Deployment of Enterprise Resource Planning (ERP) in Pakistan Broadcasting Corporations

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DECLARATION

I hereby declare that I have develop this thesis entirely on the basis of my personnel efforts under sincere guidance of my supervisor Dr. Mohsin Islam Tiwana. All the sources in this thesis are cited and the content of this thesis has not been plagiarized.

No portion of the work presented in this thesis has been submitted in support of any application of any other degree of qualification to this or any other university or institution of learning.

YASIR MUSTAFA

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ABSTRACT

The study is to analyze and examine the impact of deploying Enterprise Resource Planning (ERP) in Pakistan Broadcasting Corporation. It is about changing the traditional working into more integrated one. Technology has become very essential for the performance of organization. Now in this era of technology, it has impacted every aspect of operations and communication of an organization. First This research investigates the satisfaction level and problems of current paper-based legacy system in Pakistan Broadcasting Corporation and the need to automate the processes of departments. And then to evaluate the impact of deploying ERP the research also investigate the motivational factors of public sector organizations of Pakistan to deploy ERP, benefits achieved, ERP system success and problems to deploy ERP. Data collection has been done through questionnaires which are designed for top/middle management and staff. Finance department is the most dissatisfied department, however there is also dissatisfaction in sub-sections of Administration and Engineering department of Pakistan Broadcasting Corporation. The issues that have caused dissatisfaction from paper-based legacy system are real time access of information, dispersed data, slow decision making and accuracy. All departments have need to automate their processes. Process Improvement, Common Platform, Data Visibility and strategic Decision Making are most common motivations of public sector organizations of Pakistan to deploy ERP. ERP Top/Middle Management and End User in Public Sector Organizations of Pakistan are very satisfied with the ERP System as for the IS Success Model (Delone and Mcleane, 1992) is concerned. However Public Sector Organizations have experienced both tangible and intangible benefits by deploying ERP over paper-based legacy system. But Education and Training, User Resistance, Integration of Data, Data conversion Problems and Change Management are the challenges which public sector organization had faced to deploy ERP. So the study is ultimately to encapsulate the idea evaluation for deployment of Enterprise Resource Planning (ERP) in Pakistan Broadcasting Corporation.

Table of Contents

CHAPTER 3

RESEARCH METHODOLOGY……………………………………………45

CHAPTER 4

DATA COLLECTION………………………………………………………..50

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.Introduction:

This chapter includes objective and aim of the research. It explains the research questions to clarify the research purpose. The chapter encapsulates the basis for which the study is being carried out. So in this chapter objective, scope and research questions are discussed.

1.1 Background:

Enterprise Resource Planning (ERP) is a packaged software which is deployed in the organization to streamline the processes of departments and to access information in real-time. ERP integrates and provide a common platform to the entire Enterprise. ERP is also deployed in small and medium size Enterprises.

(Atul Gupta, 2000) Enterprise resource planning (ERP) is a set of applications that integrates all departments(Financial and Accounting, Human Resources, Material management, Sales and Distribution, Quality management and Project Management) and enables higher management to access the information in real time. (Deloitte consulting, 1998) Enterprise Resource Planning (ERP) is a packaged business software system that allows the enterprise to

- Automate and integrate majority of its business.
- Share the common data and practices across the entire enterprise.
- Produce and access information in real time.

Carlino et al. (2000) carried out studies and concluded that during the last decade $300 (billion) have been invested in ERP systems. Stein in 1999 also concluded during his studies that many of the companies had installed core ERP system applications (Financial, Manufacturing and Human Resources).

Deloitte consulting 1998 in second wave survey which consists of in depth interviews with 164 individuals at 62 fortune 500 companies anticipated that most of the companies were using the following four ERP systems.

I. Baan
II. Oracle
III. PeopleSoft
IV. SAP

In Pakistan many public sector organization like PTCL, NADRA, HEC and NIE etc. have deployed Enterprise Resource Planning (ERP) in their organizations. ERP has become very essential to automate the processes of departments for strategic decision making. In Pakistan most of the organizations have deployed SAP or Oracle based ERP systems. (Ross & Vital) 2000 anticipated research in eight multiple companies and concluded that most of the companies have adopted ERP for common platform, operational cost reduction, data visibility, customer responsiveness, strategic decision making and process improvement.

1.2 Objectives and Research Problem

ERP adoption decision is not an easy task. So before going to deploy ERP in an Enterprise the existing system should must be analyzed and problems of present system must be identified. It is also important that before going for ERP adoption in an organization the impact of ERP must also be analyzed. So the research objectives are:

1. To identify satisfaction level of existing paper-based system and need to automate the processes of departments.

2. To evaluate Enterprise Resource Planning (ERP) impact (benefits achieved and system success) in Public Sector Organizations of Pakistan.

3. To identify challenges for deployment of Enterprise Resource Planning (ERP) in Public Sector Organizations of Pakistan.

To achieve above said objectives the research is to answer the following main question.

What is satisfaction level of paper-based legacy system and what is impact of deploying Enterprise Resource Planning in an organization?

This research question is further to address following questions.

   i.   What is satisfaction level of existing paper-based system?
   ii.   What are problems of paper-based system?
   iii.   Need to automate the processes of departments?
   iv.   What were motivations of organizations to deploy ERP?
   v.   What benefits organizations have achieved by deploying ERP?
   vi.   What challenges organizations have to face by deploying ERP?

1.3 Research Rationale

The study is important because of following arguments. First however Enterprise Resource Planning (ERP) integrate all departments of organization but it is also important to know the satisfaction level of current deployed system.it is also important to know that, is there any need to automate the processes of departments or not.without knowing the satisfaction level and need to automate the process it will cause failure to big investment on ERP.

Second the study is to conclude the motivations of public sector organizations of Pakistan for deploying ERP. This conclusion is important to know why these organizations have deployed ERP. It will also help to identify that the problems identified in the current paper-based system can be addressed by deploying ERP.

Thirdthe study is to conclude the benefits achieved by deploying ERP in public sector organizationsof Pakistan. It is also important because the benefits achieved by deploying ERP in private and public sector organizations can be different.

Forth the study is also to encapsulate the ERP system success. To evaluate the system success proposed model is used. This model is important to evaluate the impact of the system deployed. So that how well this system is and how well it is used to get maximum of it.

Fifth the study is also to conclude the challenges that the public sector organizations have to face to deploy ERP in their organizations.

So the study is very important and it is divided into two phases. Phase-I includes the satisfaction level of currently deployed paper-based system in Pakistan Broadcasting Corporation. This phase is also to identify the issues and problems of current system and the need to automate the processes in the organization. Whereas Phase-II concludes ERP impact which includes the benefits achieved and ERP system success to impact the individual and overall organization performance. This phase also encapsulate the motivations of public sector organizations to deploy ERP along with challenges that these organizations had to face in the course of deploying ERP.

1.4 Delimitation of Study

 The delimitation basically defines the scope and limits of the study.The forth going study is to analyze satisfaction level of paper-based system and identification of issues and problems in this system alongwith need to automate the processes of departments in Pakistan Broadcasting Corporation. And to analyze the impact of deploying ERP in public sector organizations. So the scope and boundaries of the study are:

> ➢ The study includes public sector organizations in Pakistan only.
> ➢ Phase-I of the study is to identify satisfaction level of paper-based system currently deployed in Pakistan Broadcasting Corporation in the departments of Finance, Administration and Engineering. The study is also to identify the issues

and problems in current system and the need to automate the processes of departments.

➢ Phase-II of the study is to analyze the impact of Enterprise Resource Planning (ERP) in public sector organizations. To evaluate the impact the organizations under study are:

- PTCL (Pakistan Telecommunication Company Limited)
- NADRA (National Database and Registration Authority)

➢ PTCL has deployed SAP whereas NADRA has deployed Oracle based ERP modules.

➢ The impact includes Benefits achieved and ERP system success. The study also includes the challenges that the organization had to face in deployment of ERP. The study is also to conclude the motivations of public sector organizations to deploy Enterprise Resource Planning (ERP).

➢ Finally study will conclude the scope of ERP in the organization under study and the impact that ERP can have with the evaluation of challenges that organization had to face in deploying ERP.

CHAPTER 2

LITERATURE REVIEW

2.1Introduction

This chapter includes literature review being published on ERP in contest of the forth going research. The chapter provides the basis for research topics as necessary for forth going study. The objective of the study is to identify scope of ERP in understudy organization by identifying satisfaction level of existing system and the problems in current system. Then to identify the impact of deploying ERP. The impact includes benefits achieved, motivation for deploying ERP and system success and challenges.

2.2 ERP System overview

Enterprise Resource Planning (ERP) systems are difficult to define because there is no universally accepted definition of ERP this idea was taken by (Al-Mashari et al, 2003) and further Boersma and Kingma in 2005 also strengthen this idea. Therefore different stockholders have defined ERPaccording to their awareness.

However, (Klaus et al, 2000) defined Enterprise Resource Planning (ERP) It is a software package that automates all necessary functions and processes of an organization for the purpose to access information in real time and gives the holistic view of the business of the organization.

So the other aspect of Enterprise Resource Planning (ERP) is the integration of all the functional processes of the organization.Atul Gupta emphasized on the integration aspect of ERP. Thus ERP utilizes software application packages to effectively plan control and manage all functions and processes of the departments of the organization

to enhance performance. ERP integration aspect enables the organization to know and use its internal resources and to get maximum external advantage.

(Shehab et al, 2004) defined Enterprise Resource Planning in not only a software package to automatefunctions and processes of an organization but also integrates all necessary functional operations within the organization to facilitate comprehensive overview of the business of the organization.

Enterprise resource planning presents the fragmentary data into the structured format to facilitate decision making in speedy manner. Thus ERP systems provide best business practices that enable the enterprise to get competitive advantages.

(Sedden, Shanks and Willcocks) 2003 demonstrated the following aspects of Enterprise Resource Planning:

- Package software applications.
- Integration of functional departments.
- Best business practices.

Nzami, Tarukh&Djavanshir (2012) have thoroughly reviewed the literature of ERP systems and concluded that" it had evolved itself as per technology, people and processesrequirements and has provided ever the best business practices".

2.2.2 Evolution of ERP

Enterprise Resource Planning is an IT solution for integration of functional departments of an enterprise. The history of ERP will give us much better view to understand the ERP systems. Enterprise Resource Planning is derived from material Requirement Planning (MRP) and Manufacturing Resource Planning (MRP II).

HOY, (1996) determined that "Enterprise Resource Planning follows Material Resource Planning (MRP II) to provide comprehensive view of the manufacturing and the material

management and has improved supply chain management (SCM) and customer relationship management (CRM)".

Shankarnarayanan, (1999) and langenwalter, G.A, (2000) described the history of ERP as "During 1960,s software packages were developed to manage the inventory items. Then during 1970,s these software provided foundation for material requirement planning (MRP). MRP was to provide master scheduling and managing Bill of Materials (BOM). Then during 1980,s Manufacturing Resource Planning (MRP) was developed to provide raw material management and finished goods management in manufacturing. Afterwards all these developments lead foundation for Enterprise Resource Planning (ERP) in 1990".

(Kalakota& Robinson, 2001) asserted that the evolution of Enterprise Resource Planning (ERP) can be categorized into four phases.

a. During 1970,s to manage the manufacturing constraints Material Requirement Planning (MRP) was developed and adopted by manufacturing enterprises to carry out all manufacturing aspects from planning point of view. Further in 1980,s MRP provided basis for development of Manufacturing Resource Planning (MRP II). MRP II was to manage master scheduling, Bills of Material (BOM) and further material requirements planning and was also to manage the finished goods.

b. MRP II was not to integrate the all functional departments of an enterprise so for integration in 1990 Enterprise Resource Planning (ERP) was developed. Initially ERP was to address the back office functions as follows:

     i.   Finance
    ii.   Humana Resource
   iii.   Warehousing
   iv.   Distribution
    v.   Quality Control

c. At the end of 1990,s front office functions like sales and marketing were also integrated with all in house functions of the enterprise. Thus during this development the classic ERP was replaces with Customer centric Resource

Planning (CRP). Thus now CRP was to manage and integrate all functions from manufacturing to distribution of products and to provide Customer Relationship Management (CRP).

d. In 2000 the ERP provider companies including SAP AG, Oracle, People Soft, J. D. Edwards and BAAN developed inter enterprise integration solutions. These solutions were then widely adopted by enterprises to not only integrate the front and back office functions but also to access the information in real time.These solutions of ERP enabled enterprises to integrate internal and external activities and to evolve control and planning of all in house and front office functions.

(AMR Research Inc.)2007 carried out studies on trends of ERP in 2006 andasserted that Small and Midsize Business (SMBs) will adopt Software as a Service (SaaS) while the large organization will keep on adopting traditional licensing and on-promises deployment. The large organizations have started thinking about SaaS model also. However there is no such barrier in adopting SaaS but no vender is willing to lose a sale simply because the prospect prefer to have the software package hosted and pay for monthly. The interest in SaaS is with the delivery option. ERP venders like Glovia, Plexus and NetSuite are offering their products with SaaS model. Epicore and QAD had started to offer SaaS based products through accessories like Taxconnect and Global Trade Management product respectively.

SaaS based products are useful for:

- Fast deployment.
- Very small business units.
- When business has stronger sense of urgency.

Service Oriented Architectures (SOAs) has also impact in market and venders also have large portions of their budgets for its development. Most of the buyers are wary about SOAs as ERP is supporting their critical business processes. However SOAs have very slower uptake but even then venders are taking keen interest in it.

2.2.3 ERP Market andVenders

(Bowely, 1998) stated that ERP system are widely used by various multinational corporations. He also concluded that SAP the ERP system, is used by more than 60% of the multinational enterprises.(Janstal) 2000 asserted that SAP AG is the market leader of ERP systems and had 12% global market share. SAP has successfully integrated SAP/R3 with Customer Relationship Management (CRM) and other all new ERP applications.Seewald in 2002 described that most of the ERP market studies have been carried by consulting the venders of ERP systems. However AMR research Inc. (2007) has showed that SAP remained biggest segment of all large and mid-sized enterprises. (Everdingen et.al, 2000) conducted the academic study of ERP market and concluded that ERP venders were growing considerable by duration (1998-2000).It was also noted by the study that ERP system venders were attracting companies by low price and accelerated ERP implementations.

AMR research Inc. (2007) due to high customer demand and expanding product portfolios by vender the ERP market revenue has grown over 28Billion (US Dollars).And ERP market had 14% total revenue growth in 2006 and in license revenue up 18% over 2005. And some major trends from 2006 market are:

a. ERP venders now offer broad portfolio of products for specified industry and functional department rather internally developed product.

b. Oracle and SAP continue to dominate ERP system market and they have competition from Infor, Sag Group, Microsoft, Lawson and Epicore

c. Software as a Service (SasS) and Enterprise Licensing getting acceptance from market and it isexpected that ERP venders will offer in demand in addition to on-demand options.

ERP venders ranked by license revenue in 2006 are:

2006 Revenue Rank	Company	Revenue,2006 ($M)	Revenue, 2006 Share
1	SAP	3639	42%
2	Oracle	2323	25%
3	Sage Group	641	7%
4	Microsoft	602	7%
5	Infor	535	6%
6	Epicor	100	1%
7	Exact Software	91	1%
8	Deltek System	76	1%
9	Lawson	73	1%
10	IFS	59	1%
11	QAD	54	1%
12	Glovia	54	1%
13	Activant	43	>.5%
14	CDC Software	40	>.5%
	Sub-Total	8528	92%
Other Venders	Other Venders	709	8%
Total	Total	9237	100%

Table2.1ERP venders Ranked by License Revenue (Source: AMR Research Inc. 2007)
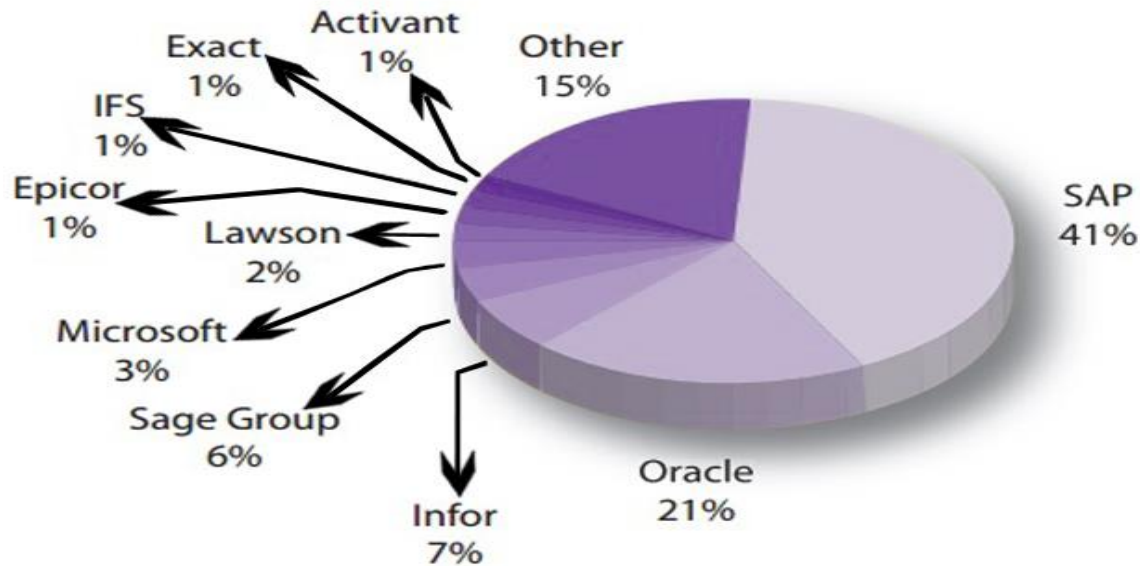
Fig. 2.1: Top 10 ERP vendors by 2006 total revenue share (Source: AMR Research Inc. 2007)

2.3 Motivation and Purpose of ERP

2.3.1 Motivation for ERP:

(Walsham, 2002) Described that during 1990,s with the development of functional departments within the enterprise it was becoming much more difficult to plan and control them. So managers of the enterprises thought of efficient solutions to address such issues. Consequently Enterprise Resource Planning (ERP) was the only solution for enterprise to deploy it and enhance their performance and to get competitive advantages. By time and time through evolution process these awareness approaches has become standardized.

(O Leary, 2004) stated that there are the following drivers for Enterprise Resource Planning (ERP):

    a. Technology.

    b. Best Business Practices.

    c. Strategy.

    d. Competiveness.

Nicolaou in 2004 asserted that the prior research has given rise to the mixed results for adoptions of ERP as the performance of the organizations in concerned. (Appleton, 1997 and Al-Mashari, 2000) concluded their results that the ERP projects failure to attain their objectives are from 50% to 70%.(Shang and Seddon, 2000) carried out the studies and have categorized the potential benefits of ERP but most of these benefits were re-judged by (Markus & Tanis, 2000) and were criticized.

(Ross & Vital) 2000 carriedout studies on eight multiple companies. The respondent of the companies described that multiple factors have motivated their companies to make decision for adopting ERP and the most common motivation factors are as follows:

a. Common Platform

b. Operational cost Reduction

c. Data visibility

d. Customer Responsiveness

e. Strategic Decision making

f. Process Improvement

It was also concluded from the studies that the most influencing factor for adopting ERP was common system platform by one firm and the others had mentioned Y2K problem. They wanted to get rid of the aging IT infrastructure and feel need to replace it with more manageable enabler for their work processes. ERP was not only to address Y2K

problem but also enabled the firms to have common system platform.Fig.1 shows above said needs for adopting ERP.

Infrastructure Capability   Performance
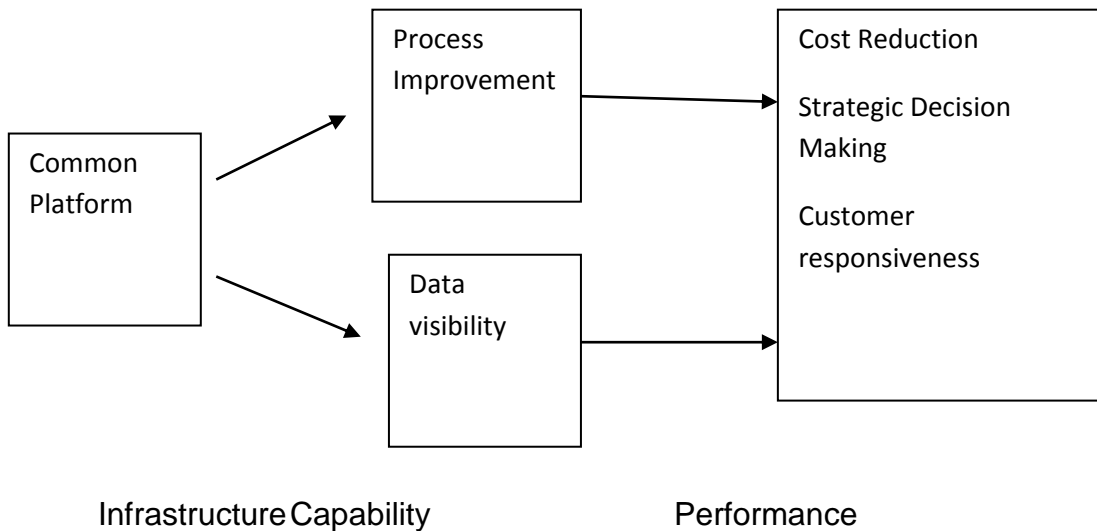
Fig.2.2 Motivations for ERP (Ross and Vital) 2000

2.3.2 Purposes of ERP:

Enterprise Resource Planning is to serve the following purposes.

Integration of functional departments:

Laudon and Laudon, (2003) Enterprise Resource Planning (ERP) integrates all the functional departments and gives better solution of the problem to get required information from the various processes and functions. Moreover ERP has provided a holistic view of the business of an enterprise. The integration of the functional departments will provide timely necessary information for speeder decision making. The integration will also enable all stakeholders of the enterprise to co-ordinate in a very efficient way.

Replacing legacy system:

(Olson, 2004)"Concluded the studies that replacement of the outdated legacy system and standard business practices are the fundamental drivers for Enterprise Resource Planning (ERP). These studies were carried out on the manufacturing industries of America and Sweden. However there were also the other reasons for adoption of ERP systems but these were ranked at top. The reason behind to get rid of this legacy system is the old and complex processes and the functions. Much more effort is required to gather the required information from the legacy system. The legacy system also has the issue of transparency and has very narrow span of co-ordination within and outside the organization. All these factors have influenced the firms and enterprises to get rid of this legacy system and adopt best business practices offered by ERP to enhance performance and co-ordination".

User friendly:

Ushasri, (1999) "Enterprise Resource Planning evolves the technology to provide best practices to take on business processes issues. But it is easy to use and the operational staff needs not to know every bit of it. ERP basically uses technology to make business functions and processes more and more sophisticated and transparent. Technology does not mean to make its use difficult".

Effective planning and Control:

Sheikh, (2003)"Enterprise Resource Planning (ERP) is a software application that provides better and effective planning and control of all functional departments i.e. Human Resource, Finance and Accounting, Material Management, Supply Chain Management".

Large and medium size enterprises:

Eggert and Fohrhols, (2009) "stated that Enterprise Resource Planning (ERP) serves the purposes of both large and medium sized enterprises. ERP systems are developed to serve the requirements of both the enterprises. ERP systems are dedicated for companies comprising of business, manufacturing, operations, sales and marketing.

ERP systems provide best practices for planning and controlling of all operational departments and manage supply chain and distribution of finished goods".

2.3.3 ERP Benefits

Deloitte consulting in 1998 carried out the research by interviewing 164 individuals of 500 companies and on the analysis of these respondents the tangible and intangible benefits of ERP are listed as:

Table.2.2 Tangible Benefits of ERP (Source Deloitte consulting, 1998)

Tangible Benefits Realized	% of Respondents
Inventory Reduction	32%
Personnel Reduction	27%
Productivity Improvements	26%
Order Management Improvements	20%
Financial Close Cycle Reduction	19%
IT Cost Reduction	14%
Procurement Cost Reduction	12%
Cash Management Improvements	11%
Revenue/Profit Increase	11%
Transportation/Logistics Cost Reduction	9%
Maintenance Cost Reduction	7%
On-Time Delivery	6%

Table.2.3 Intangible Benefits Realized (Source: Deloitte consulting, 1998)

Intangible Benefits Realized	% of Respondents
Information/Visibility	55%
New Improved Processes	24%
Customer Responsiveness	22%
Cost Reduction	14%
Integration	13%
Standardization	12%
Flexibility	9%
Globalization	9%
Y2K	8%
Business Performance	7%
Supply/Demand Chain	5%

2.4 Enterprise Resource Planning (ERP) as Business Process Re-engineering (BPR)

2.4.1: Business Process

Dhilon&Hackny (2003) described the business process it is a set of activities that are carried out to attain a specific business goal and these activities are logically interconnected with each other. More over a business process does not include any unnecessary activity and a business process has definite inputs and definite outputs.

(Ross & Moore, 2006) defined business process as:

A business process is that how a business task is being carried out in an enterprise. A business process is basically a ways by which any work is performed in an organization

2.4.2 Business Process Re-engineering (BPR)

Devonport in 2008 stated that the automation of the processes by information technology (IS) is the main driver of the Business Process Re-engineering. Furthermore Hammer in 1990 concluded that "The process which is being carried out before the automation of a particular process in an organization is called Business Process Re-engineering (BPR).

(Teng, Grover& Fiedler, 1994) stated that Business Process Re-engineering is the redesign of the current process for the purpose to make some radical improvements that will enable to increase the output performance of that particular process. So the focus of all these radical changes in processes is to improve the performance.

(Evans in 2003, Roy in 2005 and Wang & Ahmed in 2003) concluded that The Business Process Re-engineering (BPR) is basically analyzing the current business process with that of the redesign one and then further attempting to fill the gap in between them to gain improvements. They used the term "As Is" for how the currently processes are and the term "To Be" how the processes should beand then further filling the gap between these two also.

2.4.3: ERP as Business Process Change

(Arif M, kulonda D, Jones J, & proctor M) 2005 describes that If an Enterprise has not adopt any Enterprise Resource Planning (ERP) type of the software package for its business processes then that enterprise should first re-engineer its business processes. Therefore it can be assumed that BPR has key role in the deployment of ERP in an enterprise. The study also concluded that re-engineering of the processes should be carried out by the team comprising of the managers of that particular

organization.Because they know much better than others that how these processes are and how they should be by keeping inview the future planning of the organization." However (Keller and Teufel, 1998) considered "Business Process Re-engineering (BPR) as the pre-planning phase for the deployment of ERP.

(S.L. Chang, 2000) asserted that information technology (IS) plays two important roles in BPR. First it acts as facilitator for process re-engineering and second as an enabler for the new process.

(Eardly A, Shah H, Radman A, 2008) stated that "An enterprise should re-visit the existing processes to fit best for ERP adoption. The role of IT in Business Process Re-engineering is very much important thus business processes should be IT driven."

Sarkar and Lee, (2002) asserted that "Business Processes Re-engineering (BPR) and ERP implementations tasks are closely related to each other and the success of the BPR activities are closely related to the successful completion of the ERP. Thus the successful adoption of ERP can only ensure the standardization of the work processes and can enable the best business practices."

(Ahmed, Francis &Zairi) 2007 identified CSF, s for Business Process Re-engineering from studies which were conducted on the higher educational institutions.

a) Teamwork Quality culture
b) Quality Management and motivational rewards
c) Change management
d) Less bureaucratic
e) Information Technology (IT)
f) Project management (PM)
g) Financial resources

(Habib N.M&Wazir I.N) 2012 and (Habib, 2011) carried out the studies on the role of team work, education and training in the successful Business Process Re-engineering activities and asserted that "BPR is about to bring radical changes in processes of the functional departments of an Enterprise. So during processes change workforce and the

behavior side of the organization should not be neglected and the approaches should also be adopted to address the problems of workforce and their behavior. It is of highest propriety that before BPR the workforce of the organization should be given education and training about the work process change.

(Mlay, Zlotnikova&Watunda) 2013 carried out quantitative analysis to identify the limit that organizational resistance affects the Business Process Change (BPR). From the literature review they considered critical success factors and failure factors as proposed by different researchers. They included the following success and failure factors.

Human related success factors affecting BPR are listed as follows:

i. User competence in adopting an IT project.
ii. The respondent cautiousness before adopting any new initiative.
iii. Therespondentcautiousness before adopting new IT project.
iv. Possible staff lay off/reduction as result of IT project.
v. The respondent input becoming no longer needed with anew IT project.
vi. Old business process being considered satisfactory.

Organization related success factor affecting BPR are as follows:

i. Re-defining organizational mission prior to BPR.
ii. Intention to serve client better.
iii. User awareness of plans to re-engineer process
iv. Full collection of user requirements prior to new project.
v. Involvement of user during BPR development.
vi. Training the user.
vii. Provision of adequate management support for the project.
viii. High implementation speed.

BPR possible failure factors are listed as follows:

i. Technical incompetence of the implementers.
ii. Underestimation of the challenge on hand.
iii. Failure to define organizational objective.

   iv.   Poor communication between implementers and the management, inability to inform the management about the challenges.

   v.   Project management failure to respond to delays adequately.

   vi.   Organizational resistance to change.

   vii.   Lack of organizational ownership of the project.

   viii.   Significant cost over runs.

   ix.   Significant time over runs.

   x.   Project management failure to create awareness of the project.

   xi.   Poor user's requirements collection and analysis.

   xii.   Failure to train users.

   xiii.   Project failure to meet organizational goals.

2.5 ERP implementation

(Liang-chaunwu, chorng-shyongong, yaowenHso) 2006 Enterprise Resource Planning (ERP) has both social and technical uncertainties in practice. So it requires actively managing implementation of ERP. (Al-Mashari and Al-Mudimigh) 2003 asserted that ERP is about to bring dramatic changes so it is highly required that ERP implementations should be managed carefully to get maximum of ERP advantages. (Zhang et. al 2003) concluded that failures of ERP implementation are also too high. it was reported that 90% of ERP projects are over budget and late while success of ERP projects is 33%.

(Dantes, GedeRasben and Hasibuan, ZainalArifin) 2011, proposed ERP implementation framework based on key success factors (KSFs). The framework was a conceptual framework based on literature review. They proposed that ERP should be implemented in stages and at each stage key factors will attribute as activities for successful implementation of ERP.Enterprise Resource Planning (ERP) implementation process contains project preparation, technology selection, project formulation, implementation/development and post-implementationwhereascomponents are organization/people, processes application, data and infrastructure.

Gordon Baxter, 2010 in his white paper summarized thatEsteves and Paster (1999) proposed   model for ERP implementations which includes the dimensionsProduct, Processes, People and Change Management has phases of ERP implementation life cycle as:

- Adoption Decision (Whether ERP is ultimate solution and its impact)
- Acquisition (ERP Product and ERP vender selection)
- Implementation (Customization and adaptation in view of requirements)
- Use and Maintenance (Required Results achieved)
- Evaluation (Extra capabilities added)
- Retirement (Decision to Replace the System)

2.5.1 Pre-requisites of successful ERP implementation

(Somers & Nelson) 2001 described the critical success factors along the implementation stages of ERP using the responses from the respondents of 86 organizations that have completed the ERP or were in process of deploying and concluded the following pre-requisites for successful ERP implementation.

- Top Management Ownership
- Project Control
- External Consultant
- Clear and Measureable Objectives

(Gray & Larson, 2000) carried out the study and asserted that important pre-requisite for successful ERP implementation is the project ownership by the top management but efforts should also be made to minimize risk associated with the ERP implementation. Welti, Norbert in 1999 also emphasized on external consultant caliber for the successful implementation of ERP. He also mentioned that balance of IT and business, managed process changes are also too much important. (Mousseau, 1998) find out that multi-talented project team is very much essential for ERP implementations. Implementing ERP causes changes so care should be cater for to reap ERP advantages. The critical

issues must be kept in mind for ERP implementations these are commitment from top management, business process re-engineering, and integration of ERP with other business information systems, selection of consultants and employees and training of the employees on the new system.

2.5.2 Selection of ERP System

The selection of ERP system is very much important because it effects the operations of the organization. From literature review and case studies the criteria of selection for ERP system were identified and analyzed that how much they are being used by different organizations. Factors effecting the selection of ERP system were also identified from the literature review. The factors of greater importance are **ERP software suitability**, **Information quality** and **ERP vender quality**(Molnar, Szabo&Benczur 2013).

The criterion of ERP product and vender selection for a footwear factory is as under(Team L, T, Q, Y, et.al, 2011).

Table:2.4Criteria for selection of ERP product and vender (source: Team L, T,Q,Y,et.al2011)

Product Criteria	Vender criteria
Price	Reputation
Implementation Time	Support Services
System Functionality	Customer Services
Degree of Software adaptability to existing system (Integration)	Ability to meet Future needs
User Friendly	Successful Experience in delivering Solution to organizations of similar size, complexity, geographical scope

2.5.3 ERP Implementation Strategy and Framework

(Lee and Myers) 2004 the decisions taken during implementation of Enterprise Resource Planning (ERP) are strategic in nature as these decisions are to support objectives of the organization which are also strategic. The strategic decisions taken during implementation of ERP have large impact on the processes of the organization and are to shape the processes of the organization.

Enterprises deploying Enterprise Resource Planning (ERP) have to decide that whether they should have to purchase all ERP modules from a single vender or from different venders. However (Mabert et al, 2003) go with the idea to purchase ERP modules from different venders but deployment complexity will also be there.The organizations also have to decide whether they are going to configure the ERP modules in their organization or they will go for a customized solution. In configuration the organizations have to adopt the processes as proposed by venders where as by customization they can have solutions by processes requirements.

There are different ERP implementation approaches which organizations adopt to deploy ERP.

(Grabski and Leech) 2007 asserted that " **Vanila Approach** is to redesign the processes of the organization so that they become compatible with ERP system. Change management so that individuals could adopt the best proposed practices of ERP system. These best practices will give a competitive advantage to the organization."

(Grant at. el.) 2006 and (Soh&Sia) 2004a venders and consultants also emphasized on Vanilla Approach because adoption of ERP system best practices gives more business intelligence where as customization have the upgrades problem.Cost and risks are also

associated with customization consequently minimum customization is suggested to get more and more benefits from ERP system.

(Nicolaou, 2004) described that customization is changing the ERP software package to fit in organizational processes and to meet specific requirements of the organizations.The customization also makes it difficult to upgrade the ERP software to the next version offered. Rewriting of the software is being carried to fit in the new version. Every time changing the processes is not an easy task.

From the above literature review it is clear that successful implementation does not mean to adopt the best practices as offered by ERP system. But customization of both the organizational processes and the ERP systems are required to fit in the strategic objectives of the organization. Therefore interactions between Management, Users, Information System (IS) Personnel and Consultants are very much important. Negotiation is important to best fit or misfit of the ERP system in the organization.

(Shehab et al.) 2004 and (Nicolaou) 2004 stated that "Big-**bang** implementation approach refer to deploy all ERP modules in the organization at one time whereas **purchase-in** or **modular approach** refers to deploy one module." and O'Leary in 2000 described that Big-bang implementation approach can cause failure of the whole system of the organization.

(Ross) 1999 stated that "Implementation of ERP is not an easy challenge. The organization has to face resistances from users at every stage of the implementation. The stages of implementation model proposed by him are:

- Implementation
- Stabilization
- Continuous Improvement
- Transformation

(Markus and Tanis) 1999 proposed a model for ERP implementation " Enterprise System Experience Cycle" which evolves four phases:

Phase-I: Project chartering

Phase-II: The Project (Configure and Rollout)

Phase-III: Shakedown

Phase-IV: Onward and Upward

Fig.2.3 Enterprise system experience cycle (Markus& Tanis, 1999)

Ideas to dollars   dollars to assetsassets to impacts   impacts to performance

| Phase I Project chartering | Phase II The project (configure & rollout) | Phase III Shakedown | Phase IV Onward & Upward |

Decision defining the   getting system & end   Stabilizing eliminating   maintaining
system,

business case and   users "up & running""Bugs" getting to normal   supporting
users,

solution constraints.operationsgetting Results, updating.

2.6 ERP Success Factors

(Jeffer K, Startman ,AledaV.Rooth) 2000 carried out the studies and identified on basis of their research that major constructs for successful implementation of ERP are as follows:

a) Strategic IT planning

b) Executive commitment

c) Project Management

d) Information Technology Skills

e) Business process skills

f) ERP training

g) Learning

(Nah, Lau &Kuang)2001Enterprise Resource Planning (ERP) had emerged as successful information management and integrating backbone of the enterprises. The difficulties of ERP implementations have been widely discussed by researchers but the identification of critical factors for success is too much fragmented. So reviewing literature following 11 factors was found critical.

i.   ERP Teamwork and Composition.
ii.   Change Management Program and Culture.
iii. Top Management Support.
iv.   Business Plan and Vision.
v.   BPR with Minimum Customization.
vi.   Project Management.
vii. Monitoring and Evaluation of Performance.

viii.   Effective communication.

ix.   Software Development.

x.   Testing and Troubleshooting.

xi.   Project Champion.

xii.   Appropriate Business and Legacy system.

(Chauhan,Dwivedi& Sherry, 2012) carried out studies to identify critical success factors of offshoringEnterprise Resource Planning (ERP). The factors were identified by keeping in view the both vender and client. The literature review and semi structured interviews were used to identify the factors. The summarized critical success factors from literature review and semi structured interviews with managers are.

a.   Objectives

b.   Senior Management

c.   Organization Change Management

d.   Project Management

e.   Project Team Composition

f.   People Issues

g.   Communication

h.   Onsite Offshorin Norms

i.   Offsite Partnership

j.   Enabling Infrastructure.

Objectives:

It includes the strategic and long term objectives set for the enterprise. The objectives should be:

i.   Quantifiable and measureable

ii.   Comprehensive

iii.   Core Competence

Senior Management:

This success factor is from the client side. ERP deployment meets a lot of resistance from Senior Management of an Enterprise. So for successful deployment of ERP support from senior management of enterprise is very much important.

Organization Change Management:

ERP deployment will change the way of IT department is currently working in an enterprise. So this organizational change should be managed in a very efficient way.

Project Management:

It is also very important success factor. it is important that all activities should be documented. The recognized Project Management tools should be adopted for successful deployment. Time and Cost are the most important constraints for Project Management.

Project Team Composition:

The Project Team should comprise of skilled people, those who had have lot of Project Management experience. They should also be capable of abilities to cope with vender and user aspects for deployment.Appropriate knowledge should be pre-requisite for Project Team Member.

People Issues:

This factor is based on one's individual problems. The vender and client team members could have different cultures. So issues from cultural gap should be addressed for

success. cultural gap leads to the gap in requirements, deadline importance, work importance and the place of work.

Communication:

communication is also very important factor for successful deployment of ERP.because during offshoring deployment of ERP the languages of vender and client can be different.

Onsite Offshore Norms:

It is about that work activities should be as per specified Norms.

Offshoring Partnership:

It is about the partner who should must be experienced and have well recognized in market for offshoring ERP deployment.

Enabling Infrastructure:

The infrastructure which connects onsite and offsite offshoring is very much important.

Table.2.5 Critical Factors and Responsible Stackholders (Chauhan, Dwivedi& Sherry 2012)

Critical Success Factors	Responsible Stakeholder	References
Objectives	Client Specific	Holland, Light (1999)
Senior Management	Client Specific	Shao et al. (2009)
Organization Change Management	Client Specific	Jarrar et al. (2000)
Project Management	Vender and Client Specific	Mirrani (2007)
Project Team Composition	Vender and Client Specific	King (2008)
People Issues	Vender and Client Specific	Lacity et al. (2009)
Communication	Vender and Client Specific	Yuying, Yanan (2009)
Onsite Offshore Norms	Vender and Client Specific	Zhang et al. (2003)
Offshoring Partnership	Vender Specific	Upadhyay, Dan (2009)
Enabling Infrastructure	Vender Specific	Lacity et al. (2009)

2.7 Performance Impactand Challenges

ERP Systems are deployed to improve the efficiency of operations and enhance the co-ordination in the organization for speedy decision making. Therefore it is essential that ERP system does impact on the efficiency of operational processes and on co-ordination for proactive planning and control of activities.

Delone and Mcleane IS success Model is important to analyze the impact of the system on the organization as whole and on individuals. The factors that the model includes are System Quality, Information Quality, Use and User satisfaction.
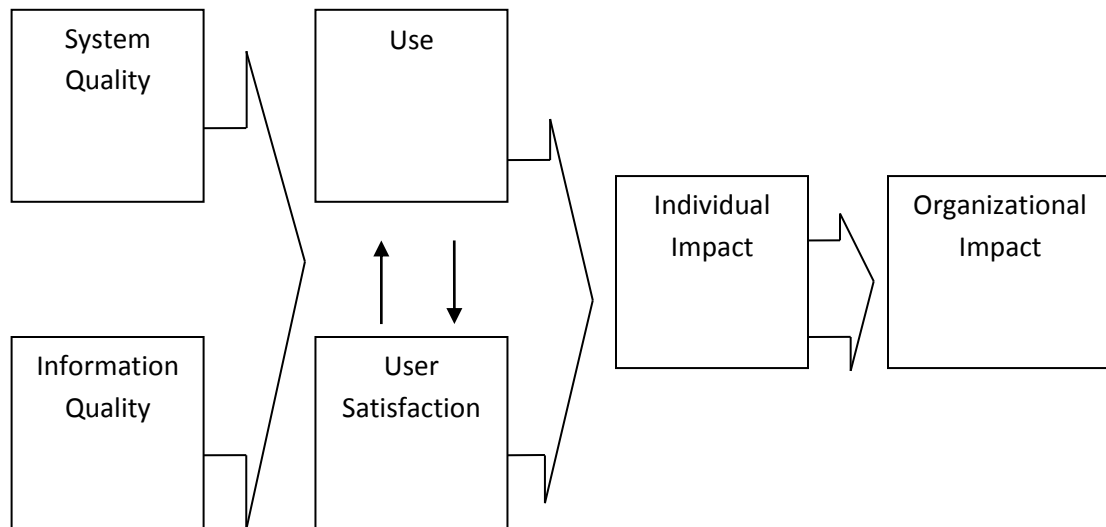
Fig 1: IS Success Model (Delone and Mcleane, 1992)

Challenges/Issues in Implementing ERP

Integration:

Enterprise Resource Planning (ERP) has to integrate various processes of operational departments to give a common platform to access the information in real time. Integration of various processes is not an easy task (Berente et al. 2009).

Complexity:

ERP systems are complex as compared to the legacy systems and require more skills for operation (Lowe & Locke, 2008).

Cost of ERP System:

ERP systems cost is very high because the cost of the software and hardware should not be considered but it also includes the consultant fee, Training and Education, integration and customization costs. So the actual cost will be 3 to 4 times the software cost (Monk & Wagner 2006).

The study was carried out to identify issues for SMEs by applying TOPSIS (Technique for Order preference by Similarity to Idea Solution) after identifying issues for successful implementations of ERP through comprehensive literature review. And pareto analysis were carried to identify the issues (Basu, Upadhyay, C.Das&K.Dan 2012). The issues are:

- Top Management Support (Bingi, Sharma &Godla, 1999)
- Properly defined Goals and Objectives (Al-Mashari et al. 2003)
- Project Management (Rosario, 2000)
- Project Team Competence (Soh, Kien&Tay-Yap, 2000)
- Education and Training (Al-Mashari et al. 2003)
- Change Management (Nah & Lau, 2001)
- Proper Package Selection(Everdingen, Hillergersberg&Waarts, 2000)
- Effective Communication(Falkowski, Pwddigo, Smith & Swanson, 1998)

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology through which the objectives of the study are achieved. It presents the data collection techniques used to collect the data for the research. The chapter also defines the data collection topics and the respondents. The research study is composed of two phases. Phase-1 is to analyze satisfaction level of existing system and phase-2 is to analyze the impact (Benefits achieved, System Success, Challenges) of deploying ERP.

Defining the data collection topics and the respondents are very important for the reader to understand the research analysis. The data collection topics are developed with respect to the objectives of the research.

3.2.1 Data Collection Method

There are various research methods however most common are quantitative and qualitative. Quantitative research method is to quantify data and conclude results as per incidence of respondents opinion in a chosen sample. Quantitative method uses structured techniques such as questionnaire and on-line interviews.Whereas qualitative research is to generate idea or developing understanding of an underlying problem. Qualitative method uses unstructured or semi-structured data collection techniques such as individualsin-depth interviews and group discussion.

3.2.2 Selected Data Collection Method/Approach

Quantitative research method is adopted to carry out the research and data is collected through a structured questionnaire.

Questionnaires are designed for both phases on the basis of the literature review. Questionnaire were further discussed with study related professionals and then finalized to conduct the survey. Questionnaire for phase-1 is annexed Appendix-B and Questionnaire for phase-2 annexed Appendix-C.

3.2.3 Selected Organizations and Respondents

Pakistan Broadcasting corporation is the organization under study.   Pakistan Broadcasting Corporation is currently using paper-based system. For decision to adopt ERP for automation of processes of different department phase-1 of study is to analyze the satisfaction level of current system.

and the respondents for data collection are:

- Top/Middle Management

- End Users/Staff

- Inter- Department Employees

Phase-2 questionnaire is to collect data from organizations where ERP is deployed. The selected organizations are PTCL and NADRA. PTCL implemented SAP and is now using Financial, HRM and Procurement modules. NADRA has implemented Oracle and is now using Oracle Financial, Oracle HRM and Oracle Procurement Modules. PTCL

and NADRA both are public sector organizations and the organization under study is also public sector organization. So the HRM rules Financial and procurement procedures are same.The respondents of Phase-II are:

- Top/Middle Management

- End Users/Staff

- Inter- Department Employees

3.3Data collection technique, Sources and Respondent

The research technique is design to answer the questions listed in chapter 1. The data collection topics of both research phases are design to fulfill the objectives of the research. The objectives of the research are listed in chapter 1 also.

Phase-1 questionnaire is to collect the data from respondents of the organization about the topics.

- Satisfaction Level of Existing System

- Usage of IT

- Acceptability of computer-based information system

Whereas

Phase-2 Questionnaire is to collect data from ERP Top/Middle Management and ERP End User/Staff and data collection topics are:

Performance Impact of ERP

- Benefits achieved

- Challenges/Issues

System Success Evaluation

- System/Information Quality

- User Satisfaction

- Acceptability

Table. 3.1 Data collection technique, Sources and Respondents

Research Phase	Data Collection Technique	Data Collection Topic	Respondents	Number of Respondents
Phase-1	Questionnaire And Semi-structured interview	• Satisfaction Level of Existing System • Usage of IT • Acceptability of computer-based information system	<u>Organization Under Study</u> • Top/Middle Management • End Users/Staff • Inter-Department Employees	30 60 30
Phase-2	Questionnaire and Semi-structured interview	<u>Performance Impact of ERP</u> • Benefits • Challenges/Issues <u>System Success Evaluation</u> • System/Information Quality • User Satisfaction • Acceptability	<u>Organization In Which ERP Is Deployed(NADRA, PTCL)</u> • Top/Middle Management • End Users/Staff • Inter-department Employees	30 60 30

CHAPTER 4

DATA COLLECTION

4.1 Data collection from Pakistan Broadcasting Corporation

The satisfaction level about the existing work processes in the departments of the Enterprise was analyzed through questionnaire and was recorded.The questionnaire were distributed among Top Management/Middle Management, Staff and the other employees who were working in other departments to judge that the subjected departments are working up to their expectations or not. The Organization under consideration comprised of Finance Department, Administration Department, Engineering Department, Programs Department and News Department. But following departments were considered for deployment of Enterprise Resource Planning (ERP):

a. Finance Department

b. Administration Department

c. Engineering Department

Sub-sections in the departments of Administration, Finance and Engineering under considerations are as under:

Table: 4.1 Sub-Sections of Administration Department

A1. Recruitment
A2. Legal Actions
A3. Personnel
A4. Performance Evaluation
A5. Pension
A6. Establishment (Employees Service Record)
A7. Employees Facilities (Hiring, Medical)
A8. Logistics (Transport Management)

Table: 4.2 Sub-Sections of Finance Department

Budget Allocation and Budget Release
Purchase Order Processing
Book Keeping (General Ledger , Accounts Receivable , Accounts Payable)
Payroll
Pension Cell
G.P Fund
Audit

Table: 4.3 Sub-Sections of Engineering Department

Maintenance and Operations
Planning and Development
Planning and Research
Procurement
Stores and Inventory
Frequency Management
Equipment Production Unit

4.2 Data Collection from PTCL and NADRA

The motivation factor, ERP System Impact (ERP Success, Benefits achieved) and problems to deploy ERP was analyzed through questionnaire and was recorded. The questionnaire were distributed among Top Management/Middle Management, Staff and the other employees who were working in other departments to judge that the subjected departments are working up to their expectations or not. The data was collected from the following ERP departments:

- Human Resource Management (HRM)

- Finance Department

- Operation Department

4.3 Response

200 questionnaire was distributed among top/middle management and staff of Pakistan Broadcasting Corporation to analyze satisfaction level of existing system and to identify problems of current system along with need to automate the processes of existing system. 168 questionnaire were got filled back. Thus response rate remained:

Response Received (Pakistan Broadcasting Corporation) = 168 out of 200 = 84%

In PTCL and NADRA 120 questionnaire was distributed and 108 being were got filled back. The questionnaire was to get response about motivation factors of the organization to deploy ERP. and questionnaire was also to evaluate the ERP System success in the organization along with benefits achieved by the organization. The

respondents were also asked about the challenges that they have faced to deploy ERP in their organization. The response rate remained:

Response Received (PTCL and NADRA) = 108 out of 120 = 90%

4.4 Demographics

The responses received from top/middle management and staff of Administration, Finance and Engineering department. The questionnaire was distributed and the response of the data from Pakistan Broadcasting Corporation is as:

Departments PBC

34.15 % 34.15 %
31.70 %

- Administration Department
- Finance Department
- Engineering Department

Work Force PBC

39.02 %
60.98 %
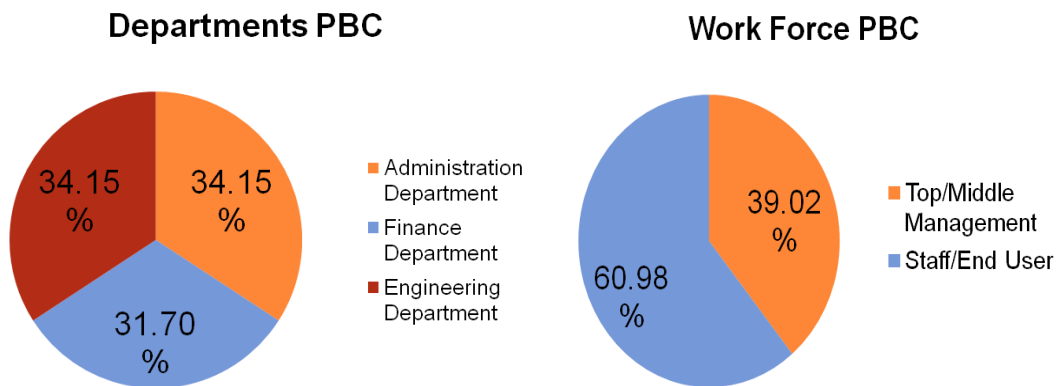
- Top/Middle Management
- Staff/End User

Fig 4.1: Response (PBC) Departments and Work Force

The responses received from top/middle management and staff of Human Resource Management Department, Finance Department and Engineering department. The questionnaire was distributed and the response of the data from PTCL and NADRA is as:

Departments ERP
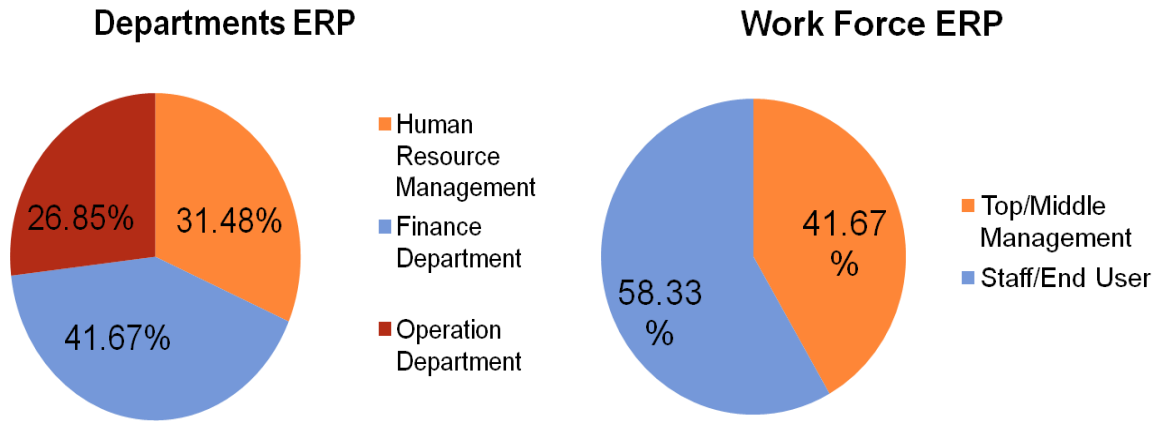

- Human Resource Management
- Finance Department
- Operation Department

26.85% 31.48% 41.67%

Work Force ERP

- Top/Middle Management
- Staff/End User

41.67% 58.33%

Fig 4.1: Response (PTCL and NADRA) Departments and Work Force

CHAPTER 5

DATA ANALYSIS AND RESULTS

5.1 Analysis ofCurrent deployed paper-based legacy System

The Current deployed system in Pakistan Broadcasting Corporation is Paper-based legacy system. So response from top/middle management collected through questionnaire to identify satisfaction level and problems of current system in administration, finance and engineering department and also to identify need to automate processes of departments.

5.1.1 Satisfaction Level of Departments

It is very important to analyze the satisfaction level of existing system. Administration, Finance and Engineering departments are being analyzed. All under study departments had different sub-sections. Each section of all departments were also analyzed. The satisfaction level not only will give the need to replace but will also identify the scope of the new system to be deployed for replacement of existing paper-based legacy system in Pakistan Broadcasting Corporation.

So the satisfaction level of sub-section of Administration, Finance and Engineering departments is as follows:
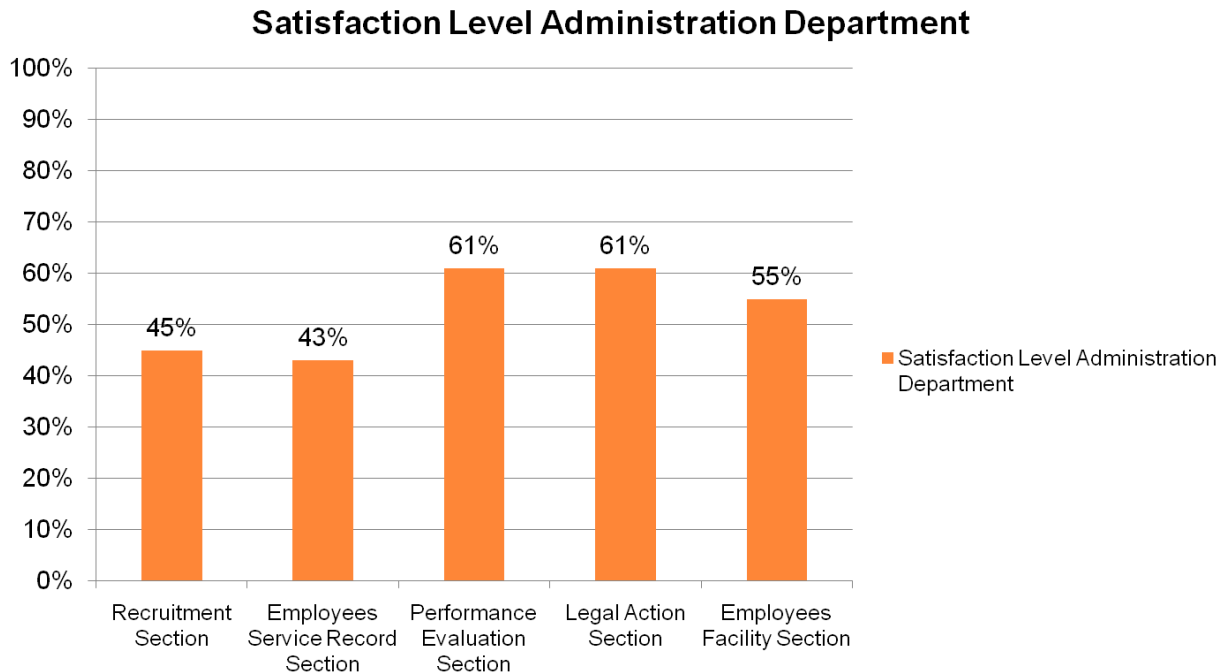
Satisfaction Level Administration Department

Fig 5.1 Satisfaction Level Administration Department

Satisfaction Level of Recruitment and Employees Service Record Section is less than 50% So there is Dissatisfaction. So it can be concluded that respondents are not satisfied from the existing paper-based legacy system as for the recruitment and Employees service record systems are concerned.As all employees service record is being managed in files from their recruitment to their retirement. So there is much chance that record can be lost. Moreover when it is urgently needed it becomes more difficult to access the whole data of an employee which includes leave, travelling, hiring, medical, promotion and transfer because record keeping is being carried out at different locations and there is no common platform.In paper-based legacy system the dispersed data is most common problem. So as the access of record becomes too difficult when it is needed for the reason the employees are so dis-satisfied from Employees Service Record section. Whereas in recruitment section there is also no such platform to record all applicants applications and all process of recruitment being recorded so that all applicants could access there status of recruitment including test and interviews. Therefore there is also dis-satisfaction in recruitment section of administration department.
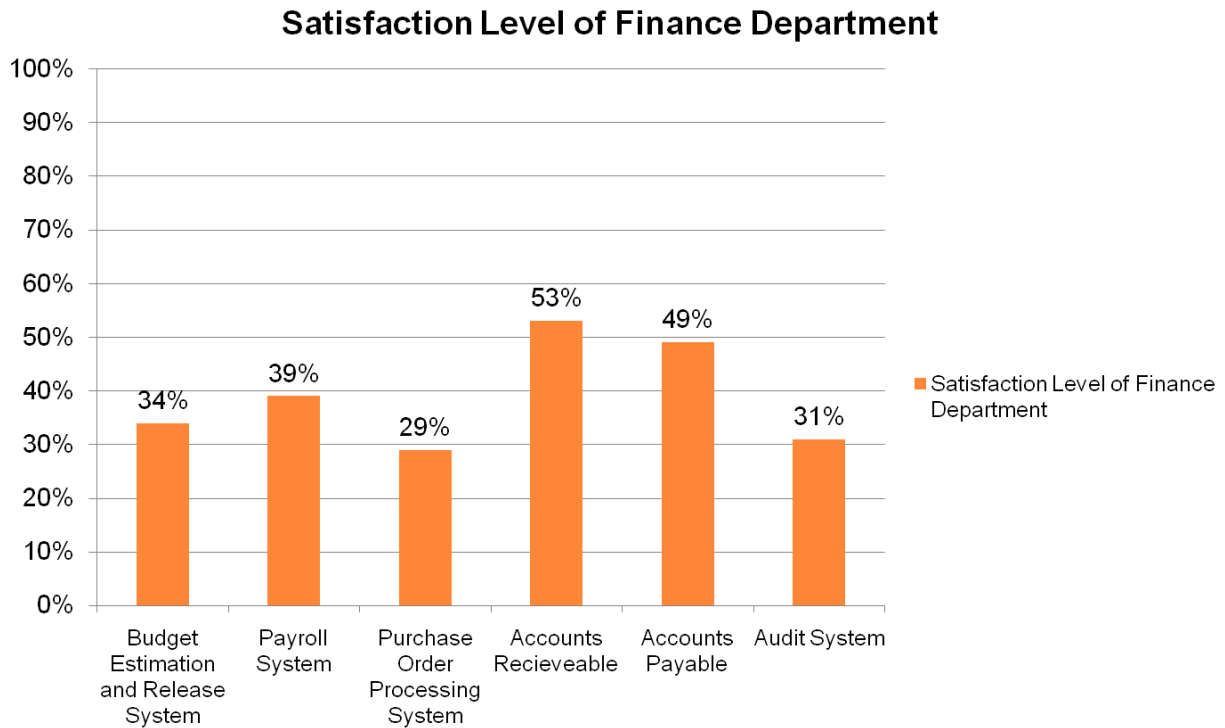
Satisfaction Level of Finance Department

Fig 5.1 Satisfaction Level Finance Department

Finance department is the most dis-satisfied department. Purchase Order Processing is most dis-satisfied sub-section of Finance department. In finance department the data is also too much dispersed that cause slow decision making for the reason employees are so dis-satisfied with the purchase order processing system. As there is no common platform therefore it becomes very difficult to audit so the employees are also dis-satisfied from the Audit System.The is no any kind of system for estimation and release of budget. Payroll section also does have any automated system to manage their transactions for the reason they also dis-satisfied from the current deployed paper-based legacy system.

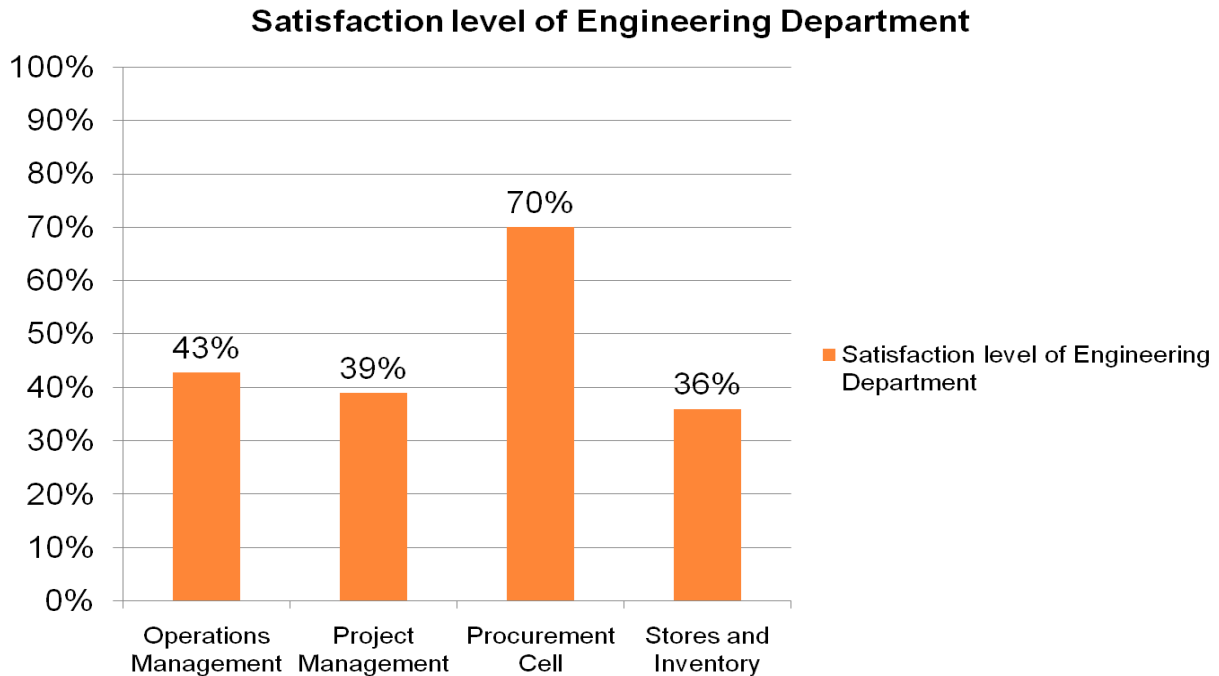SoThere is wide scope of ERP deployment in finance department.

Satisfaction level of Engineering Department

Fig 5.1 Satisfaction Level Engineering Department

Engineering is the department where all the operations of the organizations are being carried out. But here is alsodis-satisfaction because the data to carry out all the processes is not on common platform so it causes delays in decision making process. The data is also not visible in the current system so it becomes very difficult to decide that what is there in all store less or more. Due to unavailability of any project systems the project causedelays.

The most dis-satisfied section of engineering department is Stores and inventory and there is also dis-satisfaction in operation and maintenance section and project management system also. However there is satisfaction in the procurement section of engineering department.

So there is also wide scope for ERP operations module to be deployed.

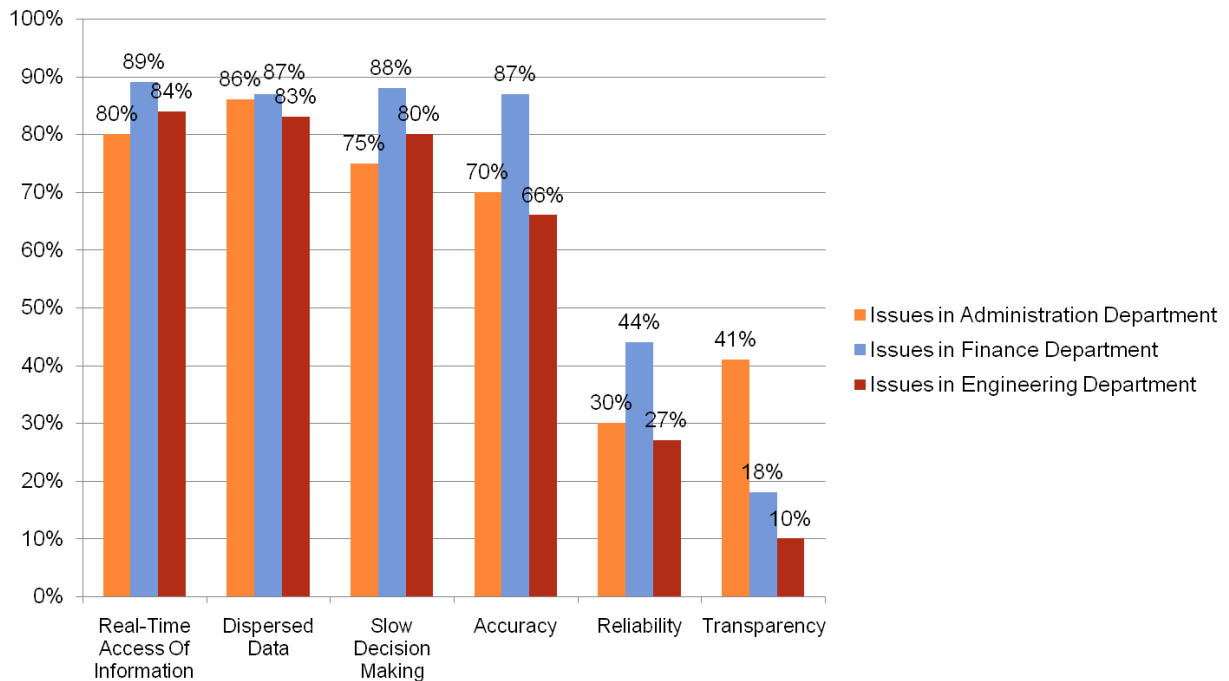## 5.1.2 Problems of Paper-based legacy System

Fig 5.4 Issues of Current Paper-based Legacy System

Most common Issues of all departments are Real Time Access of Information, Dispersed Data, Slow Decision Making and Accuracy.

In paper-based legacy system every process is being carried out manually therefore there is no common platform so that required data could be accessed in real time and decision process could be made fast. And the data is also maintained in papers so not visible all the time for the reason there be also accuracy issue. Thus due dispersed data it is not possible to access the information in real that further causes delays in decision making process.

So the issues/problems of so dis-satisfaction in departments are real time access of information, dispersed data, slow decision making and accuracy.

5.1.3 Need To Automate Processes of Departments
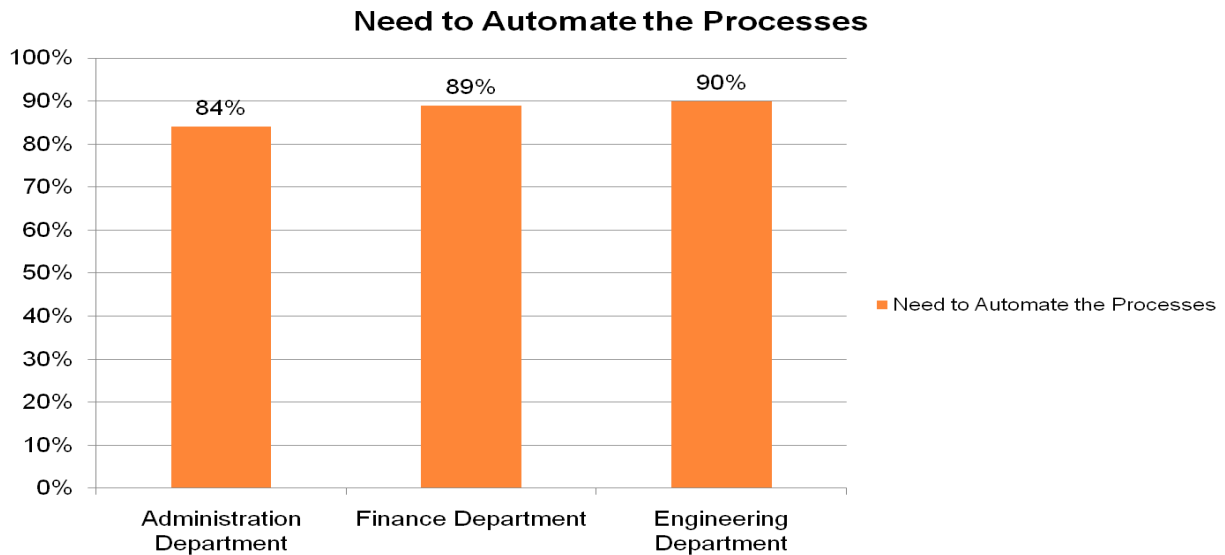
Need to Automate the Processes

Fig 5.5 Need to automate the processes of departments

All processes of under study departments need to be automated. Because the problems which the departments are facing can only be addressed through automation. Most of the respondents of all departments responded that there is entire need to automate the processes of the departments.

5.2 ERP Motivation Factors, ERP System Success and Problems to Deploy ERP

To analyze impact of deploying ERP in public sector organization of Pakistan response received from PTCL and NADRA which had deployed ERP system. Response of top/middle management and staff of ERP received through questionnaire. The questionnaire was comprised of ERP Motivation Factors, ERP System Success, ERP Benefits and ERP Deployment Challenges sections. The data was collected and analyzed through statistical tool MicrosoftExcel and SPSS version -20.

5.2.1 ERP Motivation Factors of Public Sector Organization of Pakistan

Motivational Factors
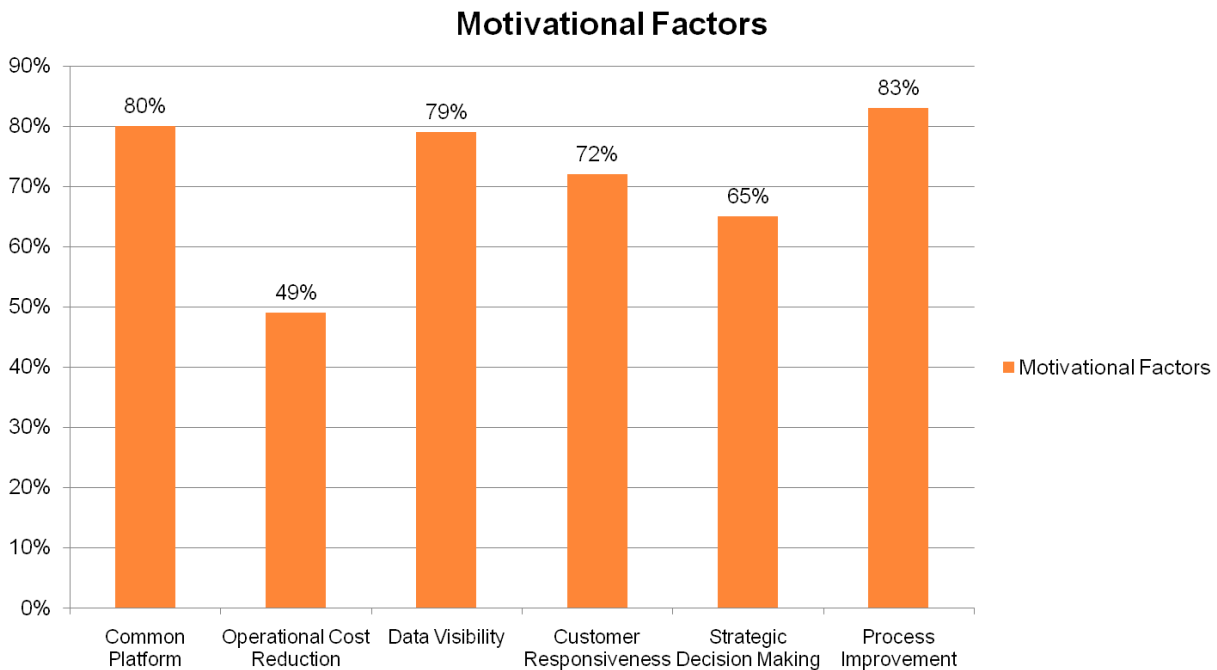
Fig 5.6 ERP Motivation Factors

Process Improvement, Common Platform, Data Visibility and Customer Responsiveness are the motivations to deploy ERP.

The motivation factors for which public sector organizations in Pakistan had deployed Enterprise Resource Planning (ERP) in their organization are also the solutions to those problems which the under study organization is facing due to currently deployed paper-based system. So this conclusion can also be made that the identified problems of the paper-based legacy system can be addressed through ERP. So ERP should be deployed to overcome the issues and problems of paper-based legacy system.

5.2.2 ERP System Success in Public Sector Organization of Pakistan

Information Quality

Very Satisfied	
Fairly Satisfied	
Niether Satisfied nor Dis-Satisfied	
Fairly Dis-Satisfied	
Very Dis-Satisfied	
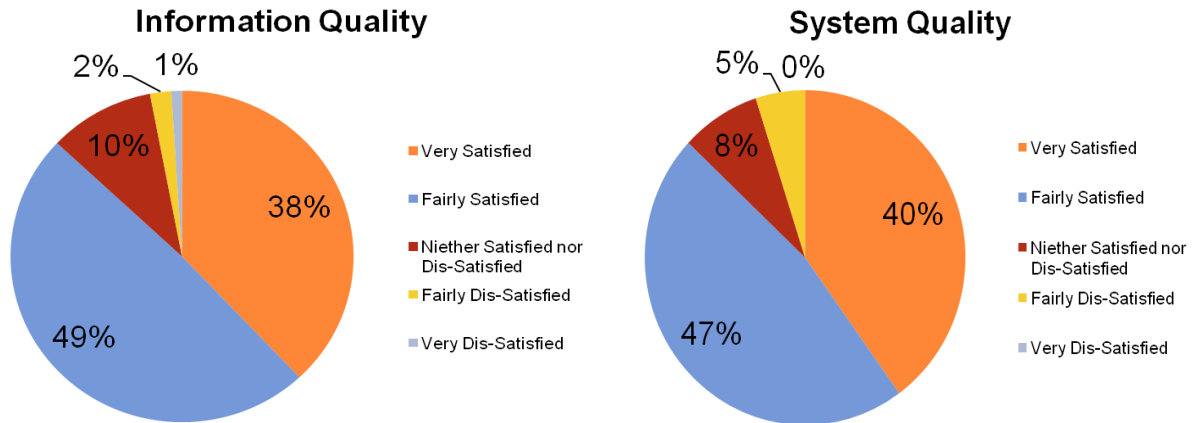
The mean is 4.24 so that ERP Top/Middle Management and End User are very satisfied with the Information Quality of ERP.

System Quality

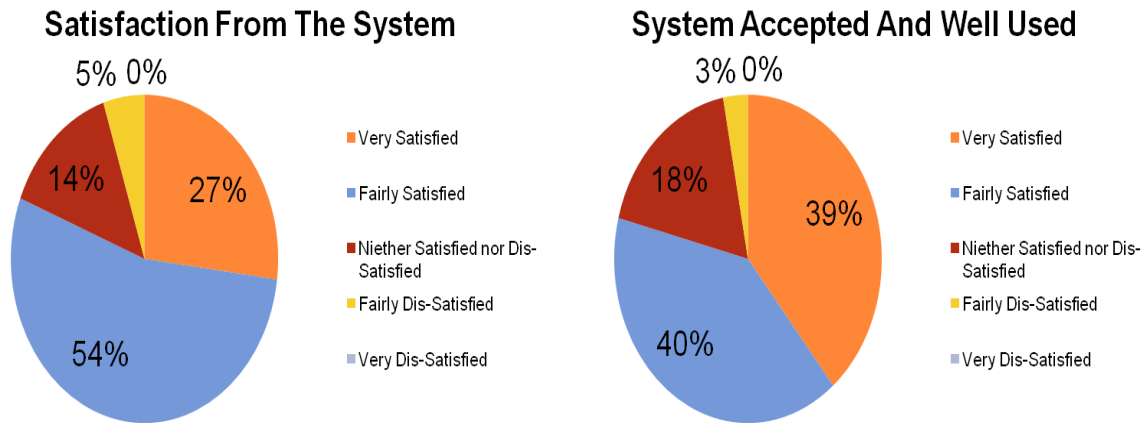The mean is 4.22 so that ERP Top/Middle Management and End User are very satisfied with the System Quality of ERP.

The information quality and the system quality of any information system are very important. So as for the information quality of ERP system is, the top/middle and staff of the public sector organization of Pakistan are very satisfied because the accuracy that was being required ERP is providing that one. And as far the system quality is concerned the respondents are also very much satisfied with the system quality of the system. Thus the ERP users of public sector organizations of Pakistan are very satisfied with the information quality and the system quality of ERP system.

These are the two more important factors to access the system success of any information system. As ERP users of public sector organizations of Pakistan are very satisfied with these both factors so this can be concluded that the ERP system had remained very successful.

Satisfaction From The System

5% 0%

14%

27%

54%

- Very Satisfied
- Fairly Satisfied
- Niether Satisfied nor Dis-Satisfied
- Fairly Dis-Satisfied
- Very Dis-Satisfied

System Accepted And Well Used

3% 0%

18%

39%

40%

- Very Satisfied
- Fairly Satisfied
- Niether Satisfied nor Dis-Satisfied
- Fairly Dis-Satisfied
- Very Dis-Satisfied

The mean is 4.02 so that ERP Top/Middle Management and End User are very satisfied with the ERP.
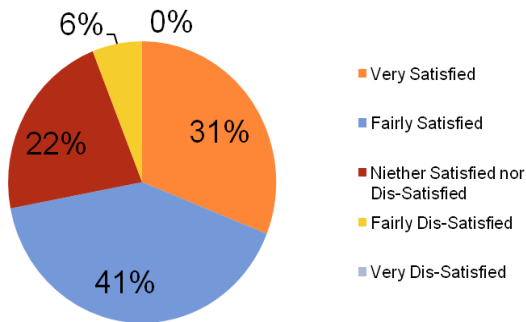
The mean is 4.13 so that ERP Top/Middle Management and End User are very satisfied with that ERP system is accepted and well used.

The other important factors to assess the system success of any information system are User satisfaction and the use of the system. As for the satisfaction of the user from the system is concerned the top/middle management and staff are very satisfied from ERP. And respondent are also very satisfied with that the ERP system has been well accepted and used.

So as for the system use and user satisfaction are concerned the ERP system in public sector organization of Pakistan had remained successful.

Information Quality, System Quality, User Satisfaction and System Use are very important factors of any information system to impact the overall efficiency of work processes and to impactthe individual and overall organization performance. As ERP users from top/middle management and staff of public sector organizations of Pakistan had remained satisfied with the system. So the deployment of ERP had impact on individual and overall organization performance.

It Had Improved Efficiency Of Processes

6%   0%
22%   31%
41%

- Very Satisfied
- Fairly Satisfied
- Niether Satisfied nor Dis-Satisfied
- Fairly Dis-Satisfied
- Very Dis-Satisfied

Impact On Individual Performance

5%   1%
19%   32%
43%

- Very Satisfied
- Fairly Satisfied
- Niether Satisfied nor Dis-Satisfied
- Fairly Dis-Satisfied
- Very Dis-Satisfied

The mean is 3.96 so that ERP Top/Middle Management and End User are satisfied with that ERP had improved efficiency of processes.
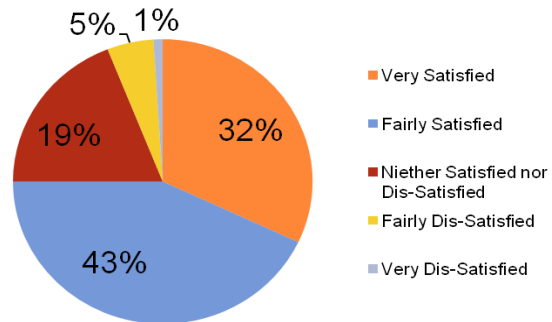
The mean is 3.99 so that ERP Top/Middle Management and End User are satisfied with that ERP had impacted the individual performance.

The top/middle management and staff/end user of ERP in public sector organization of Pakistan are very satisfied that ERP had improved the efficiency of the work processes of the organization.

Impact On Organization Performance

2%   1%
19%   36%
42%

- Very Satisfied
- Fairly Satisfied
- Niether Satisfied nor Dis-Satisfied
- Fairly Dis-Satisfied
- Very Dis-Satisfied
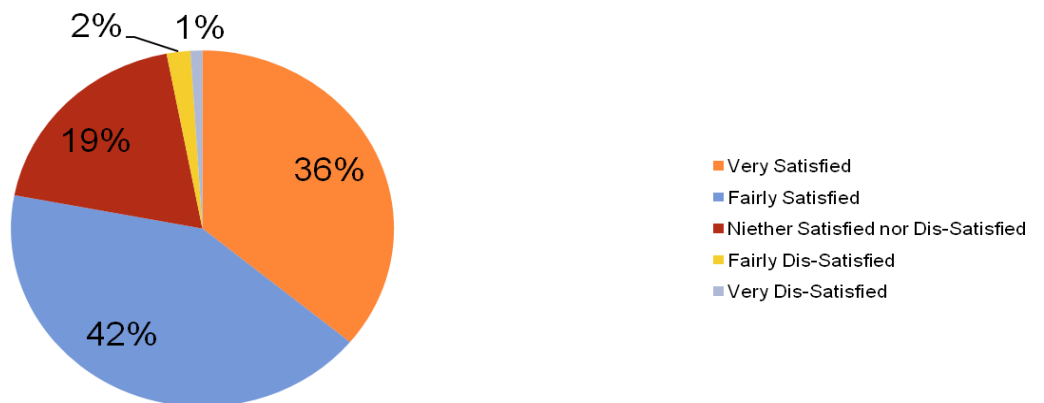
The mean is 4.08 so that ERP Top/Middle Management and End User are very satisfied with that ERP had impacted overall organizational performance.

ERP system had also impacted the overall organizational performance of the public sector organizations of Pakistan. Thus the ERP system had remained very successful in public sector organization of Pakistan. To furthermore assess the overall ERP impact on the organizations it was also investigated that what kind of tangible and intangible benefits, the public sector organization of Pakistan had experienced.

5.2.3 ERP Benefits Achieved by Public Sector Organization of Pakistan
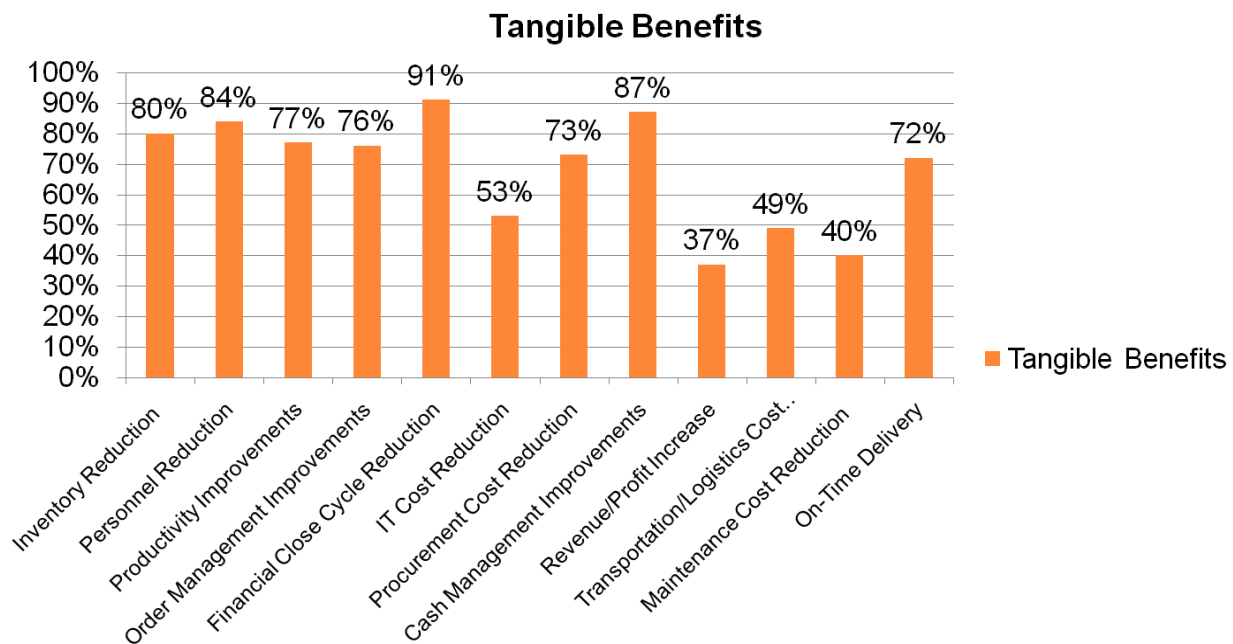
Tangible Benefits

Fig 5.7 ERP Tangible Benefits

Financial Close Cycle Reduction, Cash Management Improvements, Personnel Reduction, Inventory Reduction and Order Management Improvement are the tangible benefits which Public Sector Organizations in Pakistan have experienced.

Financial Cycle that was hardly to be closed after a year now by deployment of ERP the organizations are closing the financial cycle by 10th of every month and the reports are being submitted to the management.

Intangible Benefits
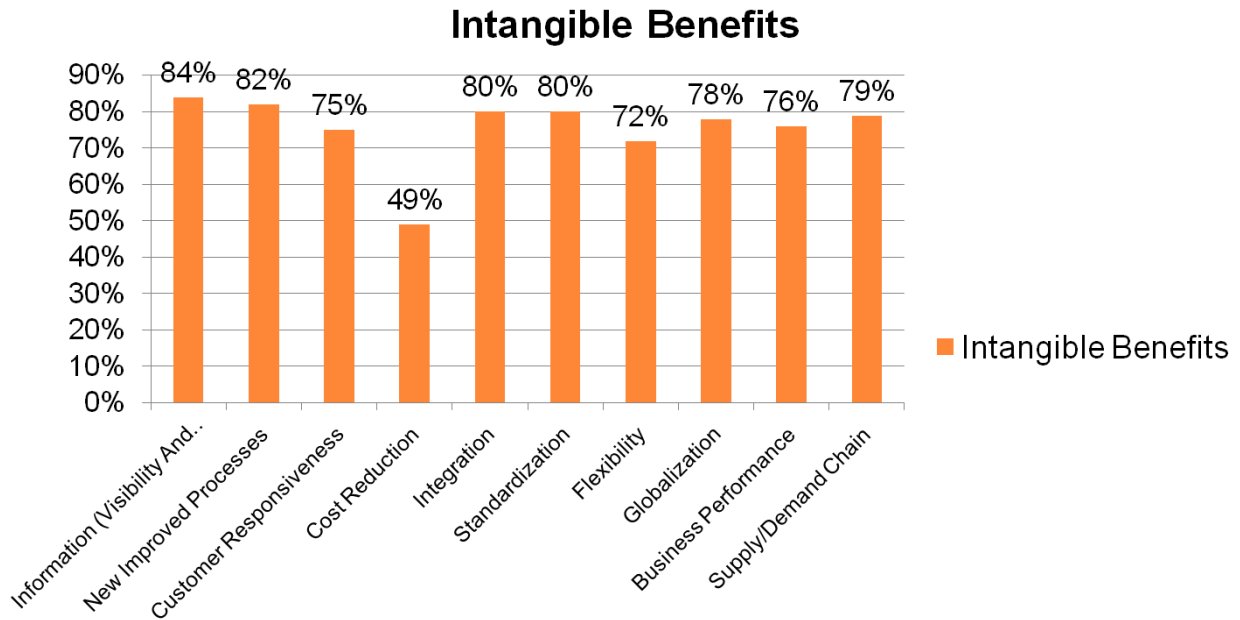
Fig 5.8 ERP Intangible Benefits

Except Cost Reduction all other intangible benefits the Public Sector Organizations in Pakistan have experienced.

Information Visibility had provided the organizations transparency and accuracy. The processes had been improved due to which the organizations have experienced customer responsiveness. The integration had provided the organizations fast and strategic decision making

Public sector organizations had also experienced standardization of the processes. So now the processes are being carried in the organizations as they should be to provide maximum work efficiency.

It can be concluded that ERP had provided many of the tangible and intangible benefits to enhance the performance of the organization. Thus ERP had also impacted overall organizational performance.

5.2.4 ERP Deployment Problems of Public Sector Organization of Pakistan

Challenges To Deploy ERP
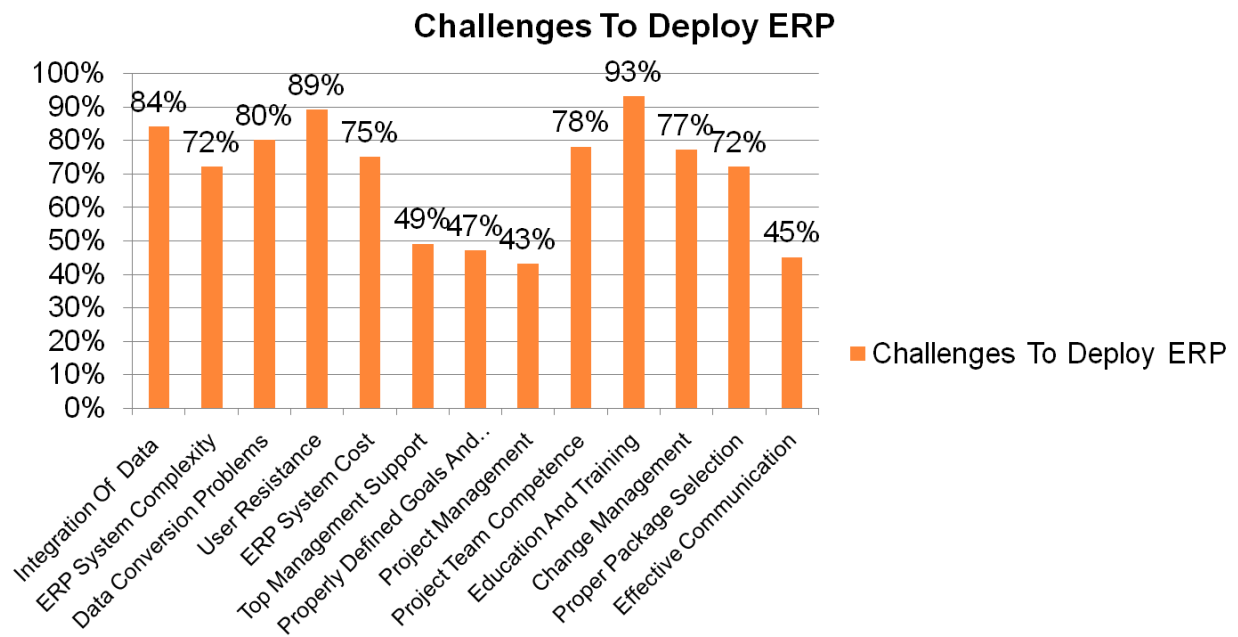
Fig 5.9 Challenges to Deploy ERP

Education and Training, User Resistance, Integration of Data, Data conversion Problems and Change Management are the   challenges which public sector organization had faced to deploy ERP.

However the organizations had experienced many benefits by deploying ERP but these benefits can only be achieved by successfully addressing the problems which these organizations had also faced.

Education and training is most important problem which public sector organizations had to face. Because ERP was a new system that had changed the work processes. So it was very much needed that employees should be educated about the new system and they should be provided the training also.

User Resistance is also another problem which public sector organizations had faced that there was also resistance from users for deployment of ERP.

Chapter 6

Recommendations

Finance department is the most dis-satisfied department, however there is also dis-satisfaction in sub-sections of Administration and Engineering department.

The issues that have caused dis-satisfaction are real time access of information, dispersed data, slow decision making and accuracy.All departments have need to automate their processes.

Process Improvement, Common Platform, Data Visibility and strategic Decision Making are most common motivations of public sector organizations to deploy ERP.

ERP Top/Middle Management and End User in Public Sector Organizations are very satisfied with the System as for the IS Success Model (Delone and Mcleane, 1992) is concerned.

Public Sector Organizations have experienced both tangible and intangible benefits by deploying ERP over the legacy system.

Financial Close Cycle Reduction, Cash Management Improvements, Personnel Reduction, Inventory Reduction, Productivity Improvements, Order Management Improvements, Procurements Cost Reduction and On Time Delivery are the benefits which Public Sector Organizations in Pakistan have experienced.

Education and Training, User Resistance, Integration of Data, Data conversion Problems, Project Team Competence, Change Management, ERP System Complexity and Proper Package Selection are the challenges which public sector organization had faced to deploy ERP.

Based on the analysis and result of survey, possible recommendations has been developed. The recommendations are:

- ➢ ERP should be deployed in Pakistan Broadcasting Corporation toaddress the issues of the current legacy system.

- ➢ ERP modules to deploy:

  - • ERP Financial complete.

  - • ERP HRM.

  - • ERP Operation.

- ➢ ERP should be deployed in modular approach starting with ERP financial.

- ➢ Top Management support should be there for deployment of ERP.

- ➢ Proper data conversion should be carried out.

- ➢ Education and Training of ERP should be effectively managed for successful deployment of ERP.

- ➢ Change Management is also an issue for successful deployment of ERP , so it should also be well addressed.

- ➢ User Resistance is very important challenge for successful deployment of ERP , so it should be well addressed to reap benefits of ERP..

- ➢ Following possible outcomes are expected by deploying ERP in PBC:

  - • Information (Visibility and Transparency).

  - • New Improved Processes.

  - • Integration.

  - • Standardization.

  - • Financial Close Cycle Reduction.

  - • Cash Management Improvements

- Personnel Reduction

- Inventory Reduction

- Procurements Cost Reduction

- On Time Delivery.
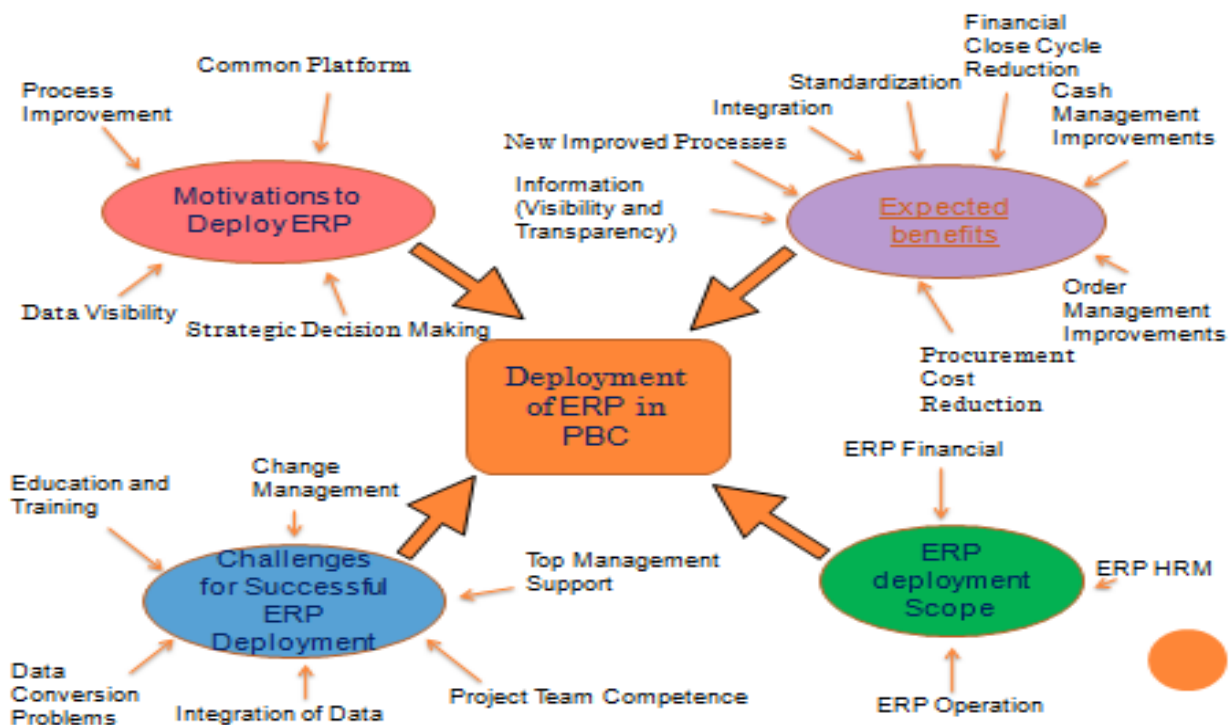
Chapter 7

Conclusion

Fig 7.1 Deployment of ERP in Pakistan Broadcasting Corporation

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Appendix:

Appendix A: Reason and source for Questions in Questionnaire:

Analyzing existing system processes

Source	Reason	Question
(Somers & Nelson) 2001	Clear and Measureable Objectives	1.How much you are satisfied from the existing processes of departments in your organization.
(Jeffer K, Startman , AledaV.Rooth) 2000	Information Technology skills	3.Did your organization have computer-based information systems for interactions and communication or using paper-based legacy system? 4. What is your competency level of using computer-based information system? 5. If adequate trainings are conducted to use computer-based information system then can you come up your deficiencies of using computer-based information system?

Performance Evaluation and Challenges/Issues

Source	Reason	Question
	Implementation Measures	
(Grabski and Leech)2007	Implementation Approach	4. Did your organization have computer-based information systems before ERP deployment? ☐ Yes ☐ No 5. Which ERP System is being deployed in your organization? ☐ SAP ☐ Oracle ☐ PeopleSoft ☐ Baan ☐ Other Specify_____ 6. ERP Modules currently deployed in your organization. (Check that apply) ☐ All ERP modules ☐ Financial Accounting ☐ Inventory Management ☐ Human Resource Management ☐ Payroll ☐ Other Specify_____ 7. Which Module was implemented first by your organization? ☐ All ERP modules ☐ Financial Accounting ☐ Inventory Management ☐ Human Resource Management ☐ Payroll ☐ Other Specify_____ 8. Which ERP implementation Approach was adopted by your organization. ☐ Single ERP package ☐ Best of different ERP packages.
(Shehab et al.) 2004 and (Nicolaou) 2004	Implementation Strategy	9. Which go-live strategy was adopted? ☐ Big-Bang ☐ Partial Big-Bang ☐ Modular approach 10. To what extent customization of ERP

84

		System made in your organization.
		☐ Minor ☐ Major ☐ Modular approach 11. Which ERP module required more customization in your organization? ☐ All ERP modules ☐ Financial Accounting ☐ Inventory Management ☐ Human Resource Management ☐ Payroll ☐ Other Specify_____
• (Al-Mashari et al. 2003) • - • - • - • Yusuf et al. 2004	**Success Criteria**	• ERP solution has come up to the general expectations • On Time • Within Budget • It had improved Efficiency of processes • System Accepted and well used
IS Success Model (Delone and Mcleane, 1992)	System Success to impact individual and organizational Performance	• Information Quality • System Quality • Use • Satisfaction from the system • Impact on Individual performance • Impact on Organization Performance
Motivations for ERP (Ross and Vital) 2000	Motivation Factors for ERP implementation	Common Platform Operational cost Reduction Data Visibility Strategic Decision Making Process Improvement

Appendix B: (Questionnaire) Analysis of the satisfaction level of the existing system

1.Organization Name: _____

2.Department: _____ Sub-section_____

3.CurrentPosition (Designation) _____

4. What is total number of employees working in your department?

_____

5. Did your organization have computer-based information systems for interactions and communication or using paper-based legacysystem?

☐ Computer-based information system
☐ Paper-based legacy system

6. What is your competency level of using computer-based information system?

☐ Excellent
☐ Good
☐ Average
☐ Poor

7. If adequate trainings are conducted to use computer-based information system then can you come up your deficiencies of using computer-based information system?

☐ Yes
☐ No

8. How much you are satisfied from the existing processes of departments in your organization.

Administration Department:

Processes	Excellent	Good	Average	Poor	Very Poor
Transparency in Recruitment					
Employees Service Record (Keeping employees personal information up-to-date)					
Fair Performance Evaluation					
Fair Legal Actions					
Employees Facility					

Finance Department:

Processes	Excellent	Good	Average	Poor	Very Poor
Budget Estimation and Release System					
PayrollSystem					
Purchase order Processing					
Transparency in Accounts Receivable					
Transparency in Accounts Payable					
Audit System					

Engineering Department:

Processes	Excellent	Good	Average	Poor	Very Poor
Operations Management System					
Project Management System					
Transparency in Procurements					
Stores and Inventory Management					

9. How much you agree or disagree with the below listed issues in your department.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Paper-Based Processes					
Discrete Information					
Dispersed Data					
Slow Decision Making					
Accuracy					
Reliability					
Transparency					

10. How much you agree or disagree with the below listed statements about your department.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Usage of IT					
Satisfied from the existing processes of the department					
Department is Equipped with up-to-date IT Infrastructure					
Need to Automate the processes of Department					

Appendix C: (Questionnaire) Performance Evaluation and Challenges

Organization Name: _____

Department: _____ Sub-section_____

Current Position (Designation) _____

Implementation Measures

1. Did your organization have computer-based information systems before ERP deployment?

   ☐ Yes
   ☐ No

2. Which ERP System is being deployed in your organization?

   ☐ SAP
   ☐ Oracle
   ☐ PeopleSoft
   ☐ Baan
   ☐ Other Specify_____

3. ERP Modules currently deployed in your organization. (Check that apply)

   ☐ All ERP modules
   ☐ Financial Accounting
   ☐ Inventory Management
   ☐ Human Resource Management
   ☐ Payroll
   ☐ Other Specify_____

4. Which Module was implemented first by your organization?

- ☐ All ERP modules
- ☐ Financial Accounting
- ☐ Inventory Management
- ☐ Human Resource Management
- ☐ Payroll
- ☐ Other Specify_____

5. Which ERP implementation Approach was adopted by your organization.

- ☐ Single ERP Package
- ☐ Best Of Different ERP Packages.

6. Which go-live strategy was adopted?

- ☐ Big-Bang
- ☐ Partial Big-Bang
- ☐ Modular Approach

7. To what extent customization of ERP System made in your organization.

- ☐ Minor
- ☐ Major

8. Which ERP module required more customization in your organization?

- ☐ All ERP modules
- ☐ Financial Accounting
- ☐ Inventory Management
- ☐ Human Resource Management
- ☐ Payroll
- ☐ Other Specify_____

Challenges

9. How much you agree or disagree from below listed issues/challenges that your organization had to face for ERP implementations.

Issues/challenges	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Integration Of Data					
ERP System Complexity					
Data Conversion Problems					
User Resistance					
ERP System Cost					
Top Management Support					
Properly Defined Goals And Objectives					
Project Management					
Project Team Competence					
Education And Training					
Change Management					
Proper Package Selection					
Effective Communication					

System Success Criteria

System Success to impact Individual/Organizational Performance

10. How much you are satisfied from the below listed key elements to measure that s

Factors	Very Satisfied	Fairly Satisfied	Nether Satisfied Nether Dissatisfied	Fairly Dissatisfied	Very Dissatisfied
Information Quality					
System Quality					
Satisfaction From The System					
It Had Improved Efficiency Of Processes					
System Accepted And Well Used					
Impact On Individual Performance					
Impact On Organization Performance					

Motivation Factors

11. What were motivation factors for deployment of ERP in your organization? How much you agree or disagree from below listed motivation factors.

Motivation Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Common Platform					
Operational Cost Reduction					
Data Visibility					
Customer Responsiveness					
Strategic Decision Making					
Process Improvement					

Benefits Achieved

12. What benefits your organization have achieved by deploying ERP. How much you agree or disagree with the below stated benefits.

Benefits	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Inventory Reduction					
Personnel Reduction					
Productivity Improvements					
Order Management Improvements					
Financial Close Cycle Reduction					
IT Cost Reduction					
Procurement Cost Reduction					
Cash Management Improvements					
Revenue/Profit Increase					
Transportation/Logistics Cost Reduction					
Maintenance Cost Reduction					
On-Time Delivery					
Information (Visibility And Transparency)					
New Improved Processes					
Customer Responsiveness					
Cost Reduction					
Integration					
Standardization					
Flexibility					
Globalization					
Y2K					
Business Performance					
Supply/Demand Chain					