentralized budget discretion	Centralized budget discretion
Alignment	IT-driven	Business-driven
# Banks	Many different (small) banks	Mergers and Acquisitions

Source: *Core banking system survey, 2008*

Table 1.1 provides information on business requirement changes with regard to banking systems over the last decade. The legacy systems that are used in banks have big challenges to meet new business oriented market conditions. Most importantly, service orientation has changed to customer satisfaction orientation, which would be the key factor in the current business context. The introduction of online real time banking which provides a better service to the customers has a competitive edge. The new core banking solutions, support the new business context to banks to satisfy customers' demands and expectations.

The CBS survey, 2008 describes the changes and developments in each banking domain, which are relevant to current context for banking system changes. For the emerging markets, these trends can be regarded as visions because sales forces use very basic products to fulfill the demanding targets in such growing markets. Basic improvements to business processes with adequate platforms are still crucial in banking operations to meet the market demand. Business issues, legal and regulatory requirements are forcing banks to implement state of the art CBS (Dortson, 2008).

CBS Survey by Dortson (2008) revealed that CBS is often compared to replacing the engine of a Boeing 747 in mid-air. Experts consider core banking replacement to be the most complex, risky and expensive IT project that any bank can undertake. CBS forms the backbone of a bank's IT infrastructure and contains records of all customer transactions and the processing of those transactions. A minor error in this area can cause a bank's entire system to crash, tarnishing its reputation in the process.

Many of the mid-tier and top-tier European banks are early adopters of the new solutions. Hence, they are replacing their legacy CBS with a single global system to support business demands. However, many large European institutions are still struggling with obsolete, inadequate core systems that no longer meet their requirements. In the United States, most banks have not yet started replacing their systems. They plan to do so by first implementing new systems only in their global divisions before tackling domestic systems (Goolsby, 2008). Similarly, it's easier for a tier-three or tier-four bank to replace its core system because it doesn't operate in as many markets as a tier-one or tier-two bank. The number of third-party applications that need to be integrated into the new core system is another factor influencing the adoption rate. Most tier-one banks have more of these applications, and they replace the applications or integrate them into the new system (Satchidananda, 2006).

The project budgets required for software and services require considerable investment that may extend up to € 250 million, in extreme cases. Software and services costs for European banks' renewal initiatives, spread over at least ten years, will be in the € 100 billion range. (Dortson, 2008).

IDC financial Insights' latest study reveals that banks are exploring how Service Oriented Architecture (SOA) platforms can be adopted to align with their vision of modern CBS. The trend of packaged, complete banking systems and compatibilities to core banking renewals has shifted. Financial institutions today are moving towards modular, component based approaches to core banking. The number of new core banking deals in Asia, is estimated to be 56 in 2008 and 52 in 2009. The total deals signed in 2009 were noticed to be more geographically spread with more deals coming from outside the high growth core banking markets, namely China, India, Indonesia, Vietnam, and Singapore (FT Fortune, 2010).

1.2 Contextual Background

Jayamaha (2008) explained that the banks have adopted systems developed in-house or used systems provided by vendors on a decentralized basis, which transforms manual systems to automated processes. The banks use core-banking systems from different vendors to meet their requirements for separate modules, and technology platforms involving key operations such as deposit mobilization and lending, trade finance, treasury operations, and more recently card transactions. The banks implemented new core-banking systems together with other sub systems and integrations making relatively large investments with sustainable gains to compensate costs. The arrival of new foreign and private banks with state-of-the-art technology-based services pushed local banks in Sri Lanka to move towards the latest technologies to retain their customer base and to face competition. The increasing competition in Sri Lanka's banking industry has widened the scope of the IT infrastructure development to meet diversified demands made by numerous users. Today, customers of some banks enjoy services through Internet Banking, Telephone Banking, Mobile Banking, ATMs and POS devices. The growing competition and expectations have also increased awareness amongst the banks of the role and importance of technology in banking. In the context of Sri Lanka, the implementation of new and comprehensive IT systems is considered to be costly and the banks tend to compromise on the use of integrated solutions and advanced technology.

There are 22 licensed commercial banks (LCB) and 14 Licensed Specialized Banks providing financial services to customers in Sri Lanka (CBSL Annual Report, 2009). The licensed commercial banks contribute to a large asset base and a magnitude of services within the economy. Further the commercial banks are the most efficient and important category of financial institutions within the Banking Industry of Sri Lanka. At the end of June 2009, the LCBs dominated the financial system with a market share of 47% of the entire financial system's assets and 84% of the banking sector's assets. Therefore, the health of the financial system depends largely on the sound background of the Licensed Commercial Banks (CBSL Annual Report, 2009).

Although the amount would differ from those of international banks, IT spending by Sri Lankan banks is no different from their foreign counterparts. As of 2009, there were ten local

commercial banks in Sri Lanka, having invested vast sums of money for foreign CBS. These banks would continue to invest in new technologies to compete in the local market. During these CBS replacements, the most preferred and common mechanism adopted by the banks for the implementation of the ‘software technology’ had been in the form of licensing. (Pilot Survey)

Table 1.2 - Core Banking Systems of Domestic Commercial Banks in Sri Lanka

#	Name of the Bank	Main Core Banking System(s)	Year of Implementation
1	Bank of Ceylon	Fiserv from ICBS	2004
2	Commercial Bank of Ceylon PLC	Fiserv from ICBS	1995
3	DFCC Vardhana Bank Ltd	Equation from Mysis	2000
4	Hatton National Bank PLC	Finacle from Infosys	2010
5	NDB Bank PLC	Flexcube from Oracle Financials Globus form Temenos	2002 2000
6	Nations Trust Bank PLC	Flexcube from Oracle Financials	2004
7	PABC Bank PLC	T24 from Temenos	1998
8	People's Bank	Silverlake from SIBS	2004
9	Sampath Bank PLC	Finacle from Infosys	2000
10	Seylan Bank PLC	Capity from Midas	1995
11	Union Bank of Colombo Ltd	In-house Developed	1996

Source: *Survey Data*

All domestic commercial banks use core-banking systems for their operations. The majority (Ten out of eleven) of banks use foreign CBS, whereas one bank is using a homegrown solution. There were seven foreign vendors, who had supplied core-banking systems to these ten licensed commercial banks in Sri Lanka. Thus, no vendor has had a clear lead in the market share. Table 1.2 shows the banks usage of foreign CBS in Sri Lanka. Although the “year of implemented” indicates the first instance, in which each bank acquired the specified CBS. Several upgrades may have taken place on these core-banking systems. Some banks have replaced their CBS quite recently and a single bank was found to be using more than one CBS to support their business due to various reasons.

Most banks upgraded their CBS to later versions to be in par with new technology changes. A few banks are in the process of looking for replacements for their existing CBS, which was revealed during the pilot survey interviews with the Heads of IT and freelance consultants.

Although the banks have implemented their systems at different times, there had been frequent upgrades to keep these systems up to date. The pilot survey shows that the upgrade process is similar to new implementation, in some cases. During an upgrade, banks acquire licenses for a later version of the software, probably free of charge but the upgrade services could be expensive.

The General Manager of Bank of Ceylon in a press release on 14 November 2006 emphasized the importance of CBS and investment to meet the requirements. It's important to see the value addition provided by the CBS to be passed by the bank to their customers at various locations. This also enables different types of products to be offered to the customer through a mix of delivery channels, which touches the customer service.

“As Sri Lanka’s No. 1 bank, Bank of Ceylon has taken the initiative and made a huge investment to link all its branches in all parts of the country into Sri Lanka’s biggest online branch network, through the country’s largest online branch network, we can now bring our world-class online facilities in core banking, fund management, and trade finance to large and small enterprises as well as to individuals in urban and rural areas” (Bank of Ceylon Annual Report, 2005)

Technology is used by Banks to meet their business growth and provide superior customer services through its delivery channels. The annual report of Commercial Bank of Ceylon PLC for the year 2008 highlighted the large investment made by the bank in technology to provide better services to the customers. The bank uses technology to provide services and reduce cost of services to gain competitiveness in the market. Investment in technology would be an ongoing expense; and hence banks budget for maintenance and adoption of new technology, every year.

“The Bank has 181 delivery points and 346 ATMs. It has invested over 2.501 Billion in state-of-the-art technology in the last 10 years. It is accessible to anyone with an Internet connection, 24 hours a day 365 days of the year. On-line banking now allows a wide array of transactions at the click of the mouse” (Commercial Bank Annual Report, 2008)

The core banking application is the backbone of all these delivery channels, which runs as the heart of any complex banking solution. Hence, compatibility between the delivery channels and the core application would be an important aspect in evaluating a replacement for existing core banking applications. Banks make considerable investment on technology to meet requirements of steady growth and provide superior customer services. (Commercial Bank of Ceylon, Annual Report - 2008) The customer satisfaction, accuracy, and risk mitigation would be the prime objectives of the banking industry (CBSL Report, 2009)

1.3 Problem Statement

Banking systems are business enablers, which provide efficient service to bank customers. The organizational growth and customer touch points are mainly dependent on Information Technology used in banking Industry (Bank of Ceylon, Annual Report 2009). Therefore implementing a suitable banking system is a mandatory requirement for the banks to meet its organizational goals and aspirations. *The problem is that local commercial banks do not meet the desired objectives during agreed project scope, timeframe and budget from the CBS project.*

1.3.1 Current Issues in Local Banks

A pilot survey was conducted to identify primary information related to Sri Lankan commercial banks. The survey revealed that most of the banks had changed their CBS with foreign core banking applications within the past 15 years, some banks were in the process of replacing their existing CBS, while a few others were evaluating core banking software solutions to replace existing systems.

The evaluation of pilot survey results indicates that most of the banks have replaced their core-banking systems when Y2K (Year 2000) was an issue. The survey result further indicated that two main banks have changed their CBS three times during the last 15 years indicating that there could be reasons to change core-banking systems so frequently. Rationale for these replacements could be attributed to factors such as failure of the previous implementation, not meeting the business requirements, major change in technology and need to have competitive advantage within the industry etc.

The BOC was using five different systems to manage its operation till new CBS rollout in 2005. During that time only 18 branches were connected to the uni-banking network, others were stand-alone systems. Taking the consolidated general ledger was a tedious task during this period. In 2004 banks started the first pilot implementation which was a success. At the pilot stage the bank started to rollout for the branch network to enable all branches to be linked to the main data center at Head Office. (BOC Annual Report, 2005)

The heads of Information Technology of these banks indicated the implementation of CBS as a complex activity, involving considerable amount of investment in time, money and human resources. It was revealed during the interviews, that in the majority of instances these projects were not completed within the anticipated period or within the financial budgets and were consuming more human resources than expected owing to a range of issues.

There had been instances where banks have opted to use more than one banking system simultaneously due to one software solution not being able to solve the entire requirements of the banks. The CBS upgrades are also important to keep abreast with technological advancements, which enable banks to acquire new functionalities and face the market competition. Pilot survey confirms the importance of the decision of changing core-banking systems, which has an average implementation period of 12 to 16 months. The pilot survey also indicated that in many instances, upgrading of CBS takes as much time as implementing a new system. This happens due to heavy customizations to be made in the older version in addition to features and functionalities, which the banks wish to retain even if it requires customization to the later version being implemented.

Pilot survey revealed of instances, where consultants were involved in core-banking system selection and implementations processes. Further, there had been occasions, where individuals, specifically at the top management level, interfering with and influencing the processes of software selection and even system implementation, beyond the usual expected levels of involvement.

A senior manager of one of the leading commercial banks explicated issues related to implementation of the CBS, which were experienced by the bank throughout the implementation process and even post implementation. According to him, the bank could not meet the expected objective of the implementation due to some unresolved technical issues. As a result, the bank had to run number of branches on the old legacy system while the rest were run on the new system. This has created complexities and as a result the bank underwent a significant operational risk. Further, the bank had to spend to maintain both systems, which was an unexpected budgetary constraint.

During an interview, a Head of IT of a leading commercial bank exposed of an instance, where a core banking implementation project in fact failed resulting in scrapping of the project due to a variety of reasons. There had been a sizable investment of time, money and human resources made for the project. Although many of these institutions are either government or public quoted companies, information pertaining to such failures are rarely published for obvious reasons, as it might adversely affect the reputation of the institution and possibly adversely affect the individuals who were involved in these projects. This signifies that the information pertaining to CBS project failures are neither documented for internal purposes nor made public to the external entities to be used for research or as learning experiences.

It was further revealed that banks seriously looked at factors such as improving internal productivity and process efficiencies, reducing operational complexities and lowering cost of ownership of new technology apart from the customer service and competitive objectives. Human resources involved in these projects were identified as a key and a critical element for the success of a CBS project. Preliminary study interviews indicated the difficulty faced by

banks in identifying correct human resources for the project and getting them assigned to the project.

Considering the importance and value of the process, the research on this area would shed some light on awareness of the CBS selection and implementation process specific to the Sri Lankan commercial Banks. Apart from that, a research in this area would capture and enhance the body of knowledge, which is currently concentrated within a minute community of individuals dispersed across the banks, who have experience in such implementations. Further, this research will assist the bank decision makers to identify the perceptions of different stakeholders related to the project, in order that future projects could be managed accordingly.

1.3.2 CBS Project Experiences Related to Local Banks

Amarasinghe (2008), evaluated the technology transfer based on CBS changes in three local commercial banks in relation to a single vendor. The research identified the problems with all implementations, and provided particularly useful information related to banking system changes. According to his research, one out of the three local commercial banks, which were the subject of the research, could not achieve their objective expected out of the project. It further indicates that a considerable time overrun has taken place to complete all three projects. The researcher has further identified the following aspects attributable to failures of CBS projects. Out of the sample of three banks, several aspects are more specific to a single bank.

- Many activities, which are crucial in selecting a suitable core banking solution and a vendor, were not performed effectively.
- Lack of flexibility in reengineering business processes and failures in adaptation of best practices incorporated in the systems leading to high customization of CBS being implemented.
- Lack of dominant decision makers within the implementation teams to control and influence radical changes in the form of business process reengineering (BPR).
- Lack of ownership and control on the customization activity.
- Lack of documentation for most of the important stages.
- Unmanaged internal organizational politics.

Analysis of data collected in relation to software implementation projects in Sri Lankan commercial banks during the pilot survey interviews indicates that successful completion of a software implementation project to the entire satisfaction of the business, as scheduled, within given budgets and within planned resource utilization is an extraordinary occurrence or a non-occurrence. There have been instances, where banks have failed to meet their objectives and expectations of the CBS project due to numerous reasons. In such an instance, financial loss and damage reputation may possibly have nullified the benefits expected out of the implementation.

1.3.3 CBS Project Experiences Related to Foreign Banks

Harris (2001), claims that successful implementation of new technologies is particularly important in an increasingly competitive banking environment, where the major players are also under threat from new market entrants. This study cites three banks, where the technology transfer had failed with one being successful. His findings assert that,

- (a) Reluctance to learn from the mistakes of earlier projects. The considerable resources devoted to IT projects rarely extended to measure the effectiveness, or to analyze why mistakes had occurred.*
- (b) Policy of moving on project leaders with accumulated experience, thus new managers faced the same difficulties in running a new project.*
- (c) Reluctance of individuals to take responsibility for failure through fear of being made scapegoats, reflects the political nature of organizations.*

The same research ponders on the need for United Kingdom (UK) retail banking industry to address the question of why the massive investments by retail banks in information technology is not being translated into significant productivity gains. The research findings suggested that it is the way in which IT projects are managed and lack of organizational learning.

Harris (2001) further states that the retail banking industry in UK has invested heavily in new technology over many years, often with disappointing results. He has noted that in each of

the 'failed' projects studied, there had been no attempt made to investigate the reasons for project failure with the intention of avoiding future repetition of the same problems.

Some reasons for the failure in these banks had been differing business priorities, cultural gaps, legal requirements and internal power struggles resulting in the eventual decision to abandon the project.

“A review was suggested to establish the cause, but the projected cost of £1 million was deemed too high. This figure was insignificant in comparison with the amount of money (some £300 million over a six year period) that had been spent on the project” (Harris, 2001)

Lievens & Moenaert (2000) had carried out a survey of seventy seven Belgium banks and found that there were thirty seven commercially successful projects, while twenty eight were unsuccessful. It is important to emphasize the use of foreign consultants for technology transfers in the banking industry, due to its relevance to this research. A study by McKendrick (1992), on the use of 'consultancy' as a mode of technology transfer claims that, the lack of specialized software consultants had been a major drawback in transferring information technology to Indonesian banks. Further, it was proven that consultation contracts with banks from the developed countries (for example, Bank Duta, Bank of America, Bank International and Citibank) had not been effective because of the consultant's lack of appreciation of daily operations and differences in accounting methods in Asia (Enos, Lall & Yun, 1997).

1.3.4 Refined problem

Based on the initial information and available literature, there appears to be no proper documentation or guide lines for selection and implementation of CBS for commercial banks to overcome the problems described in the above sections. The experience or the learning's of commercial banks are not readily available to use as reference before the decision for changing of banking systems.

Process of replacing CBS could be broadly divided in to two discrete areas namely selection and implementation. The banks found to be separately focusing on selection and implementation aspects of CBS projects, where in-fact both processes have inter-dependency and need to be focused together for the success of the project.

Selection Process:

- There is little literature in identifying critical success factors related to selection process of a CBS by the Sri Lankan commercial banks. The available literature does not provide significant value addition to the banks in the time of changing CBS.
- Lack of sharing experiences in relation to selection process, mainly dependent on the influence and convincing power of consultants and/or that of the vendor. There are no documented best practices, procedures or guideline for selecting a CBS, which meet the requirements of Sri Lankan commercial banks.

Implementation Process:

- There are no documented critical success factors related to implementation of CBS by the Sri Lankan commercial banks. The lack of information in respect of the learning or experiences related to implementations of CBS could lead to wrong decisions being made during implementation processes.
- Factors determining the success or failure in the implementation are not readily available for the decision makers and people who are managing these projects. Hence, there is a likelihood of the same mistakes being repeated by many banks which might cost Millions of Rupees to individual banks and cost much larger amounts to the economy of the country as a whole, which could be saved easily if the information, knowledge and awareness are available in relation to factors determining success or failure of a an CBS implementation.

Considering all aspects of the above sections the problem reiterates that, local commercial banks do not meet the desired objectives during agreed timeframe and budget from the CBS project.

1.4 Significance of study

Banks would constantly search for new technologies to cater the ever changing environment and to compete in global markets. As a result, selecting and implementing new technology to replace the existing technology would be an on-going activity of the banks world-wide. However, replacements of existing CBS are not an activity that is performed frequently as this would be done based on extreme necessity. More often than not, the preferred path would be to upgrade the existing CBS. It is also noted that core banking replacement is time consuming and considered to be a high risk, high expenditure activity with no guarantee of achieving expected results, unless done appropriately.

In recent years, there have been increased competition amongst banks, to attract customer loyalty towards the banks whilst elevating customer expectations to new heights. As a whole, there is great pressure for the banks to launch new services while containing costs and meeting more than ever stringent regulatory compliance requirements. Business agility has become a key determinant of commercial success. The banks must increase customer touch points and delivery channels to the market. The banks must also maintain a single view of the customer across all channels. Similarly, the customer must experience a consistent look and feel, across all banking channels. The key to success is to increase the number of banking channels without compromising service levels by minimizing systems down times. (Infosys, 2009)

The findings of this study could be used by banks in Sri Lanka when planning to invest on a CBS. In addition, the study could also be used for other information technology transfer projects in the banking sector, specifically in relation to the Sri Lankan context.

Based on the complexity, frequency of upgrades and changes in the regulatory environments, the research is significant to understand the dynamics in selecting and implementing CBS and to overcome the factors contributing to failures of such projects.

1.5 Objective of the Study

Information related to CBS projects of the banks are closely guarded secrets and are kept out of public domain. There had been many successful implementations as well as failed CBS implementations in local commercial banks. However, there is no properly documented body of knowledge with regard to CBS selection and implementation processes due to the sensitivity and confidentiality nature of this information. This research aims at collecting this information and formulating a common framework pertaining to CBS projects, specific to the local context, which could be used by Sri Lankan commercial banks to successfully select and implement CBS in the future and to avoid or minimize factors contributing to failure.

Specific objectives of the study are:

- To identify critical success factors related to the selection of CBS to meet the desired objectives of the bank.
- To identify the critical success factors related to implementation phases of CBS project to achieve the desired project objectives and outcomes.
- To propose a general framework and unified set of guidelines useful for Sri Lankan commercial banks related to selection and implementation of CBS, based on the identified critical success factors and issues.

1.6 Limitation of the Study

Limitations and delimitations are integral part of a study; hence they may affect the research design and the outcome. Research on latest CBS projects of the local commercial banks would have been the ideal scenario for this study. However, it is practically difficult to identify all the members who have managed and/or participated on full time basis in such projects. A typical CBS project involves a diverse group of people selected across bank from business and technical departments of the bank. Majority of the project team members will be re-assigned to geographically dispersed locations within the branch network of the bank on completion of the project. Due to these limitations, focus group for this research are the individuals, who have experienced at least single CBS implementations in a Sri Lankan commercial bank. They may have participated either in selection or implementation processes or both processes of CBS project. For the purpose of the research, participants were not separated for selection process and/or for implementation process due to difficulties in doing so.

Further, CBS implementation projects in banks usually take place with a frequency of five to ten years (Pilot Survey). As a result some of the issues and experiences may be out dated in relation to the current context.

The factors listed bellow, are beyond the control of the researcher, and may affect the research outcomes:

- (a) Collection of data from all the respondents in the sample was not possible due to difficulty of identifying CBS experience of respondents
- (b) Lack of interest in filling the questionnaire meticulously by the focus group.
- (c) The respondents may provide feedback based on specific incidents of the project that may not be generalized.

There will be limitations in obtaining some information critical for the research, which may be considered as sensitive or confidential by the banks. There had been instances where participants in the pilot survey have shown reluctance to provide such information specifically due to them being aware of the fact that the researcher is an employee of one of

their competitors. Hence, the researcher had to rely on information acquired through the personal contacts, where such information may not be precise but approximations, in order to fill the gaps in the information obtained via official means.

Failure of the respondents involved in the pilot survey as well as in the questionnaire to appreciate the value and significance of the study and their lack of knowledge in some of the areas related to the CBS projects made the collection of accurate data a strenuous task.

1.7 Summary

Banks play an important role in economic development of a country, where commercial banks play pivotal role within the banking industry. Due to economic reasons, market pressures and regulatory requirements, banks require to change their CBS from time to time. CBS projects involve large capital investments and expenditure, are high on risk and consume enormous amount of resources of the banks but do not guarantee achieving desired objectives due to diverse reasons. The factors possibly affecting success of CBS projects and issues faced by the Sri Lankan Commercial Banks related to such projects have been identified through a pilot survey with the intention of proposing a unified framework and a set of general guidelines useful for the Sri Lankan commercial Banks in order to minimize the risk of failures in CBS implementations.

Chapter 2

Literature Review

2.1. Introduction

This chapter elaborates the theoretical background of the research and related discussions pertaining to the commercial banking industry of Sri Lanka, selection and implementations of software system in general, project management and the case studies and experiences of the local and global banks related to CBS selection and implementation processes etc. It also contains a review of studies carried out by predecessors on the subject area and related areas. The theoretical framework of this research is also discussed and explained in this chapter.

2.2 The Sri Lankan Banking Industry

The financial system in Sri Lanka comprises of many types of financial institutions, which includes the Central Bank of Sri Lanka, Licensed Commercial Banks (LCBs), Licensed Specialized Banks (LSBs), Registered Finance Companies (RFCs), Specialized Leasing Companies (SLCs), Primary Dealers (PDs), Pensions and Provident Funds, Insurance Companies, Rural Banks, Merchant Banks, Unit Trusts and Thrift and Credit Co-operative Societies. (CBSL Annual Report, 2009)

According to the statistics published by the Central Bank of Sri Lanka, by the end of June 2009, 55.9% of the Assets of the Financial System of Sri Lanka and 94.9% of the Deposits of the country were held by the Banking Industry, which included the Licensed Commercial Banks (both Local & Foreign), Licensed Specialized Banks and the Rural Banks.

Banks play a pivotal role within the financial system and are the primary providers of liquidity to national economy. Banks are also responsible for providing payment services, thereby facilitating entities within the economy to carry out their financial transactions. Therefore, the existence of banks are of great importance, as they contribute towards maintaining confidence in the financial system and any failure of the banking system will certainly have a great impact on activities of all other financial and non-financial entities within the economy.

As of June 2009, the banking sector comprised of 22 Licensed Commercial Banks and 14 Licensed Specialized Banks. In terms of the asset base and the magnitude of services provided, the Licensed Commercial Banks are the single most important category of institution within the Banking Industry. Table 2.1 indicates, at the end of June 2009, the Licensed Commercial Banks dominated the financial system with a market share of 47% of the entire financial system's assets and 84% of the banking sector's assets. Therefore, the health of the financial system depends to a great extent on the soundness of Licensed Commercial Banks. (CBSL Annual Report, 2009)

Table 2.1- Distribution of Assets and Deposits Liabilities of the Financial System

Total Assets and Deposit Liabilities of the Main Institutions in the Financial System as at end June' 2009				
Type of Financial Institution	Assets		Deposits	
	Rs. bn.	% Share	Rs. bn.	% Share
1. Central Bank of Sri Lanka	819.8	14.6	-	-
2. Institutions Regulated by the CBSL	4,179.2	74.4	2,350.6	95.6
<i>2.1 Deposit Taking Institutions</i>	<i>3,197.5</i>	<i>56.9</i>	<i>2,350.6</i>	<i>95.6</i>
<i>Licensed Commercial Banks</i>	<i>2,503.1</i>	<i>44.6</i>	<i>1,849.6</i>	<i>75.2</i>
<i>Licensed Specialized Banks</i>	<i>509.1</i>	<i>9.1</i>	<i>381.2</i>	<i>15.5</i>
<i>Registered Finance Companies</i>	<i>185.3</i>	<i>3.3</i>	<i>119.8</i>	<i>4.9</i>
<i>2.2 Other Financial Institutions</i>	<i>981.7</i>	<i>17.5</i>	-	-
<i>Employees' Provident Fund</i>	<i>772.0</i>	<i>13.7</i>	-	-
<i>Primary Dealers</i>	<i>97.8</i>	<i>1.7</i>	-	-
<i>Specialized Leasing companies</i>	<i>111.9</i>	<i>2.0</i>	-	-
3. Institutions not Regulated by the CBSL	617.0	11.0	108.3	4.4
<i>Deposit Taking Institutions</i>	<i>129.8</i>	<i>2.3</i>	<i>108.3</i>	<i>4.4</i>
<i>Rural Banks</i>	<i>124.5</i>	<i>2.2</i>	<i>103.9</i>	<i>4.2</i>
<i>Thrift and Credit Co-operative Societies</i>	<i>5.3</i>	<i>0.1</i>	<i>4.4</i>	<i>0.2</i>
Total Assets	5,616.0	100	2,458.9	100

Source: Central Bank of Sri Lanka, Annual Report 2009

Even though a large number of licensed commercial banks exist in the country, the stability of the financial system is primarily dependent on the performance and financial strength of the six largest LCBs which consists of the two state banks (Bank of Ceylon and Peoples

Bank) and the four largest domestic private commercial banks namely, (Hatton National Bank Plc., Commercial Bank of Ceylon Plc, Sampath Bank Plc., and Seylan Bank Plc) These banks represented 76.6% of the License Commercial Bank sector assets and 64% of the banking sector assets. (CBSL Annual Report, 2009)

The Licensed Specialized Banks represent only 9% and 16% of the entire financial system's assets and banking sector's assets, respectively. The systemic importance of this sector is relatively low in comparison to the licensed commercial bank sector, both in terms of size and their impact on the financial system. Unlike the commercial banks, this sector does not play an intermediary role in the payment cycle. (CBSL Annual Report, 2009)

2.3 Commercial Banking Sector

Out of the 22 Licensed Commercial Banks currently operating in Sri Lanka, 11 are local banks while the rest are branches of foreign banks of repute. At the end of the year 2009, there were a total of 2,214 branches, 2,788 other service outlets and 1,757 automated teller machines of these banks located throughout the country. (CBSL Annual Report, 2009)

Local commercial banks could be broadly categorized in to two segments, i.e. state banks and private banks. The total assets of LCBs stood at Rs. 2,500 billion, with a growth of 10.8% in 2009 compared to a growth of 7.7% in 2008. The two state owned commercial banks recorded a growth of 14.8% in total assets while the domestic private banks and foreign banks recorded a growth of 8.9% and 5.8%, respectively, during 2009. (CBSL Annual Report, 2009)

Collective pre-tax profits of LCBs reached Rs. 27.6 billion for the year ended 2009, while maintaining a growth of 9.3% as against 18.1% in 2008. This was a result of the continuous efforts taken by such banks in managing their costs. Operational expenses recorded a growth of 5.0% during the year as against 17.9% recorded in 2008. Staff cost also increased at a low pace by 9.3% in comparison to 19.5% in 2008. In terms of cost efficiencies, the efficiency ratio, measured as total operating expenses to total operating income, has further improved over the period to 54.9% from 56.1% in end 2008. In addition, the cost to income ratio measured as total costs to total income has also improved to 77.3% from 79.0% in end 2008. Meanwhile, net interest income from core lending activities recorded an increase of 10.0%,

while net interest margin stood at 4.7%. The contribution of fee based income also grew by 4.0%. Out of LCBs, domestic private banks were the main contributor to the growth in profits of the sector, which is nearly 50%. (CBSL Annual Report, 2009)

2.4 Importance of the Banking Industry to Country's Economy

Banks play a significant role in the development of national economy of Sri Lanka. After liberalization of the economy in 1977, the banking industry underwent major changes. The economic reforms have changed the banking sector completely. The CBSL permitted new banks to be started in the private sector. Sri Lankan banking industry is dominated by the two giant state owned banks namely, Bank of Ceylon and Peoples Bank. Other private commercial banks too supported heavily to the economic development of the country. (CBSL Annual Report, 2009)

At present these banks with the use of Information and Communication Technology together with prudent and professional management has gained a reasonable position in the banking industry. The banking system in the country is effective, efficient and disciplined. (CBSL Annual Report, 2009) It has brought about a rapid growth in various sectors of the economy.

The following aspects related to the commercial banks shows the significance of the commercial banking sector in the economic development of a country.

- (a) Commercial Banks promote capital formation by accepting deposits from individuals and businesses. Banks use these deposits to lend and invest in productive economic entities such as Small and Medium size Enterprises and corporate projects, which directly contribute to the GDP of the country. Hence commercial banks provide financial resources necessary for the economic development.
- (b) The growth of commercial banking industry facilitate trade and provide vast expansion in trade and industry, through the use of financial instruments such as bank drafts, electronic fund transfers, cheques, bills of exchange, credit cards and letters of credit which are used both in domestic and international trade.

- (c) Act as a collecting agent for many government taxes and revenues and contribute themselves largely by way of corporate and other taxes to the state coffers.
- (d) Apart from that the LCB's contribute economic development by being primary dealers for government securities and investing on them hence, lending money to the government.

Some of the local commercial banks are not confined to Sri Lankan territory alone and have branches operating on foreign soils. Therefore they operate in extremely dynamic global markets. They need to understand the global customer, and use latest information technology to compete effectively in the open market. The transformation includes changing the business format from commercial banking to investment banking and wealth management satisfying the total financial needs of the target clientele. Hence, the commercial banks could be considered as the nerve system of the economic development of the country.

LCB's have 5,014 branches and other outlets throughout the country to provide financial assistance to individuals and businesses. There would be a significant demand to open bank branches in North and East areas in post war in Sri Lanka. This is also a clear indicator to show the contribution of LCB's for the economic development.

2.5 Quantified Contribution of the Industry to the Economy

The LCB's contribute to the economic development by way of turnover tax, which amount to 17.6 billion in the year of 2009 (The total pre-tax profit of the LCB's is 27.6 billion in 2009). The LCB's support the government by collecting Debit Tax, Stamp Duty, Withholding Tax and Value Added Tax from the banking transaction. (CBSL Annual Report, 2009) The table 2.2 illustrates the LCB's contribution to the government revenue through various banking taxes on profit. It's important to notice that the effective tax rate increased over the years to be 57% by the year 2008.

Table 2.2: Banking Industry Tax payments

Tax Payment (Rs: Mn)	2003	2004	2005	2006	2007	2008	2009
Financial Services VAT	2,999	4,559	5,519	5,273	10,703	13,598	14,193
Income Tax	3,797	5,982	9,995	14,292	18,781	22,668	20,144
Total Tax Payment	6,796	10,541	15,505	19,566	29,485	36,266	34,336
Profit Before Tax	23,526	27,966	35,477	42,363	54,838	64,022	59,842
Effective Tax rate	29%	38%	44%	46%	54%	57%	57%

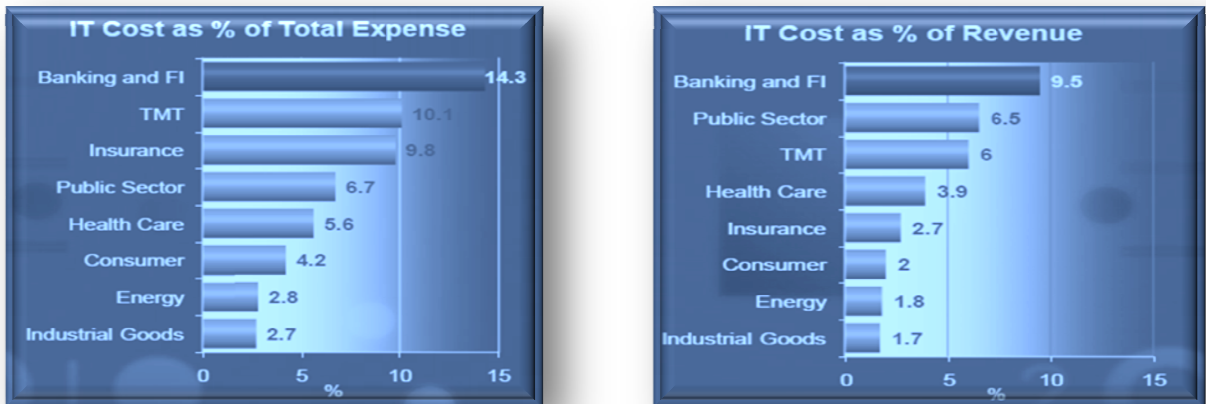
Source: *Central Bank Annual Report – 2009(Rs: Mn)*

2.6 Use of ICT in the Banking Industry

Technology has opened up new markets, new products, new services and efficient delivery channels for the banking industry over the last 10 years. The Automated Teller Machines, e-commerce and m-Commerce have been introduced as new channels to Sri Lankan customers apart from traditional branch banking. Banks use technology to maintain transaction processing and provide better service to their clients through electronic delivery channels while being competitive within the industry. Information Technology has also facilitated the banking industry to deal with challenges from economic changes leading to higher demand of banking services. Information technology has been the cornerstone of recent financial sector reforms aimed at increasing the speed and reliability of financial operations and of initiatives to strengthen the banking sector. (Dortson, 2008)

The information technology also has enabled the banks to meet expectations of demanding customers. As a result, the banks have increasingly become more tech-savvy. Customers demand instant, anytime and anywhere banking facilities from the banking industry. Traditionally, IT industry has been providing solutions to banks to take care of their accounting and back-office requirements. However, this has now given way to large scale usage in services aimed at the customers of the banks. Further, IT deployment has assumed high levels that it is no longer possible for banks to manage their IT implementations on a standalone basis (Vendor Reports). With the revolution and evolution of IT, banks are increasingly interconnecting their computer systems not only across branches in a city but

also to other geographic locations with high-speed network infrastructure, and setting up local area and wide area networks and connecting them to the Internet. (BOC Annual Report, 2009) As a result, information systems and networks are now exposed to growth to meet the requirements.

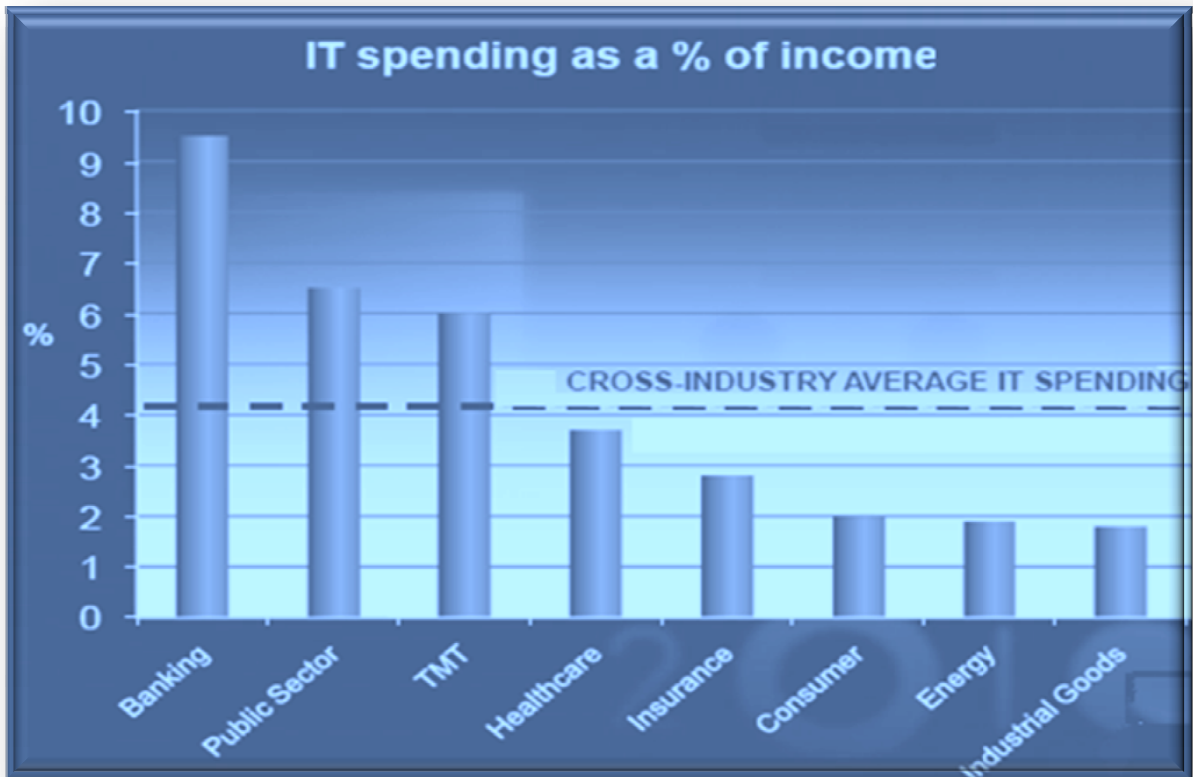


Source: BCG IT Fact-base – Presented on TCF Berlin by Temenos Private Limited

Figure 2.1 – IT Cost as percentages of Total Expenses and Revenue across Industry Sectors

The global research shows that the IT investments in banks are comparatively higher than that of any other industry sector. Figure 2.1 further illustrates the IT cost as a percentage of revenue of banks and IT cost as a percentage of expenses. It clearly shows that the finance institutions are highly investing on information technology compared to the other industries. The rapid changes of technology push banks to consider upgrading their systems to meet the current technology platforms.

The new products and delivery channels are introduced to be competitive with other banks. Technology support vendors come up with various solutions to support banks to meet the customer demand and be competitive in the industry. Also, the regulators impose guide lines to be implemented by Banks within a specified time frame, such as Basel, Know Your Customer (KYC), Anti Money Laundering (AML) etc. This leads the banks to search for suitable software, which would be costly for the banks.



Source: BCG IT Fact-base – Presented on TCF Berlin by Temenos Private Limited

Figure 2.2 – IT Spending as a percentage of Income across Industry Sectors

Figure 2.2 shows the spending on IT by the Banking Sector. The advancement of information technology has forced Sri Lankan banks also to use latest technology to maintain smooth operation and to provide superior service to their customers. There had been a significant development in the banking industry of Sri Lanka in terms of ICT and related services.

2.7 Core Banking Systems

Core Banking is defined as the business conducted by a banking institution with its customers. Many banks treat the retail customers as their core banking customers, and have a separate line of business to manage small businesses. Larger businesses are managed via the Corporate Banking division of the institution. (IBS, Wikipedia)

At present most of the banks use core banking applications to support their operations where “CORE” stands for "Centralized Online Real-time Exchange". This means basically that the entire banks' branches have access applications from centralized datacenters. On-line Real-

time means that the transactions are reflected immediately on the bank's servers and the customer can access their accounts from any of the bank's branches throughout the world. These applications now have the capability to address the needs of corporate customers as well, providing them a comprehensive banking solution. Normal core banking functions will include deposit accounts, loans, mortgages and payments. Banks make these services available across multiple channels like ATMs, Internet banking, and branches. (ISB, Wikipedia)

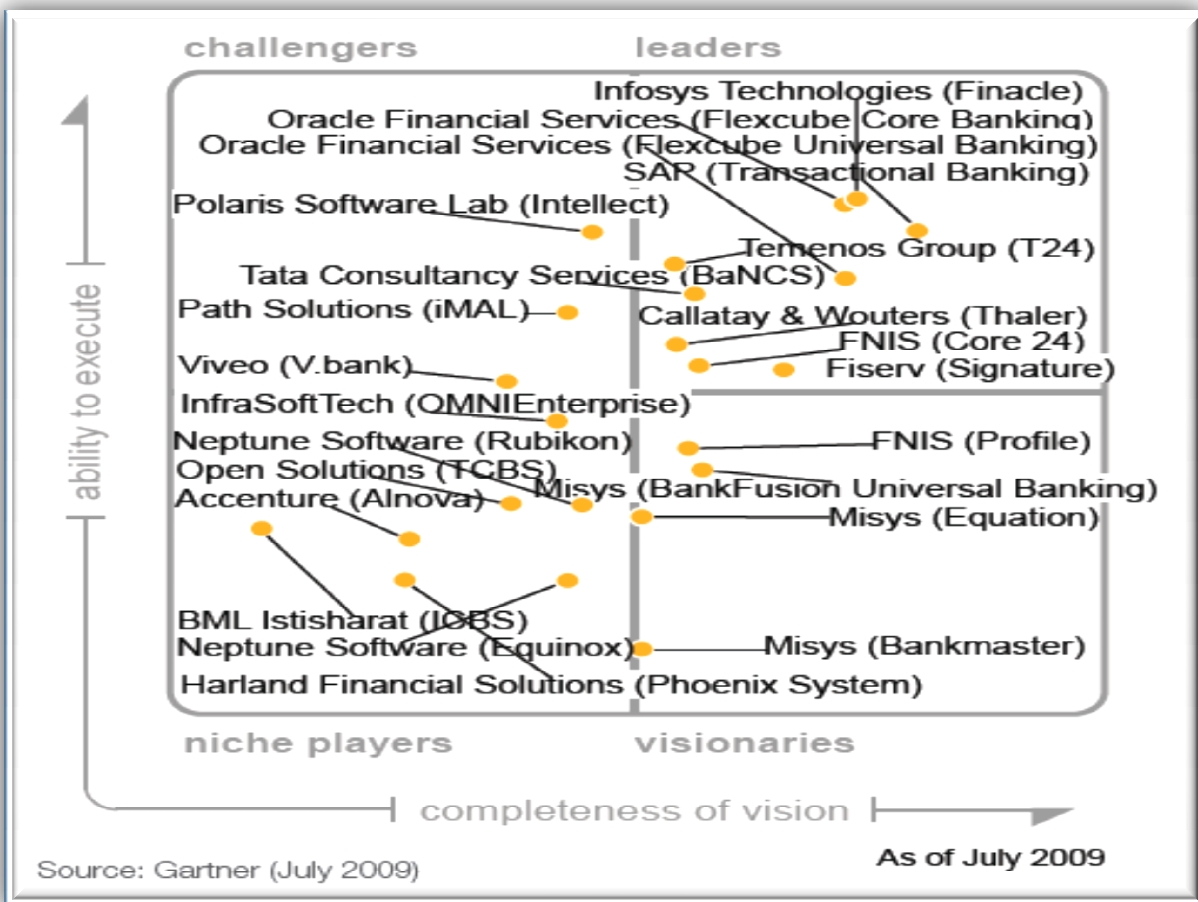
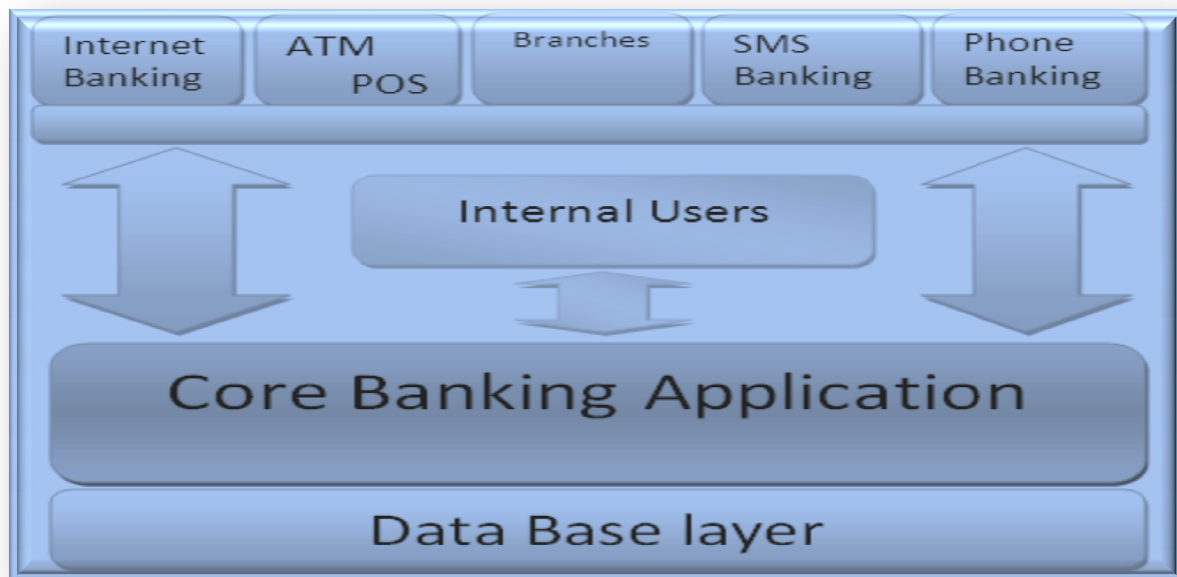


Figure 2.3: Magic Quadrant for International Retail Core Banking

According to Gartner (2009), the CBS positioning based on magic quadrant described in Figure 2.3. The CBS software packages such as Flexcube, Finacle, Temenos T24 and Fiserv, which the Sri Lankan commercial banks also are using, are leading the market. Figure 2.4 below depicts a typical banking system environment, which includes data base layer, application layer and the delivery channels. The CBS maintain all transactional information

about customers and their accounts while the delivery channels will connect to the core banking application to perform transactions. There are two types of users in banking systems namely; internal and external users. All bank staff can be categorized as internal users while others such as customers and their authorized representatives would be considered as external users.

CBS are basically the heart of all systems running in a bank and it forms the Core of the bank's IT platform.(Infosys, 2009) Amongst other functionalities, it provides the customer information management, central accounting and the transaction-processing functions, which by far are the most fundamental processes in a bank. With the advancement in technology and with passage of time, core systems now a days tend to cover more and more functionality giving the bank an integrated solution for most of its operations in different business lines. Besides that, it also provides a central operational database of customers' assets and liabilities giving facility to generate a 360 degree view of the customer's relationship with the bank, which is fundamental for the Customer Relationship Management (CRM) strategy of the bank. CBS reside in the bank's data center or in other words can also be termed as the heart of the data-centre itself. (Satchidananda, 2006)



Source: Temenos News Letter 2009

Figure 2.4 – High Level illustration of core banking application

There are many core banking applications, which support banks operations throughout the world. Some of these applications run with specific database layers while others run on independent database. Also, there are applications that support delivery channels, which provide interface to connect with third party software. The core application is the most important in entire technology used in banks. The figure 2.4 illustrates the typical CBS architecture.

The implementation of bank's core banking solution is vital for the enhancement of the function and services which the management and the employees could extend to provide excellent customer service. The core banking solution will also bring in effective controls, policies and disciplines in providing a customer centric knowledge based culture, which enhances productivity and competitiveness. (Peoples Banks Annual Report, 2006)

2.8 Core Banking System Changes

Banks invest to increase customer touch points and channels to provide better customer service and to maintain a single view of the customer, across all channels. Similarly, the customers get experience in consistent look and feel across all banking channels. The key to success of these systems is the ability to increase the number of banking channels without compromising service levels. Satchidananda (2006) discussed key reasons for change of CBS. Current technology proves to be a barrier to business growth and support, scalability issues to organic growth of the bank, Cost of Maintaining the legacy system rises, without any perceptible benefit accruing to the bank, large scale 'Manual Handling of Transactions' resulting in longer turn-around times, increasing the regulatory burden and inability of the system to handle new regulations, severe interfacing issues, viability of the vendor supplying the core system are some of the points related to core system changes in the banks.

The legacy core systems are inflexible to meet current market demand and to be on par with technological advancements. The banks face difficulty in offering new services to customers using rigid banking systems, which affects banks' ability to respond to their agile competitors. Banks require core systems that empower them to meet an ever-growing list of customer expectations, substantially improve customer experience and in turn enhance customer delight and process high transaction volumes across multiple channels, online and

in real-time. Core systems must support a range of customized products, reduce time-to-market, and offer a 360-degree customer view even, as they lower costs and achieve operational efficiency. Replacing a legacy CBS is certainly a challenging task. But taking the right approach can make the difference between success and failure, between a time-consuming, costly and disruptive exercise. (Commercial Bank of Ceylon Annual Report 2008, Bank of Ceylon Annual Report 2009)

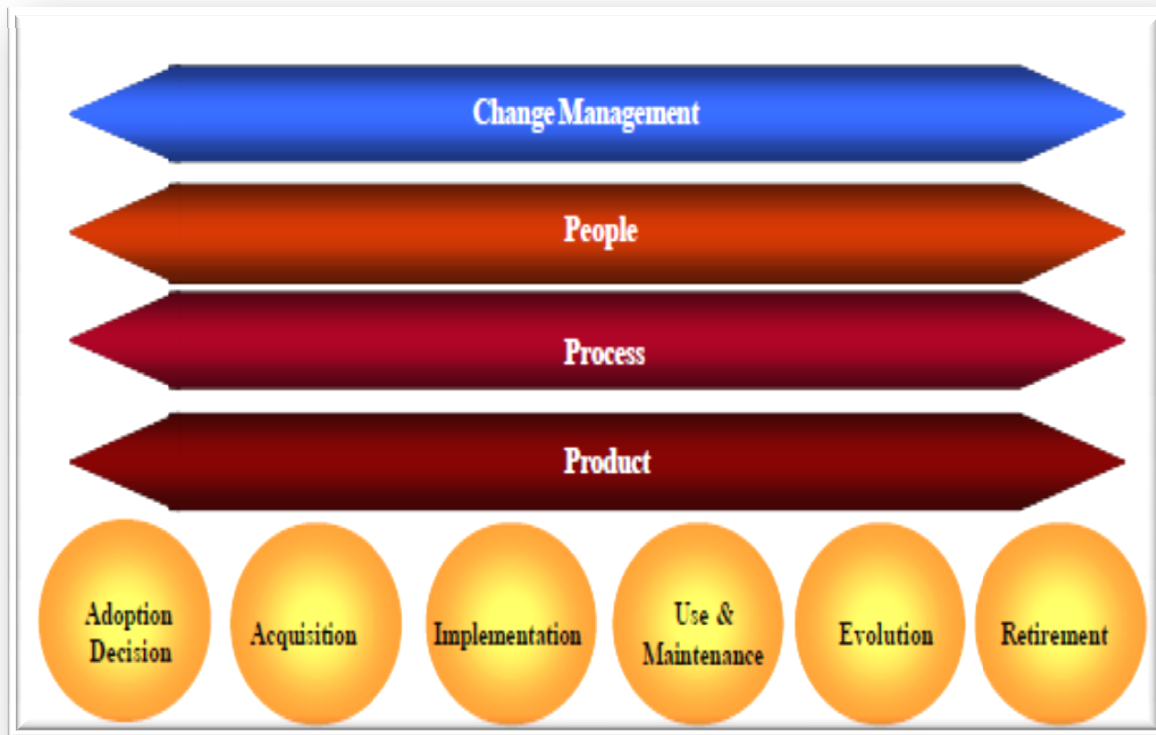
IBS describes the International Banking Systems (IBS, 2008) sales league based on 2008 sales results. The banks globally change their CBS with the state of the art systems. The sales league provides information on number of new sales each CBS vendor completed during the calendar year under review. The leading core banking software providers dominating the tables have provided CBS for Sri Lankan commercial banks as well.

The replacement of an existing system is a challenge for any institution, especially when it comes to financial institution, with financial transactions involving high sensitive segments. There are key challenges when changing CBS by banks such as, established comfort level with existing technologies and processes, relatively comfortable margins that provide the luxury of overlooking operational inefficiencies etc., (Gopal, 2009). The banks have realized the value of new technology to enhance the business opportunities. The current competitive environment with increasingly demanding customers are forcing banks to update technology environment and ensure that their IT strategy is aligned with their business objectives. (Weeraratne, 2004)

A core banking solution, once implemented, should be robust, scalable, future-proof and serve the business interest for at least 10 years. Banks need to focus on key factors, which make the core banking transformation a successful experience. Broadly speaking the key challenges in core banking transformation are vendor capabilities and credentials, dependence on legacy/vendor applications and impact of envisioned technology architecture, bank's business goals and alignment to leverage the new technology etc.,(Infosys, 2009)

The framework defined by Esteves & Paster (1999), described structured phases and dimensions in ERP system life cycle, which is also applicable for the banking systems as

well. The phases are the different stages of an ERP system life-cycle within an organization and dimensions are the different viewpoints, by which the phases could be analyzed.



Source: *First International workshop in Enterprise Management and Resource Planning: Methods, Tools and Architectures*

Figure 2.5 – The ERP Life-cycle Framework

The dimensional vision of the framework presents a set of related issues. The change management includes cultural issues, organizational structures, roles and skills, management of strategic change and business process re-engineering.

2.9 Benefit of Core Banking Solutions

The success or failure of any project primarily depends on the Return on Investment (ROI), which is generated from the implemented system. This is the factor more often used to determine projects' failure or success. Satchidananda, (2006) assesses the benefit from core banking solutions, which could be divided into two broad areas such as economic benefits and performance or subjective benefits.

2.9.1 Economic Benefits

The cost savings from core banking projects are visible over a period of many years from implementation. The high investment cost and time to market new product and services are the factors to consider. The ROI compounds, as new lines of business and geographic areas move on to the new platform. The return of investment is slow in the first few years till such time the real benefits of the system commence accruing to the bank. The research reports indicated that large core banking replacement projects enter a positive Net Present Value (NPV) as late as the 5th year (Satchidananda, 2006). The expected lower transaction processing costs within the branch and through other delivery channels could increase returns. The reduction in license fees related to other software with the implementation of a new CBS, which reduce the complexity would constitute as savings for the bank almost immediately. The reduced maintenance costs and flexibility in customizations make it easy for the bank to build the systems to suite their specific requirements in a lesser time. Efficient usage of hardware resources by the new CBS significantly reduces the investment in hardware as well as its maintenance cost.

2.9.2 Performance Benefits

The banks also implement CBS to meet its business objectives. The inflexibility more often tends to create an impediment in building new functionality, eliciting data for newer regulations like the BASEL II, accessing better information on customer so as to enable risk management, cross selling, addition of newer business lines, offering new products in the existing business lines and so on. New generation core systems provide flexibility in terms of being modular in nature and supporting an integration layer, which can be used very effectively to connect on to third party applications. (Vendor Reports)

The customer is a key factor for banks; new solutions tend to give a complete 360 degree view of the customer transactions. Satchidananda (2006) explore the objective of new core banking solution to obtain complete perspective of the customer relationship with the bank. This would enable banks many cross selling opportunities. Some of the core systems use data mining tools to harvest useful information from customer transactions and try to get a meaningful message out of that. The most transactions done in the newer core banking solutions are on-line real time not only within the package itself, but across all delivery channels. (Infosys, Temeos, iflex reports, 2009/10).

The automation of processing the transactions through Straight-Through-Processing (STP) has been used so often with new implementations, which enable banks to bring in the operational efficiencies and reduce the risks. The research reports indicated that the percentage of global trade failures and crystallized transactions resulting from unmatched trade data is of the order of around 15% of the total trades (Satchidananda, 2006). The STP technology framework seeks to provide these efficiencies by providing a seamless data flow both within the enterprise as well as across the market, without any manual intervention. Trends indicated that almost all the major core banking vendors have done considerable amount of investments in making their products STP enabled, at-least for a few key processes within the bank. (Vendor Reports)

2.10 Software Selection

The right software selection is crucial for Banks, which involves high risk decision making, there are several methodologies to select software. The consultancy firms provide a range of information on this subject based on their experience in the software industry and experience in doing this process for their clients. (TGI, 2009)

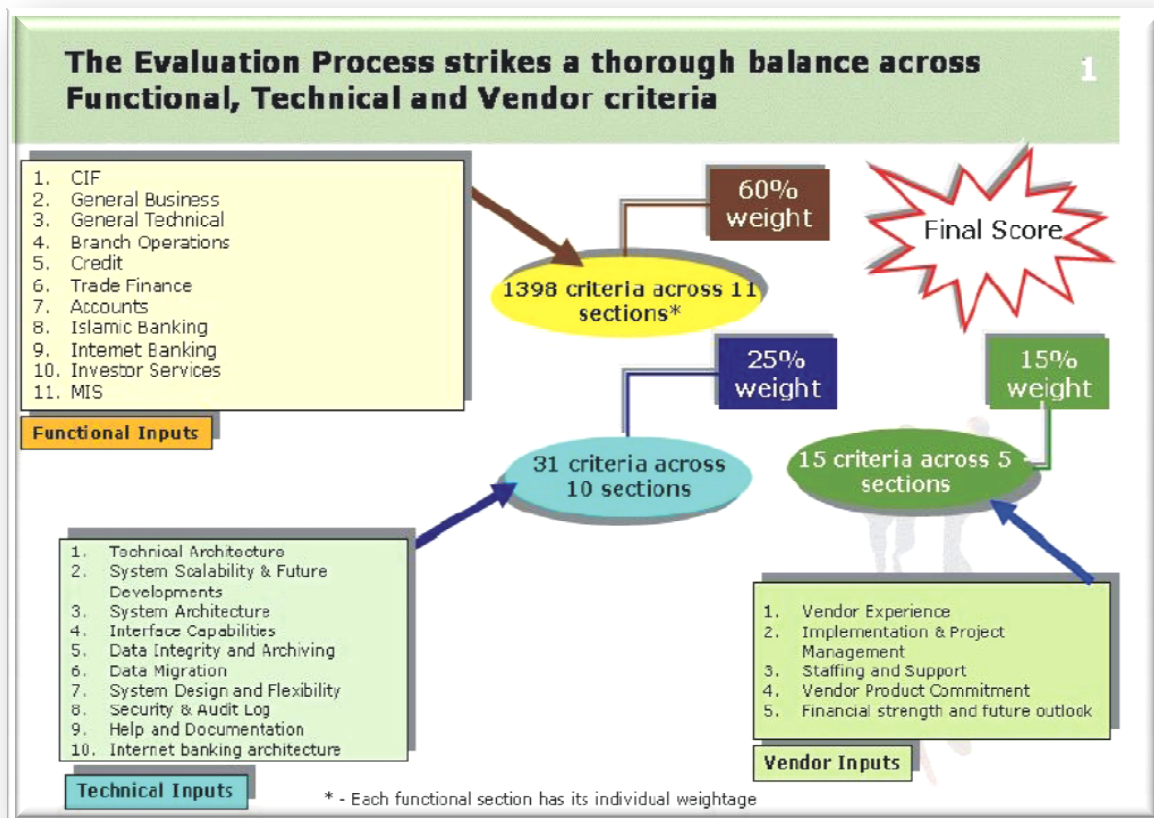
The Goolsby (2008) further described that selection of a packaged-based solution for a CBS is a complex process. It is also a strategic decision with long-term implications, to ensure that the system will achieve the vision and objectives. Banks must drive the selection process from a business perspective, rather than from a technical perspective.

Dortson (2008) compiled in 2008 CBS survey from September to December 2007. It was based, in part, on a survey sent to the 16 major vendors of core banking solutions. The survey report includes a discussion on solution selection criteria as well as a discussion on a structured approach for implementation, based on best practices.

CBS is the back bone of banking products and services. Selection of the right software is a key function of the whole process of changing CBS. The effective software selection based on defined business needs, which would be the single most important factor in the selection process. Twenty percent (20%) of IT projects fail to achieve corporate goals due to not defining proper business needs for the acquisition (Ramkumar, 2004). Therefore, it's necessary to define requirements clearly before the selection process. The prioritization, well

define selection criteria and reference feedback are some of the important factors in selection process. Twenty three percent (23%) of IT projects do not meet the business requirements. Hence, proof of concept (POC) is critical before the selection of system to identify the best fit to all requirements. (Ramkumar, 2004)

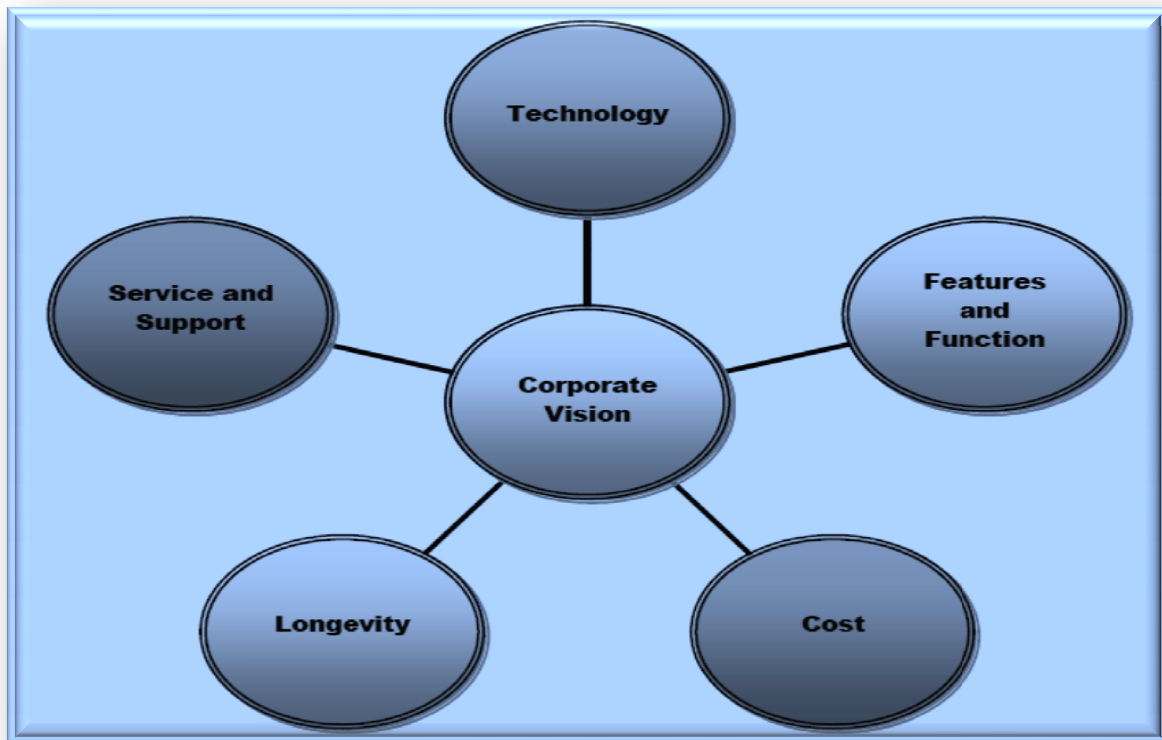
The software selection process should include functional requirements, technical requirements and vendor credentials. The figure 2.5 illustrates a better software selection process. The final score should derive from the three major areas, which should not be ignored in selecting best software for the organization. (Ramkumar, 2004) The most important factor in software selection would be the clear objective of the change. The “Best-fit” software could be identified when organization uses the framework defined in figure 3.5 with the support of top management. The top management commitment to a large project is critical and the efforts will be rewarded in the long run (TGI, 2009).



Source: Cedar Consulting

Figure 2.6: Software selection Framework

The IT system selection would commence based on research and planning to identify the need for change, which include key indicators or project drivers. Project drivers align to business goals, development of a project plan and business case. The requirement identification and proposal preparation are the first step in the selection process. The best practices in software selection will provide detailed descriptions on each steps such as the executive support, steering committee, identifying key business initiative and long term goals would be the key element in step one. A dedicated project team, which consists of members from various user-departments, would be advantage to identify requirement analysis to prepare a proposal. The team members should have cross functional knowledge and would be ideal to have from senior levels. This team can be educated on the project plan. The requirement definition portion of the selection process is of vital importance to successful selection of a package. The requirement analysis would consist of preparation for the definition of requirements, interview functional areas to evaluate needs, prioritize requirements and review completed requirements with the team. (TGI, 2009)



Source: *Technology Group International*

Figure 2.7: *Supplier Criteria for Software Selection*

The Requirement for Proposal (RFP) is the commonly used method in software selection. This would be the best practice to communicate requirements with potential vendors. The supplier evaluation can be done based on the information provided through interviews or responses for the RFP. This information would be advantageous to short list the suitable suppliers. (TGI, 2009)

The figure 2.7 illustrates six areas which should support the organization objective of the change in system. The supplier ability to deliver product services goes well beyond price and feature options. It is important to review all these six main categories before selecting the supplier. While understanding the supplier criteria, which are only a portion of the entire selection process, it is prudent to review and evaluate this alongside the other selection factors. This list is best utilized as an element of the overall software selection process and should be used in conjunction with other elements such as the RFP response, on-site demonstration, and references. (TGI, 2009)

Organizations face challenges with the existing software to meet business requirements and accordingly invest significant capital on software to compete with competitors. Hence, the selection of right software is an important factor in the whole process of implementation. Factors such as requirement not understood correctly, functionality does not match with the requirements, ignored change management process, and cutting corners on training and implementation would be some impacts on implementation. (TGI, 2009)

There are six key phases on selection of software, mainly focus on ERP system selection process such as, project Startup (Kick-Off), defining requirements/business processes, identifying a short-list of the best possible solutions, vendor demonstrations, selection summary to identify the best solution, selection support to assist with project implementation. The software selection focuses mainly on identifying and ensuring the evaluation of those attributes to meet the functional and non-functional requirements of the acquiring organization. However, the organization would review the decision on its selection strategy. It should include and evaluate the longer benefits to the organization from the software products (TGI, 2009).

2.11 Contract Negotiation and Legal Aspects

Negotiation is an important element for the successful completion of vendor selection. A good negotiation would provide better outcome for the bank. A proper negotiation team is a critical factor, which includes attorneys and accountants. It is also important to get business managers and critical functional users involved in this process. Preparation is important before the negotiation. Identification of key issues, site for negotiation, remaining flexible, avoiding premature position taking and closing the deal with good relationship would be some of the factors organizations should consider before the negotiation. (Rockne, 2010)

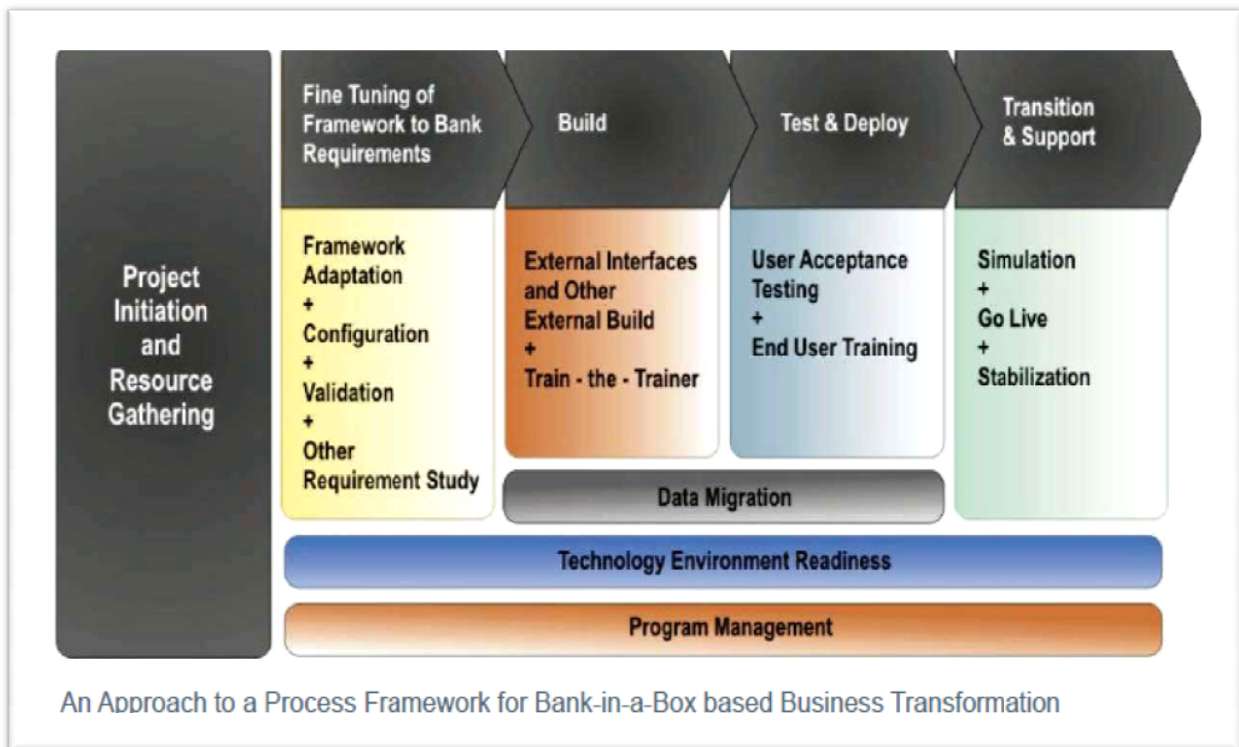
Legal concerns in contracts are a crucial area to seriously evaluate before the contract negotiation. The contract is a written agreement between the owner and the service provider, which includes mutual intent, offering and acceptance, consideration, legality of purpose and capacity. If any one of above is missing, the contract will be defective or non-enforceable. All relevant legal conditions in agreements are important factors in software implementation, which involve considerable money and time. (Eric, 2010)

The banks normally sign two agreements with the core banking vendor, i.e. license agreement and maintenance agreement. In the case of new implementation an implementation services agreement may also be signed with the vendor.

2.12 Implementation of Core Banking System

Banks face a challenge in implementing the selected CBS as per the requirements within the agreed time frame and budgets. Current vendors and their history of implementation of CBS in Sri Lanka show that the method of implementation depends on the vendor. The key challenge in core banking replacement would be vendor capabilities and credentials, dependency on legacy/vendor application, impact of the envisioned technology architecture and business goals of the bank etc. The packaged software for CBS is becoming popular, which includes all basic features of banking activities. This process has changed the traditional implementation to more focused implementation with defined time processes and time frame. (Gopal, 2009)

Figure 2.8 shows the processes involved in implementation of packaged software. Bank-in-a-Box is a comprehensive, new age technology solution and process framework for banking transformation. When developed on a powerful architectural foundation, it offers a full functional application coupled with a process stack in a ready-to-deploy state for the bank. Empowering this concept significantly is the consolidated implementation experience of a vast pool of professionals in the form of the process framework, further enriched by cross fertilization from best practices sourced from central banks world over. The implementation methodology would optimize activities such as requirement study, training and application parameterization to single-block or parallel processes as the project logic demands, dramatically reducing effort and slashing implementation lead time. The framework should be completed with user assistance that enables the bank’s IT team to truly assimilate the full functionality of the solution and leverage it for maximum advantage. The pre-configured parameter set would cover all aspects of setting up the banking enterprise that includes, but is not limited to static data, standard products and also include security and control standards, and accounting rules and the chart of accounts. (Gopal, 2009)



Source: *A Framework for Business transformation for Mid-sized Retail Banks*

Figure 2.8: Framework for Bank-in-box Business Transformation

2.12.1 Project Management

Project management is a critical activity in software implementation. It is an application of knowledge, skills, tools and techniques to manage project activities to meet the project requirements. It is accomplished through the application and integration of the project management process of initiating, planning, executing and controlling, and closing. The project manager is a person responsible for accomplishing the project objectives. (Project Management Body of Knowledge, 2004)

Projects in general involve several people, performing interrelated activities. Efficient project management is not something that should be taken for granted. It has to be advocated and implemented in the same way as other key business functions in organizations. A study by the Center for Business Practices showed that implementing project management initiatives in IT organizations led to improvements in schedule estimating, customer satisfaction and alignment to strategic business goals. Such organizations that implement project management will be at a competitive advantage compared to others. The study goes a long way in validating the considerable gains an IT organization can make by planning and instituting formal project management practices.

The most important factors relating to project management are schedule estimating, customer satisfaction, alignment to strategic business goals, cost/hours estimating, time and budget to date, and quality. Many companies do not collect metrics that show the value of a project to the organization. Matured project management techniques should be used in place for the progress and the status of projects, which is not measured and monitored consequently as the project failure comes as a surprise at the expected time of project completion.

An important part of project management procedures in organizations is to prepare and review project status reports. Organizations that do not require their project managers to submit status reports show disinterest in their projects and will often blame the project manager when a project is in trouble. On the other hand, strict procedures for reporting on the status of projects are an indication that management cares about the progress of projects and is willing to help when needed.

Implementing effective project management environment is a crucial factor for successful completion of a project. The successes in implementing effective project management environment depend on senior management commitment and involvement. The people competent are a vital factor in the project planning, execution and monitoring. (William, 2004)

Srivastava, (2009) revealed that organizations invest large amounts of money for ERP system implementation where projects fail not having top management support. From 2003, the top management had understood the causes for failures and took several strong measures turning a poor performing ERP project in to a success. He further explained that the top management appointed an experienced project manager with required authority and command at the top position to carry out the project. The project manager devised an effective project management strategy to control the ERP implementation, avoiding overrun of budget and ensuring the implementation within schedule. The project plan defined project activities committed personnel to those activities, and promoted organizational support by the implementation process.

2.12.2 Project Implementation Best Practices

The use of best practices in project implementation is important to the success of the project. Frantz, Southerland and Johnson (2002) defined best practices based on the ERP software implementation process. It further discussed similarities and differences in Chief Financial Officers (CFO) and Chief Information Officer (CIO) perceptions of best practices for ERP implementations. The study was done with a sample of 308 CIO's and CFO's from 170 different institutions. The table 2.3 ranked best practices of ERP implementation based on the survey results. The management commitment and guidance is identified as one of the critical items for project success. (Frantz, Southerland and Johnson 2002)

Table 2.3: ERP Software Implementation Best Practices

Statement	Mean	
	CFO	CIO
Executive management should endorse the ERP Project	4.85	4.95
ERP software implementation responsibilities should be shared between the IT department and functional areas where the software is being implemented.	4.70	4.86
Executive management should be cognizant about the institutions ability to adapt to the organizational changes that occur when ERP software is implemented	4.65	4.67
A project manager should be assigned full time for the implementation	4.52	4.76
The project team composition should represent all functional areas where the software will be implemented.	4.61	4.84
The institution should retain ownership of the implementation process	4.63	4.53
All employees who will use the software should receive through training	4.57	4.83

Source: *ERP software best practices-2002*

The implementation success factors have to be defined before project kick-off. The involvement of all functional units in the project implementation is vital for it's success. The training and prioritizing requirements would be an advantage in completing the project on time (Lewis, 2003).

Fichman & Moses (1999) explored a new concept for software implementation after critically evaluating traditional practices in software implementation process. The incremental process for software implementation is a concept defined which include stages of process. The user can see the benefit once each process was completed by identifying key performance indicators for each stage and achieving them successfully for each stage.

2.13 CSF's for the ERP software implementation

Bhatti (2005) defined 12 Critical Success Factors (CSF) in ERP implementations and also mentioned that past studies done to identify CSF's in ERP implementation.

Project Management: The skills and knowledge involves scheduling and monitoring of project activities to ensure that the objectives are achieved through successful implementation.

Process Redesign: The business process reengineering is an important factor in ERP implementation. This process requires examination of business process, which would be important to achieve benefit of the implementation of ERP system.

User Training: The many projects fail due to lack of user training, which is important for the successful ERP implementation.

Technological Infrastructure: The proper technological infrastructure is a mandatory requirement for the ERP implementation.

Change Management: Change management is a crucial factor of the implementation; the resistant to change is most common in any implementation. It is important to identify the change and its affect to the core system.

Risk Management: Top management support, Communication, Team work, User involvement, Use of consultants, Clear goals and objectives enable mitigation of project risks.

Somers and Nelson (2001) identified critical success factors of ERP implementation as the top management support, project champion, user training and education, use of consultants, minimal customizations, data analysis and conversion, business process reengineering, defining the architecture, management of expectations, vender/customer partnership, use of vendor's development tools, careful selection of the appropriate package, project management, steering committee, dedicated resources, project team competence, change management, clear goals and objectives, education on new business processes, interdepartmental communication and ongoing vendor support.

Table 2.4: ERP Implementations - Critical Success Factors

Critical Success Factor	Mean	Std. Dev.
Top Management support	4.29	1.16
Project Team competence	4.20	1.07
Interdepartmental cooperation	4.19	1.20
Clear goals and objectives	4.15	1.14
Project management	4.13	0.96
Interdepartmental communication	4.09	1.33
Management of expectations	4.06	1.37
Project Champion	4.03	1.58
Vendor Support	4.03	1.60
Careful package selection	3.89	1.06
Data analysis and conversion	3.83	1.27
Dedicated resources	3.81	1.25
Use of steering committee	3.79	1.95
User Training on Software	3.79	1.16
Education on new business processes	3.68	1.26
Minimal customization	3.68	1.45
Architecture choices	3.44	1.19
Change Management	3.43	1.34
Partnership with vendor	3.39	1.21
Use of vendors tools	3.15	1.57
Use of consultants	2.60	1.20

Source: *European Journal of Information Systems (2002)*

The research was based on a random sample of 200 ERP systems implemented, taken across all business areas, feedback taken from top and middle management. Table 2.4 provides the mean ranking of CSF's by degree of importance in ERP implementation.

2.14 Causes for Software Implementation Project Failures

Lewis (2003) discussed the software project failures, where there are more risks in large software projects. The software implementation faces challenges such as people, technology, culture and communication. He further describes eight reasons why software implementation fails.

Lack of line sponsorship –Most of the IT projects run by CIO or senior member in IT department, would have issues in aligning correct resources to the project. Therefore, the project sponsor has to be taken from business line to drive the project. This champion should focus on create alignment, communication, gain commitment arrange resources and build durability.

Identification of success methods – Lack of clear vision on what success will look like at the completion of the implementation, where the main problem is, focusing only on technology and IT point of view.

Competing changes in the organization – There are many changes in the organization during the implementation. The software implementation would not be a part of the initiative strategy of the organization which will impact the change process.

Training and Development – Poor documentation, not focusing on user training, not providing technology assistance for users etc. will affect the implementation.

Poor change management and Internal marketing – Not identifying the opinion leaders, will affect the project progress. These opinion leaders can derail the project phase. Communications is vitally important in handling opinion leaders and those who are not taking the changes positively.

Poor Internal Marketing from the line management – Senior management not being convinced about the benefit from the project and not building support from the staff and management would affect the project implementation adversely.

Lack of incentives for employees to change their behavior – Not encouraging and rewarding employees to use the software application with new innovation would affect the adaptability of the software.

Lack of willingness to do lessons learned – Not learning from their own past experiences and that of others.

Srivastava (2003) explained ten reasons for ERP system failures and identified how to make implementation a success. The evaluation of failure factors provided the information to eliminate those, when implementing software systems. The most common failure factors which most literature describes are the poor top management commitment and support, lack of frequent follow-ups and review from top management, not encouraging the project team to complete the implementation successfully etc. Srivastava (2009) further identified automating existing redundant or non value added processes along with unrealistic expectations as a factor leading to project failures.

Lewis (2003) mentions the importance of preparing requirements as a crucial factor for the implementation. Selection of correct vendor, correct project team and identifying the eight reasons for failure mentioned above will enhance the project success. He puts that as a slogan “You have to have a dream, but you have to get out of bed”.

Zenith bank (2008) one of the large Nigerian Bank has failed to complete their CBS implementation even after two years since implementation. The project implementation started with project scoping, after an extensive training that lasted about three months for up to about sixty users from the bank. The Bank intended to leverage on new banking system for its aggressive business strategies across subsidiaries, in Nigeria and abroad, and for its core banking needs. The new core banking implementation has been a very huge and massive implementation covering all business areas of the bank. Retail channels, corporate banking and lending, domestic treasury and international trade are covered by the proposed CBS. When the project is completed it was expected to run in over 200 Branches of the Bank. The implementation approach would be a bank wide deployment, which by implication means that user testing, training and system performance, and other change management issues must be painstakingly and thoroughly executed by the time the system goes ‘live’. There was a cut

short after three day 'live' run based on some strategic business imperatives which the Bank needs to give more urgent priorities. (www.nairaland.com)

2.15 Assessment of Case Studies

There are no published case studies related to Sri Lankan banks. However, some of the research materials provide information on CBS transformation in Sri Lanka. Amarasinghe, (2008) identified technology transfer related to CBS, which conclude the implementation success. The research describes that some banks meet their project objectives while many others don't. Pilot survey done on the domestic licensed commercial banks shows instances where there were more than one CBS being used to support customers. Vendors only publish articles related to the success stories of their implementation but are silent on failures for obvious reasons.

Bank Sohar, as a start up implemented Bank-in-a-Box solution from Infosys Technologies. The success factors which were identified based on the implementation describe the proper approach as 'recommend' approach rather than a 'requirement seeking' approach. Project management is a key for success that includes detailed project planning, which describe in detail the action plan for each activity. Proper business process reengineering and detail training have provided an advantage for the implementation team. The testing and acceptance was crucial for implementation success, and the team was required to perform a complete but timely testing during System Integration Testing (SIT) and User Acceptance Testing (UAT). The senior management commitment contributed to the success of the implementation. The more important factor was the adaptation of packaged software by the bank, which was built incorporating best practices of the banking industry, with minimum customization. (Infosys, 2009)

2.16 The new Approach

The previous researches and article related to software selection and implementation projects were used to identify success factors for the CBS projects in Sri Lankan commercial banking context. The predecessors and arguments discussed in this chapter are used as a guide to identify such scenarios to be discussed in detail in chapter 3 sections 3.2

2.17 Summary

Core banking projects are complex, time consuming and is a resource intensive activity. There had been numerous studies done on ERP implementation where limited study on CBS implementation. Also, the vendors and consulting firms published information on core banking selection and implementation related to their software package. These research findings, vendor reports and case studies and best practices pertaining software selection, implementation and project management were discussed in this chapter as a basis for the research.

Chapter 3

Research Methodology

3.1 Introduction

This chapter describes the conceptual framework and the research methodology, which is fundamental to this research work. The research methodology was based on literature review on the subject matter and on the outcome of the pilot survey, which were focused on collecting and analysing both qualitative and quantitative data,.

3.2 Conceptual framework

As detailed in the literature review, a considerable quantum of research has been done by many researchers to identify critical success factors in implementation of application software in general (Somers & Nelson, 2001, White & Fortune, 2001). Apart from those, case studies specifically related to implementation of core banking applications reveal volumes of information related factors, which could determine the success or failure of selection and implementation of software solutions, (Amarasinghe, 2008).

Research and case studies have identified large number of success factors related to selection and implementation of software solutions (Yeo, 2001). Some of these success factors may be specific to the individual projects and many others were common to majority of the projects (Fui-Hoon *et al*, 2001, Holland & Light, 1999). The Consultancy Firms, Vendors and Project Managers infer success or failure of a software project based on their own experiences. This experience came through involvement in such projects (Ramkumar, 2004). The independent researchers may view success factors differently based on past experiences.

There are considerable amount of research done on Enterprise Resource Planning (ERP) software implementation (Holland & Light, 1999, Fui-Hoon *et all*, 2001, Bhatti, 2005, Akkermans & Helden, 2002). However, there is limited research or literature available on CBS implementations, out of which majority of articles have been published by the CBS vendors.

Critical success factors related to software selection and implementations, which have been identified in various researches, have been taken as a base for this study. There are many researches, which have ranked critical success factors based on survey results. Success factors described in software vendor case studies and reports of CBS implementation by consultancy firms too have been taken into consideration in forming the conceptual framework of the research. These success factors have enabled the researcher to identify a comprehensive set of critical factors and group them under two separate activities namely selection of CBS and implementation of selected CBS.

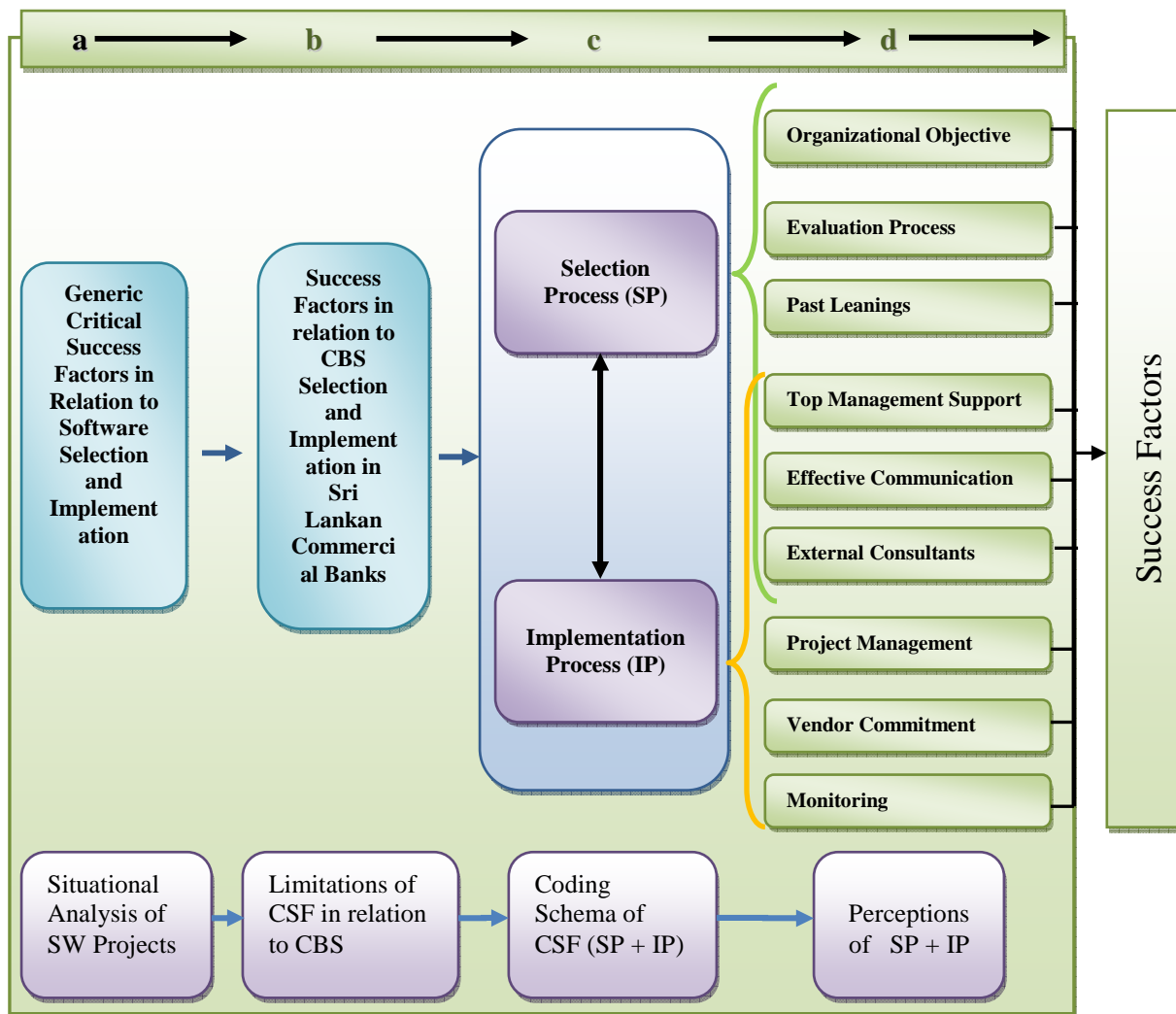


Figure 3.1: The Conceptual Framework

Figure 3.1 above shows the graphical illustration of the research model, on which the research was carried out. Stage 1 indicates identification of Generic Critical Success Factors related to selection and implementation of Software solutions, which was done through the

literature survey. In stage 2, the generic CSF's identified in stage 1 shall be used to analyze whether such are the factors that are useful in implementing CBS in Sri Lankan Commercial Banks. In addition data from interviews also was used to identify whether there were additional factors that would be relevant for the CBS project in commercial banks in Sri Lanka. Identified success factors were separated in relation to the selection and implementation processes as indicated in stage 3 and such factors are grouped under key perceptions/different attributes as shown in stage 4. Research variables under different perceptions/attributes were then converted to research questions in order to gather the data required to identify CFS related to CBS selection and implementation processes in Sri Lankan Commercial Banks. Each of the stages are described in detail below

a) Generic Critical Success Factors related to Software Selection and Implementation.

Any typical project related to acquiring a software system involves two phases namely; software selection and implementation of the selected software. Selection of an appropriate software matching the organizational goals and aspirations are an important aspect of the selection process, as failure in this phase alone could affect the success of the project. Evaluating the software to suit the organizational requirement is another key aspect in the selection phase. Learning from the experiences of the organization itself as well as from the experiences of other similar organizations would be helpful during this phase. Once the selection of suitable software is completed, the implementation could begin. The implementation strategy is largely dependent on the Software selected and the capabilities of the vendor. Many factors could affect the success of the implementation phase including the project manager and the way he/she managed the project, stake holder expectations, commitment of the vendor and the support of the top management etc. Previous Research, Project Management Body Of Knowledge (PMBOK), Case Studies and Vendor Reports provides a sound basis in identifying best practices, which leads to the success of these types of projects. Through the literature survey, success factors related to selection and implementing of software solutions were identified.

Table: 3.1 Success Factors Identified through Literature Review

Identified Success Factors	Source
Top Management Guidance and Support	Frantz, 2002, Bhati, 2005, Akkermans & Helden, 2002
Clear Organizational Goals	Somers & Nelson, 2001, Bhatti, 2005, Akkermans & Helden, 2002
Proper Requirements	Ramkumar, 2004
Use of External Experience Consultants	Bhatti, 2005, Somers & Nelson, 2001
Business Process Reengineering (BPR)	Bhatti, 2005, Somers & Nelson, 2001
Cross Functional Input	Akkermans & Helden, 2002
Steering Committee	Somers & Nelson, 2001, Akkermans & Helden, 2002
Success Stories & Case Studies	Ramkumar, 2004
Experienced, Full Time Project Manager	Akkermans & Helden, 2002
Experienced and Knowledgeable Project Team	Bhatti, 2005, Akkermans & Helden, 2002
Vendor Support and Commitment	Somers & Nelson, 2001, Akkermans & Helden, 2002
Adaptation of Solutions and Minimum Customization	Amarasinghe, 2008, Akkermans & Helden, 2002
End-user Training	Bhatti, 2005
Frequent Communication with Stakeholders	Robert, 1999, Bhatti, 2005

Source: *Literature Survey Results*

b) Success Factors in relation to CBS Selection and Implementation in Commercial Banks in Sri Lanka

Identified generic success factors related to software selection and implementation were validated for their relevance through a series of focus group interviews with the members of the senior management team and heads of IT of the Domestic Commercial banks. This was done with a view to identifying success factors in CBS Selection and Implementation in the context of the Sri Lankan commercial banking industry. Through this process, it

was possible to identify additional success factors, which were not identified in the literature survey. These additional success factors are more relevant for CBS projects in the context of domestic commercial banking industry.

Under the typical circumstances IT department of a bank plays a role of a facilitator during the process of decision making pertaining to selection of a suitable CBS and also in managing the implementation. It was revealed during the pilot survey that in the case of most of the projects, IT department was involved in both selection and implementation process. The Heads of IT of the Banks were interviewed to validate the success factors identified during literature review.

Table: 3.2 Success Factors Identified through the Focus Group Interviews

Success Factors
1. Cooperation of Senior Management & Binding of Business Users
2. Positive Thinking and Open mindedness of the Project Team
3. Proof of Concept (POC) by the Vendor
4. Response of the Vendor to the RFP of the Bank
5. Monitoring CBS project progress by the Board of Directors
6. Prioritization of Business Functionalities during Implementation phase.

Source: *Focus Group and Interview*

Tables 3.1 and 3.2 show a summary of critical success factors identified through the literature review and focus group interviews. Some of the success factors may be specific for ERP projects, which may not be success factors for a CBS project. However, majority of software selection and implementation success factors related to ERP projects appear to be valid in CBS project context. The success factors described in Tables 3.1 & 3.2 were used in preparation of the survey questionnaire to separately identify the CBS selection and implementation success factors.

c) Coding Schema of CSF

Any typical CBS project consists of selection and implementation phases where both have to be successful for the success of the project. Success factors identified under the above process were separated into these two stages namely selection phase and implementation phase. Based on the interviews with focus group, factors related to selection and implementation processes were identified.

d) Key Perceptions and Aspect of the Attributes

Factors identified in the above two processes were categorized under the Key Perceptions and Aspect of the Attributes as described in Table 3.3 below.

Table: 3.3 Key Perceptions Related Success factors

Key Perceptions	Success Factors
<p>Organizational Objectives – (<i>Rationale</i>)</p> <p>Banks need to have a clear focus related to the investment in CBS by identifying the desired goals, objectives, outcomes and benefits of the project and establishing an evaluation criterion to measure the success of the project based on achievement of the identified goals, objectives, outcomes and benefits.</p>	<p>Clearly establishing goals, objectives, outcomes, and benefits desired of the project before evaluation and selection of the CBS Package – <i>Organizational Expectations</i></p>
	<p>Willingness to critically evaluate current business processes and re-engineer them wherever necessary during the CBS Project – <i>Process Innovation</i></p>
<p>Evaluation Process – (<i>Appraisal</i>)</p> <p>Appraisal of the proposed CBS solutions based on the functional requirements matching with the “<i>Organizational Expectations</i>” reduces complications during the implementation phase and will assist the banks to be transparent and be precise in selecting the most suitable CBS.</p>	<p>Obtaining inputs from concerned cross-functional users.– <i>End-User Participation</i></p>
	<p>Documenting the functional requirements – <i>Refining the Requirements</i></p>
	<p>Evaluation of RFP – <i>Evaluating the Responses</i></p>
	<p>“Proof of Concept” (POC) prior to the final decision to select, is made. – <i>Proof of Concept</i></p>

Key Perceptions	Success Factors
<p>Learning through Experience – (Insight)</p> <p>Using the learning from own experiences and that of the other organizations in relation to similar projects will help the banks to minimize obstacles and complications during the implementation phase. Success stories and case studies related to other similar organizations will provide valuable insight on the implementation capabilities of CBS Vendors under consideration and functional capabilities of the proposed systems.</p>	<p>Use lessons learnt through own past experiences in similar projects during the selection and implementation of CBS, – Lessons Learnt</p> <p>Look for Success Stories / Case Studies related to proposed CBS solutions and implementations by the vendors short-listed for selection. –Sharing Experiences</p>
<p>Top Management Support – (Leadership)</p> <p>Contrary to the popular belief that CBS projects are IT projects, they are in-fact business projects. Hence they shall be sponsored by the business, instead of IT. Leadership provided by top management plays a vital role in all aspects of project guidance, support, and commitment which would be vital for the success of any CBS project.</p>	<p>Top Management guidance during the selection and Implementation phase of the CBS – Setting Direction</p> <p>Top Management support during the selection and Implementation Phase – Project Sponsorship</p> <p>Commitment and Binding of the Business Heads for the Project– Business Commitment</p>
<p>Effective Communication – (Transparency)</p> <p>Effective communication between different stake-holders is important for the success of the project.</p>	<p>Effective Communication with Project Stakeholders – Transparency</p>

Key Perceptions	Success Factors
<p>Use of External Consultants – (<i>External Expertise</i>)</p> <p>Expertise of external consultants, who are experienced with CBS projects in general, who have seen the best practices in similar CBS solutions are vital for such projects.</p>	<p>Use of Experienced External Consultants – <i>External Expertise</i></p>
<p>Project Management – (<i>Proficient Execution</i>)</p> <p>Project management is an important part of any software implementation. Due to the size, resource involvement, duration and business criticality of CBS projects, they should be managed by professional and experienced project managers. Project Managers need to be result oriented and driven by project objectives. They have to be extremely professional in their conduct and independent in their decisions related to the project. They need to get required resources for the project from the banks standpoint and the commitment of the vendor from the other side.</p>	<p>Prioritizing delivery of business requirements based on project timing – <i>Prioritizing Delivery</i></p>
	<p>Adopting the proposed system with minimum customization to prevent scope creep.– <i>Minimum Customizations</i></p>
	<p>Professional, experienced and full time Project Manager to manage the CBS Project – <i>Professional Project Management</i></p>
	<p>Allocation of experienced and knowledgeable Project Team for the Implementation process – <i>Competent Project Team</i></p>
	<p>Allocation of Cross Functional, dedicated Project Team for the Implementation process – <i>Dedicated Resources</i></p>
<p>Project team need be optimistic and be open minded in finding solution for issues during implementation – <i>Creative Problem Solving</i></p>	

Key Perceptions	Success Factors
<p>Vendor Commitment – (<i>Delivery of Promise</i>)</p> <p>Vendor need to be supportive and committed during the implementation phase in order to complete the project in a timely manner. Delivering the agreed criteria to win the contract is the responsibility of the vendor. Allocating capable technical resources in adequate numbers and delivering the agreed functionality on schedule are the primary indicators of the commitment of the vendor to the project. Without the commitment of the vendor during implementation phase, the project could run in to complications resulting in strained relationships, time overruns and project failures, in extreme cases.</p>	<p>Vendor Support and Commitment during the implementation phase of CBS – <i>Vendor Commitment</i></p> <hr/> <p>Proper End User Training directly by the Vendor or by the bank with the support of the vendor – <i>Knowledge Transfer</i></p>
<p>Monitoring – (<i>Scrutiny</i>)</p> <p>Monitoring the progress of implementation by and frequent guidance of the Top Management and the Board of Directors will facilitate smooth execution of the project while motivating both the bank staff and the vendor to complete the project as planned.</p>	<p>Guidance from IT and/or Project Steering Committees for the CBS Project – <i>Guidance of Top Management</i></p> <hr/> <p>Monitoring the progress of the project by the Board of Directors – <i>Supervision by the Board</i></p>

3.3 Research Design

The structure of the research is shown in Figure 3.4. Initially a pilot survey was conducted to establish the requirement for a research in the subject area.

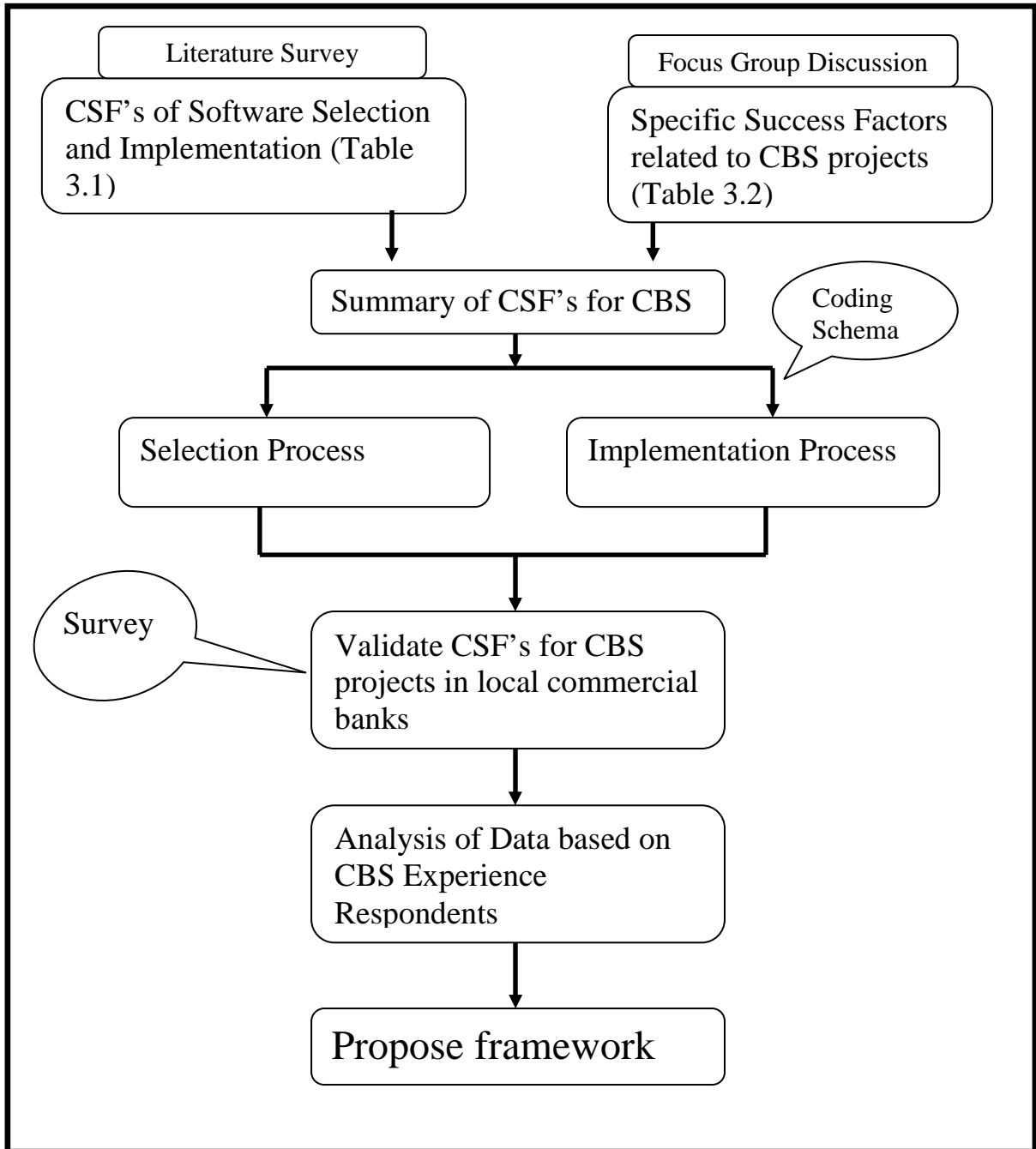


Figure 3.2 - Research Design

The inductive research approach was used for this research. The software selection and implementation critical success factors were identified from the literature survey. Identified CSF's were discussed with senior members in IT departments of the local commercial banks to identify their relevance for the CBS projects. Further additional success factors were identified from the focus group discussions.

The summary of CSF's was grouped under selection and implementation. The survey was conducted to validate the success factors in CBS projects in local commercial banks in Sri Lanka. Based on the analysis and discussions, the CSF's related to CBS projects in Sri Lankan commercial banks were identified. Finally framework was designed to facilitate CBS projects in local commercial banks in Sri Lanka.

3.4 Research Variables

The identified success factors were grouped based on factors related to CBS selection process and CBS implementation process. The phases of COTS (Commercial Off-The-Shelf) software selection and focus group discussion were employed to group the elements for software selection process. The ERP software implementation best practices and focus group decisions were employed to group the success factors related to implementation process. Factors, which were common to both the above, were grouped as common factors related to CBS selection and implementation processes.

As depicted in the conceptual framework, twenty three aspects, which could have a significant influence or impact on the success or failure of any CBS selection and implementation project, were identified as research variables. These variables were built into the survey questionnaire in the manner shown in table 3.5 below.

Table 3.4: Research Variables

Process		Success Factors of the perceptions of CBS Selection and Implementation	Related question in the Survey Questionnaire		
CBS Selection Process		Organizational Expectations	Question 7		
		Process Improvement	Question 16		
		End User Participation	Question 12		
		Refining the Requirement	Question 8		
		Evaluating the Response	Question 9		
		Proof of Concept	Question 10		
		Sharing Experience	Question 11		
		Lessons Learnt	Question 25		
		CBS Implementation Process	Common	Setting Direction	Question 13
				Project Sponsorship	Question 14
Business Commitment	Question 28				
Transparency	Question 22				
External Expertise	Question 26				
			Prioritizing Deliveries	Question 15	
			Minimum Customization	Question 18	
			Professional Project Management	Question 19	
			Competent Project team	Question 20	
			Dedicated Resources	Question 21	
		Creative Problem Solving	Question 29		
		Vendor Commitment	Question 23		
		Knowledge Transfer	Question 24		
		Guidance of Top Management	Question 17		
Supervision by the Board	Question 27				

Source: Author Compilation

3.5 Formulation of Questionnaire

Questionnaire is proven to be a suitable tool to collect data for survey based research as it allows the collection of large amount of data within a short period of time (Powel & Connaway, 2004). Hence, a survey questionnaire was used as the primary tool for collection of data for the purpose of this research. The researcher used two questionnaires to collect data from two separate categories of respondents as described in the conceptual frame work. The questionnaire for the interview process was used to validate the success factors found in related literature and to collect additional success factors, if any, other than success factors found in literature for the purpose of framework development. During the interview process, open ended questions were used to obtain more information related to the subject, which would enable researcher to produce qualitative analysis. Also certain questions were posed to interviewees in order to cross validate responses for the previous questions to make the analysis more reliable.

The second questionnaire was used to collect data for the “research proper” from the target population. The preliminary part of the questionnaire was designed to capture the demographic attributes of the respondents which would be useful in analyzing data. This section captured the demographic data such as job category of respondent, industry experience, specific experience in CBS implementation experience etc. Criteria of measuring the project success, influence of individuals or groups of individuals on selection and implementation processes and the degree of influence and criticality of different factors on the success of the project etc. were included in the questionnaire to evaluate the project objective and dependent factors. The success factors identified in Table 3.3 were used in the questionnaire to obtain feedback from the target sample population.

The survey data using the Likert scale may seem easy to analyze. (Shane, 2010). Therefore, the Likert scale, which is commonly used in this kind of survey based researches, was employed to quantify the response, which in fact is qualitative. It was used to measure respondents' feedback, where they were expected to indicate the degree of their agreement or disagreement on a given statement, where the typical five point Likert scale is "strongly agree", "agree", "neither agree nor disagree (neutral)", "disagree", and "strongly disagree."

Table 3.4 illustrates the interpretations and the weights allocated for each of the point on the Likert scale used for the survey questionnaire.

Table 3.5: Likert Scale used in Survey Questionnaire

(5)	(4)	(3)	(2)	(1)
Extremely Important for the Success of Project/Process	Important for the Success of Project/Process	Somewhat Important for the Success of Project/Process	Least Important for the Success of Project/Process	Not at all Important for Success of Project/Process

The questionnaire was primarily aimed at collecting data from respondents who were having experience in CBS implementations. As much success factors as possible were included in the questionnaire to minimize the uncertainty. This was expected to enable the participants to answer all questions with their experiences of CBS implementations in which they have participated. In certain questions, free space was allocated enabling the respondents to indicate any other factors or related information, which in their opinion deemed to be important for the research.

3.6 Quality Standards

Many steps were taken in order to maintain quality standards of the research. Primarily, the research questions were simplified and made straight forward and easily understandable as much as possible to avoid any ambiguity in the mind of the respondent related to the subject matter, on which his opinion is sought. By doing so, it was expected that the respondent would be clear of the research matter and on a broader sense would appreciate the purpose of the research, so that he/she will be truthful and honest in responding to the questionnaire.

Given the sensitivity of the information collected during the pilot survey, the researcher avoided using a voice recorder in order to make the interviewees comfortable in divulging and sharing information on a more personal note. The researcher had made every effort to capture data and information, which was deemed important for the research. Cross validation questions and pattern matching were used in the case of open ended questions to ensure the reliability of the data gathered. The interview meetings were arranged at times comfortable to

the interviewees with a brief prior introduction to the purpose of the meetings followed by e-mailing of the survey questionnaire. This was done to enable the interviewees to have adequate time to recall information related to projects and to have a constructive discussion on the subject enabling interviewee to express his/her ideas clearly. Interviewee was informed about the purpose of the study and the process prior to the “interview proper”. Notes were taken by the researcher during the interviews and the answers were verified for correctness of the understanding and to reduce misinterpretations.

The survey questionnaire was distributed in local commercial banks through contacts requesting them to distribute the questionnaire among staff members involved in CBS projects in the capacity of project team members, project managers and among senior managers who are usually involved in decision making related to CBS and/or have sat on project steering CBS committees etc. The researcher visited the banks to collect the completed questionnaires and in certain instances personally met senior managers of the banks to obtain their feedback for the questionnaire. In the case of CBS vendors, telephone interviews with the representatives of the participating vendors were conducted to cross validate the information gathered through the survey as a mechanism of enhancing the validity of the research data.

3.7 The Pilot Survey

Pilot survey was done in order to understand the basic information related to the research and ascertain the requirement for and the feasibility of the proposed research related to the subject matter. Another objective was to identify the target population for the research, in order to make it feasible. For the purpose of the pilot survey, Heads of Information Technology of the local commercial banks were targeted to obtain the required information related to CBS implementation experience for the preparation of the study. This basic information was used to determine the validity of the proposed research and was used subsequently during the preparation of the final research questionnaire. The format of the pilot survey questionnaire is attached as *Annexure I*.

During the pilot survey, it was revealed that CBS implementations involve substantial level of investments and resources, where risks were taken by the respective banks in varying

degrees. Under usual circumstances, the IT department of the banks initiates the CBS projects on the requirement and at the request of the business. A typical CBS project involves both selection of a suitable CBS and implementation of the selected CBS, which could be considered as distinct phases of the project. Typically the Business users together with the IT department staff of the banks evaluate the system for the functional requirements, based on which the vendors would be short-listed. The senior management of the banks would get involved in the process of negotiating with short-listed vendors and make their final recommendation to the board of directors. The pilot survey information indicated that at the time of implementation of CBS, the project teams generally consist of members from IT department of the bank, business users and the technical representatives and possibly a project manager from the vendor. It was noted that many banks have used external consultants for the selection process but implementation was done solely by the vendor with the assistance of the bank staff. There was evidence of few instances, where external consultants were used for implementations as well.

3.8 Population

There were 11 licensed local commercial banks operating in Sri Lanka as at the end of year 2009 (CBSL Annual Report, 2009). The study was focused on local commercial banks, which have implemented off-the shelf Core Banking Solutions. The pilot survey indicated that 10 out of 11 local commercial banks were using CBS supplied by foreign vendors while one bank was using a home-grown, in-house developed CBS, where there is no selection process involved and implementation of which had significant differences compared to implementation of an off-the-shelf CBS package. Hence this research focused on the 10 Local Commercial Banks, which were using CBS supplied by foreign vendors. The entire and the ideal population for the purpose of the research were the staff member of the above 10 banks, who had actively and on full time basis been involved in one or more CBS projects in the capacity of project team member, project manager, project director or as a members of the senior management who were sitting on IT or Project Steering Committees during CBS project involving in decision making related to the project or guiding the project. Table 1.4 illustrates the local commercial banks and the CBS in operation in those banks at the time of conducting the pilot survey.

As per the pilot survey data, the senior managers and the project team members are the individuals involved in CBS selection and implementation process from the perspective of the banks. The target population is described in Table 3.5, where senior managers and project team members, including project managers were selected as target population. It is practically impossible to identify above category of individuals and distribute the research questionnaire among them. The senior managers were identified based on the 2009 annual reports of the participating local commercial banks and the total of the project members involved in the project was determined based on the pilot survey data collected related to the latest CBS projects of each bank.

Table 3.6: Target Population

Domestic Licensed Commercial Bank	Number of Senior Managers	Number of Project Team Members Involved during Latest CBS Implementation
Bank of Ceylon	49	48
Commercial Bank of Ceylon PLC	41	41
DFCC Vardhana Bank PLC	17	30
Hatton National Bank	35	45
NDB Bank PLC	14	35
PABC Bank PLC	18	30
Peoples Bank	26	35
Seylan Bank PLC	43	40
Sampath Bank PLC	20	30
Nations Trust bank PLC	38	25
Total	301	359

Source: *Annual reports of the respective Banks & Pilot Survey Data*

During the pilot survey it was revealed that out of the senior management team, only few of the senior managers got actively involved during a CBS selection and/or implementation

processes. However, it was practically difficult to single-out members who had in fact participated in the CBS project. Hence, the total senior management was included for the population. The CBS project team consists of a project director and/or project manager and team members who get involved in the project on full time basis. The pilot survey revealed that a typical CBS project team consists of staff members drawn both from the business and the IT department of the Banks.

3.9 Sample Selection

Sampling is one of the most crucial steps in any survey research. (Krosnick, 1999) The primary objective of the sampling is to select elements that represent the total population accurately. It is important to select a representative sample, which provides more value for the survey based research. Therefore W Morgan sample selection theory (Krejcie and Morgan, 1970) was employed to select sample size from the population. The table used to determine the sample size for each bank is attached as *Appendix I*

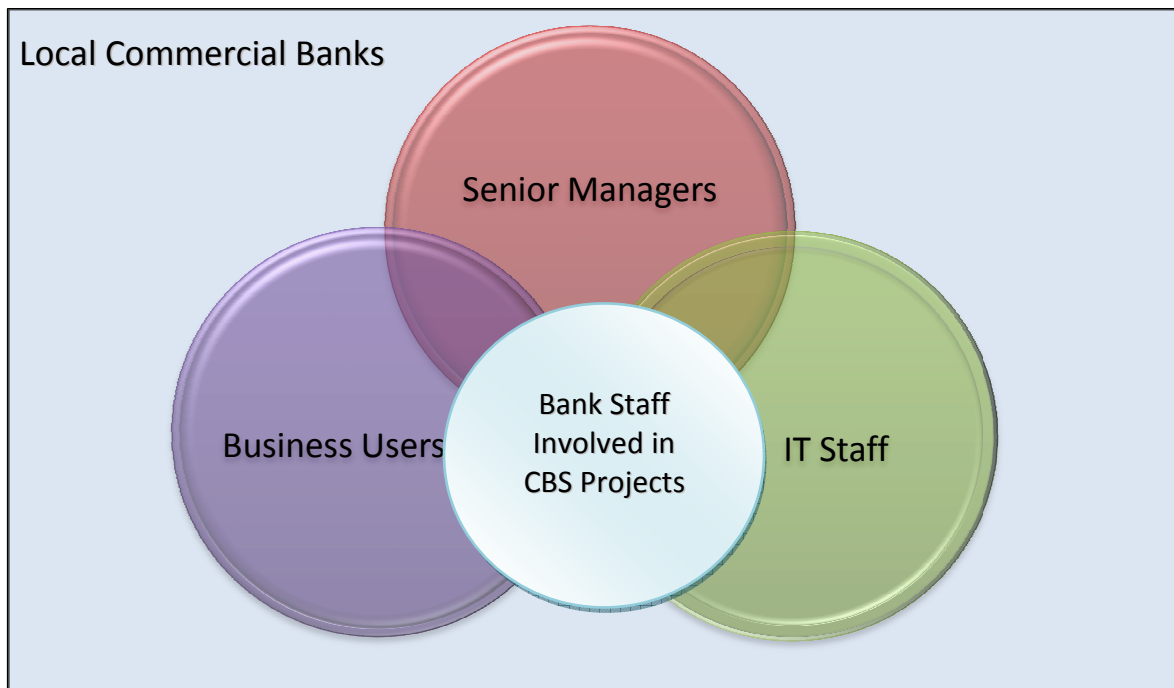


Figure 3.3: Ideal Sample

The study sample was selected from the target population, which is described in Table 3.5 under the target population section. The table 3.6 shows the selected sample from each

segment out of the target population. The selected sample was expected to cover all functional areas, involving those who have participated in CBS selection and implementation processes representing members from the IT department as well as their counterparts from main stream banking. Figure 3.3 illustrates the composition of the project team and other members who were involved in CBS projects. It was difficult to identify members who were involved in CBS projects directly; hence the senior management and project members were targeted to distribute the questionnaire.

Table: 3.7 Compositions of the Sample Population

Domestic Licensed Commercial Bank	Number of Senior Managers	Number of Project Team Members Involved during Latest CBS Implementation
Bank of Ceylon	43	43
Commercial Bank of Ceylon PLC	36	35
DFCC Vardhana Bank PLC	15	28
Hatton National Bank PLC	32	40
National Development Bank PLC	13	32
PABC Bank PLC	17	28
Peoples Bank	24	32
Seylan Bank PLC	38	36
Sampath Bank PLC	19	28
Nations Trust bank PLC	35	24
Total	272	326

Source: *Pilot Survey Data*

As per the above Table 3.6, the sample population consisted of a total 598 representatives, out of whom 272 were senior managers and 326 were CBS project team members and targeted for the distribution of the survey questionnaire.

Representatives from each vendor were also interviewed to obtain feedback for the questionnaire. The purpose of this process was to identify differences, if any, of the thinking pattern of project teams of banks and the vendors. Successful completion of any project would depend on the performance of both parties during the implementation process.

3.10 Data Collection

A total of 605 hard and soft copies of the questionnaire were distributed among the 10 local commercial banks, and seven CBS vendors who have implemented systems in those banks. Majority of them were distributed through known contacts within these banks while some were officially sent to the respondents. Awareness was given to these contacts on the expected target population and on the manner in which the questionnaires were to be distributed. They were specifically requested to distribute the questionnaire among the team members who have participated in the latest CBS project of each bank. The questionnaire was directly emailed to some of the project team members personally known to the researcher. On receipt of the completed questionnaires, some of these respondents were contacted to clarify certain feedbacks, where the data provided was incompatible. Some of the selected respondents were interviewed in order to obtain clarifications as well as to enhance the material gathering in developing the decision making framework. Further, field observations were carried out with regard to the validation and verification of facts gathered through the questionnaires and during the follow up interviews.

Obtaining responses from senior managers were an uphill task due to their busy schedules. Rigorous follow-up was done to collect the completed questionnaire from respondents in a timely manner.

On-site technical representatives of seven CBS vendors who have implemented CBS solutions in local commercial banks too were approached to obtain a feedback for the same questionnaire with the intention of ascertaining the vendor's perspective of the success factors as they are the counterparties of the banks in CBS implementations. The questionnaire was directly emailed to the vendor representatives and rigorous follow-up was done to obtain the completed questionnaire.

3.11 Data Analysis

The data collected from the questionnaires were entered into Excel worksheets, SPSS version 15 and descriptive analysis was used to analyze the data. The charts and graphs were used for better and clear representation of the results of analysis of variables which in shown in chapter 4. Different types of charts and tables were used to identify the underlying patterns. Standard deviation and lower boundary at 90% confident level was used to analyze the distribution of data in order to identify critical success factors. The data analysis was carried out using both quantitative as well as qualitative methods. During the analysis process, a descriptive statistical analysis was carried out, followed by a more in-depth discussion related to the data presented.

The relationship between the socio-demographic attributes of the sample population with the identified critical success factors were analyzed using One-Way ANOVA method, to identify significance of differences related to responses among different groups based on their socio-demographic attributes. Scenarios, having significant differences were discussed.

Table 3.8: Weights Assigned for the Responses.

Range	Interpretation of the Likert Scale	Weight Assigned	Consideration
(5)	Extremely Important for the Success of Project/Process	4	Any factor carrying value of 3 or above as the lower boundary of confidence interval at 90% confidence level would be identified as a critical Success factor
(4)	Important for the Success of Project/Process	3	
(3)	Somewhat Important for the Success of Project/Process	2	
(2)	Least Important for the Success of Project/Process	1	
(1)	Not at all Important for Success of Project/Process	0	

As described in Table 3.8, weights would be assigned to the Likert scale for the purpose of data analysis. Therefore, success factors carrying an average of three or above as the lower boundary of confidence interval at 90% confidence interval only would be considered as critical success, which would be used in developing the framework.

The range 1 (weight 0) of the Likert scale was used as the default response for the purpose of analysis in instances, where the respondents have failed to mark their responses to a particular question. In case any respondent indicating “none” as the answer to Question number three of the questionnaire (respondents not having any CBS project experience), such questionnaires would be removed from the final analysis of identifying critical success factors.

In instances where, respondents say they are aware of CBS project failures in Sri Lankan local commercial banks under question number four, but fails to indicate the number of such failures the default will be taken as one for the number of failures.

3.12 Summary

In this chapter, the research approach, conceptual framework, population, sampling, data collection methods and data analysis techniques were discussed. The two hundred and seventy two (272) senior managers and three hundred, twenty seven (327) project team members and seven (7) vendor representatives were selected as the target population to validate the success factors identified in the literature and during the interview process. W. Morgan sampling techniques was used to determine sample size from the population. Questionnaire and interviews were the basic data collection methods for the study while descriptive analysis and One-Way ANOVA were used to analyze data with a discussion using graphs and charts.

Chapter 4

Data Analysis

4.1 Introduction

In this chapter, data collected through the questionnaire is analyzed and inferences were made in relation to the respondents and their responses. Responses were analyzed based on success factors independently and combining with socio-demographic attributes of the population. Results of the descriptive statistics and impact factors of the respondents were presented in this chapter. The result of the identification of Critical Success Factors (CSF) in selection and implementation of Core Banking Systems were described as the main component of the data analysis. The feedback was analyzed from both the banks as well as vendor perspective.

4.2 Composition of the Study Sample

The study sample comprises staff members of Si Lankan Commercial Banks, having participated in at least one CBS project, on full-time basis as Project Managers or Team Members or Senior Manager who have served in IT or Project Steering Committees as a committee chairperson or committee member during a CBS project. Feedbacks were analyzed based on the socio-demographic attributes of the study sample to identify existence of significant variances of responses between groups having different attributes.

4.2.1 Analysis of Sample Distribution

Five hundred and ninety eight (598) questionnaires were distributed among the staff of ten local commercial banks targeting randomly selected staff members, who were CBS Implementation Project Team members, CBS Implementation Project Managers and the Senior Managers. Seven (7) questionnaires were distributed among the representatives of the different Core Banking Solution Providers (Vendors), who were in Sri Lanka at different sites for the purpose of implementation or for post implementation support, through emails.

Out of the 605 questionnaires, only 327 were completed and returned by the sample population. Thus, the response rate is slightly above 54%, which was satisfactory and sufficient to draw inferences on the target population and their responses. Table 4.1 depicts an analysis of the responses according to category of respondents.

Table 4.1: Response Rate of Different Member Category

Role of Respondent	Population		Sample		Responses Received	
	No.	%	No.	%	No.	%
Senior Manager	301	45%	272	45%	112	41%
Team Members	359	54%	326	54%	208	64%
Vendor	7	1%	7	1%	7	100%
Total	667		605		327	54%

Source: *Research Data*

According to the Table 4.1 above, the highest response rate was observed in relation to the representatives of the CBS Vendors, which is 100%. In the case of the Commercial Banks, the response rate was 53.51%. Among them only 41% were the Senior Managers. Response rate of the CBS Implementation Team Members inclusive of Project Managers was 64%.

Out of the 208 respondents in CBS Implementation Team Category, 48 had been acting as Project Managers and 160 had been participating as Implementation Team Members. Table 4.2 and the Figure 4.1 indicate the percentage distribution of the responses among different categories of respondents.

Interestingly, 48 Project Managers corresponds to an average of five Project Managers per Commercial Bank. This appears to be somewhat unlikely, given the fact that a project has one Project Manager (and a Project Director in certain instances) under usual circumstances and there had not been many CBS Implementation Projects among the local Commercial Banks over the past ten years. (Pilot Survey)

Table 4.2: Analysis of Category of Respondents

Category	Number of Responses
Senior Managers	112
Project Managers	48
Project Team Members	160
Vendor Representative	7
Total	327

Figure 4.1: Percentages of Response

Source: *Research Data*

Banks do embark on a large number of IT projects, which do not fall into the definition of a CBS implementation, where different individuals may manage such projects. There could be many such respondents, who have mistakenly categorized themselves as CBS Implementation Project Managers when responding to the questionnaire. Further, shifting of experienced employees from one bank to another is a moderate possibility within the banking industry. Therefore, there also exists a possibility of some respondents having participated in the capacity of CBS implementation projects in a bank, which does not fall into the category of local commercial banks. These may be the reasons for having an unexpectedly large number of Project Managers among the respondents. Many such individuals confirmed this fact during a random verification done on this information.

4.2.2 Experience of Respondents

Respondents’ experience in banking industry is a vital factor in ascertaining their knowledge of the CBS implementations. Table 4.3: illustrates experiences of the respondents related to the banking industry.

Out of the 327 respondents, 173 (or 53%) possessed experience over 10 years in the banking industry, whereas 66 (or 20%) and 62 (or 19%) respondents were having six to ten years and two to five years of experience in the banking industry respectively. There were only 26 (or 8%) respondents, who counted experience less than two years in the Banking industry

Table 4.3: Experience of the Respondents

Experience	Number of Respondents
Less than Two Years	26
2-5 Years	62
6-10 Years	66
Over 10 Years	173
Total	327

Figure 4.2: Experience of Respondents

Source: *Research Data*

Table 4.4 illustrates detailed classification of respondents based on the category and their experience in the banking industry. Approximately 73% of the respondents were counting more than five years of experience, which gives more validity to the research data. Senior managers having in excess of 10 years of experience (27.52%) formed the single largest group of respondents followed by Implementation Team Members having in excess of 10 years of experience (16.82%) and Implementation Team Members having two to five years of experience (15.29%) respectively.

It was noted that 54% of the project managers were having more than ten years of experience, whereas 85% of project managers were having more than five years of experience in the banking industry. The senior managers category provided the most number of respondents having experience in excess of ten years, which is Approximately 80%, and 91% of the senior managers were having over five years of experience in the banking

industry. Similarly 57% of team members having over five years of experience in banking industry, this too gives more validity to the research data.

Table 4.4: Distribution of Respondents Based on Category and Experience

Category of Respondents	Years of Experience in Banking Industry	Number of Respondents	Representation within the Category	Representation within the Group
Project Managers	Less than 2 Years	5	10%	1.53%
	2 - 5 Years	2	04%	0.61%
	6 - 10 Years	15	31%	4.59%
	Excess of 10 Years	26	54%	7.95%
Project Manager Category Total		48	100%	14.68%
Senior Managers	Less than 2 Years	2	02%	0.61%
	2 - 5 Years	8	07%	2.45%
	6 - 10 Years	12	11%	3.67%
	Excess of 10 Years	90	80%	27.52%
Senior Manager Category Total		112	100%	34.25%
Team Members	Less than 2 Years	18	11%	5.50%
	2 - 5 Years	50	31%	15.29%
	6 - 10 Years	37	23%	11.31%
	Excess of 10 Years	55	34%	16.82%
Team Member Category Total		160	100%	48.93%
Vendor Representatives	Less than 2 Years	1	14%	0.31%
	2 - 5 Years	2	29%	0.61%
	6 - 10 Years	2	29%	0.61%
	Excess of 10 Years	2	29%	0.61%
Vendor Representative Category Total		7	100%	2.14%
Total Respondents		327	-	100%

Source: *Research Data*

4.2.3 Respondents Involvement in CBS Implementations

Figure 4.3 depicts the involvement of respondents in CBS implementation projects. Approximately 36% of respondents had participated in more than two CBS implementation projects, whereas 18% had participated in two such projects, and 23% had participated in only one project. Therefore, out of the 327 respondents, 251 (approximately 76%) had participated in at least one CBS Implementation project, which is an encouraging factor.

Table 4.5: Respondents Involvement in CBS Implementation Projects

Number of Projects Involved	Number of Respondents
None	76
One	76
Two	58
More than Two	117
Total	327

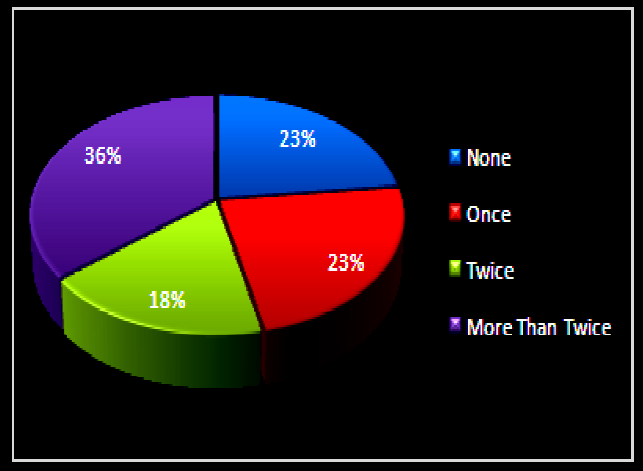


Figure 4.3: Respondents Involvement in CBS Implementation Projects

Source: *Research Data*

Approximately, 23% of the respondents have had no experience in CBS implementation projects. It was assumed that the respondents, who had no previous experience in CBS implementation projects have responded to the questionnaire based on a combination of their theoretical knowledge of the subject matter, hearsay, and judgment.

Table 4.6 indicates the distribution of respondents based on category and involvement in CBS implementation Projects. Quite interestingly, four of the respondents who have categorized themselves as Project Managers have indicated that they have no experience in CBS implementation projects. This may have taken place because of misinterpreting the 1st Question of the questionnaire, which was related to their role in the project. This further substantiates the reasons given for having 48 respondents as project managers. In order to

give more accuracy and validity to the outcome of the research, the researcher decided to exclude these four responses from further analysis of data.

Table 4.6: Distribution of Respondents Based on Category and Involvement in CBS Implementation Projects

Category of Respondents	Number of Projects Involved	Number of Respondents	Representation within the Category	Representation within the Group
Project Managers	None	4	8%	1.22%
	One	15	31%	4.59%
	Two	6	13%	1.83%
	More than Two	23	48%	7.03%
Project Manager Category Total		48	100%	14.68%
Senior Managers	None	28	25%	8.56%
	One	17	15%	5.20%
	Two	16	14%	4.89%
	More than Two	51	46%	15.60%
Senior Management Category Total		112	100%	34.25%
Team Members	None	44	28%	13.46%
	One	43	27%	13.15%
	Two	35	22%	10.70%
	More than Two	38	24%	11.62%
Team Member Category Total		160	100%	48.93%
Vendor Representatives	None	0	0%	0.00%
	One	1	14%	0.31%
	Two	1	14%	0.31%
	More than Two	5	71%	1.53%
Vendor Category Total		7	100%	2.14%
Total Respondents		327	-	100%

Source: Research Data

Approximately 92% of the personnel coming under the project manager category indicated of having CBS project experience, whereas 61% of project managers have indicated of having more than one CBS project experience. Out of the senior managers, 75% were having CBS project experience and 60% were counting more than one CBS project experience. Similarly 72% of team member category have got themselves involved in CBS projects, 46% of team member category were having more than one CBS project experience.

Twenty-eight senior managers (or 25% of senior manager category) and 44 team members (or 28% of the team member category) who have indicated that they have no CBS project experience were removed from analysis to determine the Critical success factors related to CBS projects.

4.2.4 Respondents Awareness of CBS Implementation Failures

As shown in Table 4.7, 264 respondents, which comprise approximately 81% of the total respondents, have indicated that they were completely unaware of any CBS implementation project failures. Figure 4.4 indicates that only 63 out of the 327 respondents (or 19%) have indicated that they were aware of core banking system project failure.

Table 4.7: Awareness of Respondents of CBS Implementation Project Failures

Category	Number of Respondents
Aware of Failures	63
Not Aware of Failures	264
Total	327

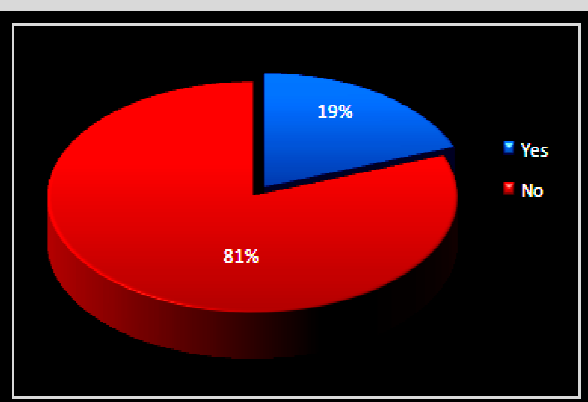


Figure 4.4: Awareness of Respondents of CBS Implementation Project Failures

Source: *Research Data*

Table 4.8 illustrates that 25% of the project managers and 24% of the senior managers indicating their awareness of CBS implementation failures in local commercial banks. Such failures could be ranging from implemented without meeting business requirements satisfactory or total abandonment of the project. It was difficult to pinpoint such projects for further study as senior managers and project managers have not disclosed details of such incidents possibly due to the sensitive nature of the information. Approximately, 15% of the project team members were aware of CBS implementation failures in local commercial banks.

Table 4.8: Distribution of Respondents Based on Awareness of CBS Implementation Project Failures

Category of Respondents	Awareness of CBS Implementation Failures	Number of Respondents	Representation within the Category	Representation within the Group
Project Managers	Yes	12	25%	3.67%
	No	36	75%	11.01%
Project Manager Category Total		48	100%	14.68%
Senior Managers	Yes	27	24%	8.26%
	No	85	76%	25.99%
Senior Manager Category Total		112	100%	34.25%
Team Members	Yes	24	15%	7.34%
	No	136	85%	41.59%
Team Member Category Total		160	100%	48.93%
Vendor Representative	Yes	0	0%	0.00%
	No	7	100%	2.14%
Vendor Representative Category Total		7	100%	2.14%
Total Respondents		327	-	100%

Source: Research Data

Question 4.2 of the questionnaire was intended to obtain information related to the respondent’s awareness of number of CBS implementation project failures. Although only 264 respondents have indicated that they were not aware of any CBS project failures under Question 4.1, 288 have indicated that they were not aware of any such failures under the Question 4.2. Twenty four (24) out of the sixty three (63) respondents, who have indicated under the Question 4.1 that they were aware of at least one CBS Implementation Project failures, have failed to indicate the number of failures they were aware of. For the purpose of further analysis, the said twenty (20) respondents’ response to question 4.2 was considered as they were aware of at least one CBS Implementation Project failure.

Table 4.9: Awareness of Respondents of No. of CBS Implementation Projects Failures

Awareness of CBS Project Failures	Number of Respondents
None	264
At least One Failure	42
More than One Failure	21
Total	327

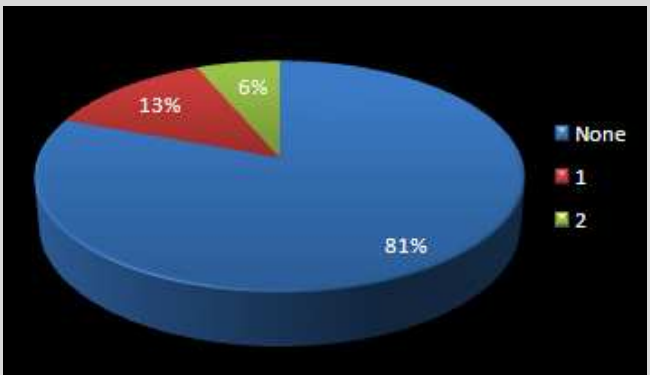


Figure 4.5: Awareness of Respondents of No. CBS Implementation Project Failures

Source: *Research Data*

Table 4.9 illustrates that the awareness of number of project failures among the respondents, 264 (or approximately 81%) have declared that they don’t have any information on project failures. Twenty-one (or approximately 6%) respondents have indicated that they are aware of more than one CBS project failures, whereas 42 respondents have indicated that and they were aware of only one failure.

4.2.5 Factors in Measuring Success of a CBS Implementation Project

Question 5 of the research questionnaire was formulated to identify the factors, which respondents consider as most important in determining success of any CBS Implementation

Project. Table 4.10 below indicates the outcome of analysis based on respondent categories. Comparisons or the responses of all categories indicated an identical pattern.

Table 4.10: Factors in Measuring Success of a CBS Implementation Project

Category of Respondent	Criteria for the Measurement of CBS Project Success	1st Rank	2nd Rank	3rd Rank	Total	%
Project Managers	Improved efficiency	29	6	2	37	28%
	End User Satisfaction	8	17	8	33	25%
	Reduce Complexity of Operation	11	8	13	32	25%
	Timely Implementation	0	10	8	18	14%
	Implementing within the Budget	0	2	4	6	5%
	Low Cost of Ownership	0	0	4	4	3%
	Other	0	0	0	0	0%
Project Manager Category Total		48	43	39	130	100%
Senior Managers	Improved efficiency	52	22	17	91	30%
	End User Satisfaction	27	35	26	88	29%
	Reduce Complexity of Operation	18	28	14	60	19%
	Timely Implementation	10	16	29	55	18%
	Implement within the Budget	0	0	7	7	2%
	Low Cost of Ownership	0	0	0	0	0%
	Other	5	0	2	7	2%
Senior Manager Category Total		112	101	95	308	100%
Team Members	Improved efficiency	86	35	6	127	33%
	End User Satisfaction	32	55	28	115	30%
	Reduce Complexity of Operation	23	24	29	76	20%
	Timely Implementation	13	4	21	38	10%
	Implement within Budget	4	4	3	11	3%
	Low Cost of Ownership	2	2	13	17	4%
	Other	0	0	0	0	0%
Team Member Category Total		160	124	100	384	100%
Vendor Representatives	Improved efficiency	3	3	0	6	35%
	End User Satisfaction	2	2	0	4	24%
	Reduce Complexity of Operation	2	0	2	4	24%
	Timely Implementation	0	0	1	1	6%
	Implement within Budget	0	0	1	1	6%
	Low Cost of Ownership	0	0	1	1	6%
	Other	0	0	0	0	0%
Vendor Representative Category Total		7	5	5	17	100%
Total		327	273	239		100%

Source: Research Data

Majority of respondents in all categories, including vendor representatives, consider “Improved Efficiency” as the single most important factor and “End User Satisfaction” as the next most important factor in determining the success of a CBS Project, third most important factor in determining the success being “Reduced Complexity of Operation”. These factors fall within the expected end- result of the project and are qualitative and difficult to measure. In contrast, factors such as “Timely Implementation”, “Implementation within Budgets” and “Low Cost of Ownership” are easily measurable. The results show a clear deviation from generally accepted measurements of success of a project, which are achieving project goals, within agreed time and budgets.

Generally, the role of a typical project manager is to complete the project meeting project objectives, within the budget, within the agreed time within the scope of the project. (Project Management Body of Knowledge, 2004) Surprisingly, the project managers have failed to appreciate these factors as the project success measurements. Instead, they have indicated achieving the business objectives of the project such as improved efficiency, end-user satisfaction and reduced complexity of operations as the factors measuring the success of the project. Possibly, this is due to project managers not being professional project managers, but senior employees of the bank. As a result, they may not be concentrating on project management principles. Furthermore, they may not have been able to make decisions independently and may have been subjected to influences from various stake-holders in the project such as Senior Managers or business users etc. Such influences may have led to change of project scope due to subsequent “scope creep” and resource allocation issues, which could consequently lead to budget & time overrun. It appears that such overruns are not seriously considered by the banks as long as the project objectives are achieved.

Table 4.10 indicates that there are seven senior managers who have indicated other measurement criteria for determining project success and have provided measurement factors such as “Automation of 75% of business process including all critical business process”, “Flexibility of Operation”, “Meet Business Strategy” and “Catering Current Business Requirement”. Some of these factors are more likely to fall within one of the categories such as Improved Efficiency, End User Satisfaction or Reduced Complexity of Operations.

4.2.6 Factors Influencing CBS Selection

Table 4.11 illustrates that out of 138 respondents (approximately 42%) indicated Corporate Management influence as the primary factor in the final decision of the selection of CBS. Forty-three (43) and thirty-two (32) respondents ranked that, as the second and third influencing factors respectively. Out of the total respondents, eighty six (86) have indicated that IT department influence for the final decision, as the primary factor, where forty seven (47) and forty two (42) respondents respectively marked that, as the second and the third influencing factor.

Table 4.11 indicates that the influence of the Corporate managers, IT department and End Users as the three most important factors influencing the final decision making for CBS selection respectively. It was interesting to observe that some of the responders indicated influence of specific individuals as the most important factor which influenced the final decision making for CBS selection. When further clarified, such respondents revealed that there had been instances that specific individuals have taken control of the entire selection process.

Table 4.11 indicates that 4 project managers, 16 senior managers, and 2 team members have identified factors other than those indicated as factors influencing the final decision of CBS selection. Many such respondents have indicated the board of directors as an influencing factor for the final decision. It was observed that some respondents have failed to describe the “other” factor(s) although they have marked “other” as an influencing factor.

It was further observed that respondents of only one bank indicating Board of Directors as the final decision makers of the CBS selection, where respondents of another bank indicated “other” as an influencing factor without specifying what it was. Similarly, two senior managers of the same bank have indicated “specific individual” as the first most important factor and two CBS project team members of another bank have indicated that as the third most important factor influencing the final decision making in CBS selection process. In the case of the two senior managers, they may have some specific reason and information to indicate so, which the others involved in the same project may not be aware. However, this

is in the case of two banks only and hence cannot be generalized for the purpose of this study.

Table 4.11: Factors Influencing CBS Selection

Category of Respondents	Influencing Factor	1st Rank	2nd Rank	3rd Rank	Total	%
Project Managers	Corporate Management	22	9	4	35	33%
	IT Department	13	8	8	29	28%
	End Users	6	10	2	18	17%
	Consultants	3	4	8	15	14%
	Other	4	0	0	4	4%
	Specific Individual	0	0	4	4	4%
Total		48	31	26	105	100%
Senior Managers	Corporate Management	46	23	10	79	35%
	IT Department	24	17	18	59	26%
	End Users	24	24	4	52	23%
	Consultants	0	6	7	13	6%
	Other	16	0	0	16	7%
	Specific Individual	2	0	2	4	2%
Total		112	70	41	223	100%
Team Members	Corporate Management	66	9	18	93	31%
	IT Department	48	22	14	84	28%
	End Users	40	46	6	92	30%
	Consultants	2	10	14	26	9%
	Other	2	0	0	2	1%
	Specific Individual	2	0	4	6	2%
Total		160	87	56	303	100%
Vendor Representatives	Corporate Management	4	2	0	6	46%
	IT Department	1	0	2	3	23%
	End Users	1	2	0	3	23%
	Consultants	1	0	0	1	8%
	Other	0	0	0	0	0%
	Specific Individual	0	0	0	0	0%
Total		7	4	2	13	100%
Total		327	192	125		100%

Source: Research Data

During the focus group discussion and interview, majority of the senior managers were of the view that the IT department is coordinating and facilitating the selection process, whereas business-users get involved in the evaluation process to identify the suitability of the system. As such, the final decision depends on the input from IT department and the business users, based on which, the corporate managers would take decision on suitable CBS package.

In relation to a CBS Projects, perspective of the banks of the project and the vendor's perspective have clear difference due to their stake in the project. Although, responses were obtained from the representatives of the vendors, those were excluded from the analysis in identifying critical success factors in order to focus on the perspective of the Banks related to the subject matter. However, the responses of the Vendor representatives, which were comparatively few (only Seven) was analyzed separately to form a general opinion on the Vendors' perspective of CBS projects.

After excluding the four project managers, who claimed that they have no CBS project experience, the balance population comprised of three hundred and twenty three (323) respondents. Out of that, seventy-two (72) had indicated that they have not participated in a CBS Implementation Project at all. Hence, their responses were analyzed separately and were compared with the responses of those who have experience in CBS Implementation Projects, wherever appropriate.

Only the data related to 244 respondents, who have indicated that they have CBS project experience were analyzed in detail. Responses for question 7 to question 29 were assigned appropriate weights as explained in Table 3.7.

4.3 Analysis of Key Perceptions and Aspect of the Attributes

Based on the nine (9) key perceptions identified related to Selection and Implementation processes related to CBS projects as described in conceptual framework (*Figure 3.1*) and according to the three most important project success measurement indicators identified by the majority of respondents, (*refer Table 4.10*) data was further analyzed. Variance analysis was done on the success factors against the socio-demographic attributes of the population.

4.3.1 Analysis of Success Factors Related to Organizational Objectives

Question 07 and 16 were designed to ascertain the response of the population, on the focus of organizational objectives, on rational and process followed by the banks during the selection process of a CBS system.

Table 4.12: Success Factors Related to Organizational Objectives

Q. No.	Success Factor	Respondents having Experience in CBS Projects			Respondents not having any Experience in CBS Projects		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q7	Organizational Expectations	3.58	0.645	3.512	3.51	0.503	3.4124
Q16	Process Innovation	3.05	0.880	2.9573	3.03	0.754	2.8839

Source: Research Data

Table 4.12 illustrates the mean values, standard deviation, and the lower boundary of confidence interval at the 90% confidence level of the responses related to the two questions. Considering the responses of the respondent having experience in CBS Projects, the *Organizational Expectations* has a mean value of 3.58 and 3.5512 as the lower boundary of confidence interval at 90% confident level. Similarly, *Process Innovation* has a mean value of 3.05 but the lower boundary of confidence interval at 90% confident level was 2.955. Hence, *Process Innovation* has failed to qualify as a critical success factor. The pattern remains similar in relation to the respondents not having any experience in CBS projects.

4.3.2 Analysis of Success factors Related to Evaluation Process

There were four questions related to the evaluation process. Question 08, 09, 10, and 12 were designed to ascertain the response of the population on four success factors, to identify the evaluation processes related to CBS selection. Table 4.13 illustrates the mean values, standard deviations, and the mean value at the lower boundary of the confidence interval at 90% confidence level for both categories of respondents.

Table 4.13: Success Factors Related to Evaluation Process

Q. No.	Success Factor	Respondents having Experience in CBS Projects			Respondents not having any Experience in CBS Projects		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q8	Refining the Requirements	3.72	0.484	3.6690	3.56	0.553	3.4527
Q9	Evaluation of Responses	3.50	0.675	3.4288	3.28	0.570	3.1694
Q10	Proof of Concept	2.92	0.851	2.8303	2.86	0.798	2.7053
Q12	End User Participation	2.96	0.741	2.8819	3.20	0.652	3.0735

Source: Research Data

In the case of *Evaluation Process*, only two success factors namely *Refining the Requirements* (mean value of 3.6690 at lower boundary of confidence interval at 90% confidence Level) and *Evaluation of Responses* (mean value of 3.4288 at lower boundary of confidence interval at 90% confidence Level) have been selected as critical success factors by both categories of respondents. Apart from the above two success factors, *End User Participation* (mean value of 3.0735 at lower boundary of confidence interval at 90% confidence level) has been identified as a critical success factor by the respondents without any CBS project experience. Both groups agree that *Proof of Concept* as an important but non-critical factor for the evaluation process.

4.3.3 Analysis of Success factors Related to Learning through Experience

There were two questions in relation to *Learning through Experience*. Questions 11 and 25 were designed to obtain a feedback on how the respondents perceive the use of experience related to the implementation history of the vendors and experience of other banks in selecting CBS solutions. Table 4.14 illustrates the mean values, standard deviations, and the mean value at lower boundary of the confidence interval at 90% confidence level for both categories of respondents.

Both success factors namely *Sharing Experience* and *Lessons Learnt* (both having a mean value of 2.52) have been rated non-critical by the both groups of respondents.

Table 4.14: Success factors Related to Learning through Experience

Q. No.	Success Factor	Respondents having Experience in CBS Projects			Respondents not having any Experience in CBS Projects		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q11	Sharing Experience	2.52	0.936	2.4214	2.75	1.002	2.5556
Q25	Lessons Learnt	2.52	0.970	2.4178	2.52	0.997	2.3266

Source: *Research Data*

Similar sentiment prevailed during the focus group interviews. Majority of the interviewees were of the opinion that, based on the circumstances, the decision on selecting a CBS is unique for each bank. Thus, the experience of the others in relation to specific vendors and their CBS may not necessarily be decisive factor in selecting a CBS.

4.3.4 Analysis of Success factors Related to Top Management Support

There were three questions related to *Top Management Support*. Question 13, 14, and 28 were designed to ascertain the response of the population on success factors, which were designed to identify the Level of Top management Support required during the CBS selection and implementation processes.

Table 4.15: Success factors Related to Top Management Support

Q. No.	Success Factor	Respondents having Experience in CBS Projects			Respondents not having any Experience in CBS Projects		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q13	Setting Direction	3.20	0.790	3.1168	3.20	0.770	3.0507
Q14	Project Sponsorship	3.36	0.817	3.2739	2.93	1.073	2.7219
Q28	Business Commitment	3.04	0.810	2.9547	2.90	0.807	2.7434

Source: Research Data

Table 4.15 illustrates the mean values, standard deviation, and mean value at the lower boundary of confidence intervals at 90% confidence level of the responses related to the three success factors. *Setting Direction* (mean value 3.20 and mean value of 3.1168 at the lower boundary of confidence interval at 90% confidence interval) and *Project Sponsorship* (mean value 3.36 and mean value of 3.2739 at the lower boundary of confidence interval at 90% confidence interval) have been identified as critical success factors by the respondents having experience in CBS projects. Respondents without any CBS project experience have identified *Setting Direction* as the sole critical success factor related to Top Management Support.

Business Commitment (mean value 3.04 and mean value of 2.9547 at the lower boundary of the confidence interval at 90% confidence level) carries a mean value above three, which fulfills the criteria for a success factor to be considered as a critical success factor. However, at 90% confidence level it does not fall in to the category of being a Critical success factor. Hence it will not be considered as a critical success factor.

4.3.5 Analysis of Success factors Related to Effective Communications

Question 22 was intended to identify the importance of having Effective Communication during a CBS project to keep stakeholders up to date with project information throughout the project to minimize, if not eliminate possible, miscommunications, misunderstandings and conflicts among the stakeholders of the project.

Table 4.16: Success factors Related to Effective Communications

Q. No.	Success Factor	Respondents having Experience in CBS Projects			Respondents not having any Experience in CBS Projects		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q22	Transparency	3.11	0.909	3.0143	2.90	1.110	2.6848

Source: *Research Data*

Table 4.16 illustrates the mean value, the standard deviation, and mean value at the lower boundary of confidence interval at 90% confidence level of the responses related to transparency. It can be noted that *Transparency* (mean value 3.11 and mean value of 3.0143 at the lower boundary of confidence interval at 90% confidence level) has been identified as a critical success factor by the respondents having experience in CBS projects, whereas respondents without CBS project experience have rated it otherwise.

4.3.6 Analysis of Success factors Related to Use of External Consultants

The question 26 was designed to identify the importance of *External Expertise* during CBS projects to obtain expert knowledge from the external consultants. This has been the practice in software projects where expert advice and support may be required for specialized functions.

Table 4.17: Success factors Related to Use of External Consultants

Q. No.	Success Factor	Respondents having Experience in CBS Projects			Respondents not having any Experience in CBS Projects		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q26	External Expertise	2.62	0.985	2.5163	2.41	1.153	2.1864

Source: *Research Data*

Table 4.17 indicates the mean value, standard deviation, and mean value at the lower boundary of confidence interval at 90% confidence level of the success factor under User of External Consultants. Both categories of respondents have ranked *External Expertise* as a success factor which is not critical for the success of CBS projects.

4.3.7 Analysis of Success factors Related to Project Management

Questions 15, 18, 19, 20, 21, and 29 were designed to identify importance of success factors related to Project Management during CBS implementation process. Table 4.18 illustrates the mean values, standard deviations and means value at lower boundaries of the confidence interval at 90% confidence level.

Out of the six success factors, the respondents having experience in CBS projects have selected five as critical success factors related to Project Management during the implementation of CBS projects.

Table 4.18: Success factors Related to Project Management

Q. No	Success Factor	Respondents with CBS Project Experience			Respondents without CBS Project Experience		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q15	Prioritizing Deliveries	3.17	0.7665	3.0893	3.39	0.5231	3.2886
Q18	Minimum Customizations	2.41	1.0482	2.2996	2.63	1.1617	2.4048
Q19	Professional Project Management	3.42	0.7412	3.3420	3.17	0.8104	3.0129
Q20	Competent Project Team	3.55	0.5823	3.4887	3.39	0.6829	3.2576
Q21	Dedicated Resources	3.10	0.7868	3.0171	3.11	0.7792	2.9590
Q29	Creative Problem Solving	3.60	0.6234	3.5344	3.68	0.4695	3.5890

Source: Research Data

Creative Problem Solving (mean value of 3.60 and mean value of 3.5344 at the lower boundary of confidence interval at 90% confidence interval) has been ranked as the top most critical success factor. This was followed by **Competent Project Team**, **Professional Project Management**, **Prioritizing Deliveries**, **Dedicated Resources** (based on both mean value and mean values at the lower boundary of the confidence interval at 90% confidence level) respectively.

The respondents of both categories have not considered *Minimum Customizations* (mean value of 2.41 and mean value of 2.2996 at the lower boundary of confidence interval at 90% confidence interval) as a critical success factor. Respondents without CBS project experience agreed with their experienced counterparts in ranking four elements as critical success factors but disagree in having a **Dedicated Resources** during CBS implementation.

4.3.8 Analysis of Success factors Related to Vendor Commitment

Questions 23 and 24 were designed to identify the critical success factors related to the *Vendor Commitment* during the CBS implementation process. Given below is the presentation of the responses to these success factors by the respondents.

Table 4.19: Success factors Related to Vendor Commitment

Q. No	Success Factor	Respondents with CBS Project Experience			Respondents without CBS Project Experience		
		Mean	SD	Lower value of confidence interval at 90% Confidence Level	Mean	SD	Lower value of confidence interval at 90% Confidence Level
Q23	Vendor Commitment	3.61	0.6735	3.5391	3.54	0.6036	3.4230
Q24	Knowledge Transfer	3.53	0.6112	3.4656	3.60	0.7250	3.4595

Source: Research Data

As indicated in the Table 4.19, success factors related to delivering the promises by the vendors, which is important to complete the project successfully. The *Vendor Commitment* (mean value of 3.61 and mean value of 3.5391 at the lower boundary of confidence interval at 90% confidence level) and *Knowledge Transfer* (mean value of 3.53 and mean value of 3.4656 at the lower boundary of confidence interval at 90% confidence level) were considered as critical success factors during the implementation process of CBS projects. Respondents without any CBS experience too have rated these as critical success factors.

4.3.9 Analysis of Success factors Related to Monitoring

The monitoring of CBS implementation project is crucial to complete it successfully within the agreed scope, time, and budget by fulfilling desired objective of the bank. The question 17 and 27 were designed to identify the *Guidance of Top Management* and *Supervision by the Board* of CBS projects during implementation process.

Table 4.20: Success factors Related to Monitoring

Q. No	Success Factor	Respondents with CBS Project Experience			Respondents without CBS Project Experience		
		Mean	SD	Lower boundary of confidence interval at 90% Confidence Level	Mean	SD	Lower boundary of confidence interval at 90% Confidence Level
Q17	Guidance of Top Management	3.07	0.851	2.9804	3.31	0.668	3.1806
Q27	Supervision by the Board	2.70	0.9591	2.5990	2.50	1.0346	2.2994

Source: *Research Data*

Considering the mean values, both categories of respondents have identified the ***Guidance of Top Management*** as a critical success factor during CBS implementation process. As far as CBS project experienced respondents are concerned, and considering 90% confidence level, it has failed to be identified as a critical success factor.

Both the groups agree in relation to the ***Supervision by the Board*** in not identifying it as a critical success factor.

4.4 Analysis of Success factors based on Socio-Demographic Attributes

With respect to the respondents having CBS project experience, responses to the twenty three (23) success factors were further analyzed based on their socio-demographic attributes using one way ANOVA to determine patterns of responses and to observe whether there are any significant variances on the opinions among different groups of respondents. This was done with the assistance of one way ANOVA extracted using SPSS software. Success factors having level of significance less than 0.05 have been identified as having significant differences among different categories of respondents.

4.4.1 Analysis of Success Factors based on Role in CBS Projects

The respondents were categorized as Senior Managers, Project Managers and the Team Members based on the roles played by them in relation to the CBS projects. Table 4.21 illustrates level of significance pertaining to above categories for the 23 success factors.

Success factors related to **Organizational Objectives** indicate no significant variance among the responses between different categories of respondents.

One out of the four success factors related to the **Evaluation Process** only one factor indicates a significant variance between the responses of different categories of respondents based on their role in the CBS project. *End User Participation* has a significant variance (level of significance 0.030), where the mean values of the Senior Managers the Project Managers and the Team Members were 2.94, 3.20, and 3.08 respectively. Though the Project Managers and Team Members have identified it as a Critical Success Factor, Senior Managers have not considered that as a critical success factor. As a result, *End User Participation* during the selection process has failed to be identified as a critical success factor.

With respect to the success factors related to **Learning through Experience**, no significant variance could be observed.

Table 4.21: Level of Significance of Success Factors with Respondents Role in CBS Project

ANOVA Output						
Based on Role of the Respondent in the CBS Project		Sum of Squares	df	Mean Square	F	Sig.
Organizational Expectations	Between Groups	0.111	2	0.055	0.132	0.876
Refining the Requirements	Between Groups	0.764	2	0.382	1.636	0.197
Evaluating the Response	Between Groups	2.159	2	1.079	2.390	0.094
Proof of Concept	Between Groups	1.836	2	0.918	1.267	0.283
Sharing Experience	Between Groups	4.702	2	2.351	2.721	0.068
End User Participation	Between Groups	3.831	2	1.915	3.557	0.030
Setting Direction	Between Groups	10.294	2	5.147	8.769	0.000
Project Sponsorship	Between Groups	13.168	2	6.584	10.623	0.000
Prioritizing Deliveries	Between Groups	3.305	2	1.653	2.856	0.059
Process Innovation	Between Groups	2.144	2	1.072	1.388	0.252
Guidance from Top Management	Between Groups	4.697	2	2.349	3.308	0.038
Minimum Customizations	Between Groups	3.609	2	1.804	1.651	0.194
Professional Project Management	Between Groups	1.538	2	0.769	1.404	0.248
Competent Project Team	Between Groups	0.481	2	0.241	0.708	0.494
Dedicated Resources	Between Groups	4.036	2	2.018	3.322	0.038
Transparency	Between Groups	3.107	2	1.554	1.894	0.153
Vendor Commitment	Between Groups	4.584	2	2.292	5.228	0.006
Knowledge Transfer	Between Groups	1.467	2	0.733	1.978	0.141
Lessons Learnt	Between Groups	0.111	2	0.055	0.058	0.943
External Expertise	Between Groups	0.402	2	0.201	0.206	0.814
Supervision by the Board	Between Groups	7.519	2	3.760	4.194	0.016
Business Commitment	Between Groups	0.251	2	0.126	0.190	0.827
Creative Problem Solving	Between Groups	1.139	2	0.569	1.471	0.232

Source: Research Data – SPSS Output

Two out of the three success factors related to the **Top Management Support** shows significant variances among the response patterns of different category of users. In the case of **Setting Direction** (level of significance 0.000), Senior Manager, Project Manager and Team Member categories have mean values of 3.37, 3.45, and 2.99 respectively. Despite Team members narrowly failing to identify this as a critical success factor, the responses of the other two categories have made it a critical success factor.

In the case of **Project Sponsorship** (level of significance 0.000), Senior Manager, Project Manager and Team Member categories have mean values of 3.68, 3.30, and 3.16 respectively, which indicates a difference between the levels of importance they have given to the success factor.

Responses patterns of the groups in relation to **Business Commitment** show no significant variance.

Project Managers perceive **Transparency** (mean value of 3.27) as the most critical success factor where Senior Managers (mean value of 3.19) and Team Members (mean value of 3.00) were on the same line. No significant variance (significance 0.153) is observed between the responses of different categories of users. Similarly, no significant variance could be observed between the responses of different categories in the case of success factor **External Expertise**.

In the case of **Project management, Dedicated Recourses** (level of significance 0.038) has mean values of 3.18, 3.30, and 2.97 for Senior Managers, Project Managers, and Team Members categories respectively. I.e. Team Members have failed to identify Dedicated Project Team as a critical success factor. However, due to the influence of the other two categories, this factor has been identified as a critical success factor. All other success factors related to Project Management were above the significant variance threshold. This pattern of responses more or less matches with the, roles and responsibilities of the respondents and the stake holding each of those categories have in the project.

Responses related to the **Vendor Commitment** indicate significant variances (level of significance 0.006) on intensity between different categories of respondents where mean

values related to Senior Managers, Project Managers and Team Members were 3.76, 3.68 and 3.47 respectively. In the case of *Knowledge Transfer*, no significant variance between the responses of different groups could be observed.

Responses of the different categories related to *Guidance of Top Management* indicate significant variance (level of significance 0.038), where mean values of the responses related to Senior Managers, Project Managers and Team Members were 3.24, 3.11, and 2.93 respectively. In this instance, the Team Members have not identified the *Guidance of the Top Management* as a critical success factor where others have identified it as a critical success factor. A significant variance between the responses of different categories of respondents could be seen in relation to the *Supervision by the Board* (level of significance 0.016) where Project Managers with a mean value of 3.07 have identified as a critical success factor. Mean values of the responses of Senior Managers and Team Members, which were 2.64, and 2.59 respectively indicate that they have not identified this as a critical success factor.

4.4.2 Analysis of Success Factors based on Banking Experience of the Respondents

The respondents banking experience were categorized in to four categories namely; “Less than 2 years”, “2 to 5 years”, “5 to 10 years” and “Over ten years”. Responses to the questionnaire were analyzed based on the said categories, to determine whether significant variance exist between the opinions of respondents of those categories. Table 4.22 illustrates the level of significance related to each critical success factors.

Table 4.22: Level of Significance of Success Factors Based on Respondents Banking Experience

ANOVA Output						
Based on Years of Experience in Banking Industry		Sum of Squares	df	Mean Square	F	Sig.
Organizational Expectations	Between Groups	3.804	3	1.268	3.119	0.027
Refining the Requirements	Between Groups	1.244	3	0.415	1.783	0.151
Evaluation of Responses	Between Groups	3.350	3	1.117	2.490	0.061
Proof of Concept	Between Groups	2.286	3	0.762	1.051	0.371
Sharing Experience	Between Groups	6.260	3	2.087	2.423	0.066
End User Participation	Between Groups	4.860	3	1.620	3.020	0.030
Setting Direction	Between Groups	3.762	3	1.254	2.033	0.110
Project Sponsorship	Between Groups	8.956	3	2.985	4.665	0.003
Prioritizing Deliveries	Between Groups	0.641	3	0.214	0.361	0.781
Process Innovation	Between Groups	3.686	3	1.229	1.597	0.191
Guidance from Top Management	Between Groups	9.554	3	3.185	4.597	0.004
Minimum Customization	Between Groups	1.783	3	0.594	0.538	0.657
Professional Project Management	Between Groups	2.984	3	0.995	1.829	0.142
Competent Project Team	Between Groups	1.160	3	0.387	1.142	0.333
Dedicated Resources	Between Groups	1.546	3	0.515	0.831	0.478
Transparency	Between Groups	11.250	3	3.750	4.748	0.003
Vendor Commitment	Between Groups	2.483	3	0.828	1.844	0.140
Knowledge Transfer	Between Groups	0.740	3	0.247	0.657	0.579
Lessons Learnt	Between Groups	3.443	3	1.148	1.222	0.302
External Expertise	Between Groups	5.329	3	1.776	1.852	0.138
Supervision by the Board	Between Groups	3.274	3	1.091	1.189	0.315
Business Commitment	Between Groups	4.348	3	1.449	2.241	0.084
Creative Problem Solving	Between Groups	0.598	3	0.199	0.510	0.676

Source: Research Data – SPSS Output

As indicated in the Table 4.22 there are only five success factors, which have significant variance among the responses of different categories of respondents. Table 4.23 illustrates the mean values related to each category of respondents. .

Table 4.23: Success Factors Mean Values based on Banking Experience

Q. No	Success factor	Experience of Respondents in the Banking Industry (Years)			
		Less than 2	2 - 5	5 - 10	Over 10
Q7	Organizational Expectations	2.86	3.60	3.59	3.61
Q12	End User Participation	3.71	2.87	2.85	2.98
Q13	Guidance from Top Management	3.14	3.20	2.96	3.28
Q14	Project Sponsorship	2.86	3.07	3.17	3.50
Q22	Transparency	3.57	3.00	2.72	3.23

Source: *Research Data*

From the above table 4.23, there appears to be clear correlation between the banking experience of the respondents and the intensity of appreciation of **Organizational Expectations** where mean values of the responses related to “Less than 2”, “2-5”, “5-10” and “Over 10” were 2.86, 3.60, 3.59 and 3.61 respectively. With the experience, level of appreciation of the success factor increases. **Project Sponsorship** too shows a positive correlation with the industry experience of the respondents where mean values of the responses related to “Less than 2”, “2-5”, “5-10” and “Over 10” were 2.86, 3.07, 3.17 and 3.50 respectively.

In relation to the remaining success factors, no clear correlation between the intensity of appreciation of the success factor as a critical success factor and the industry experience of the respondents could be observed.

4.4.3 Analysis of Success Factors Based on CBS Project Experience

Respondents were segregated in to three categories based on their experience in CBS projects and the responses were analyzed based on those categories. Table 4.24 illustrates the level of significance of the responses between the three categories against each success factor.

Table 4.24: Level of Significance of Success Factors against the CBS Project Experience

ANOVA Output						
Based on CBS Project Experience		Sum of Squares	df	Mean Square	F	Sig.
Organizational Expectations	Between Groups	0.545	2	0.272	0.651	0.522
Refining the Requirements	Between Groups	2.077	2	1.039	4.554	0.011
Evaluating the Responses	Between Groups	0.994	2	0.497	1.089	0.338
Proof of Concept	Between Groups	0.738	2	0.369	0.506	0.603
Sharing Experience	Between Groups	1.730	2	0.865	0.987	0.374
End User Participation	Between Groups	2.435	2	1.218	2.238	0.109
Setting Direction	Between Groups	4.141	2	2.070	3.380	0.036
Project Sponsorship	Between Groups	10.057	2	5.028	7.948	0.000
Prioritizing Deliveries	Between Groups	1.923	2	0.961	1.645	0.195
Process Innovation	Between Groups	0.384	2	0.192	0.246	0.782
Guidance from Top Management	Between Groups	5.503	2	2.752	3.894	0.022
Minimum Customizations	Between Groups	12.830	2	6.415	6.082	0.003
Professional Project Management	Between Groups	4.513	2	2.256	4.215	0.016
Competent Project Team	Between Groups	1.639	2	0.819	2.444	0.089
Dedicated Resources	Between Groups	0.428	2	0.214	0.343	0.710
Transparency	Between Groups	6.762	2	3.381	4.200	0.016
Vendor Commitment	Between Groups	4.851	2	2.426	5.548	0.004
Knowledge Transfer	Between Groups	0.193	2	0.097	0.257	0.773
Lessons Learnt	Between Groups	1.325	2	0.662	0.701	0.497
External Expertise	Between Groups	4.035	2	2.018	2.100	0.125
Supervision by the Board	Between Groups	2.139	2	1.070	1.164	0.314
Business Commitment	Between Groups	1.595	2	0.797	1.216	0.298
Creative Problem Solving	Between Groups	2.365	2	1.182	3.095	0.047

Source: Research Data – SPSS Output

Nine success factors indicating significant variance over the responses of different categories were identified. The highest level of significance was observed related to the *Project Sponsorship* and lowest was observed in relation to *Creative Problem Solving*.

Table 4.25 illustrates the pattern of responses related to success factors based on the number of CBS projects involved by the respondents. Only the respondents having experience in more than two projects consider *Guidance from Top Management* as a critical success factor. Experience of the respondents in CBS projects appears to have a strong positive correlation in appreciation of *Transparency* as a critical success factor in CBS projects. The CBS project experience was not impact on *Minimum Customizations* during implementation of CBS. This may due to user demand of functionalities, process improvements. It was noted during the interview process, the package software needs to be customized to suit Sri Lankan banking context where *Minimum Customization* would not be a critical element.

Table 4.25: Success Factors Mean Values based on Respondents Involvement in CBS projects

Q. No	Success Factor	Number of instances the respondents have got involved in CBS implementation projects – (Mean Values)		
		Once	Twice	More Than Twice
Q17	Guidance from Top Management	2.95	2.91	3.23
Q22	Transparency	2.88	3.12	3.27
Q08	Refining the Requirements	3.64	3.63	3.82
Q13	Setting Direction	3.33	2.98	3.23
Q14	Project Sponsorship	3.44	3.00	3.50
Q18	Minimum Customizations	2.59	2.00	2.50
Q19	Professional Project Management	3.43	3.65	3.30
Q23	Vendor Commitment	3.49	3.46	3.76
Q29	Creative Problem Solving	3.55	3.47	3.71

Source: *Research Data*

Although it is reasonable to expect a correlation between the intensity of the response and the experience of the respondents related to CBS projects, such conclusion cannot be drawn due to the response pattern of the respondents having experience in two CBS projects, which appears to be somewhat distorted. Except in the case of *Transparency*, this distortion prevails over rest of the success factors, with a high level of significance between the responses of different categories of respondents.

A clear pattern of increased in intensity of appreciation with respect to three success factors namely *Guidance from Top Management*, *Transparency*, *Refining the Requirements*, *Project Sponsorship*, *Vendor Commitment*, and *Creative Problem Solving* and could be seen among the responses of the respondents having CBS project experience above 2 years.

4.4.4 Analysis of success factors based on Awareness of Respondents on CBS Project Failures

Table 4.26 illustrates the level of significance related to variances among the average responses of different category of respondents with their awareness on CBS project failures. Out of the 23 success factors, eight indicate significant variances between the average responses of different categories of respondents. Responses for the *Business Commitment* shows the highest level of significance (0.000) and *Expert in the Team* show the lowest level of significance among the factors identified with substantial significance.

Table 4.26: Level of Significance of success factors based on Awareness of CBS Project Failures

ANOVA Output						
Based on Respondents Awareness of CBS Project Failures		Sum of Squares	df	Mean Square	F	Sig.
Organizational Expectations	Between Groups	2.891	1	2.891	7.104	0.008
Refining the Requirements	Between Groups	0.022	1	0.022	0.093	0.761
Evaluating the Responses	Between Groups	3.415	1	3.415	7.682	0.006
Proof of Concept	Between Groups	0.350	1	0.350	0.481	0.489
Sharing Experience	Between Groups	0.661	1	0.661	0.754	0.386
End User Participation	Between Groups	0.661	1	0.661	1.204	0.274
Setting Direction	Between Groups	0.443	1	0.443	0.708	0.401
Project Sponsorship	Between Groups	0.165	1	0.165	0.246	0.620
Prioritizing Deliveries	Between Groups	1.579	1	1.579	2.707	0.101
Process Innovation	Between Groups	1.313	1	1.313	1.699	0.194
Guidance from Top Management	Between Groups	6.887	1	6.887	9.865	0.002
Minimum Customizations	Between Groups	1.770	1	1.770	1.615	0.205
Professional Project Management	Between Groups	4.439	1	4.439	8.321	0.004
Competent Project Team	Between Groups	1.579	1	1.579	4.728	0.031
Dedicated Resources	Between Groups	3.553	1	3.553	5.854	0.016
Transparency	Between Groups	1.770	1	1.770	2.153	0.144
Vendor Commitment	Between Groups	3.694	1	3.694	8.391	0.004
Knowledge Transfer	Between Groups	0.111	1	0.111	0.295	0.587
Lessons Learnt	Between Groups	0.854	1	0.854	0.906	0.342
External Expertise	Between Groups	0.493	1	0.493	0.508	0.477
Supervision by the Board	Between Groups	0.137	1	0.137	0.148	0.701
Business Commitment	Between Groups	8.311	1	8.311	13.296	0.000
Creative Problem Solving	Between Groups	0.111	1	0.111	0.284	0.595

Source: Research Data – SPSS Output

Table 4.27 indicates the mean values of success factors, which has a significant variance between the average responses of different categories of respondents. There is evidence for increase in the intensity of rating in the case of respondents who are aware of project failures. This scenario may occur due to their awareness and perception on possible causes for such failure.

Table 4.27: Success Factors Mean Values based on Awareness of CBS Project Failures

Success Factor	Mean Values	
	Respondents aware CBS failures	Respondents Not aware CBS Failures
Organizational Aspirations	3.77	3.52
Response Matching	3.70	3.43
Guidance from Top Management	3.36	2.97
Professional Project Management	3.66	3.34
Expert in the Team	3.69	3.50
Dedicated Team	3.31	3.03
Vendor Commitment	3.82	3.54
Business Commitment	3.36	2.93

Source: *Research Data*

Table 4.27 illustrates that the CBS project failures experienced by respondents identified success factors as a critical success factor where other category of respondents do not agreed with two success factors. Such as, Guidance of Top Management and Business Commitment are identified as non critical success factors by the respondents who are not aware of CBS project failures.

4.5 Analysis of Success Factors based on Vendor Responses

As described in Chapter 3, the sample population consists of representatives from the foreign CBS vendors. This was done to determine the perspective of the vendor on CBS projects.

Table 4.28: Analysis of Success Factors with Vendor Perspective

Q. No	Success Factor	Vendors Response		
		Mean	SD	Lower value of confidence interval at 90% Confidence Level
Q16	Process innovation	3.14	0.37796	2.9050
Q17	Guidance from Top Management	2.86	0.69006	2.4310
Q22	Transparency	2.00	1.15470	1.2821
Q26	External Expertise	2.43	1.39727	1.5613
Q7	Organizational Aspirations	3.29	0.48795	2.9866
Q8	Precision of Requirements	3.71	0.48795	3.4066
Q9	Response Matching	3.43	0.78679	2.9409
Q10	Concept at Work	2.86	1.06904	2.1954
Q11	Sharing Experience	2.43	0.97590	1.8233
Q12	End User Participation	2.57	1.27241	1.7789
Q13	Setting Direction	2.57	0.78679	2.0809
Q15	Prioritizing Deliveries	3.00	1.00000	2.3783
Q25	Lessons Learnt	2.29	1.11269	1.5982
Q14	Sponsorship	2.57	0.53452	2.2377
Q18	Embracing Technology	3.29	1.11269	2.5982
Q19	Professional Project Management	3.43	1.13389	2.7251
Q20	Expert in the Team	2.71	0.75592	2.2400
Q21	Dedicated Team	2.43	0.78679	1.9409
Q23	Vendor Commitment	2.86	0.89973	2.3006
Q24	Knowledge Transfer	3.14	1.06904	2.4754
Q27	Supervision by the Board	2.57	0.78679	2.0809
Q28	Business Commitment	2.29	1.11269	1.5982
Q29	Creative Problem Solving	3.43	0.53452	3.0977

Source: Research Data

Table 4.28 shows the vendor perspective related to the success factors on CBS selection and implementation process. At the mean value level, vendor representatives have identified nine critical success factors. Compared to the bankers who have selected Thirteen (13) success factors out of a list of twenty three (23) as critical, vendor representatives have identified only two success factors at 90% confidence level, namely *Refining the Requirements* (3.4066) and *Creative Problem Solving* (3.0977). Bankers too have identified these as critical success factors.

Vendor's perspective need not be the perspective of the bank or vice versa as they are on opposite sides of the project. Due to the fewer number of respondents, inferences cannot be made related to the vendor's perspective and if made, they may be biased. It was found that the *Process Innovation* will become a critical success factor at a confidence level of 60% and none of the other success becomes a critical success factor above three even at that level.

4.6 Analysis of Critical Success factors Related to Selection Process

According to the conceptual framework defined in chapter 3, six key perceptions were identified for the selection of core banking system. There were thirteen success factors defined to determine critical success factors for the CBS selection process.

Table 4.29: Ranking of Critical Success Factors for CBS Selection Process

Critical Success Factor	Lower boundary of the confidence interval at 90% Confident Level	Level of Significance related to Socio-Demographic Attributes of the Respondents			
		Role of played in the Project	Banking Industry Experience	No. of CBS Projects Involved	Awareness of CBS Failures
Refining the Requirements	3.669	0.197	0.151	0.011	0.761
Organizational Expectations	3.512	0.876	0.027	0.522	0.008
Evaluating the Responses	3.429	0.094	0.061	0.338	0.006
Project Sponsorship	3.274	0.000	0.003	0.000	0.620
Setting Directions	3.117	0.000	0.110	0.036	0.401
Transparency	3.014	0.153	0.003	0.016	0.144

Source: *Research Data*

Table 4.29 illustrates the summary of analysis related to CBS selection process with the lower boundary of the confidence interval at 90% confidence level and significant variances related to the socio-demographic factors. Six out of thirteen critical success factors have been identified by the respondents as critical with some significant variances among the socio-demographic factors.

Respondents have ranked the *Refining the Requirement* (having a value of 3.669 as the lower boundary of the confidence interval at 90% confidence level) as the most important critical success factor. Significant differences of opinion could be observed for this critical success factor among the socio-demographic grouping of the respondents in relation to number of CBS projects they were involved in with mean values of 3.64, 3.63 and 3.82 for the 3 categories under this socio-demographic grouping. The mean values clearly indicate that the success factor has been identified as critical irrespective of their socio-demographic attributes.

Respondents have ranked the *Organizational Expectations* (having a value of 3.512 as the lower boundary of the confidence interval at 90% confidence level) as the second most important critical success factor. Significant differences of opinion could be observed for this critical success factor among the socio-demographic groupings of the respondents in relation to their banking industry experience and also related to number of CBS projects they were involved. In the case of four categories related to the banking experience grouping, mean values were 2.86, 3.60, 3.59, and 3.61. Only the respondents in the category of having less than two years of banking experience failed to identify this success factor as critical. Rest of the categories in this group more-or- less have ranked this success factor as a critical one with almost similar weight.

Having a value of 3.512 as the lower boundary of the confidence interval at 90% confidence level, *Evaluating the Responses* has been selected as the third most important critical success factors related to the selection process. Significant differences of opinion could be observed for this critical success factor among the socio-demographic grouping of the respondents in relation to number of CBS projects they were involved with mean values of 3.82, 3.70, and 3.43 for the 3 categories under this socio-demographic grouping. The mean values clearly indicate that the success factor has been identified as critical irrespective of their socio-demographic attributes.

Project Sponsorship, having a value of 3.274 as the lower boundary of the confidence interval at 90% confidence level was considered as the fourth critical success factor in the order of importance related to CBS selection process. Significant differences of opinion could be observed for this critical success factor among the socio-demographic groupings of the respondents related to their banking industry experience, related to number of CBS projects they were involved and also on the roles played by them in the project. Mean values related to the groupings based on role played in the project by the respondents are 3.68, 3.30, and 3.16, whereas those related to the groupings based on banking industry experience are 2.86, 3.07, 3.17 and 3.50. Mean values related to the groupings based on number of projects involved are 3.44, 3.00, and 3.50. Except in the case of respondents with banking industry experience less than two years, rest has unanimously identified this as a critical success factor.

Setting Direction having a value of 3.117 as the lower boundary of the confidence interval at 90% confidence level has been selected as the fifth critical success factors in the order of importance. Significant differences of opinion could be observed for this critical success factor among the socio-demographic groupings of the respondents related to number of CBS projects they were involved and on the roles played by them in the project. Mean values related to the groupings based on role played in the project by the respondents are 3.37, 3.45 and 2.99 (Team members) and the mean values related to the groupings based on number of projects involved are 3.33, 2.98 (two projects), and 3.23. Only the Project Team Members category and the category of respondents having involved in two projects have failed to identify this as a critical success factor whereas rest have ranked it as critical.

Transparency having a value of 3.014 as the lower boundary of the confidence interval at 90% confidence level has been selected as the last critical success factor related to the CBS selection process. Significant differences of opinion could be observed for this critical success factor among the socio-demographic groupings of the respondents in relation to their banking industry experience, and related to number of CBS projects they were involved. Mean values related to the groupings based on the banking industry experience of the respondents are 3.57, 3.00, 2.72 (5-10 years), and 3.23, whereas those related to the groupings based on number of projects involved are 2.88 (only one project), 3.12, and 3.27.

Based on the above analysis, the critical elements for the CBS selection process can be listed as *Refining the Requirements, Organizational Expectations, Evaluating the Responses, Project Sponsorship, Setting Direction and Transparency*.

4.7 Analysis of Critical Success Factors Related to CBS Implementation Process

Table 4.29 illustrates the summary of analysis related to CBS selection process with the lower boundaries of the confidence interval at 90% confidence level and significant variances related to the socio-demographic factors. Ten out of sixteen thirteen success factors have been identified by the respondents as critical with some significant variances among the socio-demographic factors.

Table 4.30: Ranking of Critical Success Factors for CBS Implementation Process

Critical Success Factor	Lower boundary of the confidence interval at 90% Confident Level	Level of Significance related to Socio-Demographic Attributes of the Respondents			
		Role of played in the Project	Banking Industry Experience	No. of CBS Projects Involved	Awareness of CBS Failures
Vendor Commitment	3.539	0.006	0.140	0.004	0.004
Creative Problem Solving	3.534	0.232	0.676	0.047	0.595
Competent Project Team	3.489	0.494	0.333	0.089	0.031
Knowledge Transfer	3.466	0.141	0.579	0.773	0.589
Professional Project Management	3.342	0.248	0.142	0.016	0.004
Project Sponsorship	3.274	0.000	0.003	0.000	0.620
Setting Directions	3.117	0.000	0.110	0.036	0.401
Prioritizing Deliveries	3.090	0.059	0.781	0.195	0.101
Dedicated Resource	3.017	0.038	0.478	0.710	0.016
Transparency	3.014	0.153	0.003	0.016	0.144

Source: *Research Data*

Vendor Commitment has been identified as the most important critical success factor related to the implementation process, with a value of 3.539 as the lower boundary of the confidence interval at 90% Confident Level. Significant differences of opinion could be observed for this critical success factor among the socio-demographic groupings of the respondents in

relation to roles played by them in the project, the number of CBS projects they were involved, their awareness of CBS project failures. Mean values related to the groupings based on role played in the project by the respondents are 3.76, 3.68, and 3.47 whereas those related to the groupings based on number of CBS projects respondents were involved are 3.49, 3.49, and 3.46. Mean values related to the groupings based on the awareness of CBS project failures are 3.82 and 3.54. Despite having significant differences in responses, all categories of respondents have ranked this as a critical success factor.

Creative Problem Solving with a value of 3.534 as the lower boundary of the confidence interval at 90% Confident Level and a significant variance related to socio-demographic groupings of the respondents with respect to their involvement in CBS project have been selected as the second most critical success factor related to the CBS implementations.

Experts in the Team, with a value of 3.489 as the lower boundary of the confidence interval at 90% Confident Level and a significant variance related to socio-demographic groupings of the respondents with respect to their awareness of CBS project failures have been selected as the third most critical success factor related to the CBS implementations. The mean values related to this grouping are 3.69 and 3.50, which indicate that despite having significant variation between the mean values, both categories have strongly identify this as a critical success factor.

Knowledge Transfer, with a value of 3.466 as the lower boundary of the confidence interval at 90% Confident Level has been ranked as the fourth critical success factor. No significance variances were observed among the different categories of respondents.

Professional Project Management has been identified as the fifth most important critical success factor related to the implementation phase, with a value of 3.342 as the lower boundary of the confidence interval at 90% Confident Level. Significant differences of opinion could be observed for this critical success factor among the socio-demographic groupings of the respondents related to the number of CBS projects they were involved and their awareness of CBS project failures. It was observed that mean values of all category of respondents in these categories are well above the threshold of making it a non-critical success factor.

Sponsorship, Setting Direction and Transparency success factors were identified as sixth, seventh and tenth critical success factors respectively in order of importance. These factors which are common to both selection and implementation phases, were discussed under the critical success factors for CBS selection phase.

Prioritizing Deliveries with a value of 3.090 as the lower boundary of the confidence interval at 90% Confident Level has been ranked as the eighth critical success factor. No significance variances were observed among the different categories of respondents.

Dedicated Team, has been identified as the ninth critical success factor related to the implementation phase, with a value of 3.017 as the lower boundary of the confidence interval at 90% Confident Level, just crossing the threshold value of 3. Significant differences of opinion could be observed for this critical success factor among the socio-demographic groupings of the respondents in relation to the roles played by them in CBS projects and their awareness of CBS project failures. Only the Project Team Members have failed to identify this as a critical success factor, where as the rest of the categories of respondents have identified this as a critical success factor.

Based on the above analysis, success factors namely *Vendor Commitment, Creative Problem Solving, Competent Project Team, Knowledge Transfer, Professional Project Management, Project Sponsorship, Setting Direction, Prioritizing Deliveries, Dedicated Resource* and *Transparency* could be finalized and confirmed as critical success factors for the CBS implementation process.

4.8 Summary

In this chapter, the research data was analyzed and presented. Critical success factors were initially identified based on the mean value of 3 or more and refined using the lower boundary of the confidence interval at 90% confidence level for enhanced acceptability. Using one way ANOVA, level of significance between the categories of respondents under various socio-demographic groups were determined and success factors having high level of significance were analyzed in detail to identify possible deviations or distortions, which may render success factors recognized as critical, being non-critical. Based on the analysis, success factors selected by the respondents as critical were further confirmed.

Following the analysis, six success factors related to CBS selection phase and ten success factors related to CBS implementation phase were identified as critical. Out of the sixteen critical success factors identified, 3 factors were common to both selection & implementation phases of the CBS projects. Therefore, out of a total of 23 success factors identified in relation to CBS project success, 13 factors have been identified as critical for the success of CBS projects.

Chapter 5

Discussion

5.1 Introduction

This chapter presents the discussion of results drawn from the data analysis. Discussion begins with CBS selection and implementation processes with critical success factors identified in previous chapter. Thereafter present the critical success factors of CBS selection and implementation for local commercial banking context. Each CSF is discussed in relation to the prevailing literature.

5.2 CBS Critical Success Factors

Out of twenty three success factors sixteen success factors have been identified by the respondents as critical success factors. Out of sixteen CSF's six (6) CSF's are related to the selection process and ten (10) are related to the implementation process. Out of the sixteen (16) CSF's three (3) CSF's are common for both processes.

Following six (6) CSF's related to selection process have been identified by the respondents which are listed in the order of importance as selected by them.

- a. **Refining the Requirements**
- b. **Organizational Expectations**
- c. **Evaluating the Responses**
- d. **Project Sponsorship**
- e. **Setting Direction**
- f. **Transparency**

Following ten (10) success factors have been identified as CSF's related to Implementation process by the respondents, which are listed in the order of importance as selected by them.

- a. **Vendor Commitment**
- b. **Creative Problem Solving**

- c. **Competent Project Team**
- d. **Knowledge Transfer**
- e. **Professional Project Management**
- f. **Project Sponsorship**
- g. **Setting Direction**
- h. **Prioritizing Deliveries**
- i. **Dedicated Resources**
- j. **Transparency**

Following CSFs are common for both CBS Selection and Implementation processes.

- a. **Project Sponsorship**
- b. **Setting Direction**
- c. **Transparency**

Following ten success factors have been identified as important for the success of CBS projects, but have not been identified as CSFs by the respondents.

Table 5.1: Success Factors not identified as CSF's

Success factor	Mean Value	Lower Boundary of Confidence Interval at 90% Confident level
Process Innovation	3.05	2.9573
Proof of Concept	2.92	2.8303
End User Participation	2.96	2.8819
Sharing Experience	2.52	2.4214
Lessons Learnt	2.52	2.4178
Business Commitment	3.04	2.9547
External Expertise	2.62	2.5163
Minimum customization	2.41	2.2996
Guidance of Top Management	3.07	2.9804
Supervision by the Board	2.70	2.5990

Source: *Research Data*

None of these success factors have been identified by the respondents as “Somewhat Important”, “Least Important” or “Not at all Important” for the CBS projects.

5.2.1 Project Success Measurement Criteria

The primary goal of any IT projects would be to meet the business objectives by implementing a suitable software package. Bhatti (2005), Somers and Nelson (2001) have mentioned in their research work the importance of having clear success measurement criteria to evaluate success of IT projects. Project Management Body of Knowledge (2004) indicates that completion of a project achieving project objectives and goals within the agreed time frame, and within the budgets at the successful completion of the project. The possible reasons for the change of success measurement criteria would be the cultural issues, resistant to change, regulatory requirements, local business practices and unique operational procedures in the banks. It was observed that overall bank objectives and end users expectations having slight mismatch. Lewis (2003) mentioned that the lack of clear vision on what success would be like when completion of the implementation would be one of project failure factor.

The research outcome related to measurement of success of a project differs from that in relation to the definition in the PMBOK and the theories of other researchers. In excess of 79% of the respondents have identified Improved Efficiency, End User Satisfaction, and Reduction of Operational Complexity as the three main factors in measuring success of a project which are more or less related to organizational objectives expected out of the project. Only 14.72% have appreciated completion of the project within the agreed time frame as an important factor for measuring the project success. Surprisingly, mere 2.69% of the respondents have identified completion of the project within the budgets as a criterion for measuring success of the project.

The research outcome shows that the identified success measurement criteria are more or less related to the project objectives. It is difficult to measure the extent of achievement as they are more or less qualitative and perceptive, which may vary from one individual to another.

In the case of project managers, in excess of 81% have identified Improved Efficiency, End User Satisfaction, and Reduction of Operational Complexity as the three most important criteria for measuring success of the project whereas, 12% and 3% of the project managers have identified completion of the project within the agreed time frame and completion of the project within the budgets respectively within the three most important factors measuring project success. However, 21% of the Senior Managers and 11% of the team members have indicated timely implementation among the three most important factors measuring project success. Only 1% of the Senior Managers and 4% of the Team Members have included completion of the project within the budgets among the three most important factors related to measuring the success of the project.

The results do not agree with the expectation in the case of the Project Managers as primary responsibility of a Project Manager is to complete the project within the project scope, time and budget. (Project Management Body of Knowledge, 2004) In general Project Managers have triple constraints such as project scope, time and cost. Project quality is affected by managing these three factors. High quality projects deliver the required product, service or result within scope on-time and within budget. The relationship of these factors is such that if any one of these factor changes, at least one of other factor is likely to be affected. The project managers in this instance have failed to identify this “Triple Constraint” to be the success measurement of CBS projects. This may be due to their not being professional project managers or their inexperience in managing IT projects.

There is a strong possibility of appointing a senior member of the Bank, who is not a professional project manager to manage CBS projects on behalf of the Bank. As a result, they fail to appreciate importance of the real project management and may be subject to influences from various stake holders of the project hence not adequately independent to make right decisions. This is further confirmed by the similarity of thinking patterns of the Project Managers and the patterns of Senior Managers and Team Members.

As a results of not identifying completion of the project within the agreed time frame and completion of the project within the budgets as a criterion for measuring success of the

project may result in time and cost overruns, tying-up business resources for long durations than anticipated and vendor losing interest in the project. This could be a result of concentrating more on factors such as user satisfaction, improved efficiency and reduced complexity, which may result in scope-creep leading to extension of project duration. As a result, cost overrun too would take place, not to mention the opportunity cost associated with delays.

This is further proved by respondents ranking End User Satisfaction as the second most important criteria for CBS projects success measurement. This implies that the project completion may largely depend on the end users satisfaction in the backdrop of respondents failing to identify End User Participation, Proof of Concept and Minimum Customizations as CSFs related to CBS projects. There is a possible mismatch in the project success measurement criteria and CSF's.

5.2.2 Awareness of CBS Project Failures

Out of Total respondents 20% of the respondents were aware of CBS project failures in local commercial banks in Sri Lanka. Further analysis revealed that 25% of Project Managers, 24% of Senior Managers and 15% of Team Members indicating such awareness on CBS projects failures.

Out of the respondents who have experience in CBS projects, 27% of the Project Managers, 30% of the Senior Managers and 21% of the Team Members have indicated being aware of CBS project failures in Sri Lankan commercial banks. Ramkumar (2004) mentioned that approximately 20% of IT projects failed without achieving corporate goals. This seems to be valid in the case of CBS project in local commercial banks given the fact that banks do not consider timely completion of the project and completion of the project within the budgets as important criteria for project success.

In reality, and going by the PMBOK definitions, actual number of CBS project failures in local commercial banks could be much higher than the industry benchmark (40%) and that was indicated by the respondents. This confirms the existence of an issue and the validity of

the problem statement “Local commercial banks not meeting desired objectives during agreed timeframe and budgets from the CBS projects.

Lessons Learnt and Sharing Experience have not been identified by the respondents as CSF's related to CBS projects. Respondents, specifically the Project Managers and the Senior Managers were aware of CBS project failures in Sri Lankan commercial banks yet have not considered that learning would help in reducing the possible project failures. This may possibly be due to cultural aspects prevalent in this part of the world.

Ramkumar, (2005) has mentioned that the past learning would be beneficial for the IT projects. Lewis, (2002) has indicated that lack of willingness to do lessons learnt causes the software implementation project failure.

5.2.3 Organizational Objectives

Under usual circumstances, a bank decides to replace its current CBS after evaluating all possible scenarios due to the size of the investment and risks associated with such projects. This includes how IT strategy can be aligned with the business strategy in achieving the business objectives of the bank. The research outcome indicates *Organizational Expectations* as a critical success factor.

This implies that clear vision and business strategy would be the crucial factor before the selection of CBS package. Bhatti (2005), Akkermans and Helden, (2002) have identified that clear goals and objectives were important to guide ERP projects, where the current research outcome agrees with their findings in case of CBS projects.

The first phase of a typical software project should commence with a conceptualization of goals and the ways to accomplish the identified goals. There could be many changes in an organization during an implementation of an IT project. CBS implementation needs to be considered as a business initiative rather than an IT initiative. Lewis (2002) mentioned that competing changes in the organization as a cause for software implementation project failure. The CBS projects may take even up to two years during which the scope of the project may

change. Therefore, it is important to evaluate the impact on the project before any drastic changes in the organization strategy is made during the duration of the project.

Process Innovation (business process re-engineering) has not been identified as a CSF by the respondents. This may lead to loss of opportunity in improving existing processes using features and facilities offered by the new CBS. Users may oppose such transformation due to various reasons, which include their resistance to change, fear of losing their importance and the job security. It was revealed during the focus group interviews, that project objective and goals though discussed among the senior levels are not communicated properly to the rest of the staff. As a result, there is a possibility of end-users having different expectations out of the project. Given the fact that end-user satisfaction being considered as important criteria in measuring the project success, this may lead to organization not achieving its project objectives.

5.2.4 Evaluation Process

Ramkumar (2005) has identified proper business needs as an important factor of the effective CBS selection. Hence, properly documented requirements (RFP) enable the bank to use it as the primary criteria to evaluate the proposed CBS software and to identify the best fit during the selection process. The respondents have identified refining the Requirements and Evaluating the Responses as CSFs. Business strategy, objectives, and requirements of the bank should be clear to all stakeholders who are involved in documenting the requirements. Experts out of the end-users representing all functional units across the bank, who are affected by the change of CBS, need to get involved in preparing the equipments, evaluating the responses from the vendor and in the POC. Further this is an important and relevant in the local commercial banking context given that the end-user satisfaction is one of the important factors in evaluating project success.

According to Akkermans and Helden (2002) cross-functional inputs in preparing the requirements was a key factor for the success of software project. This is possibly due to the fact that there is always a possibility to revise the requirements of the bank in relation to the project (altering the scope of the project) even during the implementation stage to cater to such requirements, which is a good example of scope creep (Project Management Body of

Knowledge, 2004). As a result, projects may experience cost and time overruns. However, the respondents have failed to identify *End User Participation* as a CSF in this instance.

Although Ramkumar (2005) pointed out that 20% of IT projects do not meet the business requirements and he suggests that Proof of Concept (POC) as a critical factor during the selection of CBS. However, the respondents in this research are of the view that POC is not a critical success factor. Under usual circumstances, the end users are involved in reviewing the POC. If a POC is not done, it may finally affect the end-user satisfaction or may lead to heavy customization or if there is a difference in user expectations and the system selected. If either is not desirable first it may lead to failure of the project whereas the latter results in extension of project duration, resulting in cost overrun.

As a result, banks could incur indirect costs, opportunity costs, and unanticipated resources utilization etc., during CBS projects. Extending the project duration leads to many issues such as restriction on organization growth, competitor pressure, increase of cost and lack of enthusiasm from the stakeholders, including end-users and the vendors.

5.2.5 Top Management Support

Akkermans and Helden (2002) has identified Top Management Support as a CSF for ERP projects. Many other researchers including Bhatti, (2005), Somers and Nelson (2001), Ramkumar (2004), Lewis (2003), and Sirivastava (2003) have identified the importance of Top Management Support for the success of software projects. Out of the Senior Managers, 30% have indicated that they were aware of CBS project failures in Sri Lankan commercial banks.

Three success factors, Setting Direction, Project Sponsorship and Business Commitment have been grouped under the Top Management Support for the purpose of this research. Out of the three, Setting Direction and Project Sponsorship have been identified as CSFs whereas Business Commitment has not been identified as a CSF.

The analysis of data indicated Business Commitment (mean - 3.04, lower boundary of the confidence interval at 90% confidence level - 2.9547) has narrowly failed to be identified as a CSF. CBS projects are business projects, which enable banks to grow, improve service levels and be competitive in the markets they operate. Therefore, the Commitment and Binding of the Business Heads is an important factor as the end users of the CBS are involved in many aspects of the project including preparation of business requirements, evaluation of the software, aligning business processes with the system (gap analysis), testing the systems and even signing-off the user acceptance. Lack of Commitment and Binding of the Business Heads may lead to issues related to allocation of resources and prolonging the project duration due to their pressure leading to heavy customization.

5.2.6 Effective Communication

Akkermans and Helden (2002), and Bhatti (2005) have indicated efficient communication between the stakeholders as a critical success factor for ERP projects. The respondents in this research have validated the importance of this as a CSF for CBS projects as well.

Effective communication between the stakeholders is important for the transparency of decisions as well as to synchronize the stakeholders with respect to their expectations. Effective communication reduces the misunderstanding between the stakeholders, hence disputes. Project Manager takes the centre stage in disseminating required information to the stakeholders via various meetings and reports. It is important to have a single source for the purpose of project communication.

5.2.7 Project Management

Project Management is a key aspect of CBS implementation process. Planning the implementation, assessing resource requirements, managing issues and project risks, liaising with the vendor and completing the project, achieving project goals and objectives to the satisfaction of stakeholders and completing the project within the scheduled time and within the budget are the responsibilities of a project manager. Project Management in a CBS implementation is a complex task, a full time job requiring a professional project manager.

Fortune and White (2002), and Akkermans and Helden (2002), in their research have identified the importance of experienced full time project managers for the success of IT projects.

The respondents in this research too have identified a ***Full time, Experienced Project Manager*** as a CSF for the CBS Implementation process. However, the response patterns of the project managers among the respondents suggest that they are not professional project managers or if they are professional project managers, they seem to have limited authority, are heavily influenced by the stakeholders from the Bank, and are not adequately independent in managing the projects. Focus group interviews also confirmed that the project managers in CBS projects are senior bank staff drawn either from the IT division or from Business. As a result, they may put a lot of effort in appeasing the stakeholders instead of managing the project professionally.

Ramkumar (2005) has indicated that, not all requirements are equally important, and some requirements could be more critical than the rest and hence the need for prioritization. ***Prioritization of Delivery*** is a crucial aspect of an IT project, where there are large numbers of localization/customization take place. Depending on business criticality of the customization delivery could be staggered, some even as post go-live deliveries. This would enable the project to be completed within the expected period without delaying it pending delivery of some non-critical requirements.

In the backdrop ***Minimum Customizations*** has not been identified as a CSF, ***Prioritization of Delivery*** has been identified as a CSF by the respondents of this research. Hence, this being a CSF has a strong rationale where they were trying to compensate completion of the project on schedule without compromising on the requirement. Prioritizing the delivery would ease-off the pressure on the vendor to deliver large number of customizations within a practically unrealistic period. If the delivery is pressed within the project duration, it would be probably achieved at the cost of the quality of delivery. Given the fact that ***End User Participation***, and the ***Commitment of the Business Heads*** have not been identified as a CSF, prioritization of requirements could run in to difficulty due to the requirement of the end-users, and the

business heads approval as they are the stakeholders affected due to the prioritization of the requirements for delivery.

Having a dedicated project team, which comprise of competent and open-minded team members would be extremely useful during the implementation stage of the selected CBS. Bates (2004), Bhatti (2005), and Akkermans and Heldon (2002) have indicated that Competent Project Team and Dedicated Resources as CSFs for IT projects. Respondents in this research seem to have appreciated these factors as they have selected *Competent Project Team*, *Dedicated Resources*, and *Positive Thinking and Open Mindedness of the Project Team* as CSFs contributing for the success of CBS projects. If the resources were dedicated to the project, they would be committed to the project and their only interest would be to complete the project successfully. Further, their performance evaluations would be directly linked to their performance in the project, which will motivate them to complete the project in a positive note. Positive thinking and being open minded will enable them to find creative solutions for complex issues during the project, which cannot be resolved by thinking conventionally. Therefore, all these factors are important for the successful completion of the CBS projects.

5.2.8 Vendor Commitment

In the case of a CBS project, vendors and the banks represents two sides of the same coin. Banks opt to maximize the benefits out of the project while the vendors try to maximize their profits from the project. Vendors make various promises and agree on numerous concessions during the selection phase to win contracts, which are worth multi million dollars. Banks on the other hand bargain on pricing and negotiate heavily on terms and conditions, which appear to be beneficial to them. The outcome of those could be the compromise on the quality of delivery during implementation phase by the vendors trying to cut corners to maintain their profit margins. Hence, the contracts need to have win-win position for both banks and vendors. If that is not the case and banks become inflexible and insist on delivery to the letters of the contract, vendors too will become inflexible, and may lose interest on the project halfway through. In such situations, the project duration will have to be extended.

Extending the project period would not be beneficial to both parties as there will be budget overruns and loss of opportunities for both sides.

In reality, the vendors and their implementation teams manage the CBS implementation projects. As a result, banks have to largely depend on the vendors for the successful completion of the project. Though the parties agree on the terms, conditions, and deliverables at the time of signing the contract, contingencies may crop up requiring corrective measures beyond the printed letters of the agreements. Unless the project is abandoned halfway, maintaining amiable relationship with the vendor is a long-term requirement, specifically for the post live period during which banks have to heavily depend on their support. Thus, mutual understanding and flexibility of the parties are extremely important in such instances. An independent professional project manager representing the bank would be best positioned to accomplish this delicate balancing act in order to complete the project successfully. Quite correctly, the respondents have identified *Vendor Commitment* as the most important CSF of all CSFs.

Somers and Nelson, (2001) and Akkermans and Helden (2002) in their research have identified vendor support and commitment as a CSF for the success of ERP projects. Bhatti (2005), Somers and Nelson (2001) have identified process Innovation as a critical success factor for FRP projects. Amarasinghe (2008) recommended that the *Minimum Customization* would be the important aspect when implementing package core banking software. He has further pointed out that the banks do not meet the required goal and struggled to complete the project due to scope creep. From the vendors' perspective, customizations could lead to cost and maintenance implications. Hence, they try to minimize customizations. Banks on the other hand try to maximize customizations rather than adapting to the new software. In this process, they might lose the flexibility offered by the system.

Bhatti (2005), and Holland and Light (1999) have identified the end user training as a CSF for ERP implementations. The respondents in this research have identified *End User Training* as a critical success factor. It was revealed during the focus group interviews that knowledge transfer to end users could be done directly by the vendor to the end-user or vendor to the selective group of trainers, who in turn would train the end-users for this

purpose. Few members in the focus group revealed that they were aware of projects which have had some key issues after going-live due to unsatisfactory end user training.

5.2.9 Proposed Frame Work

This research presents an effective operational framework (Figure 5.1) for CBS projects in Sri Lankan LCBs. The foundation of the proposed framework is based on the Critical Success Factors identified through this research.



Figure 5.1: Core Banking System Selection and Implementation Framework for Local Commercial Banks in Sri Lanka

5.3 Summary

As the outcome of the survey, thirteen CSFs have been identified in relation to CBS projects in Sri Lankan commercial banks. Respondents have failed to identify 10 success factors as CSFs out of a list of 23. This chapter critically evaluated the selected CSFs and their impacts on the project. Further analysis has been made on the success factors, which have not been selected as critical and their impact on the project.

Chapter 6

Conclusion and Recommendation

Delivering a profitable banking service is a significant challenge for the eleven Sri Lankan commercial banks targeting about a 20 million population. Apart from the competition among them, they face competition from the Sri Lankan operations of well-established foreign commercial banks that have the backing of their head offices, which are capable of investing in appropriate technology. At present banks market similar range of products with different positioning to the identical set of customers, where differentiation is more or less based on the technology supporting the banking systems. Therefore, the CBSs play a vital role to meet customer expectations with innovative products, superior service levels, and the demand for speedy error - free transaction processing.

There are some key drivers related to business transformation. They have assumed considerable significance for local commercial banks, such as higher operational efficiency, the ability to tap into new sources of income, scalability, innovation, agility and rapid time-to-market, harmonization of enterprise-wide processes, a proactive approach to risk management and regulatory reporting, and most importantly, higher return on investments of their IT infrastructure. The latest CBSs could be effectively and profitably implemented with a high degree of automation in both front office and back office. Investing on proper core banking solutions for transformation require crucial decision making on selecting right products, right timing and right partners.

6.1 Conclusions

Analysis of data indicates that approximately 25% of CBS projects in local commercial banks fail to achieve desired project objectives. When the projects are evaluated against the accepted project management practices, number of project failures could be more than that as majority of the CBS projects in local commercial banks have had time & cost overruns as a general norm.

Following specific conclusions have been made based on the outcome of this research.

6.1.1 Critical Success Factors for CBS Selection Process

Objective One: “Identify critical success factors related to the selection of CBS to meet the desired objectives of the bank”.

Six Critical Success factors were identified related to the CBS selection process covering four key perceptions and aspect of attributes. The key perceptions and aspect of attributes namely *Organizational Expectations, Refinancing the Requirements, Evaluating the Responses, Project Sponsorship, Setting Direction and Transparency* identified as CSF's related to CBS selection process.

However, there were two key perceptions and aspect of attributes namely, *Past Learning and External Expertise*, which have not been identified as critical success factors.

6.1.2 Critical Success Factors for CBS Implementation Process

Objective Two: “To identify the critical success factors related to implementation phases of CBS project to achieve the desired project objectives and outcomes”.

Ten critical success factors were identified related to the CBS Implementation process covering four key perceptions and aspect of attributes. The key perceptions and aspect of attributes namely *Setting Direction, Project Sponsorship, Transparency, Prioritizing Deliveries, Creative Problem Solving, Competence Project Team, Professional Project Manager, Dedicated Resources, Vendor Commitment, Knowledge Transfer* identified as CSF's related to CBS implementation process.

Here also, two key perceptions and aspect of attributes namely *External Expertise* (common to both Selection and implementation processes) *and Monitoring* have not been identified as critical success factors for CBS projects.

6.1.3 Proposed Framework for CBS Selection and Implementation for Local Commercial Banks in Sri Lanka

Objective Three: “To propose a general framework and unified set of guidelines useful for Sri Lankan commercial banks related to selection and implementation of CBS based on the identified critical success factors and issues”

The need for improved Selection and Implementation processes of CBS has been emphasized in this research. Sri Lanka commercial banks have been enthusiastic in embracing and taking advantage of new developments in technologies to gain a competitive advantage in highly challenging markets with complex customer requirements.

Organizational strategy forms the basis for IT strategy and the IT strategy indicates the requirements for changing the CBS to meet the Organizational objectives. Business requirements flow from the overall organizational objectives and proposed IT strategy. Selection of a CBS solution shall primarily rest on the extent of match between the identified business requirements with the functions, features and facilities available in the proposed system which discussed in previous chapter (Figure 5.1).

Having a Professional Project Manager and a Competent Project Team are critical for the success of the project. Effective Project Management and Vendor Relationship Management are important contributory factors for the success of the project.

Top Management Support and Direction and, Effective Communications are two important aspects of the project required during all stages of the project.

In order to measure the success of the project, it is important to have a Project Success Measurement Criteria.

The above framework developed based on the identified CSFs related to CBS projects in Sri Lankan LCBS, indicates the relationship between each of the above.

6.2 Recommendations

The following recommendations are made in order to enhance the effectiveness of the CBS selection and implementation processes in Sri Lankan Licensed Commercial Banks.

6.2.1 Recommendations for CBS Selection

Having Clear Organizational Objectives

Organizational strategy forms the basis for the IT infrastructure and the functional capability requirement for a CBS. Therefore, having clear organizational objectives is of paramount importance. It will enable the bank to have an IT strategy aligned with the business strategy. Following guidelines will assist the banks in identifying the organizational requirements clearly.

- a. Clear identification of broad organizational objectives, goals, and business models based on the Business Strategy of the bank shall be done as the first step of the CBS selection process. Minimum of a five-year window shall be taken in to account when doing this exercise.
- b. Identified organizational objectives and goals shall be converted in to operational business goals and targets, which could be useful in developing the IT Strategy.
- c. IT strategy shall be developed and documented based on the operationalized business goals. Current and anticipated technological developments, IT infrastructure requirements, sizing and capability requirements of systems based on the business strategy, regulatory requirements, requirements to integrate with other systems and the service delivery channels bank intends to put into operation within the planned window etc., shall be taken in to consideration when developing IT strategies.

Developing Clear Business Requirements

Developing clear business requirements is an important activity in the process of identifying a suitable CBS. Clearly documented business requirements enable the bank to identify a CBS, which closely matches with its requirement, avoiding possible issues such as scope creep, loss of flexibility, bugs, and future upgrade issues, which could extend the project duration and make matters complex. Following guidelines will assist the banks in developing the business requirements clearly.

- a. Development of the business requirements shall be done based on the current business requirements, operationalized business goals and objectives, delivery channels and integration required with other systems.
- b. Cross-functional experts from business and business analysts from the IT department should get involved in preparing the requirements.
- c. Requirements shall be documented in detail as much as possible and all business areas and functionalities, which the bank thinks critical, shall be included in the requirements document.
- d. Based on the documented requirement and on the capabilities of the current CBS, bank may decide whether to upgrade the existing CBS or replace it with a new CBS.

Vendor Selection

Selecting an appropriate CBS, which can cater to the requirements of the bank, is a decisive factor in any CBS project. Capability of the vendor of the selected CBS in implementing the system is equally important to make the implementation a success. Following guidelines will assist the banks in selecting the appropriate vendor for a CBS.

- a. Primary consideration in selecting the CBS shall be given to the closeness of the proposed system to the requirements.
- b. This could primarily be done on the responses of the vendors to the RFP. A scoring mechanism could be developed to ascertain the closest-fit to the requirement out of the proposed solutions.
- c. Once the vendors are shortlisted based on the above, it is advisable to inform the vendor to perform a Proof of Concept (POC). POC could be done either by installing a model system within the bank premises for a specified period or through vendor arranged visits to live sites, or both. In such instances, competent end-users and IT experts need to get involved in the POC and submit two independent reports to the management subsequent to their evaluations of the CBS on their findings on suitability of the system for the requirements of the bank and on the system performance and technology respectively.
- d. Prior to finalizing the system, the bank shall do a background check of the vendor's capabilities in implementing systems in banks of similar size. Recent success stories and learning from the experience of others are two choices banks could use to evaluate the capability of the shortlisted vendors.
- e. Bank shall be cautious in bargaining pricing and the terms and conditions of the contracts. Though the prices and conditions may look favorable to the bank there could be potential pitfalls, such as cut down on resources during implementation, compromise on quality of delivery and inflexibility of the vendor in changing the agreements if the bank has missed out any important requirement, and tight deadlines and unrealistic conditions for user acceptance etc. Such problem could have greater impact on the bank than the savings made and could lead to strained relationships with the vendor and subsequent abandoning of the project in extreme cases.

- f. Banks shall adopt a mechanism to evaluate CBS proposals based on the total project cost and on the cost of ownership instead of only looking at the cost of the CBS. Though the price of CBS may look reasonable, the technology used by the CBS may require expensive hardware, software, databases, communication and even live-ware, which in the long run could be relatively expensive.
- g. A decision to purchase a specific CBS shall be arrived only after considering all of the above factors.

6.2.2 Recommendations for CBS Implementation

Vendor Relationship Management

Strained relationship with the vendor (including vendor's project manager and the implementation team) could hamper the implementation process. Unless a serious violation of the contract occurs, both parties need to be adequately flexible and need to facilitate each other, specifically during the implementation phase. Arrogance on the part of the Banks would not be effective in managing the vendor. Following guidelines will assist the banks in managing the relationship with the vendor during the CBS implementation.

- a. Banks shall maintain a cordial relationship with the selected vendor throughout the project to ensure that the project is completed as expected.
- b. Banks shall ensure that the vendor sends an adequately experienced project manager and an implementation team. Background check (based on the CVs) is recommended on the vendor's implementation team to avoid issues during implementation.
- c. Banks (including their Project Managers and the implementation team members) shall be adequately flexible during the implementation and shall be practical and reasonable in assessing the situations.

- d. When required, apply appropriate amount of pressure on the vendor is recommended. However, banks shall refrain from applying excessive pressure.
- e. Banks shall refrain from making decisions unilaterally on matters that could have an adverse effect on the vendor. Such matters should be discussed with the vendor and amicable solutions should be arrived at.
- f. Banks shall maintain communication channels open with the vendor at different levels and shall agree on an escalation mechanism of issues.
- g. Joint review meetings between the Bank and the vendor shall be held at regular intervals and all issues shall be resolved without any delays and without leading to strained relationships.
- h. Vendor support is extremely important within the first few days after going-live as that is the period possibly many issues may crop-up related to the system. In most of the situations, this may be beyond the non-return point to the old CBS. Having best of the vendor's resources, and able support are mandatory for the bank during this period, for which the banks need to maintain good rapport with the vendor.

Professional Project Manager

Usually, implementation of the core banking solution is the responsibility of the selected vendor, the vendor needs support from the bank staff for this purpose. Activities such as aligning the banks business processes with the CBS (Gap Analysis), User Acceptance Testing (UAT) and Data Migrations from existing systems require participation of the Bank staff. Proper coordination of these activities is extremely important for the successful completion of the project. For this purpose

Banks need to have a project manager. Following guidelines will assist the banks in selecting an appropriate project manager for implementation.

- a) Banks shall identify experienced, professional Project Manager, ideally within the bank. If such a person is not available within the bank, is recommended to obtain the services of an experienced, professional Project Manager.
- b) The selected Project Manager ideally shall have a professional qualification in Project Management and preferably have experience in CBS implementation projects as a project manager.
- c) Banks need to ensure that the project manager has adequate authority in making decisions and he/she is independent of any influences of either from the bank staff or from the vendor. Project manager ideally shall report to the CEO of the Bank to ensure that he/she be made independent up to that extent. The project manager shall be allowed to make un-biased decisions for the best interest of the project and the bank.
- d) Performance of the project manager shall be evaluated based on the success of the project measured against the pre defined project success measurement criteria. On the successful completion of the project, the project manager shall be adequately compensated (by way of a project bonus etc.), indication of which at the initiation of the project would encourage the project manager to achieve the desired project outcome.

Competent Project Team

Similar to having a competent project manager having a competent project team is also an important factor. The project team is a key resource required from the bank during CBS implementation. The following guidelines will assist banks in selecting a suitable project team.

- a) The project team members shall be include experienced senior staff members related to business and service areas, which are related to CBS under implementation and who are capable of making decisions related to areas they represent. Staff members having an open mind, and with positive thinking and who are capable of voluntarily working long hours shall be preferred over the others in selecting the project team.
- b) The project team shall be released to the project on full time basis and shall report to the project manager. They should be made independent of their former heads of the departments and the senior management for the purpose of the project.
- c) It is advisable to include few staff members representing IT, Internal Audit and Risk/Compliance in the project team.
- d) Based on the size of the project and on the anticipated duration, adequate number of team members shall be allocated to the project.
- e) During the continuity of the project the project team shall be evaluated purely based on their performance in the project.
- e) On the successful completion of the project, the project team shall be adequately compensated (by way of a project bonus etc.), indication of which at the initiation of the project would encourage them to achieve the desired project outcome.

Effective Project Management

Effective project management is a mandatory requirement for any project to be successful. Having a professional Project Manager would be a key factor in effective project management. Managing project risk is an activity, which is often ignored by Project Managers who are not professional project managers. The following guidelines will assist banks to have effective project management.

- a. Project shall be managed according to the acceptable project management guidelines, and best practices of the industry. Appropriate project management tools may be used for this purpose.
- b. Managing the risks of the project is an extremely important activity in project management. The project manager needs to maintain a project risk profile on regular basis and take necessary steps to mitigate the project risks.
- c. Scheduling based on practical and realistic estimates, managing resources of the projects including the project budgets, maintaining a complete set of project documentation including technical documents, test scripts, list of issues etc., coordinating and maintaining effective communication with the stakeholders, and managing the project according to the agreed project scope are important.
- d. Minimizing if not preventing scope-creep and prioritizing and scheduling deliveries based on their complexity, extent of modifications and on estimated time taken to perform the testing etc are important activities, which would be useful to complete the project on schedule.
- e. Effective follow-up actions on decisions are required to ensure that decisions are implemented as agreed and on time.

6.2.3 Recommendations Common for both CBS Selection and implementation

Top Management Support and Guidance

Top management support and guidance throughout the CBS project is a mandatory ingredient for the success of the project. The following guidelines will assist banks to have effective Top Management support for the projects.

- a. CBS implementation projects shall be considered as business projects and not as IT projects, as the project is an outcome of business decisions (strategy). This would ensure that the support of the entire bank is obtained for the project.
- b. Due to the size of the investment and the business risk involved in CBS projects, CEO of the bank shall be the project sponsor. This would ensure the acceptance and binding of the entire senior management, business heads, and the end-users for the project, without which the project could run in to issues.
- c. Top management should guide the selection process by clearly defining and spelling out the future business strategy of the bank and providing guidelines for developing business requirements and selecting the matching CBS.
- d. The top management shall release the best of the resources to the project as and when necessary and resolve issues related to the project in a timely and effective manner.
- e. A project steering committee headed by the CEO and maximum of six other senior managers, including the head of IT may be set-up to provide directions, guidance, and necessary support for the project. The committee shall regularly review the progress of the project. However, too many committees related to the project may not be productive and conducive.
- f. Top management shall give their full corporation to the project manager and the project manager shall be made adequately independent to make decisions related to the project within his scope, but shall made him/her responsible and accountable for such decisions and their implications on the project and the bank.
- g. The management shall device appropriate rewarding schemes to encourage the active participation and obtain support of the bank staff for the project. Actions need to be taken to minimize and subside any resistance for changes, which is a usual occurrence in this kind of projects.

Effective Communication

Communication between the stakeholders of the project is vital to maintain transparency, reduce misunderstandings and to keep the stakeholders up to date on the project status thus making them enthusiastic. This could be done by correctly identifying the expectations of different stakeholders of the project and managing their expectations accordingly. The following guidelines will assist banks in having effective communication between the stakeholders of the project.

- a. All important mass communications related to the project shall be made by the CEO or the Project Steering Committee.
- b. During the selection process, senior management need to have constant communication with the teams involved in developing business requirements, preparing RFP and evaluation of systems to provide required guidance.
- c. Project steering committee need to have direct communication with the project manager and let the project manager manage the project, project team and the vendor relations. Progress review meetings with the participation of the bank's project manager and the vendor's project manager shall be held on a frequent basis.
- d. Project manager shall have constant communication with the project team by way of project team briefings to obtain feedback on project progress and provide guidance.
- e. Based on the requirements, project manager or team members appointed by the project manager may arrange meeting with, business heads, end-users and the IT staff on need basis.
- f. Project manager of the bank shall have regular meetings with the project manager and the project team of the vendor to have a constant update on project status and resolve issues related to the project.

- g. All meetings must be initiated with an invitation for the meeting to all parties concerned followed by the agenda of the meeting. All important matters discussed, decisions and point of actions need to be recorded with the due date of action and persons responsible and minutes circulated within the shortest possible time after the meeting to all participants and copied to others only on need to know basis.
- h. E-mails may not be the best medium of communication in CBS projects.

6.2.4 Project Success Measurement Criteria

Without appropriate success measurement criteria, it is difficult to assess whether the project was concluded successfully or not. Further, it is important to know the extent of the project success to make corrective actions (if necessary) and to reward the people who were involved in the project. Criteria to measure the success could be a mix of both qualitative and quantitative factors, which shall be based on the business objectives and scope of the project. In order to be effective, project success measurement criteria shall be agreed at the beginning of the project. Modifications to success criteria shall not be done without the agreement of the project stakeholders (specifically, project manager, the project team and the end-users who are expected to be rewarded on successful completion of the project) to avoid disappointments and discouragement of the stakeholders.

Degree of achievement of expected project objective, outcomes, on-schedule implementation and implementation within the allocated budgets shall be included in the measurement criteria. Qualitative and subjective measurements such as end-user satisfaction shall be avoided as measurement criteria. It is advisable to convert such qualitative factors in to quantifiable or measurable factors

6.3 Areas for Further Research

The CBS selection and implementation would be complex and time-consuming activities which cannot be covered fully in this research. Therefore, only CBS projects related to the Sri Lankan licensed commercial banks were considered for this research. The researcher has found certain critical areas that may require further research. They are,

- The role of foreign consultants in CBS implementation and the composition of consultants and bank project team to complete the project successfully
- IT licensing contracts – Conditions and aspects that cannot be compromised by the Sri Lankan banks; especially on the dispute resolution processes in terms of Sri Lankan law.
- Vendor perspective of CBS projects to find a mechanism of mitigating the risk of misunderstandings between bank and vendor.
- The disaster recovery plan at the time of new system cut over. How banks can minimize disruption to customer service and down time during cutover to the new CBS package.

6.4 Summary

Many conclusions related to the outcome of the research were drawn based on the research outcome. Existence of the issues raised under problem statement has been established in this chapter. According to research outcome in excess of 25% of CBS projects have failed without achieving anticipated project objectives. Based on the research outcomes some important recommendations related to CBS projects of Sri Lankan LCBs were made. Areas for further research have been identified in this chapter.

References

- Akkermans H. and Helden K. (2002)** Vicious and Virtuous Cycles in ERP implementation: A case Study interrelation between critical success factors, *European Journal of Information Systems* V 11, Page 35-46
- Al-Mudimigh Zairi M. and Al-Mashari M. (2001)** ERP Software Implementation: An Integrative framework, *European Journal of Information Systems*, Vol. 10 PP 216-226
- Amarasinghe T. (2008)** Technology Transfer in Sri Lankan Commercial Banks, Postgraduate Institute of Management. Colombo
- Asia Pacific Journal of Finance and Banking Research, (2010)** Volume 4, Number, Global Business Investments and Publications LLC,
- Bank of Ceylon** wins IBM award for fastest deployment of online banking system in Asia Pacific, <http://www.boc.lk/bochome/news/newsrel9.jsp> [access on 13 April 2010]
- Bhatti T. R. (2005)** Critical Success Factors for the Implementation of Enterprise Resource Planning (ERP): Empirical Validation. College of Business. Zayed University, UAE.
- Celent (2006)** IT Spending Trends, *Global Financial Services Review*, New York, USA
www.celent.com/PressReleases/20061113/GlobalITSpending.asp [Accessed on 25 October 2010]
- Christopher et al (1995)** Software Processes and Project Performance *Journal of Management Information Systems*, Vol. 12 No. 3, PP 187-205
- Cooper R. G. and Edgett S. J. (2006)** 10 Ways to Make Better Portfolio and Project Management Selection Decisions, Published by PDMA vision magazine
- Dortson et al (2008)** Core banking System Survey, published on www.capgemini.com [accessed on 04 November 2010]

- Dumbukola B. C. and Weeraratne C. G. (2002)** Aligning Business and IT Strategies and Effective Use of Data for Business Advantage in Sri Lankan Commercial Banks, Postgraduate Institute of Management, Colombo
- Eagle Linda (2009)** Maximizing Return on Investment on Your Core Banking System, Bankers Academy, New York, USA
- Enos, J. Lall, S. and Yun, M. (1997)**, 'Transfer of Technology', *Asia Pacific Economic Literature*, vol. 11(1), pp. 56-66
- Eric T. (2010)** Legal Concepts in Contract and Project Management, published on www.projectperfect.com.au [accessed on 10 July 2010]
- Esteves J. M. and Pastor J. A. (1999)** An ERP Life-Cycle Based Research Agenda, Published in: First International workshop in Enterprise Management and Resource Planning: Methods, Tools and Architectures, Venice, Italy [accessed on 2 August 2010]
- Fichman G. R. and Moses S. A. (1999)** an Incremental Process for Software Implementation, *Sloan Management Review* Vol. 40, No. 2 Pg 39-52
- Finney S. and Corbett M. (2007)** ERP Implementation: A Compilation and Analysis of Critical Success factors, *Business Process Management Journal* Vol. 13 No. 3 pp 329-347
- Frantz P. S., Southerland A. R. and Jonson J. (2002)** ERP Software Implementation Best Practices, Published on *Educause Quarterly*
- Fui-Hoon Nah F. et all (2001)** Critical Factors for Successful Implementation of Enterprise System, *Business Process Management Journal*, Vol 7, No 3, PP 285-296
- Gardner (2009)** Magic Quadrant for International Retail Core Banking, Gardner Industry Research
- Gopal T. N.**, A framework for business transformation for mid-sized retail banks, published on www.infosys.com [accessed on 10 June 2010]

- Goolsby K. (2008)** Outsourcing the Replacement of Core Banking Systems Article Published on <http://www.outsourcing-center.com> [accessed on 10 September 2010]
- Harris, L. (2001)**, 'The IT productivity paradox - Evidence from the UK Retail Banking Industry', *New Technology, Work and Employment*, vol. 16, pp. 35-48
- Holland P. C. and Light B. (1999?)** A Critical Success Factors Model for Enterprise Resource Planning Implementation Manchester Business School
- Howcroft D. and Light B. (2008)** IT Consultants, Salesmanship and the Challenges of Packaged Software Selection in SMEs. *Journal of Enterprise Information*, Vol 21, No 6 PP 597-615
- IBS (2008)** The IBS Sales League Table, *International Banking Systems*, The Journal of Banking Operation and Systems www.ibspublishing.com [accessed on 2 April 2010]
- Infosys (2009)** Key Challenges in Core Banking Replacement, article published on www.infosys.com [accessed on 07 July 2010]
- Infosys (2009)** Risk-Managed Approach to Transformation, Infosys Technologies Limited Bangalore India www.infosys.com [accessed on 07 July 2010]
- Infosys (2009)** Core Banking Transformation, Infosys Technologies Limited, Bangalore India www.infosys.com [accessed on 07 July 2010]
- Infosys (2009)** Thinking Out of the Box, case study Bank Sohar Infosys Technologies Limited, Bangalore India
- Krejcie R. V. and Morgan D. W. (1970)** Determining Sample Size for Research Activities Educational and Psychological Measurement, Published on www.fns.usda.gov/fdd/processing/info/SalesVerificationTable.doc [accessed on 28 December 2010]
- Kontio et all (1995)** A COTS Selection Method and Experiences of Its Use Presented at the NASA Software Engineering Laboratory, Greenbelt Maryland

- KPMG (2010)** Banking System Survey, KPMG Accounts, N.V. Published on www.kpmg.com [accessed on 05 December 2010]
- Krosnick J. A. (1999)** Survey Research, Department of Psychology, Ohio State University, Columbus, Ohio
- Laurence C. T. and Kurt M. K. (2009)** Software Implementation best Practices, The magazine for Construction Financial Management Association
- Lewis K. (2003)** Eight Reasons Why Software Implementation Projects Fail!, Quorum Business Solutions, Houston, TX, published on www.powerandgasmarketing.com [accessed on 06 June 2010]
- Lievens A. and Moenaer R. K. (2000)**, 'Project Team Communication in Financial Service innovation'; *Journal of Management Studies*, vol. 37(5), pp. 733-766
- Lucas H. C. Jr., Walton E. J. and Ginzberg (1988)** Implementing Packaged Software MIS Quarterly, Vol. 12 No. 4 PP 537- 549
- Minz et all (2006)** Renewing Core Banking IT Systems: Open-Heart Surgery for European Banks Boston Consultancy Group Third Annual IT Cost Benchmarking Study, The Boston Consultancy Group.
- McKendrick, D. (1992)**, 'Use and Impact of information technology in Indonesian commercial banks', *World Development*, vol. 20(12), pp. 1753-1768
- Pierron A. (2005)**, 'IT Spending Trends in European Banking', *Celent*, July, www.celent.com/PressReleases/20050720/ITSpending.htm [accessed on 25 October 2010]
- Plant R. and Willcocks L. (2007)** Critical Success Factors in International Implementations: A Case Research Approach, published on *Journal of Computer Information Systems*
- Project Management Body of Knowledge (2004)** third edition published by Project Management Institute, Pennsylvania USA

- Powell R. and Connaway L. S. (2004)** Basic Research Methods for Librarians, 4th Edition, London. Libraries Unlimited.
- Rahman I. (2007)** Role of information technology in banking industry, Review of Business Research published on <http://www.softresources.com/software-selection-tips> [accessed on 06 June 2010]
- Ramkumar V. (2000)** 10 steps for effective Core Banking Software Selection, Article Published on www.cedar-consulting.com [accessed on 06 June 2010]
- Rockne J. (2003)** Tips for Negotiating Contracts, Washington State Bar Association Vol. 14, Issue III Published on www.wsba.org [accessed on 2 July 2010]
- Safeena, Abdullah and Hema, (2010)** Journal of Internet Banking and Commerce published on <http://www.arraydev.com/commerce/jibc> [accessed on 2 July 2010]
- Satchidananda S. S., Rao S. and Wadhavkar R. (2006)** Core Banking Solutions: An Assessment. Working Paper 8, CBIT Center of Banking and Information Technology, International Institute of Information Technology, Bangalore
- Shane H. (2010)** How to Use the Kikert Scale in Statistical Analysis, Published on http://www.ehow.com/how_4855078_use-likert-scale-statistical-analysis.html [accessed on 28 November 2010]
- Srivastava R. (2009)** Learning from Failed ERP Implementation, Published on <http://apps2fusion.com/at/rs/427-failed-erp-implementations> [accessed on 5 November 2010]
- Slideshare Inc (2008)** Role of Commercial Banks in the Economic Development of a Country,. <http://www.slideshare.net/Mustafaseady/role-of-commercial-banks-in-the-economic-development-of-a-country> [access on 05 June 2010]
- Somers T. M. and Nelson K. (2001)** The Impact of Critical Success Factors Across the Stages of Enterprise Resource Planning Implementations, Hawaii International Conference on System Sciences

- Technology Consultancy PLC (2008)** Avoiding the Failure of Software Implementation Projects, Christopher, Published on www.altiris.com [accessed on 20 August 2010]
- Temenos, (2010)** A survival Guide for Core Banking Renewal, White Paper published in <http://www.temenos.com> [accessed on 2 June 2010]
- Temenos (2009)** Core banking Systems for Large Banks: The package Solutions Comes of Age, White Paper Published on www.temenos.com [accessed on 20 December 2010]
- TGI (2009)** Software Selection Process Steps, Technology Group International (TGI), published on www.tgitd.com, [accessed on 27 June 2010]
- Transparentlogic (2006)** 8 Steps to Successful Software Implementation: Aiding the Failure of Software Implementation Projects Published on www.transparentlogic.com [accessed on 7 July 2010]
- William S. B. (2004)** Implementing an Enterprise Project Management Environment, Bates Project management Inc
- White D. and Fortune J. (2002)** Current Practice in Project Management- an empirical study, International journal of Project Management www.elsevier.com/locate/ijproman
- Wybo M. et all (2009)** Information and Management Volume 46, Issue 5 Pages: 285-293, Elsevier Science Publishers B. V. Amsterdam, the Netherlands, the Netherlands
- Yeo K. T. (2002)** Critical Failure Factors in Information System Projects International Journal of Project Management Elsevier Science Ltd and APMA www.elsevier.com/locate/ijproman

Web Sites

<http://www.businessdictionary.com/definition/commercial-bank.html> [access on 13 June 2010]

http://www.investorwords.com/955/commercial_bank.html [access on 13 June 2010]

<http://www.nairaland.com/nigeria/topic-104592.0.html#msg1834724> [access on 04 November 2010]

<http://www.softresources.com/> [access on 12 June 2010]

http://www.ibsintelligence.com/index.php?option=com_labels&view=label&label=com_rebankingsystems. [Accessed on 26 January 2010]

Annual Reports

Bank of Ceylon (2009) Annual Report

Bank of Ceylon (2005) Annual Report

Central Bank of Sri Lanka (2009) Annual Report

Commercial Bank PLC (2009) Annual Report

Commercial Bank PLC (2008) Annual Report

DFCC Vardana Bank (2009) Annual Report

Hatton National Bank PLC (2009) Annual Report

National Development Bank PLC (2009) Annual Report

Nations Trust bank PLC (2009) Annual Report

Pan Asia Bank PLC (2009) Annual Report

Peoples Bank (2009) Annual Report

Peoples bank (2006) Annual Report

Sampath Bank PLC (2009) Annual Report

Seylan Bank PLC (2009) Annual Report

Annexure I

Pilot Survey Questionnaire

FACULTY OF GRADUATE STUDIES
University of Colombo
Pilot Survey
Information from Sri Lankan Commercial Banks
To identify the Critical success factors in acquiring and implementing core banking system.

The information provided will be used for the Masters Research purpose only. Your valuable support is highly appreciated and will definitely add value for the research. Please provide information as at 31 December 2009.

Bank Basic detail					
Name of the Bank					
No of Branches	< 50	50 - 100	100- 150	150-200	> 200
No of Employees	< 1000	1000- 1500	1500- 2000	2000- 2500	> 2500
No of ATM	< 50	50 - 100	100- 150	150-200	> 200
IT budget as a % from total Budget	< 20%	20-30%	30-40%	40-50%	> 50%
IT Systems					
Core Banking System					
Year of implemented					
Approximate Project duration					
Approximate Cost					
No of Members in the Project Team					
Latest upgrade year					
Upgrade time period					

No of upgrades since implementation	
Other sub systems	
Available interfaces	
How many times CBS change during last 15 years	
Previous Core Banking systems	
Year of Implemented	
Reason for Change	
Detail of the respondent - Optional	
Name	
Department	
Designation	
Contact Number	
e-mail address	

Thank you for your valuable time.

Annexure II

Interview Questionnaire

FACULTY OF GRADUATE STUDIES
University of Colombo
Master of Information System Management (MISM)
The Research on Acquiring and implementation of Core banking System
A study based on Sri Lankan Commercial Banks
H. C. Nishantha (2009/MISM/025)

- This survey is done purely for academic purposes.
- All information provided herein will be treated in the strictest confidence. Neither you nor your organization will be identified in any publication resulting from this research project.
- Please fill in the questionnaire as fully as possible.

Q1. Which of the following **best describes** your role in the Core Banking System Implementation Project?

Head of IT / Senior Manager (IT) Consultant

Q2. Years of experience in Banking Industry

Less than 1 2 – 5 5 – 10 Over 10

Q3. How many instances have you got involved in an area of core banking software selection?

None Once Twice More than Twice

Q4. Are you aware of any Sri Lankan Commercial Banks where Core Banking System Implementation has failed?

Yes No if yes, how many such failures?

Comments:.....

Q5. On what key factors do you define Core banking system implementation Success? (Please rank if more than one selected)

Improved efficiency	<input type="checkbox"/>	Reduced Complexity of operation	<input type="checkbox"/>
End user Satisfaction	<input type="checkbox"/>	Low cost of ownership	<input type="checkbox"/>
Timely implementation	<input type="checkbox"/>	Implement within budget	<input type="checkbox"/>
Other (Please Specify)	<input type="checkbox"/>	

Q6. In your opinion which of the following factor influence the final decision making? (Please rank if more than one selected)

IT Department	<input type="checkbox"/>	End Users	<input type="checkbox"/>	Corporate Management	<input type="checkbox"/>	Other	<input type="checkbox"/>
Vendor	<input type="checkbox"/>	Consultants	<input type="checkbox"/>	Specific Individual	<input type="checkbox"/>		

Please Specify

Success Factors Related to Selection and Implementation of Core Banking Software System

Not at all	Low	Medium	High	Not known	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Not Known					
1	2	3	4	5	1	2	3	4	5	6					
					To what extent has this been practiced during last CBS change in which you were involved?					What is your opinion of the relevance of these factors in Core Banking implementation?					
					1	2	3	4	5	1	2	3	4	5	6
Q7	Clear Organizational goals should always be defined in place before considering a change of system.														
Q8	The proper requirements preparation will guide the institution to select the best suited software solution, capable of meeting the business requirements.														
Q9	The methods of evaluation used in selection of core banking system shall be, 1. Responses of the vendor to our requirements (RFP) 2. Proof of concept (POC) 3. Success Stories / Case Studies 4. Other (Please Specify).....														
Q10	The Cross functional inputs for the selection process provides\ a value addition for the evaluation criteria.														
Q11	Top Management support and guidance is crucial for successful completion of the 1. Selection Process 2. Implementation Process														
Q12	Prioritization of specific functions of the system always provides a better direction in 1. Selection Process 2. Implementation Process														
Q13	Business process re-engineering is considered as positive factor in core banking applications during 1. Selection Process 2. Implementation Process														

Q14	IT/Project steering committees provide value addition for, 1. Selection Process 2. Implementation Process										
Q15	Appropriate customization to the system to meet business requirement is vital in implementation. However, minimum customization policy is best for the implementation success.										
Q16	Full time experience Project Manager is a key to achieve success in the implementation process,										
Q17	The project team should consist of experienced and knowledgeable users from all business and technical users from internal departments.										
Q18	Dedicated project team is mandatory to achieve successful implementation of a core banking system.										
Q19	Effective communication between stakeholders of the project is vital for the success of the project.										
Q20	Vendor support and commitment is a key for successful implementation.										
Q21	User Training is a important factor for implementation success. 1. Vendor train the trainers and trainers train the end users 2. Vendor train all users directly 3. All training handled internally by Bank staff.										
Q22	Considering learning experiences of other banks is valuable to make the project a success during. 1. Selection Process 2. Implementation Process										
Q23	Involvement of external experienced consultants in these processes is beneficial during. 1. Selection of a system 2. Implementation process										
Q24	Any other factors related to banking system selection / Implementation? 1.										

	2.																			
	3.																			
	4.																			
	5.																			
	6.																			
	7.																			
	8.																			
	9.																			
Q25	Undue influences or interference to selection or implementation process adversely affect the outcome of the project.																			

Comments:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....

(Thank you for completing this questionnaire)

Annexure III

Survey Questionnaire

FACULTY OF GRADUATE STUDIES
University of Colombo
Master of Information System Management (MISM)
The Research on Acquiring and implementation of Core banking System
A study based on Sri Lankan Commercial Banks
H. C. Nishantha (2009/MISM/025)

- This survey is done purely for academic purposes.
- All information provided herein will be treated in the strictest confidence. Neither you nor your organization will be identified in any publication resulting from this research project.
- Please fill in the questionnaire as fully as possible.

Q1. Which of the following **best describes** your role in the Core Banking System implementation project?

Senior management Project Manager Team Member

Q2. Years of experience in Banking Industry

Less than 1 2 – 5 5 – 10 Over 10

Q3. How many instances have you got experienced in an area of core banking system changes?

None Once Twice More than Twice

Q4. Are you aware of any Sri Lankan Commercial Bank where core banking system implementation has failed?

Yes No if yes, how many such failures?

Comments:.....

Q5. On what key factors do you define Core banking system implementation Success? (Please rank if more than one selected)

Improved efficiency	<input type="checkbox"/>	Reduced Complexity of operation	<input type="checkbox"/>
End user Satisfaction	<input type="checkbox"/>	Low cost of ownership	<input type="checkbox"/>
Timely implementation	<input type="checkbox"/>	Implement within budget	<input type="checkbox"/>
Other (Please Specify)	<input type="checkbox"/>	

Q6. In your opinion which of the following factors influence the final decision making? (Please rank)

End Users IT Department Vendor Specific Individual/s
 Corporate Management Consultants Other (Please Specify).....

(5)	(4)	(3)	(2)	(1)
Extremely Important for the Success of Project/Process	Important for the Success of Project/Process	Somewhat Important for the Success of Project/Process	Least Important for the Success of Project/Process	Not at all Important for Success of Project/Process

Success Factors Related to Selection and Implementation of Core Banking Software System

Please tick (X) one according to its relevance						
		5	4	3	2	1
Q7	Clearly establishing goal, objectives, outcomes and benefits desired of the project before evaluation and selection of the CBS Package					
Q8	Documenting the functional requirements clearly and in detail prior to preparation of Requirement for Proposal (RFP)					
Q9	Considering responses of the vendors for the requirement indicated in RFP as the primary criteria for short listing vendor					
Q10	Requiring short listed vendors to demonstrate “Proof of Concept” (POC) prior to the final decision to select is made					
Q11	Look for Success Stories / Case Studies related to proposed CBS solutions and implementation by the vendors short-listed for selection and implementation					
Q12	Obtaining input from concerned cross functional users for preparation of requirements for the software selection process					

Q13	Top Management Guidance during the CBS project.					
Q14	Top Management Support during the Selection and Implementation Process					
Q15	Prioritizing delivery of business requirements based on project timing					
Q16	Willingness to critically evaluate current business processes and re-engineer them whenever necessary during the CBS project					
Q17	Guidance from IT and/or Project Steering Committee for the CBS Project					
Q18	Adopting the proposed system with minimum customization					
Q19	Professional experienced and full time Project Manager to manage the CBS Project					
Q20	Allocation of experienced and knowledgeable Project Team for implementation					
Q21	Allocation of Cross Functional, Dedicated Project Team for the Implementation					
Q22	Frequent Communication with Project Stakeholders					
Q23	Vendor Support and Commitment during the Implementation of CBS					
Q24	Proper Ed User Training directly by Vendor or by the bank with the support of the Vendor					

Q25	Use lessons learnt through own past experiences in similar projects during the selection and implementation of CBS					
Q26	Use of External Experienced Consultants					
Q27	Monitoring the progress of the project by the Board of Directors					
Q28	Binding of Business Heads for the CBS Project					
Q29	Project Team need be optimistic and be open minded in finding solution for issues during implementation					
Q30	Other Features (Please Specify)					

(Thank you for completing this questionnaire)

Appendix I

**Table for Determining Sample Size from a Given Population 95%
Confidence Interval**

N	S	N	S	N	S
10	10	230	140	1200	291
15	14	240	144	1300	297
20	19	250	148	1400	302
25	24	260	152	1500	306
30	28	270	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	181	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	246
85	70	440	205	4000	351
90	73	460	210	4500	351
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	225	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	373
150	108	750	256	15000	375
160	113	800	260	20000	377
180	118	850	265	30000	379
190	123	900	269	40000	380
200	127	950	274	50000	381
210	132	1000	278	75000	382
220	136	1100	285	100000	384

Note: "N" is population size

"S" is sample size.

Source: *Krejcie R. V. and Morgan D. W. (1970)*