THE PRACTICES AND CHALLENGES OF ENTERPRISE RESOURCE PLANNING PROJECT IMPLEMENTATION OF COMMERCIAL BANK OF ETHIOPIA

BY

NEBIYOU SOLOMON

A RESEARCH PROJECT SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN PROJECT MANAGEMENT

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SOLOMON MARKOS (PHD)

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Approval Sheet

As members of the examining Board, We certify that we have read and evaluated the research project prepared by Nebiyou Solomon entitled "The Practices And Challenges of Enterprise Resource Planning Project Implementation of Commercial Bank of Ethiopia" and recommend that it be accepted as fulfilling the research requirements the degree of master of arts in project management.

Advisor	Signature	Date
Internal Examiner	Signature	Date
External Examiner	Signature	Date

Dedication

I dedicated this research project to my families to whom I am forever gratifying. Especially, My mom “Semmy” and my wife “Hiwi”, for nursing me with affection and love. You are there in the success of my life. Thank you for being my source of inspiration. Particularly, my three children Emmanuel, Soliyana & Salsawi who are great golden gift from the above heaven “eternal God” and also my esteemed brothers who are definitely part & parcel of my life. I dedicated this research project share also to them. I wish a wish for them to graduate like this even more than.

Statement of Declaration

I, the undersigned, declare that this research paper entitled “The practices and challenges of enterprise resource planning project implementation of Commercial Bank of Ethiopia” is a result of my own investigation, except all sources of materials used for the study have been duly acknowledged. I have undertaken the study independently with the guidance and support of my research advisor. Other sources have been acknowledged by citations giving for further references.

Nebiyou Solomon T/Mariam

Signature: _____

Date: _____

Statement of Certification

This is to certify that this project work, *"The Practices and Challenges of Enterprise Resource Planning Project Implementation of Commercial Bank of Ethiopia"* undertaken by Nebiyou Solomon for the partial fulfillment of Master of Project Management at Addis Ababa University. I have read this research project prepared under my direction and recommended that it be accepted as fulfilling the research requirement.

Signature _____

Date _____

Research Advisor

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Abstract

Currently, organizations are using Enterprise Resource Planning Software (ERP) for better business progress and managing increasingly complex operations to attain success and competitive edge over their competitors. The ERP software is a technology information system which accustomed to integrate all functional areas of business processes and resource of an organization. Therefore, commercial bank has introduced this new information system solution named ERP in August 2015 with respect, the major objective of this study is to assess the practices and challenges of ERP project implementation in the bank and to recommend the possible solutions for the gap identified during the implementation. As a result, The Sample size was determined from the total 150 population size to conduct the study using the formula developed by Taro Yamane (1967). Thus, the sample size of the study was 110 individuals who were selected from five ERP modules practices project areas. The researcher used proportionate stratified sampling from probability and purposive (judgmental & Quota) sampling from non-probability technique sampling to get a representative of needed sample from total population of project employees. Data collected from target group by means of questionnaires and interviews including observation. Then after, Beside 6 interview questions, questionnaires with items of 35 were distributed and collected 89 with a response rate of 80%. The collected data was analyzed using SPSS (Statistical Package for the Social Sciences) version 20. Presentation, interpretation and discussion also concluded using table, percentage, mean to get ample findings. The researcher has used descriptive research method. Consequently, the paper focused on the practice, success factors & challenges. However, regarding success factors, the most critical success factors such as top management commitment, project team composition, training & education and system's customization & integration were found out of all critical success factors. It is also observed that the ERP system is being practiced effectively across the divisions of the organization where the system is implemented although problems which hinder the practice of the system related to technological, organizational, people, and process challenges were identified while implementing ERP project. These challenges were data cleansing challenge, Problem in User's adaptability, System performance & network interruption, Integration of modules interface with existing system, Standardization challenges, Knowledge and skill for ERP implementation and technical challenges were the major one encountered. Finally, possible recommendations and suggestions like "the bank has to have a holistic approach not just a focused on only single application, the bank should pay great attention to keep the safety or guarantee of IT at first before applying additional system with it, software vendors & consultants should use latest ERP version zero modification approach regarding customization etc. have outlined at the end in order to resolve the gap or those challenges and to improve the practices.

Keywords: ***ERP, ERP Practice; ERP success factor and ERP challenges.***

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List of Acronyms

AP	Application package
BIW	Business Information Warehouse
BI	Business Intelligence
CBE	Commercial Bank of Ethiopia
CAAM	Computer Aided Audit Management
CRM	Customer Relationship Management
CRP	Conference Room Pilot
CORE	Centralized Online Real-Time Electronic
CSFs	Critical Success Factors
DBMS	Data Base Management System
EDMS	Electronic Document Management System
EC	Electronic commerce
EDW	Enterprise Data Warehouse
ERP	Enterprise Resource Planning
ERM	Enterprise Performance Management
EPM	Enterprise Performance Management
EMEA	European, Middle East, and Africa
ESS	Employee Self-Service
HCM	Human Capital Management
HCM	Human Capital Management
HRD	Human Resource Development
HRMS	Human Resource Management Software
MRP	Manufacturing Resource Planning
MRP	Material Resource planning
MTO	Money Transfer Organization
NBE	National Bank of Ethiopia
PMO	Project Management Office

POS	Point Of Sales
ROI	Return on Investment
SAAS	Software as a Service
SCM	Supply Chain Management
S.D	Standard Deviation
SFA	Sales Force Automation
SBM	Small Business Management
SOP	Standard Operating Procedures
SPSS	Statistical Package for Social Science
SWIFT	Society Worldwide Inter finance Telecommunication
T24	Temoneos 24
UAS	User Acceptance Test
WMS	Warehouse Management Systems

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

ERP is an information technology project application which integrates and supports all business functions of an enterprise especially logistics, billing, procurement, inventory management, quality management, and human resources management into one organization-wide system. (Klaus, Rosemann and Guy, 2000)

Regarding the practice of *ERP implementation in a business*, in recent years, many organizations have initiated Enterprise Resource Planning (ERP) software IT project to integrate all functional areas of business, including sales, logistics, billing, production, inventory management, quality management, and human resources management into one organization wide system using software application packages from their vendor like SAP, Oracle, BAAN, J.D. Edwards, PeopleSoft, etc. (Forger and Gary 2000). This is because, ERP has incorporated other business extension modules such as supply chain management (SCM), human capital management (HCM), enterprise performance management(EPM), sales force automation, electronic commerce (EC), business information warehouse (BIW) and customer relationship management(CRM) to become more competitive. (Abbas, 2011)

Commercial bank of Ethiopia (CBE) is the first bank in Ethiopia which has currently implemented "ORACLE" application of ERP system project up on five modules which is due to short coming of using the present paper based and semi-automated systems for most of the processes. CBE needs to have an automation, planned resources and real time data interfaces and reporting through integrated business environments. Those targeted modules are (1) *Finance Process*, (2) *Procurement process*, (3) *Human Resource process*, (4) *Office strategy management process* and (5) *Enterprise Data Ware housing and Business Intelligence or management information system.*

According to Ehie and Madsen (2005) suggestion five-stages of ERP life cycle frame works or process models for implementation These stages are (1) Project preparation phase-here develop ERP implementation charter, forms a project team with leadership roles, sets budget targets, and defines the project approach, objectives, scope and plan, (2) business blueprint phase-the current

business process is analyzed in detail like business drivers and critical success factors (3) realization phase-a project team concentrates on implementing an ERP system with describes the major milestones and deliverables, (4) final preparation phase-the entire process is fully integrated and tested throughout the organization, project governance and so forth and finally, (5) "Go-Live" and support phase-technical and Functional documents, Business application components.

"CBE- Enterprise Resource Planning (ERP) Implementation Project" has been done among the consultant called Tech Mahindra Business group which is one of Tata technology group of India and the sponsor of CBE which is the owner with proponent sub process called PMO/project management office. "Automation of the Bank's main Processes" is the project focus area. The period it took was planned 1 year & 2 months started from August 11, 2015. The Cost incurred for implementation is fixed amount for both software license & implementation. However, in order to adopt ERP systems which are sold by vendors like Oracle on average, cost $15-20 million and implementations take, on average, 21 months to complete (O"Leary 2000).

The ERP system is integrated with the existing core (Centralized online real-time Electronic) banking system of the bank T24 application, by which CBE"s transaction, payments, settlements and taxes are automatically monitored (CBE, 2015).

As Siau k. (2004) stated, "Customization and Standardization and integration of processes and data allows a company to centralize administrative activities, improves ability to deploy new information system functionality, and reduces information system maintenance costs." These ERP standardizes processes and data integration within an organization is one major practices. On other hand, according to Mohammed.A. Abd Elmonem Journal (2016), to state the *benefits*, the investment of implementing ERP system and whose expected Return on Investment (ROI) can be in the form of reducing cost, maximize profits and helping in decision support. ERP System collects, records, integrates, manages and delivers data and information across all functional units of the enterprise. It helps break down information between inventory, production, planning, materials, engineering, finance, Human Recourses, sales, marketing and operation in the enterprise.

In spite of ERP"s significant growth and its benefits, there are a number of challenges that companies may encounter when implementing ERP. Some literature indicates that ERP implementations have sometimes failed to achieve the organization's targets and desired outcomes. Much of the failure of ERP implementations was not caused by the ERP software itself, but rather by a high degree of complexity from the massive changes ERP causes in organizations (Scott & Vessey, 2000).

According to Helo, (2008), "Unlike other information systems, the major problems of ERP implementation are not technologically related issues such as technological complexity, compatibility, standardization, etc. but mostly organization, process and people related challenges like resistance to change, Problem in User's adaptability, Communication challenge, top management commitment, integration & Standardization, knowledge and skills etc. ERP implementations commonly have delayed an estimated schedule and overrun an initial budget (Ehie & Madsen, 2005). In order to best implement ERP, project team members should be selected with a balance between members of business experience within the organization and external experts. From the perspective of effective project management, the iron triangle can illustrate how important it is to balance the three corners of the triangle – scope, schedule and cost. However, in ERP implementations, both schedule and cost tend to be underestimated, while scope is overestimated (Lamers, 2002).

In fact, the motive of the bank for ERP implementation is due to realize its Vision "To become a world class commercial bank by the year 2025" and to meet the world's bank standards, CBE has considered ERP adoption as a method of achieving greater integration of its management systems to better manage increasingly complex operations. For these reasons, top managements believed that ERP systems can be very appealing to CBE as a potential route to meeting these standards. Thus, the bank is able to change manual & semi-automated process in to automation. (CBE corporate strategy document 2015-2019/20)

Finally, the motive of this research is also to identify and recommend on the above mentioned gaps for both academicians and practitioners. Moreover, CBE becomes highly dependent on technologies, it is not new to implement new technology based system. But regarding ERP system, it is new phenomena. So the researcher's interest and motive is to assess the practices and challenges of implementing the system, to show the potential benefits and challenges and finally to recommendation with possible solutions are there. the practice and challenges of ERP-

Oracle System in CBE focusing mainly on automating the major support activities of the bank like finance, human resources, supply chain management, office of the strategy & information system.

1.2 Background of the organization

Modern banking was introduced to Ethiopia in the early 20th century, during the regime of Emperor Minilk II. It was begun in Ethiopia in 1905 when the bank of Abyssinia was first established in Addis Ababa under a 50 year franchise agreement with the British owned National Bank of Egypt. The agreement made between emperor Minilk II and the representative of the

National Bank of Egypt Mr. D. Mae Gilliveray. After Haile Selassie came to power. The Bank of Ethiopia, which was a purely Ethiopian institution or the first indigenous bank in Africa was established by an official decree on August 29, 1931 with a required capital of pounds sterling 750,000. In addition since it was the first Ethiopian bank it had the interests of Ethiopians at heart. But it operated until 1935 and ceased to function during the fascist invasion and it was closed by Italians in 1936. During the Italian occupation from 1936-1941, banks were established in the main towns of Ethiopia. After liberation of Italian occupation, Barclays‟ Bank in 1941 to 1942 was established as foreign banks in the country. On August 1942, a charter was granted to the state Bank and was published on 30th November 1943. In 1963, the National Bank of Ethiopia and Commercial Bank of Ethiopia were established. The National Bank of Ethiopia was proclaimed in 1963 and began operation in January 1964. The Bank was reestablished in 1976. Commercial Bank of Ethiopia was incorporated as a share company on December 16, 1963 which of the former state Bank of Ethiopia.

Then, as per the proclamation No. 184 of August 2, 1980, the Addis Bank and the former Commercial Bank of Ethiopia S.C were merged to form the sole commercial Bank in the country, the present day Commercial Bank of Ethiopia. Currently Commercial Bank of Ethiopia (CBE) is 100% state owned financial organization and the leading commercial Bank in Ethiopia.

In its economical contribution the bank is the greatest source of finance to the country. It is a Pioneer to work with Western Union Money Transfer Services in Ethiopia. And now a days CBE is working with more than 19 worldwide known Money Transfer agent /MTO. It has strong correspondent relationship with more than 52 renowned foreign banks and a SWIFT bilateral arrangement with more than 718 financial institutions. It has about birr 495.4 billion in assets, 43

billion capital & contingency, 14.6 billion profit, 384.6 billion deposit, holding 65.4% of market share in deposits, 16.6 million customers. The bank currently (June 2017) has about 33,706 employees with different qualification. 1,586 ATM, 6,985 POS machines and 1,235 branches through positioned in a main cities and regional towns. Currently, various services have been giving as per NBE proclamation 592/2008.

The *Vision* of CBE is formulated as "To become a world-class commercial bank by the year 2025" & its *Mission* has stated as "*We are committed to best realize stakeholders' values through enhanced financial intermediation globally and supporting national development priorities, by deploying highly motivated, skilled and disciplined employees as well as state-of the-art technology. We strongly believe that winning the public confidence is the basis of our success."* Moreover, the corporate *values of CBE* are Integrity, customer satisfaction, employees" satisfaction, learning organization, team work and collaboration, public trust, value of money, decentralization, and corporate citizenship. The major strategic objectives of the bank are also: Ensure Sustainable Profitability, Ensure Sustainable Profitability, Enhance Developmental Financing, Ensure Financial Soundness, Increase Customer Satisfaction, Expand the Customer Base, Enhance Accessibility of Services, Improve process efficiency and effectiveness, Improve Employee Satisfaction and Engagement, Enhance Information Systems, Enhance Human Resource Development, Enhance Communication.

1.3 Statement of the problem

ERP systems defined as commercial software packages that integrate different business processes and information flows within an organization (Maheshwari, & Kumar, 2003), so Many organizations choose to implement Enterprise Resource Planning (ERP) systems, with the aim of increasing productivity, efficiency and organizational competitiveness to gain a competitive edge. But they are continually facing challenges, causing them to rethink and adapt their strategies, goals, structures, processes and technologies in order to remain competitive (Kwahk & Lee, 2008).

Mohammed A. Abd Elmonem.(2016), said that some well-known benefits of ERP project are improve timeliness information, improve cost control, cost transparency, easy finance transactions, faster response and follow up, focus on core competencies, achieve competitive advantage and so forth. Although implementing an ERP system may be costly and time consuming its benefits are worthwhile. The main features of ERP-software application are the

provided business solutions, which support the core processes of the business and administrative functionality. High functionality is one of the main differentiators of ERP.

Hence, the main CBE ERP project goal is implementation of ERP application that suite at CBE to support its strategic objectives and the standard functionality of the system is able to maximum possible extent. Within the overall goal stated leads to meet major objectives such as (1) Address the current support organs setback to maintain sustainable, efficient and superior support for the core and support process, (2) Bring bank wide integration on a common system; increase data integrity, validity and reliability, (3) Support sophisticated data analyses by implementing business intelligence tools for better decision making, (4) Integrated workflow, industry best practices, and platform for re-engineering business practices and continued process improvements, (5) Well organize and manage Strategy of the bank, (6) Lower operating costs and expenses and (7) Improved internal communications and create better information accessibility.

Despite its worthwhile benefits, adopting ERP system project in the organizations is faced by several obstacles which are the major problems persist during ERP project implementation. They are mostly organization and human related issues like resistance to change, organizational culture, incompatible business processes, project mismanagement, top management commitment and sometimes technologically related issues such as technological complexity, compatibility, standardization, etc. may happened. This high degree of complexity from the massive changes resulted by the fact that ERP implementation forced companies to follow the principle of" best practices" in most successful organizations. In addition, Organizations continuously underestimate the complexity of implementing an ERP system, resulting in cost overruns, implementation delays and failures (Gargeya & Brady, 2005).

Meanwhile, in our native country Ethiopia, most organizations have implemented ERP system. Hence following to these implementation, some researches have been conducted in order to realize the gap and the features of ERP project system. For instance, Abiot and Jorge (2012) have made an assessment on MS-Dynamics ERP implementation in Mesfin Industrial Engineering, so they have found out experiences of a successful ERP implementation projects based on the investigated case study, Derese (2013) has conducted a study on Oracle ERP system at EthioTelecom. As a result he addressed a framework proposed on critical factors that need to be focused on each phase of ERP implementation, Sintayehu (2014) reviewed success

factors for implementation of Enterprise Resource Planning system at Ethiopian Airlines, hence he could identified twenty critical success factors of ERP implementation, Elsa, T. (2015) made an assessment To investigate technical, organizational and operational issues of ERP post implementation management and design a solution framework. Thus she known that the framework presents core issues or activities from four perspectives (Management, People/users, Process and Technology), Kibework (2015) has conducted research on the challenges and current status of ERP implementation at Mugher and Derba Cement industries so, its finding was identified the strategy, Organizational and people factors and Foziya, A. (2017) has conducted research on "Factors Affecting the Implementation of Enterprise Resource Planning At Commercial Bank of Ethiopia" and findings that of technological, organizational and people or individual factors affect ERP implementation into the company.

In view of CBE organizational, environmental, people and process practical Problems that are encountered while implementing ERP project, the major challenges are (1) Overall system performance challenges that are Lack of addressing adequate training for all end users by ERP team. And less number of trainees, lack of full time commitment to project activities by end users and/or branch managers and not give emphasis on reporting or sensitive issues (2) Communication-I.e. lack of formal communication with end users who outside the project team which may knowledge gap. (3) Internal Staff expertise-specially where Insufficient knowledge about the system in early stage of project. (4) System performance i.e. low performance and failure in the system (5) Integration with other modules and interface with T24 specially, Effect of dependency across modules. Such as FA module in mass addition functionality, System integrations test problem. (6) Requirement definition and customization which are late request of some functionalities and reports from other parties. For instance, Request from Hyperion and IFRS (7) Consultants knowledge means Consultant knowledge gap and less communication skill. (8) Data Cleansing and readiness (Difficulty in data completeness). It is known that the impact of data inaccuracy in a unified system of ERP was great affecting every decisions made on that data, which requires utmost effort and rework to purify the current data. (9)

Problem in users' adoptability-ERP project is expected to trigger major changes in way of doing business across the bank. Along with the implementation of the new system, the bank has planned to adopt best practices and hence it is required to pass through substantial changes from its prevailing business practices and processes. The ERP system is expected to fully automate the internal processes and support functions based on its strong features

of " Self Service" functionality. Therefore users are required to initiate and follow up specific transaction online using the self service features. This is a new business paradigm which expects users to Shifting to standard or shift to paperless transaction, globalized practice, System performance and Network Interruption are critical challenges and Sudden organizational changes is Sudden and fast changes are bound to increase the scope of ERP in enterprise operations.

Consequently, all the above theoretical and practical problems encountered, a continuous research need on ERP implementation project that affects the entire organization with regard to the process, people, and culture. Particularly, the researcher initiate to perform this paper by focusing on the investigation up on the practices and challenges while implementing ERP project.

1.4 Research Questions

- What was the employee's perception of current practice of ERP?
- How were the practices of ERP project implementation to address the areas that the bank needs to be changed?
- What are the major challenges that the bank encountered in implementing ERP Project?
- To what extent did ERP package modules properly customized in CBE?

1.5 Objectives of the study

1.5.1 General Objective

The general objective of this study or purpose of the study is to examine the practices and challenges of Enterprise resource planning implementation project of Commercial Bank of Ethiopia.

1.5.2 Specific Objective

Having the general objective, the specific objectives are:-

- ✓ To assess the employee perception of current practice of ERP;
- ✓ To identify the experiences of ERP system implementation in connection with addressing the areas that the bank needs to be changed;

- ✓ To identify the challenges and problems which obstruct the ERP implementation project and to recommend possible solutions;
- ✓ To assess the process of ERP implementation project modules within the organization framework;

1.6 Significance of the Study

This study had a great contribution to different institutions/organization, individuals and other bodies who want to implement ERP application system as a Project. And especially it is also essential to the concerned officials of the bank in order to identify the challenges and the gap areas. For competitive advantage, the research paper gave some highlights about the worthwhile benefits of the project. It may also enable the scholars, counseling bodies and so forth to be aware of implementing the ERP system in an organization ahead of time. The study would have a certain practical but more of theoretical significance.

Finally, arrive at a certain findings and cope up with possible recommendations and produce document which is used as reference or guidelines material for researchers.

1.7. Delimitations/ Scope of the Study

According to Creswell (2003) „delimitation" is a parameter defining the "boundaries, exceptions, reservations" in a research, and its inclusion and position in a research proposal or write up varies from one situation to another.

Accordingly, the study has delimited to assess the practice and challenges of ERP implementation Project in commercial bank of Ethiopia. Particularly, it focused on organizational, environmental, people, process and technological challenges of ERP implementation project with its drill of integration, customization and standardization process up on the five functional areas of an organization in terms of creating automated work environment. These five functional wings are finance process, procurement sub process, human resource management process, office of strategy management and enterprise Data Warehousing & Business Intelligence specific areas. It was also looking in to the perception of both management and employees. To make the research complete, it is better to have the necessary information from all Commercial Bank of Ethiopia ERP Project functional or business and technical team members who are composed of subject area experts and technical staffs. But this paper covered only delimited concerned bodies of ERP project. Namely, functional team leaders,

System/Application support technical team leaders or administrative, Application Development team, hardware and storage team, and network team as appropriate in the project area due to time and budget constraint.

1.8 Limitations of the Study

In spite of the intensive efforts, the researcher assumed that there was a quite limitation so as to finalize the paper. For instance, the feedbacks received from the respondents were based on their 2 years‟ experience only this is because of ERP system is implemented in CBE since August 11, 2015 and completed on July 2017. Besides this, getting inadequate qualitative and quantitative collection of data which is due to the interaction with the end-users, support-users and managerial staff involved in key facets of the ERP implementation provided not an ample information related to processes and challenges experienced by active users of the system, during distribution of questionnaires to get primary data it might take long time and even the respondents can also reluctant to provide relevant information and in this case the researcher encountered to collect the questionnaires as well as the failure of the respondents to return questionnaire. In addition, the researcher was fright to conclude the paper easily. This is owing to the fact that ERP application system is a cross-functional by nature, and its impact on the organization implementing it can be quite extensive.

1.9 Organization of the study

This research paper has been organized in five chapters, in which chapter one deals with the introduction part that is background of the study, background of the organization, statement of the problem, research questions, objectives of the study, significance of the study, scope of the study, limitation of the study whereas chapter two includes related literature review and Chapter three deals with research methodology then chapter four was the main part of the paper and in this section data presentation, analysis and interpretation are going to be conducted. Finally, summary of findings, conclusion and recommendation about ERP Project practices and its challenges in the case of commercial bank of Ethiopia organized in chapter five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Definition of ERP

Enterprise resource planning (ERP) refers to a computer information system that integrates all the business activities and processes throughout an entire organization. ERP systems incorporate many of the features available in other types of manufacturing programs, such as project management, supplier management, product data management, and scheduling. The objective of ERP is to provide seamless, real-time information to all employees throughout the enterprise. Companies commonly use ERP systems to communicate the progress of orders and projects throughout the supply chain, and to track the costs and availability of value-added services. (Encyclopedia of management 2006)

Enterprise Resource Planning (ERP) is a software solution that integrates business functions and data into a single system to be shared within a company. While ERP originated from manufacturing and production planning systems used in the manufacturing industry, ERP expanded its scope in the 1990‟s to other "back-office" functions such as human resources, finance and production planning (Swartz & Orgill, 2001). Moreover, in recent years ERP has incorporated other business extensions such as supply chain management and customer relationship management to become more competitive. We can see the following figure.

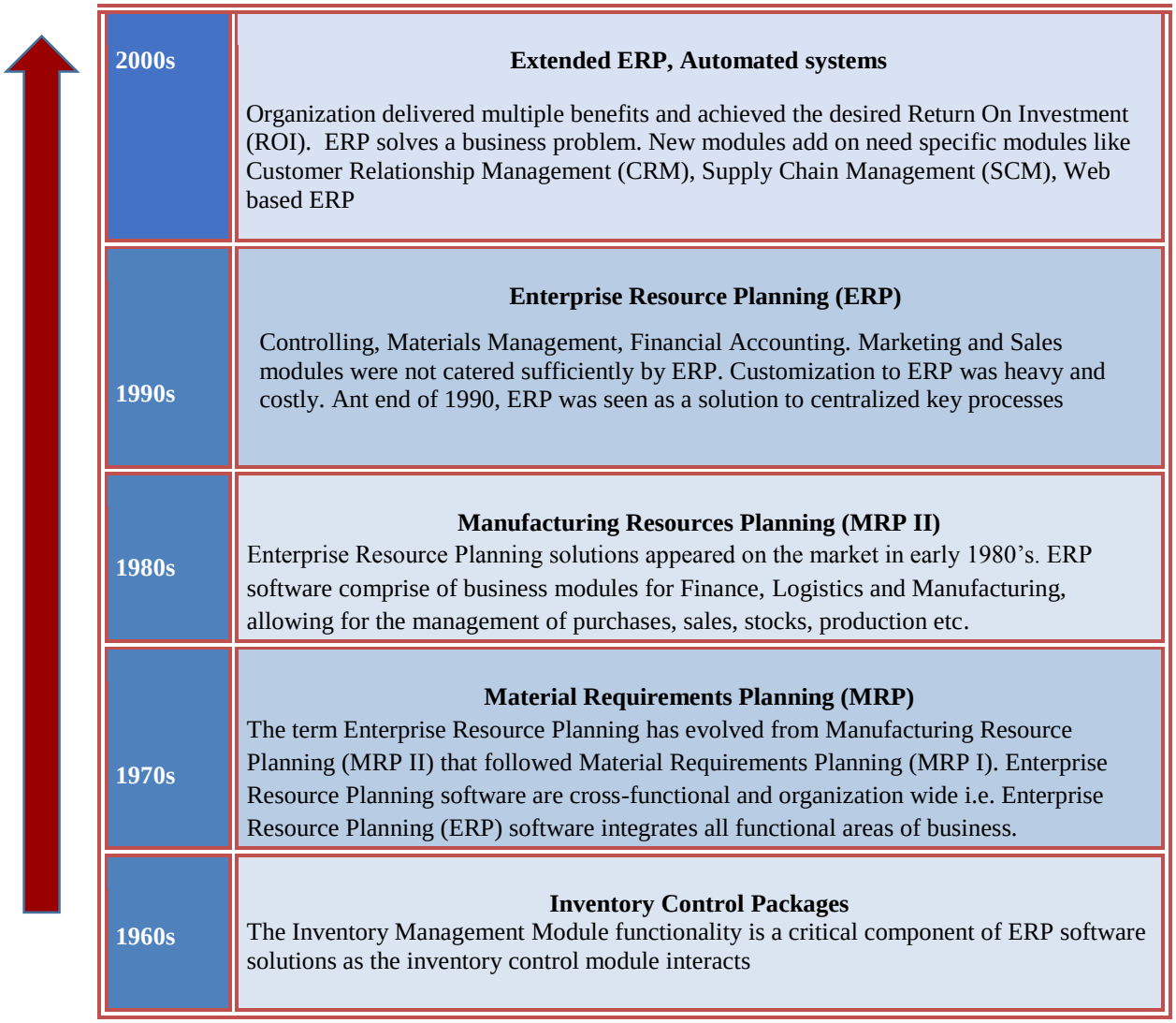
Figure 2-1. ERP Extension

Source: Abbas, 2011

2.2. Evolution of ERP Systems

The evolution of ERP systems closely followed the development in the field of computer hardware and software systems and the history of ERP systems starts with efforts of automating inventory control systems in the1960s when most organizations designed, developed and implemented centralized computing systems for their inventory control systems (Rashid, M.,Hossain, L., & Patrick, J. D, 2002).

Figure 2-2. ERP evolution



Source: Rashid et al, (2002**)**

During the 1960s most organizations designed, developed and implemented centralized computing systems, mostly automating their inventory control systems using inventory control packages (IC). These were legacy systems based on programming languages such as COBOL, ALGOL and FORTRAN.

Material requirements planning (MRP) systems were developed in the 1970s, which involved mainly planning the product or requirements according to the master production schedule. Following this route new software systems called manufacturing resource planning (MRP II) were introduced in the1980s with an emphasis on optimizing manufacturing processes by synchronizing the materials with production requirements. MRP II included areas such as shop floor and distribution management, project management, finance, human resource and engineering (Rashid, 2002).

ERP systems first appeared in the late 1980s and the beginning of the 1990s with the power of enterprise wide inter-functional coordination and integration. Based on the technological foundations of MRP and MRP II, ERP systems integrate business processes including manufacturing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, and transportation, providing accessibility, visibility and consistency across the enterprise (O‟Leary, 2000).

During the 1990s ERP vendors added more modules and functions as "add-ons" to the core modules giving birth to the "extended ERPs". These ERP extensions include advanced planning and scheduling (APS), e-business solutions such as customer relationship management (CRM) and supply chain management (Rashid et al 2002).

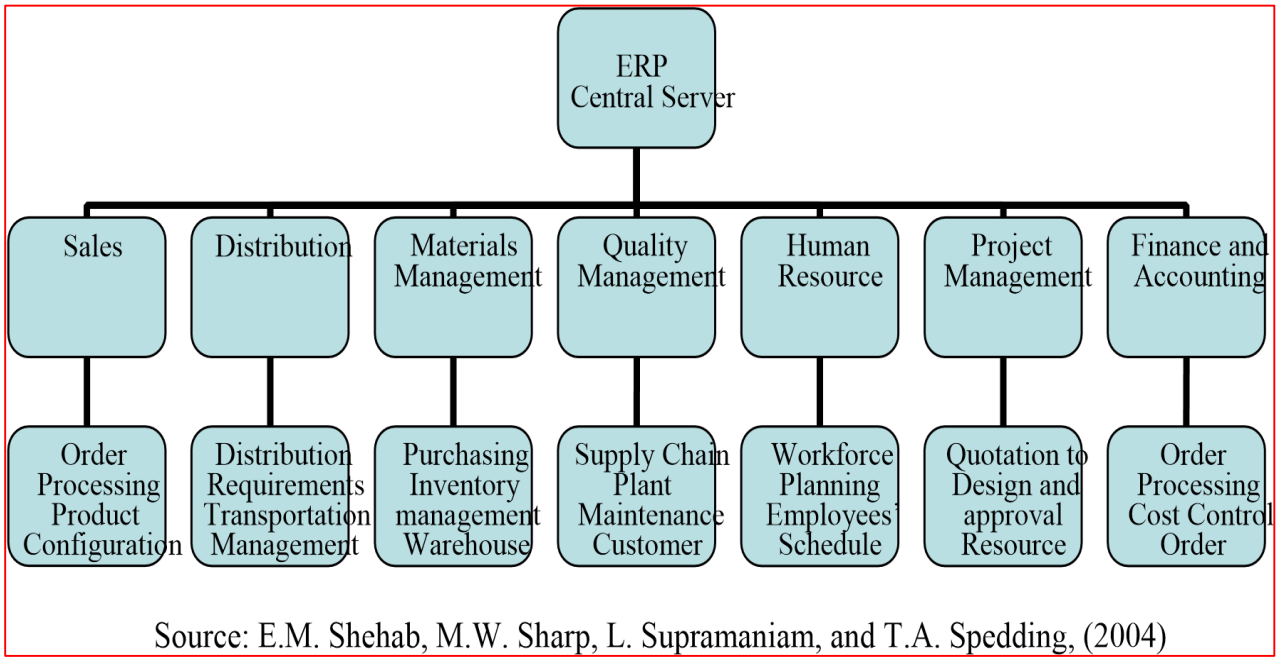
2.3. Basic Concept of ERP System

ERP systems are characterized as large, complex, multifunctional, modular and generic systems which support and integrate the key functional areas of an enterprise. An ERP system is more than merely an IT solution and implementing an ERP system can be considered as "a change management initiative which encompasses a review of business processes across the whole organization, requiring careful management" (Nafeeseh & Al-Mudimigh, 2011).

ERP system enterprise resource planning comprises of a commercial software package that promises the seamless integration of all the information flowing through the company–financial, accounting, human resource, supply chain and customer information (Davenport, 1998). And

also “ERP systems are computer-based systems designed to process an organization’s transactions and facilitate integrated and real-time planning, production, and customer response” (O‟Leary, 2000). In addition, Adel (2001) said that “the enterprise resource planning (ERP) system incorporates a set of programs that provides support for main organizational activities such as manufacturing and logistics, finance and accounting, sales and marketing, and human resource.” Moreover, Enterprise resource planning systems or enterprise systems are software systems for business management, encompassing modules supporting functional areas such as planning, manufacturing, sales, marketing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, transportation and e-business (Rashid, et al, 2002). Therefore, we can understand that Enterprise Resource Planning (ERP) software integrates all functional areas of business, including sales, logistics, billing, production, inventory management, quality management, and human resources management into one organization-wide system. Let’s see an integrated view of Enterprise Resource Planning System approach of (Shehab, Sharp, Subramanian and Spedding 2004)

Figure 2-3: An integrated view of Enterprise Resource Planning System



Source: E.M. Shehab, M.W. Sharp, L. Supramaniam, and T.A. Spedding, (2004)

2.4. Goal of ERP

The major goal of ERP is to increase operating efficiency by improving business processes and decreasing costs. ERP allows different departments with diverse needs to communicate with each other by sharing the same information in a single system. Also, ERP standardizes processes and data within an organization with best practices. Standardization and integration of processes and data allows a company to centralize administrative activities, improves ability to deploy new information system functionality, and reduces information system maintenance costs (Siau, 2004). It increases cooperation and interaction between all business units in an organization on this basis. ERP is designed to adapt to new business demands easily. A significant number of organizations have adopted ERP over the last two decades, and the revenue of the ERP market has grown from $17.2 billion in 1998 (O‟Leary, 2000) to $39.7 billion in 2011 (Dover, 2012).

2.5 Characteristics of ERP

The following are essential characteristics of ERP system.

- ✓ Multifunctional in scope and modular design comprising many distinct business modules such as finance, manufacturing, accounting, distribution, etc.
- ✓ Use centralized common data base management system (DBMS)
- ✓ Integrated in that when a transaction or piece of data representing an activity of the business is entered by one of the functions, data regarding the other related functions is changed at the same time.
- ✓ Flexible and offer best business practices.
- ✓ Require time-consuming tailoring and configuration setups for integrating with the company's business functions.
- ✓ Financial and business information is often generated automatically by ERP systems based on data previously entered, without further human instructions and manipulations.
- ✓ ERP provides business intelligence tools like Decision Support Systems, Executive Information System and reporting for better decision making.

2.6. Market Scenario of ERP Software

Over the past 15 years, businesses have changed enormously. The clients are putting lot of pressure for faster service, wider choices, and even lower prices. The globalization of the economy has accelerated and, as a result, many organizations have been redrawn. A number of Information Systems have been developed in order to reply to the challenges of the modern economy. When ERP systems first emerged in the early1990s, manufacturers in a wide variety of industries enthusiastically adopted them. ERP implementation, without professional help, can be a very expensive project for bigger companies, especially trans-nationals. Companies specializing in ERP implementation, however, can expedite this process and can complete the task in within six months with complete pilot testing. To implement ERP systems, companies often seek the help of an ERP vendor or of third-party consulting companies. Consulting in ERP involves two levels, namely business consulting and technical consulting. A business consultant studies an organization's current business processes and matches them to the corresponding processes in the ERP system, thus 'configuring' the ERP system to the organization's needs. Technical consulting often involves programming. Most ERP vendors allow modification of their software to suit the business needs of their customer.

Based on revenue earned by Enterprise Resource Planning software market in 2006, top providers of ERP software include Oracle, SAP, BAAN, J.D. Edwards, PeopleSoft, etc.. Business information systems can be either designed as custom applications or purchased as off the-shelf standard solutions. The development of custom applications is generally expensive and is often plagued by uncertainties, such as the selection of appropriate development tools, the duration of the development cycle, or the difficulties involved in assessing costs. Therefore, companies are radically changing their information technology strategies by purchasing off-the shelf software packages instead of developing IT systems in-house. Out of more than 100 ERP providers worldwide, SAP-AG, Oracle, JD Edwards, PeopleSoft and Baan five major ERP software vendors who used to control approximately 70 per cent of the ERP market share (Mabert., 2001)

2.7. ERP Project software vendors

The major ERP software suppliers are SAP, Oracle, PeopleSoft, Baan and J.D. Edwards. Each vendor, due to historic reasons, has a specialty in one particular module area such as Baan in

manufacturing, PeopleSoft in human resource management, J.D. Edwards runs on multiple platforms with multiple databases, SAP in logistics and Oracle in financials (Rashid, et al, 2002)

Table 2-1: Major ERP Vendors

Vendor	Major Clients
SAP	BPCL, IOC, ONGC, Reliance, Nestle, Colgate-Palmolive, Procterand Gamble, L and T, Mahindra and Mahindra, Tata Motors, Tata Steels, Marico
Oracle	KPMG, TCS, HP, Compaq, GE, Sony India
BaaN	Godrej and Boyce, Kirloskar Copeland, Tata Info Tech, Larson and Toubro,
Peoplesoft	Allianz Insurance, Citibank, Ford, VISA, Merrill Lynch
JD Edwards	Philips, Lexmark, SmithKline Becham
QAD	HLL, Godrej Soaps, Nicholas Piramal, Jhonson, Lucent Technologies
Ramco	Jindal Iron and Steel, Indian Air Force – Nasik, Madras Cements, Madura Fabrics

Source: Scott Engler (2008)

SAP: - "System Application & Product" Developed by German company SAP SE. it was founded in 1972. Today, SAP is one of the leading international providers of business software. SAP is the world's third-largest independent software manufacturer. SAP has more than 97,000 customers in over 120 countries and employ 47,598 people at locations in more than 50 countries in the European, Middle East, and Africa (EMEA); Americas; and Asia Pacific Japan (APJ) regions. SAP is headquartered in Walldorf, Germany with annual review of $ 9.4 billion in year 2006. The SAP R/3 enterprise application suite for open client/server systems has established a new standards for providing business information management solutions. The main advantage of using SAP as ERP system is that SAP has a very high level of integration among its individual applications that guarantee consistency of data throughout the system. SAP‟s global development approach focuses on distributing development across the world in strategically important markets. A global network of SAP is spanning across Bulgaria, Canada, China, Germany, Hungary, India, Israel, and the United States, enables SAP to operate globally.

Oracle: - "Oak Ridge Automatic Computer & Logical Engine. A computer built by oak ridge national laboratory in 1950" (Oracle, 2001), founded in 1977 in the USA, is best-known for its database software and related applications and is the second largest software company in the world after Microsoft.

Oracle's enterprise software applications started to work with its database in 1987. It accounts for $2.5 billion out of the company's $9.3 billion in 1999, which places Oracle second to SAP in the enterprise systems category with over 5,000 customers in 140 countries. Oracles ERP system is known as Oracle Applications, having more than 50 different modules in six major categories: finance, accounts payable, human resource, manufacturing, supply chain, and front office. Oracle has other strong products in the software field including DBMS, data warehousing, workflow, systems administration, application development tools (APTs), and consulting services. A notable feature of Oracle is that it is both a competitor and a partner to some of the industry leaders in the ERP market such as SAP, Baan and PeopleSoft because of the use of Oracle's DBMS in their ERP systems (Oracle, 2001)..

PeopleSoft: - it is one of the newest ERP software firms started in 1987 in Pleasanton, California, with specialization in human resource management and financial services modules. PeopleSoft quickly managed to offer other corporate functions and attained a revenue of $32 million in 1992. Enterprise solutions from PeopleSoft include modules for manufacturing, materials management, distribution, finance, human resource and supply chain planning. SAP AG and Oracle–with longer experience, stronger financial base and worldwide presence–are the main competitors to PeopleSoft. Many customers comment that PeopleSoft has a culture of collaboration with customers, which makes it more flexible than its competitors. One of the strengths of PeopleSoft is the recognition by its customers that it is flexible and collaborative. The flagship application PeopleSoft with scores of applications was developed by PeopleSoft with an expenditure of $500 million and 2,000 developers over 2 years as a pure Internet-based collaborative enterprise system. "This revolutionary e-business platform is the first open platform to offer scalability and ease of use for all users. PeopleSoft requires no client software other than a standard Web browser, giving you the ability to securely run your business anytime, anywhere" (PeopleSoft, 2001).

The Baan: - "Budget Authorization account Number" Founded in 1978 in The Netherlands, Baan (Baan, 2001) started with expertise in software for the manufacturing industry and by 1997 claimed an ERP market share of roughly

5%. Bann's revenue in 1998 was roughly $750 million and while facing a slight slowdown in 1999 started growing again in 2001 with sales up 12% at $ 7,231million and operating profit of $926 million. Baan has more than 15,000 customer sites all over the world and more than 3,000 employees. Baan believes that "the Internet is the ultimate enabler" and "internet technologies help companies become order-driven and customer focused by enabling collaboration across the „value chain." Suppliers, distributors, manufacturers and customers can work together to deliver the right product at the right price" (Baan, 2001)

V. J.D. Edwards:-It was founded in 1977 in Denver (cofounded by **J**ack Thompson, **D**an Gregory and C. **Edward** McVaney with long experience of supplying software for the AS/400 market. J.D. Edwards" flagship ERP product called One World is "capable of running on multiple platforms and with multiple databases, etc. [and] revolutionizes enterprise software by liberating users from inflexible, static technologies" (JD Edwards, 2001). The product includes modules for finance, manufacturing, distribution/logistics and human resource, quality management, maintenance management, data warehousing, customer support and after-sales service. J.D. Edwards" revenue jumped to $944 million in 1999 from $120 million in1992, having more than 5,000 customers in over 100 countries. The One World system is considered to be more flexible than similar competing products and within the reach of smaller enterprises. J.D. Edwards" Internet-extended version of One World was launched recently as One World Xe ("Xe" stands for "extended enterprise") (JD Edwards, 2001)

2.8. Major Modules of ERP Software

Accounting Module

Within an ERP system, the accounting software modules manage the recording and processing of accounting transactions within functional areas such as accounts payable, accounts receivable, and payroll. These functional areas and their corresponding sub ledgers feed transactions into the

general ledger from where financial reports are generated for management and external stakeholders.

Business Intelligence Module

Business intelligence module provides Enterprises with the ability to make effective and relatively fast decisions due to the availability of reliable and easy to understand information. Standard business intelligence software functionality includes a decision support system driven by an attached data warehouse. This data warehouse feeds management with real-time access to ad hoc reports, online charts and tables, as well as graphical dashboards that offer a range of information in the form of financial reports, and key performance indicators. Many ERP solutions provide real-time business intelligence capability that is available for data mining and financial analysis. With this module data can be viewed in summary form with the option to zero down to a detail level to investigate concerns or potential anomalies. This advanced business intelligence provides a 360-degree view the organization's overall health and helps to the executive staff with the tools necessary to make better and faster decisions.

Customer Relationship Management (CRM) Module

Customer Relationship Management software or CRM software module supports front office operations and the customer service, sales, and marketing functions. CRM software is available as stand-alone software packages and in more recent years.

Distribution Management Module

When a company is operating in wholesale distribution environment, distribution management software will be at the heart of that ERP system. However, all ERP software solutions have distribution software functionality, not all ERP solutions offer robust enough features to manage complex distribution channels.

Order Management Software

Regardless of the industry segment, order management software functionality is key to an organization's success. A large portion of many ERP software selection projects is dedicated to

documenting order entry requirements and reviewing an ERP supplier's order management software functionality.

Inventory Management Module

The Inventory Management Module functionality is a critical component of ERP software solutions as the inventory control module interacts practically with many other module of functional area. From the purchase indent through sales order entry through purchasing and receiving to shipping and ultimate invoicing, strong inventory management software is necessary to provide high order fill-rates, contain operational costs, and maintain profit margins. Inventory management requirements vary by industry, although critical inventory control features easily. **Discrete manufacturing** environments generally require multi-level serial number tracking, attributed inventory, revision level tracking, and kitting capabilities for value added distributors. **Process manufacturing** environments will typically need lot control and lot property tracking, complete backward and forward traceability of lot numbers, expiration date management, and multiple units of measure per product. **Mixed mode manufacturing** environments become even more difficult, since organizations will require a combination of both process and discrete inventory management software features.

Financial Management Module

A quality Enterprise Resource Planning software solution will include strong financial management module that is fully integrated with the organization's core functional areas of manufacturing, shipping and receiving, and sales order management. In robust Enterprise Resource Planning systems, the transactional data generated from these departments will be available for immediate review via online inquiries, ad hoc reports, and real-time dashboard data.

These capabilities offer full financial visibility into the organization's payables and receivables with up-to-date access to inventory levels and sales forecasts.

Human Resources Management Module

It is often said that an organization's most valuable resource is its workforce. This requires observing the best human resource management software (HRMS). HRMS is critical as managing the complexities of talent, payroll, and government regulations should not be left to

manual processes. Enterprise Resource Planning system that can effectively manage the day-today operations, as well as the needs of the human resources department, is important for an

Enterprise Resource Planning project's overall success and ultimate Return on Investment (ROI).

Manufacturing Management Module

The "Production and Operations management" software is very important for manufacturing oriented companies, their requirements for manufacturing software functionality will be the core of any ERP software. Though there are stand-alone manufacturing software packages available on the market, yet the best manufacturing solutions can be tightly integrated into a centralized ERP system.

Point of Sale (POS) Module

Retailers rely on their ERP system's POS software or point of sale module to deliver an easy to use interface that can be quickly deployed to a single store location or hundreds of stores and retail outlets. Large or small, a POS software solution needs to be tightly integrated with the inventory management software and produce timely information for individuals across the enterprise.

Planning Module

Manufacturers and distributors rely on their ERP system's planning module to optimize the delivery of incoming materials and the movement of is inventory between facilities. With efficient planning, manufacturers can reduce raw material inventories and increase production output, while distribution companies can significantly reduce transportation costs and improve customer responsiveness and overall satisfaction.

Service Module

For the service industry, the terms "service module" and "ERP software" are used interchangeably. While there are a number of ERP solutions that include service software functionality, not all ERP packages offer functionality capable of managing the needs of contractors or professional service companies. Due to this, service organizations must take

additional care in documenting their service software needs and comparing these requirements to prospective ERP vendors.

Software as a Service (SaaS)

"Software as a service" software (SaaS software) is a method of deploying ERP software in a hosted or on-demand environment. Unlike the traditional method of purchasing ERP software licenses, the software as a service software model allows for the ERP software package to be rented or licensed for a protracted period of time. The ERP software is either hosted on the ERP developer's web server or via a third-party provider commonly referred to as an ASP or application service provider.

Supply Chain Management (SCM) Module

The Supply chain management module supports the management and movement of raw materials, work-in-process inventory, and finished goods from a given point of origin to the ultimate point of consumption. These supply chain activities help build the backbone of the organization's cost structure and ultimate profitability. As such, strong supply chain management software functionality is critical for successful companies and therefore a core concern for many ERP software selection projects.

Small Business Management (SBM) Module

The Small Business Market is full of organizations that have outgrown their entry-level small business software and are in need of migrating to more robust software solution.

Warehouse Management Systems (WMS) Module

Warehouse management systems (WMS) are available as stand-alone WMS software packages and as integrated modules within many ERP solutions. Strong warehouse management systems will reduce costs and improve customer satisfaction by providing warehouse personnel with the tools necessary to optimize the warehouse and thus operate at the highest level of efficiency.

2.9 ERP Practical Application

ERP application is a complex and dynamic process, one that involves a mix of technological and organizational interactions. According to Al-Mashari & Al-Mudimigh (2003) implementing ERP systems in many instances caused dramatic changes that need to be carefully administered to reap the advantages of an ERP solution. Tougher competition in the marketplace is generating the need to better optimize resources, improve profitability and keep customers satisfied. Companies are increasingly implementing Enterprise Resource Planning (ERP) software solutions to improve operations and provide faster customer response. Choosing an ERP solution that meets your *specific* business requirements will enable you to have a smoother operation.

If the software package is written for your industry, you won't have to custom design a solution. Customized solutions are time consuming to implement and add unnecessary cost. One of the top reasons ERP implementations fail is because the software doesn't meet basic industry specific business requirements.

2.10. ERP Application process

In order to better understand the process of ERP adoptions, a number of researchers have developed conceptual ERP life cycle frameworks or process models. Ehie and Madsen (2005) suggested five stage ERP application process using various reviews of the previous literature: project preparation, business blueprint, realization, final preparation, "Go-Live" and support.

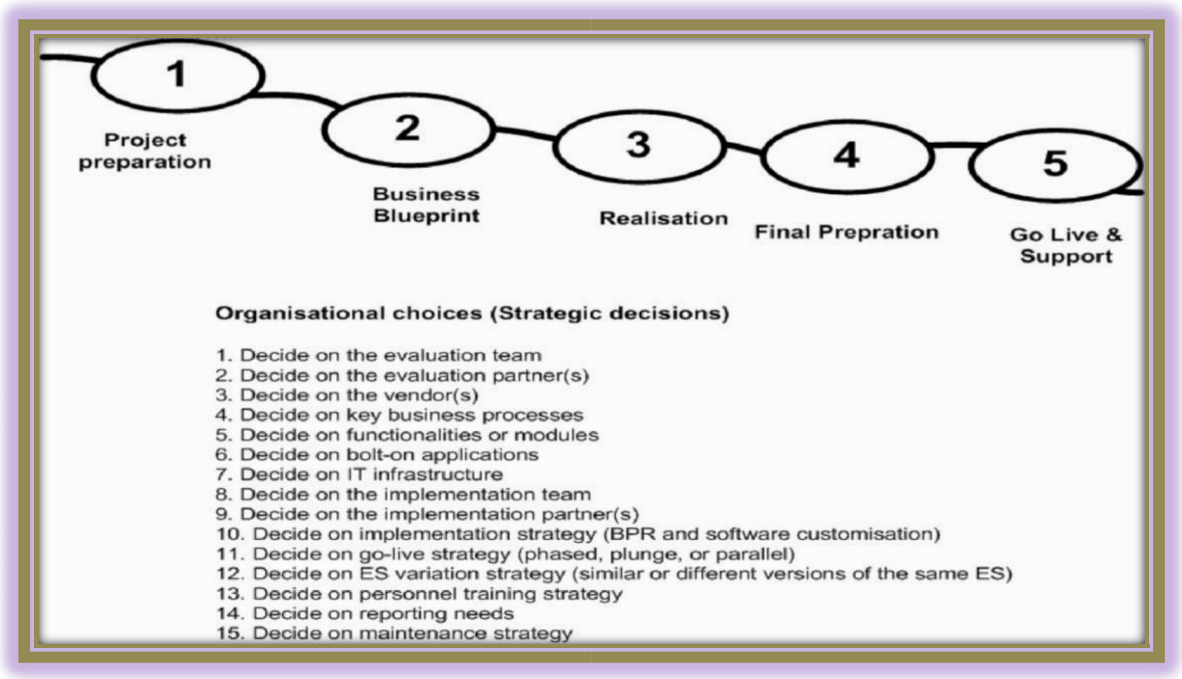
The decisions taken during ERP application system are strategic in nature. These decisions relate to the ERP system to be adopted, the scope of application, the application strategy, the "go-live" strategy, the training strategy, whether or not to upgrade and so on. The literature rarely consider this decisions to be strategic. These decisions are strategic decisions in ERP because they: are normally adopted in organizations to support strategic objectives of organizations; commit a large amount of organizational resources; have a long-term impact on shaping the ERP system and/or organization processes; are complex because they spurn the entire organization and involves different stakeholders. The following figure illustrates the ERP application phases and the organizational choices to be made by organizations implementing ERP systems.

Project preparation phase of the application process consists of getting ready by planning and organizing people and tasks. It is a very important and critical stage of the ERP project since it constitutes the basis for the project. Among the decisions organizations have to make are decision on the ERP product, decision on functionalities or modules, decision on the application consultant etc. Blueprint phase comprises a detailed analysis that will allow the production of documentation on the business process requirements. In addition, blueprint phase consists of analyzing the current business processes and investigating the chances for BPR or customizations. During blueprint phase, organizations need to decide on whether to customize the ERP system or re-engineer the existing business processes. Realization phase deals with the technical aspect and involves building up a system prototype based on the processes and procedures investigated in the former stage.

Final preparation phase is critical to the success of the application project and involves conducting a set of tuning and testing activities related to the configuration, integration, quality, interfaces and reports of the system. Moreover, this phase is concerned with the education and training of the users on the system processes, data discipline and modules. Therefore, organizations must make a decision on personnel training strategy. Lastly, go live and support phase deals with the maintenance and improvement issues to keep the implemented ERP system running and up to date.

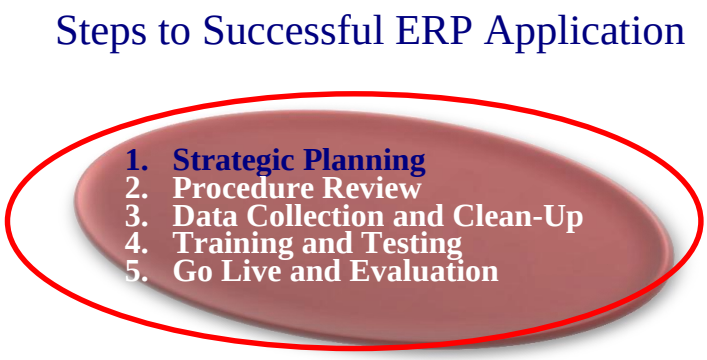
The Go Live phase includes also the monitoring of the implemented system in order to make sure to make the necessary changes and modifications if problems are to occur and that could affect the performance of the ERP. During this phase, organizations make decision on: go live strategy, maintenance strategy, and bolt-on applications. The figure provides a pictorial representation of the ERP life-cycle phases and the application decisions organizations are required to make based on the researcher's conception.

Figure 2-4: ERP application phases



Source: Ehie and Madsen (2005)

2.11. Successful ERP Practical Application



Strategic Planning

Assign a project team, Examine current business processes and information flow, Set objectives and Develop a project plan.

Project team: Assign a project team with employees from sales, customer service, accounting, purchasing, operations and senior management. Each team member should be committed to the success of the project and accountable for specific tasks, i.e. developing a timeline, finalizing objectives, formulating a training plan. Make sure you include first line workers as well as management on your team. Base the selection on the knowledge of the team not status of the employee. Examine current business processes: Have the team perform an analysis on which business processes should be improved. Gather copies of key documents such as invoices, batch tickets and bill of lading for the analysis. To start the team discussion, consider questions such as: Are your procedures up to date? Are there processes that could be automated? Are personnel spending overtime processing orders? Does your sales force and customer service personnel have real-time access to customer information? The team members should also conduct interviews with key personnel to uncover additional areas of improvement needed. Set objectives: The objectives should be clearly defined prior to implementing the ERP solution.

ERP systems are massive and you won't be able to implement every function. You need to define the scope of implementation. Ideally, the scope should be all inclusive. But practically, it is very difficult to implement. Examples of objectives would include: Does the solution reduce backlogs? Can the solution improve on-time deliveries? Will you be able to increase production yields? Develop a project plan: The team should develop a project plan which includes

previously defined goals and objectives, timelines, training procedures, as well as individual team responsibilities. The end result of the project plan should be a "to do" list for each project team member.

Procedure Review

- Review software capabilities, Identify manual processes and develop standard operating procedures.

Review software capabilities: Dedicate 3-5 days of intensive review of the software capabilities for the project team. Train on every aspect of the ERP software to fully educate the team on capabilities and identify gaps. Determine whether modifications are needed prior to employee training.

Identify manual processes: Evaluate which processes that are manual and should be automated with the ERP system. Develop standard operating procedures (SOPs): for every aspect of your business. These procedures should be documented. Make sure that you modify the document as your SOPs change. This is a huge task, but it is critical to the success of your implementation.

Examples of SOPs:

- How do you handle global price changes?
- What are the processes for inputting new customer records?
- How do you currently handle the paperwork on drop shipments?
- How do we add a new product or formula?

Data Collection and Clean-Up

- Convert data, Collect new data, Review all data input and Clean-up data.

Convert data: You can't assume 100% of the data can be converted as there may be outdated information in the system. Determine which information should be converted through an analysis of current data. Collect new data: Define the new data that needs to be collected. Identify the source documents of the data. Create spreadsheets to collect and segment the data into logical tables. Review all data input: After the converted and manually collected data is entered into the ERP database, then Data drives the business, so it is very important that the data is accurate. Data clean-up: Review and weed out unneeded information.

Training and Testing

 Pre-test the database, Verify testing, Train the Trainer and perform final testing.

Pre-test the database: The project team should practice in the test database to confirm that all information is accurate and working correctly. Use a full week of real transaction data to push through the system to validate output. Run real life scenarios to test for data accuracy. Occurring simultaneously with testing, make sure all necessary interfaces are designed and integration issues are resolved to ensure the software works in concert with other systems. Verify testing; Make sure the actual test mirrors the Standard Operating Procedures outlined in step 2, and determine whether modifications need to make. Train the Trainer: It is less costly and very effective if you train the trainer. Assign project team members to run the in-house training. Set up user workstations for at least 2 days of training by functional area. Provide additional tools, such as cheat sheets and training documentation. Refresher training should also be provided as needed on an ongoing basis. Final Testing: The project team needs to perform a final test on the data and processes once training is complete and make any needed adjustments. You won't need to run parallel systems, if you have completed a thorough testing.

Go Live and Evaluation

 develop a final Go-Live Checklist and evaluate the solution.

Sample Final Go Live Countdown Checklist Sample

- ✓ Physical inventory process is complete.
- ✓ Beginning balance entry procedures are developed for all modules.
- ✓ Any transition issues are addressed.
- ✓ Documents & modifications are tested thoroughly.
- ✓ Executives and departments heads are fully trained.
- ✓ Vendor is available for go-live day.
- ✓ Users will have assistance during their first live transactions.

Evaluation: Develop a structured evaluation plan which ties back to the goals and objectives that were set in the planning stage. In addition, a post-implementation audit should be performed after the system has been up and running for the first week for reconciliation purposes and three to six months following to test whether or not the anticipated ROI and business benefits are being realized. Comparing actual numbers with previously established benchmarks will reveal if the software tool does what it is intended to do - add value to the business. It is important to periodically review the system's performance to maximize ROI. Upper management and project team members should be committed for the company to realize the benefits of successful ERP. (Sourced from Sean W, 1981)

2.12. Success Factors for ERP Application

Rabaai (2009) researched previous studies identifying critical success factors (CSFs) for ERP application. This research presents the top most frequently cited CSFs which are: Top management commitment and support, change management, project management, business process reengineering and system customization, training, ERP team composition, visioning and planning, consultant selection and relationship, communication plan, ERP system selection, ERP systems integration, and post-implementation evaluation measures.

Top management commitment and support

Successful ERP application depends on management to prepare for challenges that might be faced as well as senior management who are involved in overall strategy of the company and are not familiar with technical aspects and also, top management commitment and support leads to overall organizational commitment across an organization. It results in the successful ERP application (Umble & Umble, 2002).

Change management

Ehie and Madsen (2005) stated that ERP application involves more than changing software or hardware systems. Ideally, by reengineering business processes, ERP application can help an organization to benefit from higher levels of efficiency and improved performance. Therefore, ERP application may cause changes that lead to resistance among employees. Consequently, balancing conflicts between staff and technology and effectively managing employees in the change process are key elements for the successful ERP application.

Project management

Effective project management is critical for the successful ERP implementation a lack of proper understanding of the project needs and the inability to provide leadership and guidance to the project are the main factors when ERP implementation fails. Thus, effective project management should define clear project objectives, develop a work and resource plan, and carefully track the project's progress (Umble & Umble, 2002).

Business Process Re-engineering and system's customization

There are two approaches to implementing ERP systems in an organization: reengineering business processes and ERP customization. Business process reengineering creates deep changes in organizational processes in order to fit them to ERP functions. On the other hand, when an organization wishes to maintain its existing processes using an ERP system, it can customize ERP functions.

Training

End user training has been recognized a critical factor for ERP implementation. Due to the complexity of the integrated ERP system, end user training is essential for a robust understanding of how the system works and how to use it. Consequently, appropriate end user education and training will maximize ERP benefits and increase user satisfaction.

ERP team composition

Since ERP covers diverse functional areas across an organization, ERP team composition is also important for the successful ERP implementation; an ERP project team should consist of representatives from all functional units related to ERP.

Consultant selection and relationship

ERP consultants play a critical role in ERP implementation. Consultants can be essential knowledge resources for ERP‟s hardware, software, and personnel. They also can help staff, have responsibility for project management, and audit the project. On the other hand, in order to be successful system maintenance after post-implementation, knowledge transfer from consultants is crucial for the organization.

Communication plan

Strong communication within the entire organization during the implementation process increases success for ERP implementation. It allows the organization's stakeholders to understand the goal and the expected benefits of the project as well as to share the progress of the project. An "open information policy" protects the various communication failures for the project. (Al-Mashari, Al-Mudimigh 2003)

2.13. Major Benefits/Merits of ERP system

I. **Reduction of Operating Cost** - ERP systems have large-scale business involvement, internal and external process integration capabilities. They can assist in achieving the strategic competitive advantages. With a centralized database and built in data analysis capabilities, ERP systems provide informational benefits to management decision making. As ERP systems automate business processes and enable process changes, an organization may expect ERP systems to offer strategic advantage through **Cost leadership** by Cycle time reduction, Productivity improvement, Quality improvement, Customer services improvement.

II. **Improved Job Time** - As the different parts of the organization are connected with each other, people have faster access to information and require less time to do their tasks. This helps to improve the time and resources for decision-making

III. **Centralization of Information System -** As all the departments and the functions in the organization are integrated and linked to one single database, data needs to be entered only once into the system.

IV. **ROI earlier than the software developed in-house -** Developing software in-house requires a great amount of investment, experienced professionals and tremendous amount of time. The payback from the in-house system takes an equally longer time. As ERP software packages are developed by vendors who have the required expertise, they are basically off the shelf packages that companies pick up that require minor customizations as per company requirements, and so they don't involve an in-depth development like the in-house software. ROI is received faster from the ERP system.

V. **Ease of use** - The system of ERP is very user friendly. With the correct amount of training, it becomes easy for the employees to use the system.

VI. **Efficient business practices -** The ERP system helps companies to do away with the erroneous ways of carrying out the different business functions and introduces business best practices. This further helps to provide better control and introduces standardized ways to execute business processes.

VII. **Ready-made elucidation for most of the problems -** Most of the problems get resolved as the vendors who develop ERP software packages, take the best ideas from all their customers and incorporate them into their products.

VIII. **Only customization required -** ERP Systems are already developed to suit the general businesses. But as every company has a slightly different way of operating, only minor changes may be needed to customize the system to suit the company's particular business requirements.

2.14. Major Limitations/Demerit of ERP Implementation

Many of the problems that companies face with ERP system are due to inadequate investment in training of all relevant personnel, including those implementing and testing changes, and setting corporate policies. There are limitations and pitfalls to ERP, for instance:

i. ERP vendors can charge sums of money for annual license renewal that is unrelated to the size of the company using the ERP or its profitability.

ii. Success depends on the skill and experience of the work force, including education in how to make the system work correctly. Many companies attempt to cut implementation costs by cutting user training. Privately owned small enterprises are often sufferer, their ERP system is often operated by personnel with inadequate education in ERP in general.

iii. Personnel turnover; companies can employ new managers lacking education in the company's ERP system.

iv. Proposing changes in business practices that are out of synchronization with the best utilization of the company's selected ERP.

v. Total cost of ownership of ERP systems is very high.

vi. Technical support personnel often give replies to callers that are inappropriate for the caller's corporate structure. Computer security concerns arise, for example when telling a

nonprogrammer how to change a database on the fly, at a company that requires an audit trail of changes so as to meet some regulatory standards.

vii. ERPs are often seen as too rigid, and difficult to adapt to the specific workflow and business process of some companies.

viii. The system can suffer from the "weakest link" problem - an inefficiency in one department or at one of the partners may affect other participants.

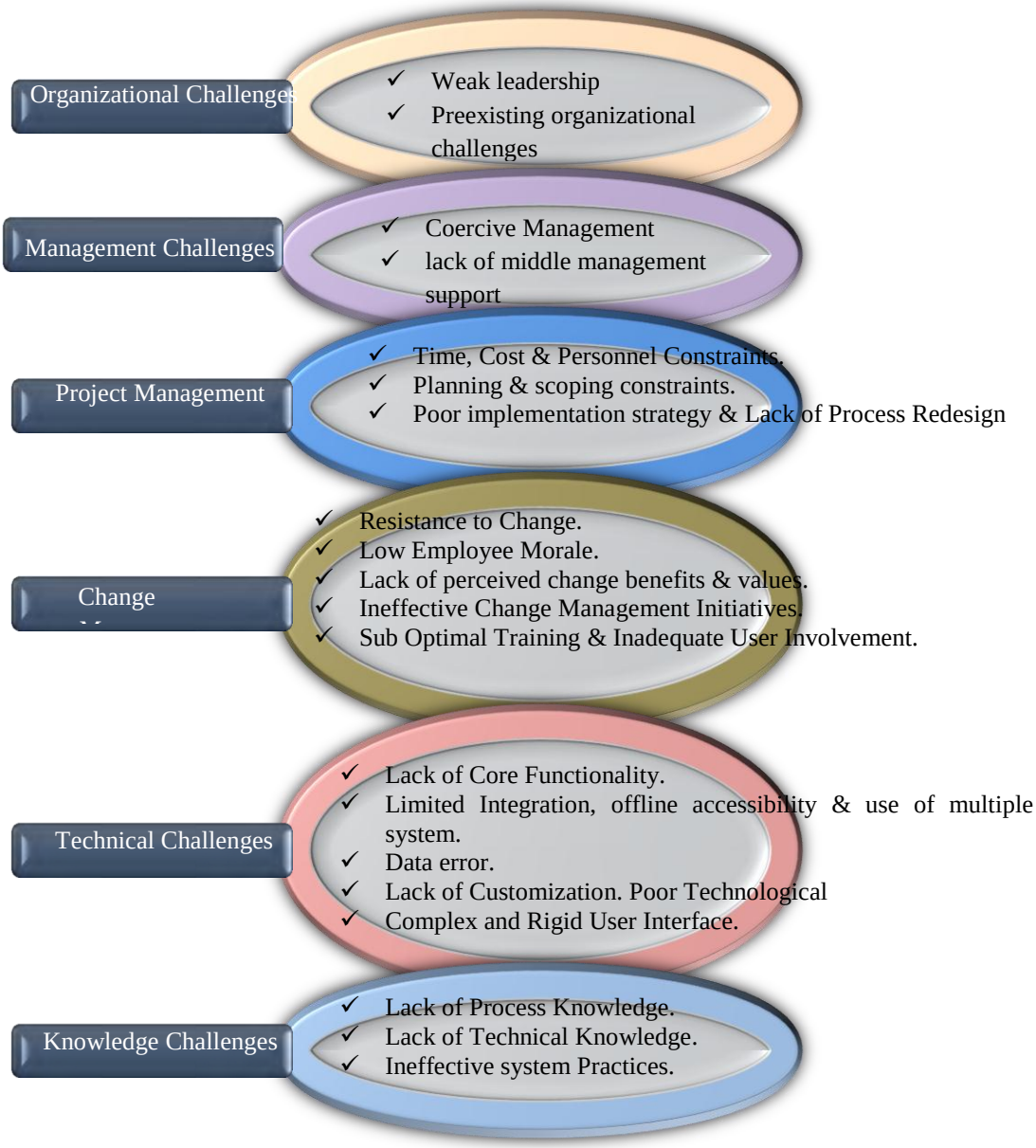
ix. Many of the integrated links need high accuracy in other applications to work effectively. A company can achieve minimum standards, then over time "dirty data" will reduce the reliability of some applications & compatibility problems with the various legacy systems.

2.15. Challenges of ERP implementation

In spite of ERPs significant growth from the late 1990s to the present day, there are a number of challenges that companies may encounter when implementing ERP. Most multinational firms are using ERP and that more small and midsize companies have begun to adopt ERP. Despite ERP‟s promises to benefit companies and a substantial capital investment, not all ERP implementations have successful outcomes. ERP implementations commonly have delayed an estimated schedule and overrun an initial budget (Ehie & Madsen, 2005). However, most of the research reported that the failure of ERP implementations was not caused by the ERP software itself, but rather by a high degree of complexity from the massive changes ERP causes in organizations (Scott & Vessey, 2000). These failures can be explained by the fact that ERP implementation forced companies to follow the principle of “best practices” in most successful organizations and form appropriate reference models. (Zornada & Velkavrh, 2005).

Helo, (2008), stated “Unlike other information systems, the major problems of ERP implementation are not technologically related issues such as technological complexity, compatibility, standardization, etc. but mostly about organization and human related issues like resistance to change, organizational culture, incompatible business processes, project mismanagement, top management commitment, etc.” According to Gregor (2006), the proposed taxonomy classification of ERP implementation challenges are likely to face during the different stages of their implementation lifecycle.

Figure 2-5. Taxonomy of ERP implementation Challenges



Source Gregor (2006)

Based on the above figure, we are able to know ERP implementation challenges in various major catalogue or classification such as organizational challenges, management challenges, technical challenges and knowledge base challenges. These challenges categorization or arrangement is said to be Taxonomy of ERP implementation challenges.

2.16 Top challenges causing ERP implementation failure

Huang, Chang, Li and Lin (2005) presented the top ten challenges causing ERP implementation failure.

Table 2-2 : Top challenges causing ERP implementation failure.

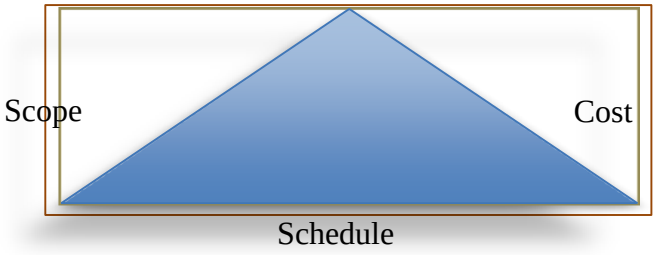
Priority	Name
1	Lack of senior manager commitment
2	Ineffective communications with users
3	Insufficient training of end-users
4	Failure to get user support
5	Lack of effective project management methodology
6	Attempts to build bridges to legacy applications
7	Conflicts between user departments
8	Composition of project team members
9	Failure to redesign business process
10	Misunderstanding of change requirements

Source: Huang, Chang, Li and Lin (2005)

These top challenges illustrate various organizational considerations: organization fit, skill mix, project management and control, software system design, user involvement and training, and technology planning. Since ERP implementation inevitably causes organizational changes, it requires the engagement of senior management from across the organization who is able to resolve conflicts. Without the commitment of senior management, ERP implementation has a high challenge of failure. In other words, due to changes in business processes across an organization, there can be resistance to adopting the ERP system. ERP connects and integrates all business functions within the organization. Therefore, it is critical that management staff be committed, and particularly that they equip employees who are using business functions

influenced by ERP with clear channels of communication. Lack of end-user training increases challenges by creating confusion and inaccuracy, thereby decreasing user satisfaction and the credibility of the system. Excellent project management is also needed for successful ERP implementation. Project teams should have clear guidelines to execute ERP implementation from their project objectives and work plan to their resource allocation plan. Without good project management, ERP implementation projects that are large in scale and must take place over longer time periods may end in failure. Furthermore, the composition of team members plays a crucial role in ERP implementation. ERP integrates diverse business functions across an organization into one single system, necessitating a complex and integrated software package. If a project team does not clearly understand the changes in its organizational structure, strategies, and processes from ERP implementation, it will not be in a position to benefit from ERP‟s competitive advantage. In order to best implement ERP, project team members should be selected with a balance between members with business experience within the organization and external experts with specialties in ERP. From the perspective of project management, the ***iron triangle*** can illustrate how important it is to balance the three corners of the triangle – ***scope, schedule*** and ***cost***. (Lamers, 2002)

Figure 2-6: The iron triangle of project management



Source: (Lamers, 2002)

However, in ERP implementations, both schedule and cost tend to be underestimated, while scope is overestimated. ERP changes the entire organizational environment by reengineering the entire business process; thus, after implementation, it is not easy to revise previous processes. Therefore, ERP implementations need accurate estimation, preparation with a holistic view, and systematic management of the entire implementation process.

2.17. ERP in Commercial Bank of Ethiopia

1. Business Problem

Short coming of using the present paper based and semi-automated systems for most of the support processes have led the bank to initiate implementation of an Enterprise Resource Planning system that address the current support organ setback. To this effect, CBE is looking for a suitable software solution which is readily deployable with a rare customization and contain all the security features that are needed to protect the confidentiality, availability, integrity of information and non-denial of the transactions carried out through ERP.

2. Project scope

2.1 Finance Process

The finance process has two sub-processes under it: Fund Management and Accounts & reconciliation. The activities under these sub-processes are partially supported by the core banking solution. Fixed asset administration is handled by in-house developed isolated system.

2.2. Enterprise Data Warehousing and Business Intelligence (EDW &BI)

The other strategic functionality the bank wants to acquire on the proposed software is Business Intelligence that enables the company to easily keep track of all the information important for the organization. Business Intelligence modules are:-

2.3. Procurement process

Procurement sub process is responsible for facilitating the acquisition & distribution of fixed and non-fixed assets, stationary and other items that are useful in running the bank's day to day activities.

2.4. Human Resource process

Human Resource process which is also supported by isolated software named Unique that handles the profile of the employees; and other independent systems for handling of payroll and leave management. The bank is using Unique to administer records and profile of all CBE employees centrally at its head offices, while the payroll and leave management systems are used in decentralized manner. The other wing of HR expected to be incorporated in the ERP system is the Human Resource Development wing. The project is planned to incorporate the Learning

management, Succession planning and Performance Management aspect of the bank. Currently the business side of HRD is supported by School of Frankfurt consultants.

2.5. Office of strategy management

The strategy management process mainly focus on aligning the organizational mission and vision with strategic goals and objectives of the bank. It is also concerned with the effective cascading of the scorecard/plan and budget up to the level of individuals. The requirements of three sub-processes structured under it, namely planning and strategy management, Evaluation and Monitoring, and change management.

3. Critical success factors

The success factors for ERP are: (1) Process Owners ownership and support, (2) Change management and excellent communication to process owners, (3) Business Process Re-engineering / system customization, (4) Project management, (5) Dedicated and Competent team composition and (6) Training.

4. Milestone and major deliveries

The following are description of the major milestones and deliverables. Slight adjustment might be done upon the project plan finalization phase, pursuant to the agreement to be reached.

Table 2-3: ERP Project Major Milestone and deliveries in CBE

Milestones	Expected Deliverables
○ Finalize project plan	Signed plan document
○ Delivery of Conference Room Pilot (CRP1) Training	Each process CRP 1Training material and detail functionality document
○ Completion of Requirement (Functional, security, reporting, integration) Gathering and current process mapping	Current business process map/ document Detailed Business Requirements Document
○ Future (To Be) & Gap Analysis	Future business process model that critically address work flow, integration, security, and reporting requirements
○ Data preparation and migration	Data conversion design document
○ Completion of CRP 2	CRP 2 document
○ Solution design	Application Architecture document Application functional design document
○ Designing High level and low level technical architecture	Signed High level and low level architectural document
○ Develop test script for not configured functionalities	System test script document
○ Completion of CRP3	CRP 3 document , Training Manuals
○ User Acceptance Test-UAT	UAT accomplishment document
○ Prepare transition plan for production and go-live	Plan document, User and administrative guide, support plan and Procedure
○ Go-live	Go-live document, , Technical and Functional documents, Business application components

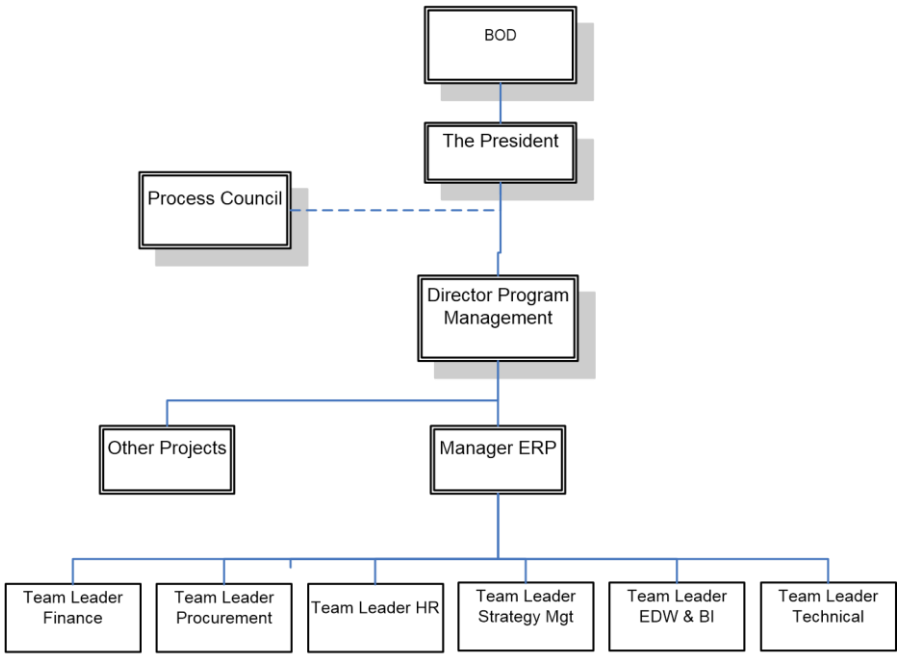
Source: CBE ERP Implementation project charter 2015

5. CBE ERP Project organization chart

ERP Project team is composed of functional/business team and technical team both reporting to a Project Manager. All project staff and the project manager are full time staff. As ERP covers diverse functional areas across an organization, CBE‟s ERP team composition is also organized in a way it comprises representatives from all functional units namely, Finance, Procurement, Human Resource Management, Office of Strategy, and Transport

Management. Team involves experts of the domain process as well as junior staff who are assumed to contribute in the change initiative as well as for the rollout of the system.

Figure 2-7: CBE ERP Project organization chart



Source: CBE ERP Implementation project charter 2015

2.18. Enterprise Resource Planning /ERP/ in Ethiopia

ERP Systems have been successfully implemented in many enterprises in Ethiopia. Such as

Ethiopian Airlines, Ethiopian telecommunication, Mugher and Derba Cement industries and Mesfine industrial engineering. Besides this, In Ethiopian banking industry, it is also currently implemented in commercial bank of Ethiopia which is the first bank that applied the new Enterprise Resource planning application called Oracle in Ethiopia. After implementation, ERP Software provides tremendous benefits like quality improvements, optimum utilization of scarce resources and cost reduction in the organization. An ERP Suite plays a critical role in integrating and automating the business processes in an enterprise. ERP in Ethiopia has helped in exposing the Ethiopian enterprise to the best practices and processes adopted internationally and serves as a catalyst to enhance their productivity and efficiency as well. Increasingly Ethiopian enterprises

are witnessing and realizing the tremendous benefits a versatile and powerful ERP System brings to an enterprise and the imperative need for them to start their own enterprise automation journey as well with the implementation of a suitable ERP Solution in their enterprise too. As it has been mentioned in the above, six researches have conducted on ERP as follow:

Abiot and Gomez (2012) conducted a research on a successful ERP implementation in the case study of Mesfin industrial engineering and its main objective of the study was to examine the implementation of ERP system considering the key technical, business and cultural dimensions. At the last of recommendation was necessary to study and report more ERP implementations in different Ethiopian companies.

Secondly, Derese (2013) has made an assessment on successful ERP implementation framework at Ethio-Telecom, a government company. The main objective of the study was to present experiences that were obtained from a successful ERP implementation project. Hence, the researcher developed a framework and identified CSFs that need to be addressed during reimplementation, implementation and post-implementation phases. Finally, he recommended that more researches should be conducted to identify more contextual factors.

Thirdly, Sintayehu (2014) also conducted the research on the success factors for implementation of Enterprise Resource Planning system at Ethiopian Airlines. The objective of the study was to investigate CSFs and sharing experiences to other Ethiopian organizations with similar context and environment. At last, the researcher identified twenty factors that can be critical for the success of ERP system implementation in the context of Ethiopia. These are project planning, top management support, project management and leadership, capability of consultants, change management and communication, organizational readiness and overall knowledge transfer. The researcher also recommended more single and multiple case studies of ERP implementation should be conducted in Ethiopian organizations to strengthen the findings of success factors.

The fourth research conducted by Elsa (2015) on ERP post implementation management framework on Ethiopian Airlines. The Main objective of this study was to investigate technical, organizational, and operational issues of ERP post-implementation success in the context of Ethiopian airlines. The study has indicated a high-level ERP post implementation management framework.

The fifth one was Kibebework (2015) who also conducted research focusing on the challenges and current status of ERP implementation, the case of Mugher and Derba cement industries. The main objective of this study was to assess the challenges and current status of ERP implementation in both companies. The researcher has found factors that affect ERP implementation, namely; disregarding organizational, people and strategy factors that encompass top management support, users training and education, effective project management, user involvement, suitability of software and hardware communication and data accuracy creates great challenge for the success of an ERP implementation. The researcher also found that, there is an explicit linkage between critical success factors and ERP implementation stages. Knowing such relation and determining which critical success factor are best needed in which ERP implementation stage may enable organizations to successfully implement an ERP.

Finally, Foziya, A. (2017) has conducted research on "Factors Affecting the Implementation of Enterprise Resource Planning At Commercial Bank of Ethiopia" these, findings that of technological, organizational and people or individual factors affect ERP implementation into the company.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

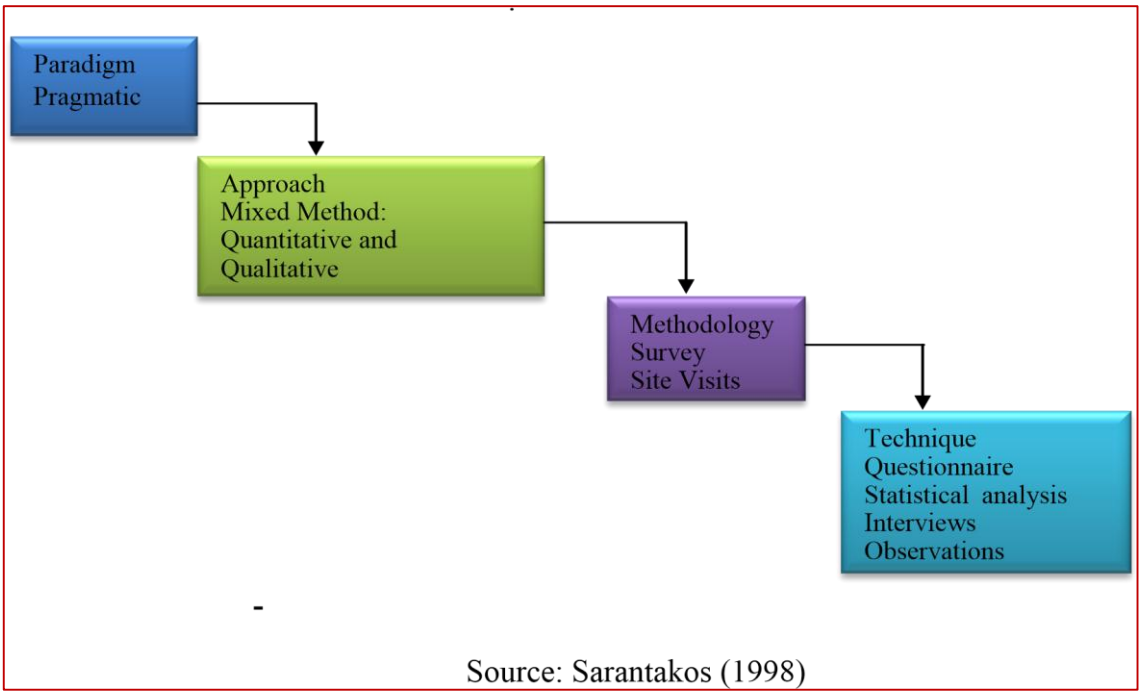
This chapter consisted the research design and method descriptions that are going to use in this paper such as deciding on data collection method for the study, uses of both primary and secondary types of data decision making, types of the research and sampling techniques.

3. Research Methodology

According to Bryman and Bell (2007), Research methodology refers to the procedural framework within which the research is conducted. It describes an approach to a problem that can be put into practice in a research process, which could be formally defined as an operational framework within which the facts are placed so that their meaning may be seen more clearly.

Sarantakos (1998) provides a guideline for selecting a research design, beginning with a paradigm, approach, methodology and appropriate techniques for data collection and analysis.

Figure 3-1: Research Design



Source: Sarantakos (1998)

3.1. Research paradigm

Guba (1990) defines research paradigm as an interpretative framework guided by "a set of beliefs and feelings about the world and how it should be understood and studied." Even if there are three main types of research paradigms commonly used in the field of study: positivist, interpretive and Realists (critical), here in this paper, the researcher used both positivism and realism to answer the questions what, when and how for well describe the quantitative analysis.

3.1.1 Pragmatic Research

Infract, by using pragmatism, researchers can focus on quantitative versus qualitative data from the mix of subjective and objective approaches to answer their research questions. Furthermore, Tashakkori and Teddies' (2003) explained that pragmatic paradigm contains deductive and inductive approaches that aim to clarify the truth of a particular phenomenon. In pragmatism, answering the research questions is more essential than the research method that is employed. With pragmatic paradigm, researchers have the freedom to choose procedures, methods and techniques of research that best suit their research requirements and objectives (Creswell, 2003). Therefore, the researcher focused on quantitative and qualitative data from the mix of subjective and objective approaches to answer their research questions and inductive approach also used.

3.2. Research design and approach

3.2.1 Quantitative and Qualitative Research

As it can be observed from the research objective this study tries to assess the practices and challenges of ERP implementation Project in CBE. Research approach can be either qualitative or quantitative or mixed approach. However, in order to achieve the broad objective of the study; the mixed research method used for this study. This Mixed research method involves both collecting and analyzing quantitative and qualitative data. It is obvious that researchers to follow a mixed approach Combining quantitative and qualitative methods to achieve a comprehensive understanding of the research. The rationale of using such a mixed approach in this study is to gather data that could not be obtained by adopting a single method (Creswell, 2003).

Accordingly, both qualitative and quantitative methods applied so as to present facts in a reasonable way. The qualitative method enables surveys to collect primary data or uses already collected or processed data called secondary data in their studies. Therefore, the researcher can describe or reveal the nature of ERP Project, its settings, processes, integrations, standards the

system with the organization and people as well. Denzin and Lincoln (2011) explain that qualitative approach uses a variety of techniques including detailed interviews, observation and document analysis. Following this, the quantitative method was applied to support the quantitative findings and to gain additional insight into the bank specific issues on ERP implementation project. This quantitative portion of the study involved a statistical analysis of data collect from survey questionnaires. Pinsonneault and Kraemer (1993) state that quantitative research attempt to answer questions of 'what', 'how much' or 'how many'. Quantitative approach requires the collection of data or numerical objective that can be processed statistically to obtain a map, graph or tabulation as a basis for analysis.

3.2.2. Deductive and Inductive Approach

Deductive reasoning is described as a top-down, theory-testing process which is initiated by the analysis of the existing knowledge. The results are generalized. The generalized results contribute to new knowledge while the ultimate aim of deductive reasoning is a quest to uncover the truth and elements such as culture, language, knowledge and previous experiences, the researcher has a non-negligible influence on data collection. Furthermore, the inductive research reasoning is described as a bottom-up approach with the focus on theory generation, as opposed to theory testing. Here Concepts, themes and logical argumentation are derived through detailed analysis of the raw data and interpretation of the empirical observations. Propositions are derived based on the observations and interpretations which are then developed in a theory (Blaikie, 2009).

Accordingly, for this research paper *inductive approach* was used because to identify the practice and challenges of ERP implementation project, the researcher derived through detailed analysis of the raw data and interpretation of observation, questionnaires and interviews comes to conclude generally.

3.2.3. Types of the Research

According to Yin (2003), the types of the study can be exploratory, descriptive, or explanatory. Exploratory studies are practical if one wish to clarify his/her understanding of a problem. It describes exploratory studies as a method of finding out "what is happening; to seek new insights; to ask questions and to assess phenomena in a new light". Whereas Explanatory studies are useful when one wish to establish causal relationships between variables. The emphasis in

this sort of study is to examine a situation or a problem in order to explain the relationships between variables (Saunders, Lewis & Thornhill, 2000). Descriptive studies are appropriate when one wish to describe phenomenon such as events, situations or process. Furthermore, a descriptive is seek to describe and categories entities and are the antecedent to the research growth (Gregor, 2006).

As a result, the type of research that also employed here is descriptive. This is because the intention of the study in order to describe and evaluate the practices and challenges of ERP project implementation in Commercial Bank of Ethiopia. And this descriptive study was also involved in the fat finding equities of different kinds and phenomenon in the study and their reasons.

3.3 Target population, sampling and sampling technique

In drawing the sample, knowing population is mandatory. The population or universe is defined as the total group which the research deals with. But the selected region population is the representative or targeted population. Indeed, the individuals to be studied are large and due to factors of time, cost of the study and accessibility that obstruct to get information from the whole population. Then, sampling is needed to find out something about the entire population. Sampling is a process by which a relatively small number of individuals object or events are selected and analyzed.

3.3.1 Target population

The researcher considered team members of ERP project namely, functional team leaders, System/Application support technical team leaders or administrative, Application Development team, hardware and storage team, and network team as appropriate in the project area. This considered the ERP Project experience as a parameter of interest to define the study population. This is, because, those team members that are experienced for two year and above. This specific area employees are taken as target group. The total population of the target group is 150 project employees from which sample has drew for this study.

3.3.2 Sampling and Sampling Technique

The total population of project target group is 150 which has been stratified departmentally in to finance process, procurement sub process, human resource management process, office of

strategy management and enterprise Data Warehousing & Business Intelligence specific areas. Sampling techniques provide a range of methods that enable the researcher to reduce the amount of data need to collect by considering only data from a sub-group rather than all possible cases or elements (Saunders, Lewis and Thorn hill, 2000). Sample size is determined by considering the size of population variance, budgetary constraint and time given to conduct the study so that the researcher can use a proportionate stratified sampling from probability sampling technique to get a representative sampling and again due to its homogenous characteristics of the population within the strata, the researcher shouldn't to get variety of responses, so to adjust it, the researcher selected the sample members using purposive i.e. judgmental and Quota sampling technique from non-probability sampling technique. The sample size of this study is determined by using the formula developed by Taro Yamane (1967);

$$\mathbf{n = \frac{N}{1 + N\,(e)^2}}$$

Where, **n** is the sample size
N is the population size,
e is the level of precision or sampling error = (**0.05**)

$$\mathbf{n = \frac{150}{1 + 150\,(0.05)^2} = 110}$$

Thus, sample size of 110 employees have been selected from the population of 150.

Table 3-1: Total population, target group & sampling of CBE ERP Project team members

	Team	**Sample**	**Team**	**Sample**	**Team**	**Sample**	
Project Manager	1	1			1	1	2
Finance Team	18	13	10	7	3	2	31
Procurement Team	16	12	8	6	2	1	26
HR Team	20	15	10	7	3	2	33
EDW & BI Team	9	6	11	8	1	1	21
Strategy / Hyperion	10	7	10	7	2	2	22
Technical/Database, storage, network	NA		11	9	4	3	15
Population size	74		60		16		150
Sample Size		54		44		12	**110**
From total population 150, **Sample Size** is :				**110**			

Source: CBE ERP Implementation Project Charter (August 2015)

N: B. Here to get the sample from the strata, the researcher calculated as each target group multiply with number of sample (110) and divided by total population (150). For example (18*110/150 = 13)

Once the sampling unit clearly identify here above which help the researcher to get variety of responses, the sample items in each number of sample distributed to each department at the time of questionnaire distribution, respondents selected using purposive i.e. judgmental & Quota sampling technique of non-probability sampling technique. Besides this, the purposive or judgmental sampling technique also allowed the researcher to make the respondent their own selection participants and also to judge individuals who are particularly the project managers and each team leaders to participate in semi structured interviews.

3.3.3 Types and Sources of Data

To make the study complete and meaningful both primary and secondary data collection methods were used. The methods are used to collect primary data: Personal interviews, Questionnaires and Observation of the system and document review was helpful when data is impossible through questionnaires or when respondents might be unwilling to respond for this purpose direct observation was needed to understand the services have been giving.

3.3.4 Methods of Data Collection

For the success of this paper, both primary and secondary data collection methods were used. The primary data collected from the different level of ERP Project team members. Primary data consists of interviews, observations, questionnaires (Arbnor and Bjerke, 1999). Interviews allowing the researcher to have a rich understanding and interpretation of the occurrence of events and actions through the perception of the participants. (Walsham, 2006). Direct observations allow the researcher to gain useful information on the phenomenon of interest through the monitoring of behaviors during a selected period of time. Besides, open and close-ended questionnaires were used. The secondary data was also collected from various sources including books, annual reports, internet, magazine and ERP Project documents of commercial bank of Ethiopia. Yin (2003) argues that evidence from case studies may arise from six different sources, namely, interviews, archival records, documentation, direct or participant observations, and physical artefacts.

3.3.5. Data Analysis and Presentation Techniques

This research employed by using both qualitative and quantitative measurements. The collected data has clearly been presented by using tables then which would have been expressed in the form of frequency, percentage and mean. This is for the purpose of data organizing, analyzing, interpreting and presenting of the open-ended interview, questionnaires and direct observations with document review. Here descriptive analysis technique has been applied to manipulate the organized data. Meanwhile, SPSS V20 was used as the main tool to manipulate the data.

3.4. Validity and Reliability

Validity and reliability were important aspects of the research methodology to get a better explanation of the world. Validity determines whether the measuring instrument truly measures what it was intended to measure or how truthful the research results are. To measure the validity of results, we consider the theory and the measuring instrument used. Validity can be measured by factor Analysis.

Data Triangulation, Methodological Triangulation and Analysis Triangulation are critical to measure the validity of research findings. (Here, Triangulation means a technique in surveying in which distances & directions are estimated from an accurately measured baseline.)

According to Singleton and Straits (2005), the quality of conceptualization of an operational definition and its relevance for empirical examination is demonstrated with a valid and reliable measurement model. Data validity refers to how variables (questions) are able to measure what the researcher actually wishes to measure. On the other hand, data reliability demonstrates the consistency and stability of the data collected. Data reliability refers to accuracy and precision of measurement.

Therefore, the paper kept reliability by making all interviewees from part of the ERP implementation projects and even the research used managers and team leaders of ERP project in addition to technical and business members. The reliability of the questionnaire was checked by the Cronbach‟s-Alpha test coefficient using SPSS version 20.0 software and the result obtained was 0.804. Or 80.4%.

3.5 Ethics and Confidentiality

Since the research is performing on specific project in the organization, data collection should be ethical and confidential, so for getting data, documents and interview questions, the researcher used a formal authenticated cover letter, a participant consent, together with an ethics application form. At the start of each interview, the researcher briefed each interviewee on the purpose of the research. The interviewees will also be informed of their rights to withdraw from the study or not to answer any uncomfortable questions.

Consequently, the researcher assured confidentiality, namelessness and facelessness just by withholding names and ensuring that no individual or company details may not published in the final report.

CHAPTER FOUR

DATA PRESENTATION, ANALAYSIS AND DISCUSSION

4.1. INTRODUCTION

This chapter deals with three parts. The first part deals with the profile of respondents showing gender, age group, level of education, work experience and secondly, presentation of sample data study variables that were collected from the respondents and the other one is interview results analysis. Then the data was analyzed using quantitative descriptive statistics with the help of SPSS application version 20 statistical computer software of Cronbach's Alpha test model. Finally, data from the respondent's questionnaire and semi structured interview were used for analysis and interpretation.

4.2 Participation Rate

Regarding the response rate, in order to get the primary data, questionnaires each contained 35 variables or questions were distributed to 110 individuals for quantitative data analysis. Consequently, the given questionnaires have been collected back from 89 respondents out of 110 sample respondent individuals and yet due to various reason 21 respondents haven't yet returned so that 80% response rate could properly be completed and returned. According to Mugenda O.M and Mugenda A.G (2003) a 50% response rate is adequate, 60% good and above 70% rated very well. Moreover, to make the study more reliable, semi structure interview questions that consisted six (6) significant inquiry items have been interviewed the higher position employees of the ERP project such as project managers and project team leaders by which qualitative data analysis has been done. Here the researcher has selected Seven (7) candidates only from managerial and supervisor position for an interview. 5(five) Team leaders (supervisors) candidate selected from each five ERP modules that have been implemented in the bank and two (2) from managerial position. As a result, their proper response have also been taking in to consideration for data presentation, analysis and interpretation.

4.3 Respondents' personal profile/ Demographic Information

Here employees who have been working in the specific project responses. Those questions regarding gender, age, level of education, work experience and service years. Therefore, the responses of the respondents and the implication are presented as follow.

4.3.1 Gender information of respondents

Table 4-1: Gender information of respondents

		Frequency	Percent	Cumulative Percent
Label	Male	68	76.4	76.4
	Female	21	23.6	100.0
	Total	89	100.0	

Source: Primary Survey, 2018

According to the collected data, the overall staff composition of the bank's project area is highly dominated by male employees whereas the female employees are very low in number and they are counted as 23.6% of the total target group of the bank's project area and the remaining 76.4 % has been covered by male employees. Therefore, from the data collected from respondents, we can concluded that the proportion of female employees compared with male employees, the general sex composition of commercial bank ERP project's human resource is highly dominated by male employees. Comparatively, when we see the gender ratio composition, the female counted 30% of the male that is the male higher by 70% in gender.

4.3.2 Age information of respondents

Table 4-2: Age information of respondents

		Frequency	Percent	Cumulative Percent
Labels	26-30 Years	42	47.2	47.2
	31-40 Years	45	50.6	97.8
	Above 40 Years	2	2.2	100.0
	Total	89	100.0	

Source: Primary Survey, 2018

Regarding the age status, 50.6 % of the employees are between the age 31-40 Years and the other 47.2 % are between 26-30 Years. However, the least 2.2 % of the employees are at the age of above 40 years. From the distributed questionnaires demographic information whose age from 18 – 25 years were not participatory group of the respondents. This indicated that the bank didn't assigned or less assigned on the average age from 18 – 25 years in the project area deliberately. Whereas staffs who are experienced and matured in age or developed in terms of behavior and thinking from age 31-40 Years have been assigned in the project area. In other words, most of the employees at large are belonging in the productive age group that is from 26-30 Years and 31-40 Years whose summation percentage is counted as 97.8 % (47.2%+50.6%).

4.3.3 Educational status of respondents

Table 4-3: Education information of respondents

		Frequency	Percent	Cumulative Percent
Label	Degree	80	89.9	89.9
	Master	9	10.1	100.0
	Total	89	100.0	

Source: Primary Survey, 2018

The study found it of paramount importance to determine the level of education of the respondents. The results of the findings in the above table reveal that most respondents had degree whose percentage is 89.9% while 10.1% had master degrees and yet there is no diploma holder in the bank project area specifically. Due to the findings of the study it can be therefore concluded that the respondents had enough education to execute the roles assigned to them effectively and efficiently in regard to the effect of the implementation of enterprise resource planning.

4.3.4 Service year of respondents

Table 4-4: Service year information of respondents

		Frequency	Percent	Cumulative Percent
Labels	4 -9 Years	28	31.5	31.5
	10-15 Years	36	40.4	71.9
	16-20 Years	21	23.6	95.5
	Above 20 Years	4	4.5	100.0
	Total	89	100.0	

Source: Primary Survey, 2018

The study determined the number of service years of the respondents so that they have been asked for how long they operating in the Bank. The data was analyzed and illustrated in percentage.

Based on the results most indicated that most employees in the Bank's project area having more than 10 years' service year. That is more than 68% of the respondents in aggregate. Between 10-15 years who comprised the majority accounting for 40.4% while 31.5% of the respondents indicated from 4 - 9 years which is the next higher service year group and the other 23.6% of the respondents are grouped from 16 -20 service years. However, the remaining 4.5 % of the respondents who also were the minority of the respondents have worked in the bank more than 20 years. It can be therefore noted that most respondents have been working from 10 -15 years in the bank's project area.

4.3.5 Working division or Department of respondents

Table 4-5: Working Division or Department information of respondents

		Frequency	Percent	Cumulative Percent
Labels	Finance	5	5.6	5.6
	Human resource	64	71.9	77.5
	Sourcing and facility	12	13.5	91.0
	Office of strategy	2	2.2	93.3
	Project management office	6	6.7	100.0
	Total	89	100.0	

Source: Primary Survey, 2018

As it is already explained in the research design and methodology part, the researcher has focused on five project working divisions/departments considering ERP implementation, and these divisions are considered as strata. Accordingly, out of the 110 employees 89 individuals who returned the questionnaire composed from all project working division. Hence, the highest number of respondents who counted as 71.9 % of the total respondents belong to Human resource division while sourcing and facility Division covers 13.5%.

Furthermore, 6.7 % of the respondents from project management (CPO) department and the other 5.6 % the respondents are from finance division but the remaining least percentage of 2.2 % of respondents are from office of the strategy division. This is, therefore, we can concluded that from five modules of ERP project implementation areas of working divisions, the highest and majorities of the respondents were from human resource department.

4.4 Data Related to the Practices of ERP Implementation

Based on questionnaires survey, the researcher was able to get confirmation about agreement of respondents using Likert rating scale regarding to the ERP practices in commercial Bank of Ethiopia.

The rate are - 1 = Strongly Disagree, 2 = Disagree; 3 = Uncertain, 4 = Agree, 5 = Strongly Agree

Although there were various crucial variables in connection with ERP project practices, here ten major ERP practice have been identified and they were distributed on survey questionnaires. Let's see the analysis and interpretation of the following presented data. Then after, we would discuss as per the findings of data related to the practice of ERP implementation in CBE. By considering their mean and percentage value, the following table indicated us variables which have greatest mean implied that they are the highest practices of ERP implementation. These respondents strongly agreed practices are: *Centralized control of operation, Centralized control of operation, Cost efficiency in operations, progress of ERP system, Employees access "ERP link" of the modules/oracle application and Implementation of ERP at all levels of the organization* whose mean 4.33, 4.12, 4.10, 4.10, 3.99, and 4.36 respectively. They are quite far from average mean of 3.4 and their aggregated mean is 25 which is 73% of total mean of 34.04. The implication is, since all are greater than average mean, they are strongly exercised practices of ERP project in CBE.

Table 4-6: ERP practice in Commercial bank of Ethiopia

Statements	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	S.D
Centralization of data	**0%(0)**	**0% (0)**	**5.6% (5)**	**56.2% (50)**	**38.2%(34)**	**4.33**	**.579**
Centralized control of operation	**0% (0)**	**2.2% (2)**	**5.6%(5)**	**69.7%(62)**	**22.5%(20)**	**4.12**	**.600**
Cost efficiency in operations	**0%(0)**	**6.7%(6)**	**6.7% (6)**	**56.2%(50)**	**30.4%(27)**	**4.10**	**.798**
ERP modules customization	**0%(0)**	**6.7%(6)**	**27.%(24)**	**39.%(35)**	**27%(24)**	**3.87**	**.894**
Employee work process effectiveness	**0% (0)**	**6.7%(6)**	**27%(24)**	**39.3%(35)**	**27%(24)**	**3.87**	**.894**
Communication change among employees	**0%(0)**	**4.1%(5)**	**25.8%(23)**	**30.3%(27)**	**39.7%(34)**	**3.91**	**1.114**
Employees resistance to the system	**32.%(29)**	**59.6%(53)**	**7.9%(7)**	**0%(0)**	**0%(0)**	**1.75**	**.589**
progress of ERP system	**0%(0)**	**0%(0)**	**23.6% (21)**	**53.9%(48)**	**22.5%(20)**	**3.99**	**.682**
Employees access “ERP link” of the modules/oracle application	**0% (0)**	**0% (0)**	**16.9%(15)**	**56.2%(50)**	**27%(24)**	**4.10**	**.658**
Implementation of ERP at all levels of the organization	**0% (0)**	**0% (0)**	**0%(0)**	**64%(57)**	**36%(32)**	**4.36**	**.483**
Aggregate Mean & standard Deviation						**34.04**	**7.291**
Average mean & standard deviation						**3.4**	**0.73**

Source: Primary Survey, 2018

As we have seen in the above table, for all the required variables about ERP practice in Commercial bank of Ethiopia, respondents haven’t yet said strongly disagree except to the question of *Employees resistance to the system.* For the question which asked participants regarding to *Centralization of data* in connection with the practice of ERP project

implementation, Except 5 (6%) respondents who are uncertain whether the data made centralize or not, the rest all 94% (84) of the respondents agreed and replied that the deployed ERP system fully centralized the business process of the Bank. None of them said disagree. From this it can be concluded that all the departments and the functions in the organization are integrated and linked to one single database.

From the interview result analysis also, we are able to know practice of *Centralization of data* is one of the main benefits brought to the bank because the interviewee said *Centralization of Information System* made all the departments and the functions in the bank have integrated and linked to one single database. It can then, be accessed by different departments according to their needs.

Similarly, 92% (82) of respondents also reflected the same view point about *Centralized control of operation* I.e. they were agreed and even strongly agreed. However, except 5.6% (5) uncertain participants, the other 2.2% (only 2 respondents) disagree on Centralized control of operation. Therefore, it implied that the core operational activities and processes have been controlled centrally so that it can reduce time cycle and cost even increase productivity. The interview with project manager and team leaders also shown us *Centralized control of operation* practiced by ERP system has its unique benefit of "Reduction of Operating Cost"

They said CBE proactively believed that ERP systems automate the bank's business processes and it enables process changes, so that CBE has got strategic advantage of Cost leadership from systems by Cycle time reduction, Productivity improvement, quality improvement, Customer services improvement.

In addition, almost 87% (77) of the respondents have agreed that the practice or exercising ERP system brings *Cost efficiency in operations* but the other 6.7% (6) and again 6.7% (6) respondents were uncertain and disagree about the ERP cost efficiency in operations respectively. Whereas, we can observed that resulting from the majority 87% of the respondents have agreed that ERP project implementation has an advantage of cost efficiency in operations. In connection with this practice,

The interviewees of the ERP project higher position employees have also argued that both *Cost efficiency in operations* and *efficient business practice* are the other major benefits. They are different sides of the same coin to bring efficiency as the bank needed.

Concerning the practice of *ERP modules customization*, none of the respondents said strongly disagree which means they said that customization is not practiced during and after ERP implemented when any additional requirements happen from different organs of the bank.

Moreover, 6 number of respondents count 6.7% of the total respondents disagree on customization that is not allowed to practice so that they reflected the same viewpoint. Whereas, 27% (24) of the participants were uncertain whether customization of module is practiced or not. They do not have an idea. However, the majority of the respondents at large who counts 65% (59) have agreed & strongly agreed that modules customization is the one and mandatory practice of ERP project in commercial bank of Ethiopia. From this fact, we can deduce that possibility of customization or modification is one practice to address the late additional definition of requirements that arise from the bank during or after the integration of all those modules or legacies.

During interview, as attached the activities of each module processes in the appendix, if modification needs among the activities or new requirements, candidates told us, customization of ERP modules is possibly practiced as the bank needed in all the major five legacies of ERP application processing center which is the scope of the project. These are (1) Finance: The finance support process has two sub-processes under it. These are Fund Management and Accounts & reconciliation. The activities under these processes are partially supported by the core banking solution is handled automatic inter branch as well as head office accounts settlement, tangible or fixed and intangible asset management, and fund management activities by ERP system (2) Human Resource: The other core support process is the Human Resource process which is also supported by ERP software in a centralized way. The bank is using this system to administer records and profile of all CBE employees centrally at its head offices. (3) Supply Chain Management: this is a procurement sub process responsible for facilitating the acquisition & distribution of fixed and non-fixed assets, stationary and other items that are useful in running the bank's day-to-day activities (4) Hyperion: The strategy management process mainly focuses on aligning the organizational mission and vision with strategic goals and

objectives of the bank. It is also concerned with the effective cascading of the scorecard/plan and budget up to the level of individuals. The requirements of three sub processes structured under it, namely planning and strategy management, Evaluation and Monitoring, and change management, are included in this document and (5)Business Intelligence: The other strategic functionality the bank acquired from the proposed software is Business Intelligence that enables the company to easily keep track of all the information important for the organization. Business Intelligence is an important component of banks‟ implementation of IT based strategies. So customization was being exercising when any needs of new definitions requirements risen from all the aforementioned five modulation centers of the bank.

For the question asked about *Employee work process effectiveness,* the majority 66% (59 in number) of the respondents believe that the ERP implementation makes the banks‟ employees working process effective which is due to fully automated so that tasks that can be handled by system even if the system. While there are some respondents who count 6.7% (6) disagree that employee work process effectiveness is not as such practice in the bank after ERP implementation. Plus 27% (24 in number) are responded as uncertain that whether employee work process effectiveness practice exist or not.

From the interview dialogue, one good benefit of ERP has expressed that as the different parts of the organization are connected with each other, people have faster access to information and require less time to do their tasks so that it helped to improve the time and resources for decision-making. As a result, ERP brought an *improved Job Time* and it made *Employee work process effectiveness.*

Regarding to the practice issues of ERP project implementation, especially whether to know there is *Communication change among employees* practice or not, 89 respondents have been asked. As result, the total summation of 30.3% (27) agreed participants & 39.7% (34) strongly agreed, 70% (61) of the aggregate respondents have definitely agreed that *Communication change among employees* is currently practiced in the bank. This is, therefore, excluding almost 4% (5) disagree respondents and 26% (27) uncertain respondent’s contradictory response, 70% told us ERP project implantation is significantly brings practice of effective communication change among the employees of across the bank. On the contrary, except 7.9% (7) of the respondents who were uncertain whether employee resist or not, all the remaining 92% or 82

respondents in number were disagreed with *Employees resistance to* the deployed ERP system. Rather, employees relief due to it automation. Unfortunately, none of the respondents have strongly agreed or agreed that *Employees resistance to the system.*

It is so unique that from all questions (variables) asked to participants, for inquiries such as *progress of ERP system, Employees access "ERP link" of the modules/oracle application* and *Implementation of ERP at all levels of the organization,* none of them are disagreed or even strongly disagreed for the aforementioned three interrogations. Rather 24% (21) and 17% (15) of the respondents are being so uncertain for the question *progress of ERP system* and for question *Employees access ERP link of the modules/oracle application* respectively, the remaining majorities‟ which account 76% (68) and 83% (74) of the respondents have agreed and even strongly agreed that *progress of ERP system* and *Employees access "ERP link" of the modules/oracle application* respectively are the main practice of ERP project implementation in the bank. From this point of views, we can conclude that the progress of ERP system and parallel with Employees accessibility of using the modules/oracle application are being practiced in the best manner.

The interviewees answered that if we see, the overall *progress of ERP system,* it clearly brought additional benefits such as the Ease of use, Easy information sharing, rapid performing & update, increase core competencies, improved accessibility, mobility, and usability, security standard etc. Finally, in surprise manner, 100% (89) of the respondents have agreed that *ERP has been implemented at all levels of the organization.*

The mean analysis at end briefly told us, the value of the mean as expressed in the above table of ten indicators of ERP project implementation practices in commercial Bank of Ethiopia, We can get their aggregated mean valued as 34.04 with standard deviation 0.7291. Therefore, from all practices Implementation of ERP, Centralization of data, centralized control of operation, Cost efficiency in operations, employees access "ERP Link" of the oracle application, ERP system progress and practice of implementation of ERP at all level of the organization are the most highly realizable practice of ERP implementation in CBE whose mean value are 4.33, 4.12, 4.10, 4.10, 3.99 and 4.36 respectively. Here we understood that these the most highly realizable

practice of ERP implementation total summation of mean is 25 which 73% of the aggregated mean value.

If we discussion about those all the most highly realizable practice of ERP implementation, primarily, concerning *Centralization of data* Based on 94% of the respondent response including their mean value of 4.33, indicated us the data or information of the bank raised from single data base in the center. Meaning, As all the departments and the functions in the organization are integrated and linked to one single database, data needs to be entered only once into the system. It can then, be accessed by different departments according to their needs.

Additionally, the successful project is characterized by the synergy of a new generation of knowledge workers, interested in project advancement, coming together, separating, and regrouping as the project orders from center. Basically, the centralization of data and processes, decentralization of non-added value functional or hierarchical divisions, and the admittance of an

"Unmanaged" project team. The standards of measure should be increased productivity and competitiveness, increased flexibility and adaptability and continuous change. Secondly, *Centralized controls of operation,* the response of participants 92% with high mean of 4.12 told us one main practice of ERP system is highly centralized controls of the bank operations. This is, because, ERP system has large-scale business involvement, internal and external process integration capabilities. It can assist in achieving the strategic competitive advantages. With a centralized database and built in data analysis capabilities, ERP systems provide informational benefits to management decision making. As ERP systems automate business processes and enable process changes, an organization may expect ERP systems to offer strategic advantage through Cost leadership by Cycle time reduction, Productivity improvement, Quality improvement, Customer services improvement. Alongside this, all core operations such as human resource, finance at large, procurement, office of strategy operation and management information system operational activities and processes have been controlled centrally. Third, *Cost efficiency in operations* is also the highest practice Since the above ERP practices of data is centrally managed and the operations are centrally controlled, those have a direct implication with "Cost efficiency in operations" that is why its mean value (4.10) is high and so, the majority 87% of the respondents have agreed that ERP project implementation has an advantage of cost efficiency in operations which is best practice. Finally, the fourth 83% of the participants

including the mean value of 4.10 justified that Employees accessibility of using the modules/oracle application are being practiced in the best way. Every employees whether they are managerial or non-managerial can access the oracle application of ERP using their password & user ID for logging on to Oracle E-Business Suite (EBS).

In addition, they use "ERP link" of http://ebsprodapp1.cbe.local:8010 then they access modules of Oracle E-Business Suite of local workstation through self-service and/or managerial service. Even when see the progress of ERP system practice for which 76% of the respondents" agreement and their mean value of 3.99 told us the progress of ERP system is being practiced in the best manner. Starting from implementation so many processes have been customizing eventually. As a result, the current status of ERP system progress over changing the overall operation and its target is quite successful.

The above mentioned highest practices average standard deviation of .579, .600, .798, .682, .658 and .483 calculated as the sum of their deviation 3.8 divisible by their no resulted .633 which is quite nearest to the aggregated standard deviation of .730. It implied that there is no significant variation among them. Therefore, they are strongly consolidate practices in the ERP system.

4.5. Critical Success Factors of ERP Project Implementation

Even if there might be various critical success factors in connection with ERP project, eight major factors have been identified as important for ERP success were distributed on survey questionnaire for getting confirmation about impotency ranking by eighty nine respondents based on likert scale. Most of the survey responses were with "Important" and "Very Important" ranking as can be seen from the survey results summary in above table. Here, the researcher categorized the success factor in to the most critical success factors and critical success factors as per the respondent's response.

Table 4-7: The critical success factors (CSFs) of ERP

Statements	Not Important	Less Important	Uncertain	Important	Very Important	Mean	S.D
Top management commitment & support	0%(0)	0%(0)	3.4%(3)	40.4%(36)	56.2%(50)	4.53	.566
Effective project management	10.%(9)	0%(0)	14.7%(13)	48.3%(43)	26.8%(24)	3.80	1.140
project team work and composition	1.1% (1)	1.1%(1)	14.6%(13)	41.6%(37)	41.6%(37)	4.21	.818
communication to integrate legacy system	0%(0)	6.7%(6)	17.9%(16)	42.7%(38)	32.5%(29)	3.88	.877
Training and education	0% (0)	3.4%(3)	10.1%(9)	62.9%(56)	23.6%(21)	4.07	.688
Consultant selection and relationship	6.7%(6)	3.4%(3)	7.9%(7)	75.3%(67)	6.7%(6)	3.72	.904
Business Process Reengineering	4.5%(4)	6.7%(6)	9%(8)	46.1%(41)	33.7%(30)	3.98	1.055
System's customization and integration	0%(0)	0%(0)	10.1%(9)	67.4%(60)	22.5%(20)	4.12	.560
Aggregate Mean & Standard Deviation						32.31	6.608
Average mean and Standard deviation						4.04	0.826

Source: Primary Survey, 2018

First by considering the mean analysis, as shown in the above table 89 respondents were asked conditions under which critical success factors for the accomplishment of ERP project in commercial Bank of Ethiopia. They responded as follows: Top management Commitment and support is recognized highly with the mean value of 4.53.in addition to this commitment, the participants also argued that project team work and composition is highly critical for the success of the project. That is why its mean indicated as 4.21 which is higher. Beside this, the system is allowed to customize and its ease integration is another paramount success factor whose mean value is 4.12 and still we can understand that it is the very important success factor. And over, training is provided greatly with mean value of 4.07 when the project team members need training on new technologies, its application and new working methods. It leads to increase the

expertise and knowledge level of the users within the bank. Therefore, from this, the researcher concluded that based on total success factors, the most critical success factors such as top management commitment, project team composition, training & education and system's customization & integration were found out of all critical success factors. They accounts 53% of the aggregated mean of success factors.

The average mean of *top management commitment, project team composition, training & education and system's customization & integration* 4.53, 4.21, 4.07 and 4.12 respectively *is* 4.2 *which is very near to the aggregated mean average of 4.04.* Therefore, it implied that they are found the most critical success factors out of all success factors. And even the average standard deviation of them is .658 which is very near to aggregated standard deviation of .826. It told us no variation among them regarding the nature of success factors. Meaning, they are the most critical one.

However, from the above table it can be perceived that Business Process Reengineering, effective communication to integrate legacy system, Effective project management and Consultant selection and relationship (with mean value of 3.98, 3.88, 3.80 and 3.72 respectively) are relatively next second group of major success factor conditions under which the ERP project was able to complete successfully.

According to collected data from respondents with regard to the impotency of ERP success factors, almost all of the respondents said that all the eight mentioned major factors are really success factors for ERP project implementation in commercial bank of Ethiopia. However, some number of respondents were uncertain whether they are success factors or not.

Regarding to *top management commitment and support*, none of the respondents said that the success factors are not important or less important to ERP project implementation. Rather, except only 3 % (3) respondents, all the rest 97 % (86) of the respondents agreed that all the success factors are important even very important. The result shown us the top management were as highly committed and supportive as they are the owner and sponsor of the project. In addition to this, ERP project implementation needs an appropriate attention and aggressive top management involvement for accomplishment. Otherwise unless, it is going to be turned in to ERP implementation failure.

According to interviewees response, when ERP project implemented, as owner, the top management were so committed and highly supportive. The candidates have said, this is because of their curiosity about the radical change of the bank. It is operating in continuous momentum of change and has implemented Centralized Online Real-time Electronic (CORE) banking solution on its domestic and international banking system. This core banking system is fully interfaced with other separate and independent systems.so it enables to implement ERP system and even it could applied other technology based IT application. Based on this, they did have great motive that initiated the bank towards implementing ERP was for short coming of using the present paper based and semi-automated systems for most of the main processes have led the bank to initiate implementation of an "*Enterprise Resource Planning"* system. In addition, there are other specific motives of top management of the bank towards implementing ERP project system which have mentioned by interviewee are:-

- ✓ To accomplish the overarching objectives of its vision, to become a bank aimed to join world-class banks, hence ERP is one of the standards to be fulfilled.
- ✓ Successful implementation of core banking, the previously existing T-24 core banking system and ERP enabled to implement ERP system.
- ✓ Solution for its core processes and support processes like finance, HRM, SCM, BI and Hyperion.
- ✓ Need for common enterprise-wide database reduces Inconsistency & reconciliation
- ✓ To integrate financial information of different sources such as revenues, sales and cost.
- ✓ To standardize Human Resources information for tracking of employees time and benefits data.
- ✓ To standardize and speed up operating processes
- ✓ To reduce operation costs

Similarly, concerning the question whether *Effective project management* is important success factor or not important, like top management commitment, almost all the respondents said that "Effective project management" is one of the critical success factors which enabling the ERP project implementation to be successful. It counts as except 25 % (22), at large 75% (67) of the total respondents agreed that effective project management is a very critical success factor in addition to top management commitment. And yet, almost 10% (9) of the respondents said effective project management is not important success factor for ERP project implementation.

Whereas almost 15% (13) of the respondents were uncertain about effective project management in important or not important success factor. The overall result for this specific point shown that the majority of the respondents (75%) agreed that effective project management is a critical success factor for the projects so that the project manager should be effective in every aspects and responsibly in ERP project implementation.

Interviewees strongly emphasized that for any project, if the project manager is not effective especially for controlling every actual activities with the estimated plan, the project immediately face to failure otherwise the reverse is true for project success factor. Hence, they said *Effective project management* is one major success factor that enable the bank beneficial. They mentioned the project core idea of the three corners of Iron Triangle project management as an example, so they said that the ERP system project of CBE was not faced by top challenges of unbalancing the three corners of iron triangle project management I, e ***scope, schedule*** and ***cost***. It is obvious that, in ERP implementations, both schedule and cost tend to be underestimated, while scope is overestimated. However, in commercial bank ERP implementation such a problem was not happen due to effective project management and top management commitment.

Therefore, ERP implementations need accurate estimation, preparation with a holistic view, and systematic management of the entire implementation process. The estimation plan of all the three corners of triangle were very similar with the actual one.

The scope was not overestimated but which is in the limitation of accurate estimation. That is

ERP system project has implemented in five core processes of Finance, HRM, SCM, BI and Hyperion (Office of the strategy).

When we see the resource or budget and time schedule, since ERP is an IT project, it doesn't need many equipment resource and even the bank couldn't know the type, quantity & quality equipment by which ERP implemented properly. Consequently, the bank ordered Tech Mahindra ERP consultant to provide such a resource when needed through contractual agreement. Regarding the time schedule, even if there was a disparity between the plans and actual, it was not that much a challenge. They also stated to regarding the period of ERP project took was 24 months which started from August 11, 2015 while the plan was 1 year & 2 months. Moreover, concerning the cost or budget, it was not more than the plan. The Cost incurred for implementation is fixed which costs 6 Million dollars for both software license & implementation. Accordingly, the bank has paid 2.6 million dollars for the purchase and

licensing of Oracle ERP from Oracle whereas the remaining 3.4 million paid for implementation. Literary, which is quite fair compare to adopt ERP systems which are sold by vendors like Oracle on average, cost $15-20 million and implementations take, on average, 21 months to complete. Thus, *Effective project management* is a critical success factor for ERP project.

Respondents were asked to find out that the important of project team organization and composition for the sake of ERP project successful implementation. Thus, when we see the result of data collected from them, more that 80% (74) of the respondents said that "*project team work and composition* "has a great role for ERP project accomplishment so that they can assured that it is a very important success factor. Whereas 15% (13 in number) of the respondents were uncertain. Only 2% of the respondents noticed the existence of project team work and composition can't be a critical success factor for the project achievement. This result implies that majority of the respondents agreed to best success, the project needs experienced and best organized employees from different angles, so the ERP team should involve of the best people in the organization. The success of projects is related to the knowledge, skills, abilities, and experiences of the project manager as well as the selection of the right team members. Also, team should not only be technologically competent but also understand the company and its business requirements are a very critical issues. Moreover, the team should be familiar with the business functions and products so that they know what needs to be improved to the current system.

Moreover, a specific question asked that whether communication among the various project areas to integrate the legacy system is important or not. As a result, more that 75% of total respondents agreed that "*communication to integrate legacy system"* the major critical success factor for ERP project implementation applied. Out of the rest 25% almost 18% (16) of the respondents are uncertain to judge. Finally, the other very least respondents of 7% (6) have agreed communication to integrate legacies is not as such a critical success factor.

However, the majorities 75% of the respondents have supposed that communication to integrate legacy system is so critical success factor due to this, we can understand that a proper communication among departments or divisions where ERP legacies (wings) integrating is very important and mandatory.

Based on collected data information, almost 87% (77) of respondents believed that "*Training and education* "is the one the major critical success factor for successful ERP project implementation

so that they can say which is an important and very important. On the other hand, only 3% (3) of the respondents said training and education are not a success factor. However, the remaining 10% (9) of the respondents were uncertain and restrained from saying training is whether important or not important success factor for the ERP project. Supposing the majorities response, we can arrived at conclusion. That is training is very critical factor in ERP implementation since ERP system is relatively new and complex. Respondents stressed that sufficient training to users is mandatory. Otherwise, lack of training may lead to failure.

For the sake of selecting consultant and making relationship taking in to consideration as a critical success factor for the project completeness, as all the above manner, 82% (73) of the majority respondents at large understood that *"Consultant selection and relationship' is* an important and critical success factor where as 10% (9) of the respondents said it is not an important success factor. Beside this the rest 8% (7) of the respondents were also uncertain. From the analysis, we can understand that can consultant selection is the first critical step to make the project successful.

According to "*Business Process Reengineering"* as a success factor inquiry, almost 80 % (71) of the total respondents are said that it is quite critical success factor for ERP project good implementation. Out of the other 20% (18), 9% (8), 6.7% (6) and 4.5 % (4) of the respondents are uncertain, less important and not important respectively. However, the majorities 80% led us "Business Process Reengineering is a very important success factor for implementing ERP technology based IT project. This is because, it is well known that BPR plays a significant role in the early stages of implementation. Furthermore, it is important in the acceptance stage and tends to be less important when the technology becomes routine.

This reengineering should continue with new ideas and updates to take full advantage of the ERP system when the system is in use.

Finally, just like top management commitment and supporting, none of the respondents have said that "*System's customization and integration"* is not important or less important success factor for ERP project implementation. Whereas 90% (80) of the respondents have understood that System's customization and integration is an important critical success factor for ERP project completeness. The remaining 10% (9) of the respondents have chosen uncertain option to make them abstain from answering the question.

When we see the most critical success factors, as per 97 % of the respondent response, top management support refers to the positive commitment and support of senior management for ERP project. Top management support has been thought to be the most important factor and confirmed by majority respondents. Their support in ERP implementation might be providing leadership and providing the necessary resources. Additionally, the roles of top management in ERP implementation comprise developing an understanding of the capabilities and limitations, establishing reasonable objectives for ERP system, commitment, and communicating the corporate strategy to all employees. In fact, top management support does not end with initiation and facilitation, but must extend to the full implementation of an ERP system. Furthermore, top management support should provide direction to the implementation teams and monitor the progress of the project. They are the owner and sponsor of the project. Top management should actively participate and be visible in the project by approving fund and resources to facilitate the implementation. As ERP is huge investment, it should be considered as one of the main operational activities of the bank. Middle management should support the project by releasing and allocating appropriate staff and resources for the project. Top management involvement was mentioned to be high in this project as sponsor and involving in the project steering committee.

Regarding 80% of the respondents‟ responses team work and composition is very important success factor. It implied that the ERP team should involve of the best people in the organization. The success of projects is related to the knowledge, skills, abilities, and experiences of the project manager as well as the selection of the right team members. And also, team should not only be technologically competent but also understand the company and its business requirements. It demands the effort and cooperation of technical and business experts as well as end-users. Both business experts and technical knowledge are important for success. Moreover, the team should be familiar with the business functions and products so that they know what needs to be improved to the current system. Therefore, It is the human or people aspect of a project that determines its success the most. Project members must be selected carefully and must be assigned dedicated and retained until the project completion.

In addition, 87 % of the respondents have agreed that training is crucial and very important success factor for ERP project. The main reason for education and training is to increase the expertise and knowledge level of the users within the bank So, formal and exhaustive training must be given to the respective roles in the project (for users, for support team, for technical/infrastructure team). Educating and training users to use ERP is important because ERP

is not easy to use even with good IT skills. Due attention should be given to documentation and knowledge transfer. The client company should be aware that the main purpose of using external consultants or implementers should be knowledge transfer and they must be willing and open in this regard. Appropriate user guides, manuals and support documents should be delivered by the consultants and approved by the client for completeness.

From the point view of *System's customization and integration* one of the best practices and benefits of ERP system is the possibility of customization/modification even if it is so expensive and complicated. That is why 90% of the respondents have said that the system is allowed to customize the late additional definition of requirements. It is known that Some ERP packages are very generic in their reports and inquiries, such that customization is expected in every implementation. ERP Systems are already developed to suit the general businesses. But as every company has a slightly different way of operating, only minor changes may be needed to customize the system to suit the company's particular business requirements. It is important to understand that for these packages, it makes more sense to buy third party reporting packages that interface well to particular ERP. The second and ultimate sign of a successful ERP implementation is the cost effective integration of complete business processes being used in the organization. The ERP system by itself has good application for integration. That is interfaces are designed and integration of functional modules is done to ensure that the software works correctly with other subsystems.

Rely on the respondents' response, the researcher is able to indicate the most critical success factors in addition to other critical success factors. Hence, those critical success factors make the project be to success rather than failure.

Besides this, interviewees said that the project had also its own strengths and weaknesses. The strengths were like Project Team Structure designed by top management, Top management leadership and Executive sponsorship, Good Project Management, Dedicated team members, Resource availability as required, Ability of System adaptability by team members, Good working environment, Involvement/ownership/ of Process owners etc. whereas some of its weaknesses were Lack of communication with end-users and poor control mechanism., Lack of time management, especially due to consultant side, Low System performance/resiliency, Long time taken by Interface issues Lack of incentives/allowances and less attention to Project members and so forth.

4.6. The Challenges of ERP Project Implementation

Table 4-8: The Challenges of ERP Project implementation

Statements	Very Low	Low	Uncertain	High	Very High	Mean	S.D
Data cleansing challenge	0%(0)	0%(0)	7.9% (7)	60.7%(54)	31.5% (28)	4.24	.584
Problem in User's adaptability	0%(6)	11.2% (10)	5.6% (5)	48.3% (43)	34.8% (31)	4.07	.927
System performance & network interruption	6.7%(44)	9.0%(8)	6.7% (6)	46.1%(41)	31.5% (28)	3.87	1.16
Overall system performance	49.4%(12)	40.4%(36)	4.5%(4)	2.2% (2)	3.4% (3)	1.71	.667
Communication challenge	13.5%(48)	7.9%(7)	12.4% (11)	31.5% (28)	34.8% (31)	3.66	1.38
Customization & Requirement definition	53.9% (0)	32.6% (29)	13.5%(12)	0%(0)	0%(0)	1.67	.542
Integration of modules interface with existing system (T24)	0%(0)	0%(0)	9.0%(8)	46.1% (41)	44.9% (40)	4.36	.644
Standardization challenges	0% (29)	0%(0)	5.6% (5)	47.2%(42)	47.2% (42)	4.42	.599
Resistance to accept the system	32.6% (0)	58.4% (52)	6.7% (6)	2.2% (2)	0%(0)	1.79	.665
Knowledge and skill for ERP implementation	0%(0)	0%(0)	5.6% (5)	67.4%(60)	27.0%(24)	4.21	.532
Technical challenges	0%(34)	12.4% (11)	6.7% (6)	33.7% (30)	47.2% (42)	4.16	1.01
Management commitment challenges	38.2%	57.3%(51)	4.5% (4)	0%(0)	0%(0)	1.66	.563
Aggregate Mean & Standard Deviation						39.82	9.274
Average Mean and standard deviation						3.3	0.77

Source: Primary Survey, 2018

As it has precisely described in the statement of the problem of this study paper, there might be various major problems or challenges when ERP project implementing which is due to ERP project is specifically an IT project, it could have technological challenges, organizational challenges, environmental challenges, people challenges and process challenges that are encountered while implementing ERP project. However, in this research paper, 89 respondents were asked only twelve major specific challenges whose tendency of challenging is really high or low during ERP project implementation in the bank.

Accordingly, regarding Data cleansing challenge, none of the respondents have said very low or low, rather except 7 participants or almost 8% of them who were uncertain whether it was a challenge or not, the remaining 92 % (82) of the respondents have argued that while ERP project implementing Data cleansing was a very high challenge. From this point of view, we can concluded that during recruiting of ERP IT project in the bank, there were migrating & clearing up data challenges when definition can be created and system requirements definition can be documented.

Concerning to User's adaptability, only 10 respondents that account 11.2 % have believed that the challenge of user's adaptability is low. Meaning, it is not taken as a challenge whereas 5 respondents whose percentage is 5.6% were uncertain about its challenge. On contrary, 83% of the respondents said User's adaptability was highly challenging. This is, therefore, it is cleared that at the stages of ERP project implementing, there was expected to trigger major changes in way of doing business across the bank.

When respondents asked about whether the System performance & network interruption was a challenge or not, 6.7 % (7) and 9% (8) of the participants were consider the System performance & network interruption was very low in challenge and low respectively. In addition, another 6.7% (7) were uncertain. The rest almost 78% of the participants were said the System performance & network interruption was highly challenged.

Except 10% of the total respondents who believed that overall system performance has high challenge. Nevertheless, 90% of the participants mentioned that the overall system performance didn't have challenges. From this, we could understand that due to 10% gap the overall system performance has few challenges.

On the question on Communication challenge during ERP project implementation, 14% (12) of respondents said very low, 8% (7) of them believed low communication challenge, 12.4% (11) of the participants were uncertain but the remaining 66% (59) of the respondents said that there was a high communication challenge while implementing ERP project.

Based on the response of 86% (77) of respondents, we ensured that there is no challenge in Customization & Requirement definition except 14% (12) of uncertain participants. However, more than 90% of the respondents can make us to be ensured that there was a very high unforeseen challenges of both standardization and Integration of modules interface with existing system (T24). On the other hand more than 90% of the respondents have stated that very low challenge of Resistance to accept the system.

The reason why ERP IT project is newly implementing project in CBE is that regarding Knowledge and skill for ERP implementation, except 5(6%) respondents 94% of the total participants stated that the knowledge and skill to know about ERP more was highly challenged in addition to high Technical challenges which was expressed by 80% of the total respondents. Whereas 95% the respondents have strictly said that there was no Management commitment challenges.

As shown in the above table respondents when we see the very low or low challenge for variables like overall system performance, Customization & Requirement definition, Resistance to accept the system and Management commitment challenges (with mean value 1.71, 1.67, 1.79 and 1.66) were respectively representing the very low tendency that contributes to challenges of ERP Implementation in the bank.

On the other hand, difficulties or challenges to evaluate the ERP project implementation with mean value 4.24, 4.07,3.87, 3.66, 4.36, 4.42, 4.21 and 4.16 are the major challenge highly stated by the respondents respectively are Data cleansing challenge, Problem in User's adaptability, System performance & network interruption, communication challenge, Integration of modules interface with existing system (T24), Standardization challenges, Knowledge and skill for ERP implementation and technical challenge whose total mean value is 32.99 which is 83% of aggregated mean of 39.82. Finally, when we see the mean of mean or weighted average mean which is 39.82 relative to the total summation mean of highly critical challenges 32.99 that is almost similar. Therefore, they are shown us the very high challenges encounter to the ERP project implementation in commercial bank of Ethiopia. The researcher needs to show how much

their natures became really high challenge to the project implementation. And also the average standard deviation of all the eight highest challenges is 0.71 which is very nearest to average aggregated standard deviation of 0.77. Thus, they are the highest challenges other than the other one.

For example, regarding *Data Cleansing* ,It is known that the impact of data inaccuracy in a unified system of ERP was great affecting every decisions made on that data, which requires at most effort and rework to purify the current data. The HR profile was maintained in legacy system. However, the new system require multiple times more data than the existing to smoothen intra module integration. Accordingly, cleansing the existing data as well as collection of additional information took more time. In Finance module the major migration is done on fixed asset data and Renaissance dam bond. In SCM (supply chain management) also there was a differences between T24 Stock balance & Inventory balance; doing reconciliation and migration was difficult. Even if the task has affected the schedules, finally the project team /ERP SCM & Finance/ has identified what should be migrated to Oracle GL.

The other one is *Problem in users' adoptability:* ERP project is expected to trigger major changes in way of doing business across the bank. Along with the implementation of the new system, the bank has planned to adopt best practices and hence is required to passed through substantial changes from its prevailing business practices and processes. The ERP system is expected to fully automate the internal processes and support functions based on its strong features of "Self Service" functionality. Therefore users are required to initiate and follow up specific transaction online using the self service features. This is a new business paradigm which expects users to shift to paperless transaction, thus has become a challenge *System performance and Network Interruption, d*ue to extension programs developed to address specific CBE requirements that could not met through parameterization, system encountered repeated slowness especially the payment approvals and data loading. Considerable improvements are observed through time though still it needs further enhancement. The other challenge encountered was lack of sub processes connection to the centralized system as most of the Head office organs didn't require such connection before. Before go-live and start of operation, all user organs make it ready by the help of project technical team and start of system becomes stable.

Lack of formal communication with end users outside the project team which means communication among departments or divisions during ERP system integration in the five legacies, was so good. There was no as such communication challenge and even after implementation of ERP, communication among the employees is so best. However, the communication challenge was only with end users while implementing the system. They didn't immediately update, inform & mentor about its nature & feature.

Integration with other modules and interface with T24 Effect of dependency across modules. For e.g. FA (Fixed asset) financial module in mass addition functionality System integrations test problem. For e.g. Test between AP (Application package) and SCM (supply chain management) delay in interface issues.

Standardizing and mapping the bank's business processes to match the ERP software is seen as a challenging task, leading to attempts of modifying the software to match their business needs. Standardization of the processes across the unit's works such as Bank's former trend of paying acting allowance of the employee was effective when he/she worked 15 days of the month otherwise not paid but now the system is by no means paying acting allowance for the employee who working even for a day, so many cases just like these should be standardized in to the system. That was so challenging to become to one consensus between the bank and the consultant.

Since the ERP project system is newly implementing here in the bank even in Ethiopia, lack of immediate knowledge and skill in the composed staffs have been seen. It was taken time to grasp the process and handle it. In contrast, there was also knowledge and capability gap of consultants about knowing the bank's performance and processes.

Finally, numerous technical limitations relating to the implemented enterprise solution which were lack of core functionality, limited integration, limited offline accessibility and use of multiple systems were perceived as the most significant challenges. Data errors, lack of customization, complex and rigid user interface and poor technological infrastructure formed the remaining challenges of this category.

According to the interviewees‟ responses, the researcher summarized and displayed in the following table which indicated us when the ERP system project implemented, different

challenges which have been mentioned in this research paper earlier were encountered in the bank. However, only the following one were tried to be mitigated.

Table 4-9: The Challenges and Mitigation of ERP project

Challenges Faced	Mitigated Methods
User involvement ✓ Lack of addressing adequate training for all end users by ERP team. And less number of trainees. ✓ lack of full time commitment to project activities by end users/branch managers ✓ not give emphasis on reporting/sensitive issues	✓ The training was delivered to districts‟ dedicated team and gave to end users by the team. ✓ Give support on job place. ✓ Create awareness to end users/managers via memorandum, telephone, email ✓ Informed to prioritize issues and forward on time to ERP team.
Communication □ lack of formal communication with end users(outside the project team)	□ Created communication within ERP team; Bond management/district support team.
Internal Staff expertise □ Insufficient knowledge about the system in early stage of project.	✓ Further reading and more practice to cope up with the system ✓ Develop knowledge by training
System performance □ low performance and failure in the system	□ Frequent discussion with ERP Data Base Administration team.
Dependency on the legacy data □ high tendency of users in using the legacy data for their financial information/report	□ Encouraging to use oracle system data
Integration with other modules and interface with T24 ✓ Effect of dependency across modules. For e.g. FA module in mass addition functionality ✓ System integrations test problem. For e.g. Test between AP and SCM. ✓ delay in interface issues	✓ Continuous meetings with T24 interface team □ Maintain set up problem in procurement module. ✓ Discussions with SCM team ✓ Continuous discussion with T24 interface team
Requirement definition and customization/ Modifications □ Late request of some functionalities and reports from other parties. For eg. request from Hyperion and IFRS	□ Accept and working the requirements

Sources: primary Survey, 2018

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary of Findings

Regarding to participants profile, the general sex composition of commercial bank ERP project's human resource is highly dominated by male employee who are 70% in gender & near to 98% of them at large are belonging in the productive age group. They had enough education qualification with ample experience to execute the roles assigned to them effectively and efficiently in regard to the effect of the implementation of enterprise resource planning.

Concerning the centralization of data, 94% of the respondents asserted that all the departments and the functions in the organization are integrated and linked to one single database and the core operational activities and processes have been controlled centrally.

Resulting from the majority 87% of the respondents have agreed that ERP project implementation has an advantage of cost efficiency in operations and *efficient business practice* as well.

From all practices of ERP project Implementation, the most highly realizable practices are Centralization of data, centralized control of operation, and Cost efficiency in operations, ERP system progress, practice of implementation of ERP at all level of the organization and employees access "ERP Link" of the oracle application which accounts 73% of the aggregated mean value ERP practices in CBE.

Larger proportion of the respondents argued that Implementation of ERP modules have been successfully done with the option of customization of late requirement additional definitions as the bank desired in all the major five legacies of ERP application processing center which is the scope of the project and the main areas of what the bank needed to be changed .i.e. finance, Human resource management, supply chain management, Hyperion & business intelligent.

Most of the respondents believe that the ERP implementation makes the banks" employees working process effective which is due to fully automated so that tasks that can be handled by system and 70% of the aggregate respondents have definitely agreed that *Communication change among employees* is currently practiced in the bank.

All 100% of the respondents have agreed that ERP has been implemented at all levels of the organization and its overall *progress of ERP system,* it clearly brought additional benefits such as the Ease of use, Easy information sharing, rapid performing & update, increase core competencies, Improved accessibility, mobility, and usability, security standard etc.

Regarding to *Employees resistance to* the deployed ERP system, 92% of them are so disagreed. Rather, employees relief due to it automation. Unfortunately, none of the respondents have strongly agreed or agreed that *Employees resistance to the system.*

According to collected data from respondents with regard to the importance of ERP success factors, almost all are success factors for the project but the most critical success factors that accounts 53% of the aggregated mean of success factors are top management commitment, project team composition, training & education and system's customization & integration were found out of all critical success factors. They accounts 53% of the aggregated mean of success factors.

Majority of the respondents asserted that from technological challenges, organizational challenges, people challenges and process challenges that are encountered while implementing ERP project, Data cleansing challenge, Problem in User's adaptability, System performance & network interruption, Integration of modules interface with existing system, Standardization challenges, Knowledge and skill for ERP implementation and technical challenges are the major one.

5.2. Conclusion

This chapter at the end concluded the research project titled "*The Practices and Challenges of Enterprise Resource Planning Project Implementation of Commercial Bank of Ethiopia.* "To answer this case study of research paper topic, the research questions were designed from which questionnaires and interviews have been derived. Subsequently, the research findings are analyzed and briefly summarized to confirm the relevance of this study. At the result of detail investigation, the research, ultimately, attempts to understand the practice and challenges considering the case of ERP project implementation in commercial bank of Ethiopia.

The purpose of the study was to identify the practices and challenges of ERP project implementation of commercial bank of Ethiopia. Accordingly, the study has conducted with interview discussions, survey questionnaire, observations and documents review and finally identified eight critical success factors important for the success of ERP implementation. Success factors such as top management commitment & support, Effective project management, project team work and composition, communication to integrate legacy system, training and education, Consultant selection and relationship, System's customization and integration and BPR are high ranking findings of this study as to be critical for ERP system in addition to the major ERP practices that have been exercising in the bank through challenges of the system implementation.

Finally, this thesis paper noticeably concluded that the practices of ERP project implementation with the possibility of customization of late requirement additional definitions as the bank desired in all the major five legacies of ERP application processing center which is the scope of the project and the main areas of what the bank needed to be changed. These are finance, Human resource management, supply chain management, Hyperion & Business intelligent. Here, customization, integration, standardization, centralization of data & operation, Employee work process effectiveness with effective communication, their access use of "ERP oracle application link" are the major practices in ERP system project. On contrarily, the major challenges encountered were mix of technological, people, organizational & process challenges like Data cleansing, User's adaptability, System performance & network interruption, Integration of modules interface with existing system, Standardization, Knowledge and technical skill for ERP implementation.

5.3. Recommendation

It is fairly obvious that recommendation was done by the researcher in order to minimize the gap by providing clear solutions and/or suggestions arise from the research investigated brief findings. This is, therefore, rely on the findings, the following have been recommend suggestions:

From this research paper investigated findings either from primary data or secondary data like reviewing the documents and observing the system, one of the fact that the researcher would strongly like to suggest is that of the issues which made the researcher very impressed. These are the Proper top management commitment and supportive action, effective communication and effective project management. Therefore, such having a nature of critical project success factors and major project practices of CBE ERP system's pleasing experience should be shared to other organization's owners who want implement ERP. For instance, an accomplishment on the capability and curiosity of both the top management and project management their dual cognizable best performing to balance the three corners of the Iron triangle of managing the project was very attractive. It is so critical for the project to be success or failure.

Even if ERP system has an advantage of provides integrated modules across all organizational functions including finance, Human resource management, supply chain management, Hyperion & business intelligent of the bank's major processes, the bank should notice and fail to appreciate the degree of change an ERP solution causes which is due to focusing on only implementing the particular single application like oracle. Thus, the researcher recommended that regarding integration, the bank needs to have a holistic approach, business application, technology and people perspective, and not just a focus on only implementing the particular application.

It is very known that ERP system controlled all the bank's major business processes centrally and also inter linkage to ERP system as a host, other additional IT projects what the bank needs to implement, such as EDMS (Electronic Document Management System), CAAM (Computer Aided Audit Management) and the like are existed. They themselves are going to attach with IT software project. Consequently, taking ERP system as a host of other IT projects and all plus all projects applied on IT software, it has a paradox effect of if IT software project often „fail" and ERP implementation projects do not escape this tendency as a result the other IT projects will

immediately failed. Hence, the bank should pay great attention to keep the safety or guarantee of IT at first by applying additional system.

In spite of having the possibility of ERP system customization to treat the late requirement of definitions which came from different parts of the bank's organ, it has its own adverse effect. Therefore, this research paper recommended to the other practitioners, customization is so costly and its length of implementing modules and functions will take longer process, so it is greatly affected by the scope of the project. This is, therefore, substantially recommended software vendors and consultants, to keep the system as much as possible enable number of packages that require customization for implementation affix without modification. This is termed as a zero modification approach that has nowadays become a current applying standard.

In addition to this, the obvious resolving data misfits is a complex undertaking as it usually involves modification of an ERP system's structure. These modifications should not be recommended as they require massive development efforts and specialized skills and might even lead to unexpected future software difficulties during upgrades

Finally, the researcher also recommended that it is very essential more research case studies of ERP implementation should be conducted in our native country's organizations to strengthen the findings of success factors and adaptability of the system advantage.

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Appendix

College of Business and Economics (CoBE)
SCHOOL OF COMMERCE

ስልክ Tel — ማዞሪያ PBX 011 551 80 20-23; BAIS ት/ክፍል BAIS dept. 011 515 75 79
ፋክስ FAX 251-1-51-57-86
ፖ.ሣ.ቁ P.O.BOX 3131
አዲስ አበባ ኢትዮጵያ
ADDIS ABABA, ETHIOPIA

ቁጥር Our Ref. BAIS/H/121/18
ቀን Date 10/05/2018

To: - Commercial Bank of Ethiopia
Addis Ababa

The Addis Ababa University School of Commerce currently runs five Masters level programs and one Doctoral Program: Human Resource Management (MA), Project Management (MA), Marketing Management (MA), Supply Chain and Logistics Management (MA), Business Leadership (MA, PhD) In addition to this, the School is also Preparing itself to launch some more expedient Programs very soon.

As an immediate and direct stakeholder to this socioeconomically pragmatic move, we would like you to cooperate with us by way of assisting our students to conduct academic researches and case analyses in your organization. As such, we kindly request your esteemed organization to provide student **Nebiyou Solomon Teklemariam IDNo. GSE/0091/08** with information pertaining to **The Practice and Challenges of Enterprise Resource Planning Project Implementation.** A copy of the paper produced may be provided to you if so demanded.

Thanking for your earnest Cooperation, we remain

Sincerely Yours

Dr. Tilahun Meluneh
BAIS Department Head

የኢትዮጵያ ንግድ ባንክ
COMMERCIAL BANK OF ETHIOPIA
INTER DEPARTMENTAL MEMORANDUM

DATE ቀን	:	**April 11, 2018**
TO ለ	:	**Director – Office of Strategy Management**
FROM ከ	:	**A/Manager – Learning and Development**
SUBJECT ጉዳዩ	:	**Request for Cooperation to Conduct Research**

Addis Ababa University College of Business & Economics Department of School of Commerce under its letter reference BAIS/H/121/18 dated 10.05.2018 has requested our bank to assist **Nebiyou Solomon Teklemariam ID No. GSE/0091/08, MA** Student to undertake his Research paper on "**The Practice and Challenges of Enterprise Resource Planning Project Implementation",** in case of Commercial bank of Ethiopia.

This is therefore, to kindly request you to provide the required assistance and cooperation without compromising confidentiality.

Wegayehu Ergette

The ERP project is executed to address the needs of the under detail listed five processes of the bank:

1. **Finance Process** The finance support process has two sub-processes under it. These are Fund Management and Accounts & reconciliation. The activities under these processes are partially supported by the core banking solution is handled automatic inter branch as well as head office accounts settlement, tangible or fixed and intangible asset management, and fund management activities by ERP system. Major activities are:-

✓ Advance Payments	✓ Settlements of Advance Payment
✓ Handling of Suspense Account	✓ Provisions for Suspense Items
✓	✓
✓ Investment Securities	✓ Insurance, Tax and other Contributions
✓ Preparation of Financial Statements and Analysis	✓ Chart of Account
✓ General Ledger	✓ Reports & Inquiry
✓ Reconciliation	✓ Audit trial: mechanism to check whether activities are performed as required.
✓ Fixed Asset(FA)	✓ FA issuance, transaction and registration
✓ Maintenance of FA information	✓ Transfer of FA
✓ Dispose/Sell of FA	✓ Revalue Assets
✓ Depreciation of Assets	✓ Insurance
✓ FA Inquiry, Reporting and control	✓ Integration
✓ Tagging of FA	✓ Intangible assets, Projects in Progress and Acquired Assets
✓ Audit trial mechanism to check whether activities are performed as required.	✓ Actual and Projected Local Currency (LCY) & Foreign Currency (FCY) Cash Flows
✓ Maturity Gap Analysis	✓ Liquidity Risk Analysis
✓ Interest Rate risk Analysis	✓ Foreign Exchange liquidity Risk Analysis
✓ Financial Analysis, Ratios and Limits	✓ Cash holding limit setting Cash Holding Monitoring
✓ Petty Cash Setting	✓ Dealing
✓ Audit trial: mechanism to check whether activities are performed as required	✓

2. **Procurement Sub Process** is responsible for facilitating the acquisition & distribution of fixed and non-fixed assets, stationary and other items that are useful in running the bank's day to day activities. This process is also undertaken manually.

✓ Supplier Registration	✓ Supplier Performance Rating
✓ Purchase Requisition	✓ Preparation of Tender document
✓ Tender Invitation & Acquisition	✓ Tender Period, Extension of Tender submission Period & Pre-Tender Clarifications
✓ Submission of Tenders, Late Tenders & Tender Opening	✓ Tender Cancellation

✓ Evaluation Procedures - Basis of Rejection of Bids at preliminary stage	✓ Technical & Financial Evaluation Report and Extension of Tender Validity Period
✓ Price Negotiation	✓ Contract Award Procedures
✓ Purchase Order	✓ Contract Variations
✓ Contract Termination	✓ Contract Close out
✓ Advance Payment Guarantees/Bonds	✓ Performance Bonds
✓ Bid Bonds	✓ Pro-forma Purchase
✓ LC opening & settlement	✓ Payment
✓ Guarantees/Bonds Reporting	✓ Purchase Order Reporting
✓ Purchase Requisition Reporting	✓ Contract Reporting
✓ Follow Up Sheet	✓ Item/Material Information
✓ Purchase Requisition	✓ Material Requisition
✓ Processing costs/claims	✓ Physical Inventory
✓ Reports	✓ Inventory Sheets

3. **Corporate Human Resource Management Process: -** The other core support process is the Human Resource process which is also supported by isolated software named Unique that handles the profile of the employees; and other independent systems for handling of payroll and leave management. The bank is using Unique to administer records and profile of all CBE employees centrally at its head offices, while the payroll and leave management systems are used in decentralized manner. The other wing of HR expected to be incorporated in the ERP system is the Human Resource Development wing. The project is planned to incorporate the Learning management, Succession planning and Performance Management aspect of the bank. Currently the business side of HRD is supported by School of Frankfurt consultants. Major activities,

✓ Employees‟ Master Data	✓ Job Related Information
✓ Human Resources Administration	✓ HR Planning and Budgeting
✓ Internal Recruitment Process	✓ External Recruitment
✓ Transfer	✓ Signature Authorization
✓ Employee's Self-Services	✓ Leave management
✓ Attendance Management	✓ Payroll , Allowance, Other Benefits Administration and Deductions
✓ Pension Administration	✓ Employee Training and Learning Management System
✓ employee's Appraisals	✓ Career and Succession Planning
✓ Employee Relation	✓ Learning and Knowledge Management

4. Hyperion it is the strategy management process mainly focus on aligning the organizational mission and vision with strategic goals and objectives of the bank. It is also concerned with the effective cascading of the scorecard/plan and budget up to the level of individuals. The requirements of three sub-processes structured under it, namely planning and strategy management, Evaluation and Monitoring, and change management, are included in this document.

✓ Annual scorecards at Corporate, Process and District levels; forecasting Annual budget; Weekly, quarterly, semi-annual and annual performance evaluation reports;	✓ Create strategic awareness to management and employees;
✓ Manage cross-process strategic initiatives;	✓ Best practice scaling up reports;
✓ Annual budget utilization reports;	✓ Demand based and problem solving studies;
✓ Initiate change programs;	✓ Corporate strategy
✓ Produce statutory reports to various stakeholders.	

5. Enterprise Data Warehousing and Business Intelligence (EDW &BI) The other strategic functionality the bank wants to acquire on the proposed software is Business Intelligence that enables the company to easily keep track of all the information important for the organization.

Business Intelligence is an important component of banks‟ implementation of IT based strategies. It helps to improve products, enhance customer relationships, make better forecasts based on past trends, handle competition, manage risk, increase operational efficiency etc., on the way to a healthier bottom line.

✓ General requirements	✓ Business requirements
✓ Data	✓ Information
✓ Delivery Mechanism	✓ Data access from different source systems
✓ Accurate data driven decision making	✓ Business intelligence and financial analytics

ADDIS ABABA UNIVERSITY

SCHOOL OF COMERCE GRADUATE PROGRAM

MASTERS IN PROJECT MANAGEMENT

Questionnaire To Be Filled By CBE Staffs

Dear Respondent's,

This is a survey questionnaire which is aimed at identifying and collecting data about the problems, concerns and issues of MA thesis research which is entitled on "***The practice and challenges of Enterprise Resource Planning Implementation Project.***" The study is being conducted in a partial fulfillment of the requirements of MA in Project management and your response used for academic purposes. I kindly request your assistance in completing this questionnaire based on completely voluntary so that it is highly appreciated. Please give your thoughtful and honest answers as your response have been kept confidential.

Thank you in advance for your unreserved co-operation

Instruction:-

- ✓ Please tick (√) in the space provide that best reflects your answer for each question.
- ✓ In order to ensure confidentiality do not put down your name on the questionnaire.

PART I: DEMOGRAPHICAL INFORMATION

1.1. Gender

Male ☐ Female ☐

1.2. Age Group

☐ 18 - 25 ☐ 26 – 30 ☐ 31 – 40 ☐ 41 and above

1.3. Educational Status

☐ Diploma ☐ BA/BSC ☐ Masters ☐ Above Masters

Other please specify_____

1.4. Your service year

☐ ≤ 3 ☐ 4 – 9 ☐ 10 – 15 ☐ 16 - 20 ☐ ≥ 21

1.5. Which department/division are you working in?

☐ Finance	☐ Sourcing & Facilities	☐ Office of strategy
☐ Human Resources	☐ project management office	☐ Other Department

PART II: QUESTIONS RELATED TO THE PRACTICES OF ERP IMPLEMENTATION

Please read each statements in the first column carefully and show the extent of your agreement on the statements by putting (√) the in the next column using the following rating scale (Likert Scale). The rate are - 1 = Strongly Disagree, 2 = Disagree; 3 = Uncertain, 4 = Agree, 5 = Strongly Agree

2.1. How do you observe the level of current ERP practice in the Bank?

Statements	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Centralization of data					
Centralized control of operations					
Cost efficiency in operations					
ERP modules customization					
Employee work process effectiveness					
Communication change among employees					
Employees resistance to the system					
progress of ERP system					
Employees access ERP link of the modules/oracle application					
Implementation of ERP at all levels of the organization					

PART III: THE CRITICAL SUCCESS FACTORS OF ERP PROJECT IMPLEMENTATION

Please read each statements in the first column carefully and show the extent of your opnion on the statements by putting (√) the in the next column using the following rating scale (Likert Scale).

Here, 1 = Not important, 2 = Less important; 3 = Uncertain, 4 = Important, 5 = Very important

3.1. Do you agree to say important or not whether the following Critical success Factors (CSFs) enabling the ERP project implementation successful?

Statements	Not Important	Less Important	Uncertain	Important	Very Important
The top management commitment & support					
Effective project management					
Project team work and composition					
Communication to integrate legacy systems					
Training and education					
Consultant selection and relationship					
Business Process Reengineering					
System's customization & Integration					

PART IV - THE CHALLENGES OF ERP IMPLEMENTATION PROJECT

Please read each statements in the first column carefully and show the extent of your agreement on the statements by putting (√) the in the next column using the following rating scale (Likert Scale).

Here the scaling rate are, 1 = Very Low, 2 = Low; 3 = Uncertain, 4 = High, 5 = Very High

4.1. What is your opinion about the major challenges or problems encountered during ERP project implementation in Commercial Bank of Ethiopia?

Statements	Very Low	Low	Uncertain	High	Very High
Data cleansing challenge					
Problem in User's adaptability					
System performance & network interruption					
Overall system performance					
Communication challenge					
Customization & Requirement definition					
Integration of modules interface with existing system (T24)					
Standardization challenges					
Resistance to accept the system					
Knowledge and skill for ERP implementation					
Technical challenges					
Management commitment challenges					

Finally, I'd like to say thank you a lot for your unreserved co-operation cordially.

Interview Questions

Here these interviews questions were provided for those who are managers and team leaders of the ERP project areas.

1. What conditions that made the Bank motivated towards implementing ERP project?
2. What are the strengths and weaknesses of ERP project in CBE?
3. Which Challenges that the bank tried to mitigate to make the ERP project successful?
4. To what extent ERP package module(s) customized in Commercial Bank of Ethiopia
5. Were there any top challenges related to scope, schedule and cost causing ERP project implementation failure?
6. What kinds of benefits that the bank has been accomplished by implementing ERP project?

Finally, I'd like to say thank you a lot for your unreserved co-operation cordially.