

**MANAGING STAKEHOLDERS IN ENTERPRISE RESOURCE PLANNING
(ERP) CONTEXT –
A PROPOSED MODEL OF EFFECTIVE
IMPLEMENTATION**

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ABSTRACT

Managing Stakeholders in Enterprise Resource Planning (ERP) Context – A proposed Model of Effective Implementation

Key Words: ERP, Roles, Responsibilities, ROI, Model, Stakeholders, Sponsors, Post Implementation, Go-Live, Holistic, Implementation.

Organisations pursue Enterprise Resource Planning (ERP) systems to achieve improvements in their performance. However, the literature reports that organisations that implement ERP systems still suffer from a gap between the promised ERP benefits versus the actual realised benefits after the completion of the implementation

The literature review in this thesis examines the factors, which may prevent a newly-implemented ERP system from being successful. Prior research suggests several models to assist organisations in managing their ERP investments for the sake of leveraging business performance and hence retaining or enhancing competitive advantages. Each implementation model addresses ERP implementation from a single perspective such as generic, process management and training management. As long as stakeholders in ERP implementation are concerned, a review of the critical success factors (CSF) in ERP implementation shows a gap in the literature regarding the holistic view of what key stakeholders perceived as the CSF that results in implementation success. This leads to the assumption that stakeholders' views are not considered valuable, and as a result, they are receiving less attention of managing their roles and responsibilities. Throughout the thesis, -stakeholders management is addressed along two main dimensions; 1) the effect of ERP on stakeholders; 2) the different roles of senior managers, ERP managers, consultants, suppliers and customers on the effectiveness of the implementation.

The aim of this research is to establish a well-designed and holistic framework for ERP implementation, centred on the management of roles and responsibilities among stakeholders. The study is an exploratory investigation into the ERP implementation process. Therefore, the research design, involving qualitative methodology, covers: (1) the identification of ERP critical success factors commonly cited in the literature; (2) a review of the existing ERP implementation models; (3) using an in-depth case studies approach to understand how the roles and responsibilities among stakeholders being managed and how it can improve ERP ROI; and (4) reviewing Secondary data sourced from prior academic research studies, so that the findings from the cases investigated could be compared with the findings of this study, to provide triangulation and hence to enhance the validity of the findings.

A holistic model for effective management of roles and responsibilities among ERP stakeholders is built, along with a set guidelines and recommendations representing an integrated framework that is straightforward to understand and implement by ERP sponsors to increase the degree of the ERP implementation success.

The research findings explain clearly how effective management of roles and responsibilities can optimise return on ERP investment. It suggests three decisive points where ERP sponsors need to focus on how to define, review and amend roles and responsibilities to sustain ERP benefits which increase the long-term ERP investment.

Finally the study provides a foundation and proposals for further research and investigation.

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2. Al-Rashid, W., Alshawhi, M. and Al-Mashari, M., 2009. Exploring Enterprise Resource Planning (ERP) Implementation From Stakeholders Perspective: Analysis of Case Study. In Proceedings of The 4th European Conference On Intelligent Management System In Operations (IMSIO4), Greater Manchester, UK, 7-8 July 2009, pp.140-147.
3. Al-Rashid, W., Alshawhi, M. and Al-Mashari, M., 2012. Exploring Enterprise Resource Planning (ERP) Implementation From Stakeholder Perspective: A Case Study. In the 5th International Conference on Communications, Computers and Applications (MIC-CCA2012) Istanbul, Turkey, 12-14 July 2012, pp. 65-70.
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CHAPTER ONE

Introduction

1.1 Research Problem

Many of the world's leading companies consider Enterprise Resource Planning (ERP) as an essential information systems infrastructure to survive and prosper in the modern economy (Hawking *et al.*, 2004).

ERP systems, as defined by Beheshti (2006, p.184), are:

"a set of business applications or modules, which link various business units of an organisation, such as financial, accounting, manufacturing, and human resources, into a tightly integrated single system with a common platform".

The continuous development of ERP systems for businesses exemplifies a major innovation in IT over the past two decades (al-Mashari, 2003). ERP represents the fastest-growing sector of the business software industry, with ERPs offering an efficient and effective way of linking all business operations, including planning, manufacturing, sales, vendor relations, inventory control, human resources and accounting requirements and systems (Legare, 2002). As Legare (2002) comments, ERPs are, therefore, important for businesses in terms of the streamlining that they offer across many different business and operational areas and systems.

Despite widespread adoption of ERP only a minority of companies are able to reap the full benefits of ERP systems (Stewart, 2013). A survey by IDC (2008), for example, indicates that ERP implementation feedback is very low in terms of realising ERP benefits.

Such deficits in deriving the promised ERP benefits by organisations that implement ERP systems led researchers to identify a plethora of critical factors that can lead to successful ERP implementation from different perspectives.

A study by Nah *et al.* (2001) provides an example of the generic critical success factors (CSFs) perspective, in contrast to Ngai *et al.* (2008), who focus on the CSFs in a cross cultural context. Some studies attempt to examine critical success factors like the research by Momoh *et al.* (2010), whilst the change management perspective has also been used to propose CSFs models by researchers such as Francoise *et al.* (2009). Alternatively, some CSFs studies have centred on the training perspectives like the study by Kapp *et al.* (2001). A Process Change Management (PCM) for successful ERP implementation is suggested as an important perspective, according to a number of researchers notably including the study by al-Mashari *et al.* (2003)

Although the failure rates of ERP implementations have been widely publicised, this has not deterred companies from making huge investments in ERP systems (Ehie *et al.* 2005). Over the last four years, the rolling average of ERP cost as a percentage of revenue of survey respondents was 5.5% (Panorama, 2013, p. 15). Organisations continued to focus on ways to strategically leverage their ERP investment (Hawking *et al.*, 2004).

It is widely cited that developing countries face additional challenges in implementing ERP solutions. Al-Turki (2011: p. 403) stressed that those additional challenges are applicable for oil producing countries in the Middle East.

The ERP market in Saudi Arabia is expected to grow at a CAGR of about 18% to reach revenues of \$494.4 million by 2017 (CommsMEA, 2012).

In their study of ERP implementation in Saudi Arabia Al-Turki *et al.* (2003) found that Saudi Arabia is in a transient phase with regard to ERP implementation and a number of organisations are either implementing or planning to implement one of such systems.

Saudi Arabia's IT market, the biggest in the in the Gulf region valued at \$3.8 billion in 2011, is forecast to rise to \$5.7 billion by 2016, Business Monitor International said in its "Saudi Arabia Information Technology Report Q1 2012" (Saudi Gazette, 2013).

This means that the scale of this problem was considered likely to increase as the ERP market in general and in Saudi Arabia in particular showed dramatic growth and organisations were increasingly requiring support in order to maximise their organisational benefits as a consequence of ERP implementation.

The literature indicates two critical elements to ERP success, 1) the role of top management; and 2) the definition of roles and responsibilities.

Albert (2006), using a case study of a large organisation with 3 major divisions showed how changing role definitions (esp. of the Board - project sponsor) and lack of stakeholder responsibility agreements led to deviation from initial project goals with major conflicts by three stakeholder groups with their own interests, leading to 3 separate ERP projects in various stages of implementation.

The findings outlined above lead to the following conclusions, 1) organisations that implement ERP systems still suffer from a gap between the promised ERP benefits versus the actual realised benefits after the completion of the implementation., 2) there is a gap in defining roles and responsibilities in an ERP implementation context, and 3) the role of the ERP sponsor in driving implementation to success is crucial.

In this context, good governance structures for change management and effective communication, and a clear definition of the roles and responsibilities of all stakeholders by the top management become crucial in deciding ERP project success (Boyer, 2001; Wang and Chen, 2006).

These findings suggest that strengthening the management of the roles and responsibilities among ERP stakeholders is expected to derive implementation success.

The inference was that there remained significant opportunity to introduce a new CSF(s) model, which would assist ERP sponsors to improve the return from ERP investment. This model is centred on the management of the roles and responsibilities among ERP stakeholders.

The research problem was therefore clarified as;

Organisations investing in Enterprise Resource Planning (ERP) systems in Saudi Arabia continue to suffer from the gap between promised ERP benefits versus the actual realised benefits after the completion of the implementation,

as a direct consequence of the poor understanding and management of the roles and responsibilities of various stakeholders.

The researcher studied a variety of highly regarded texts on research methodology in order to find the appropriate approaches to the research, which would enable the objectives to be met (Mouton and Marais, 1993).

1.2 Aims and Objectives

The aim of this research project is, therefore, to establish a well-designed and holistic model for ERP implementation in Saudi Arabia. The model is centred on the management of roles and responsibilities among its stakeholders and it is intended to be used primarily by ERP sponsors.

Examples of such ERP sponsors are Chief Executive Officers (CEOs), General Managers (GMs) or Chief Information Officers (CIOs) who are normally responsible for the decision to adopt ERP. In effect, they are accountable for ensuring that it achieves the highest possible ERP implementation benefits. The model is intended to be easy to understand and implement, and to equip organisational ERP decision makers to enhance their management of ERP stakeholders. This is expected to facilitate the achievement of maximum success from the ERP implementation.

The holistic nature of the framework would ensure that the ERP implementation is perceived as an on-going and long-term initiative beyond the 'go live' stage.

Specifically, this thesis is concerned with the achievement of the following objectives:

- To explain how roles and responsibilities management interrelates with the targeted success from ERP investment
- To identify, wherever possible, specific areas in which business benefits can be obtained throughout the implementation process
- To demonstrate milestones where roles and responsibilities must be defined or amended during ERP implementation phases

- To demonstrate how roles and responsibilities management interacts with other key elements of the success of ERP implementation, such as the management of training, business processes, technical aspects and conflict.
- To develop a model of successful stakeholder management in ERP implementation.

1.3 Significance of the Study

The significance of the study results from a number of reasons. Firstly the study focuses on the roles and responsibilities among stakeholders. The close linkage between the successes of the introduction of a new information system is specifically linked to the role of stakeholders within the organisation by Madhani (2012) who attributes the success of the implementation to the extent to which the new system is accessible to the people working within the organisation. Research conducted by Arlbjorn and Haug (2010) suggests that the key reason for the failure of ERP implementations is due to the fact that the methods which are used to manage the human issues that arise in relation to the ERP implementation are ineffective. Secondly, the study adopts a holistic view of the implementation. That the majority of failures that have occurred in the field of ERP in the past are due to the fact that the process of implementation has focused solely on isolated parts of the organisation (Murphy et al., 2012). The implementation of a new ERP system can result in significant changes to the management processes, culture and structure of an organisation and the success of the implementation of a system therefore requires a holistic view of such changes to be adopted (Madhani , 2012). In such cases, an insufficient amount of attention has been dedicated to managing the effects that the new ERP system is likely to have on the culture of the organisation, which has given rise to recommendations that a more cohesive and more comprehensive approach should be adopted, which acknowledges and manages the changes that the ERP system has on the entire range of stakeholders which exist within the organisation.

Finally, the framework this study aims to produce is tailored to the needs of ERP sponsors in Saudi Arabia. Esteves and Pastor (2002), through a literature review and web survey identified the project sponsor (in a project champion role) as a critical success factor in ERP projects.

Top management support is vital in ensuring ERP project success (Ngai et al, 2008; Ike and Mogens, 2005; Davenport, 1998).

This research aims to fill the research gap regarding the management of roles and responsibilities among stakeholders in increasing ERP success. In doing so, it will address various elements that can build a road map for ERP sponsors to achieve this mission.

1.3.1 Significance to Practitioner

The primary beneficiaries of this research are ERP sponsors who are responsible for maximising the organisational benefits implementation.

Ike and Mogens (2005) in their survey study of 36 companies with ERP systems found that two-thirds of ERP projects were initiated by top management and that project management principles and top management support explained nearly 30% of the variances that impact ERP implementation success.

Clear delineation of responsibilities of the two top management groups (Board of Directors and CEOs/Executives) in Saudi Arabia will ensure a cohesive “top management” team to provide fully integrated support to the ERP system implementation project (Fitz-Gerard and Carroll, 2003).

This study will be of great help in assisting ERP sponsors in Saudi Arabia to choose appropriate approaches to derive the promised ERP benefits. The study will enable the practitioners to view ERP from two angles; 1) the targeted ERP implementation benefits, and 2) the return on ERP investments. Through its holistic focus, the targeted framework assists practitioners in the development of a longer view of ERP implementation. In other words, ERP is not necessarily confined to a single and large project where its benefits are constrained by the state of the go-live stage. In fact, the go-live stage may be regarded as the end of the beginning rather than the beginning of the end (Deloitte, 1999).

The study also assists ERP sponsors in Saudi Arabia in structuring the project management team to prevent and resolve conflicts once they arise. Wang and Chen

(2006: p. 1056) also stated that visible top management support should be critical for inter-unit conflict resolution during the ERP implementation process.

Finally, through the focus on roles and responsibilities, this study aims to assist practitioners to plan more effectively for necessary ERP resources. Planning for resources can be managed through external and internal hiring or through development and training programs for in-house resources. This is even more crucial as any ERP project team is a cross-functional one and companies often cannot find the resources to let all ERP project team members work solely on the ERP implementation alone; many individuals work on multiple projects at the same time (Ike and Mogens, 2005). This will make it more difficult to clearly allocate duties.

1.3.2 Significance to Researcher

Prior research report gaps have been identified in two areas; 1) deriving promised ERP benefits (IDC, 2008; Panorama, 2013), and 2) the lack of understanding regarding the significance of effective roles and responsibilities management among stakeholders and its importance in producing results (Burns, 2011; Garg & Garg, 2013). This study aims to contribute by addressing the way in which effective management of roles and responsibilities may increase the business benefits from ERP.

It attempts to unify and integrate different schools of thought regarding existing critical success factor models into a new integrative perspective. These schools of thought typically gather around existing CSFs models, which this study aims to build on by introducing a perspective on the management of roles and responsibilities.

It will clarify how roles and responsibilities among stakeholders can be effectively managed during the implementation process. This includes the definition of factors that are closely related to the management of roles and responsibilities.

In other words, introducing the management of roles and responsibilities can act as an enabling tool to leverage the value from the various CSF models suggested by the different perspectives.

For example, it has been widely suggested that senior management support is a critical factor for the success of ERP implementation (Nah *et al.*, 2001; Holland & Light, 1999; Somers & Nelson, 2001; Umble *et al.*, 2003). This study elaborates further on how ERP sponsors can best dedicate and demonstrate their support and commitment in further detail. In effect, top management can therefore successfully follow the recommendations suggested to them by the various CSFs to achieve ERP success.

The final conclusions of the study are presented in the form of a holistic ERP implementation model using the perspective of roles and responsibilities management among stakeholders. The research findings of this study pave the way for further cumulative and positive research areas.

1.4 Overview of Research Framework

As described earlier, the primary objective of this study is to establish a holistic model to be used by ERP sponsors to derive optimal return on ERP investment. This model is centred on the management of roles and responsibilities among ERP stakeholders. Considering the building of such a model entails a study of organisations that have experienced ERP Implementation.

As a result, the purpose of this research is exploratory, as it considers ERP implementation from a stakeholder perspective. The relative paucity of available data and previous studies in the field of stakeholder's management in the context of ERP implementation in Saudi Arabia demanded a particular research philosophy and approach to data collection. The use of case studies can permit the researcher to conduct an in-depth analysis in a genuine 'real life' context, drawing on multiple data sources across each organisation. It aims to investigate how roles and responsibilities are being managed in organisations. Issues of interest to the case studies are related to the operationalisation of key elements of ERP implementation in real organisational settings.

The study will examine the management of roles and responsibilities among ERP stakeholders in four organisations in Saudi Arabia. The diversity of the chosen organisations ensures that different types of ERP implementation can be covered.

By focusing on four specific cases that exhibited significant common factors in addition to profound differences, the data to be gleaned from interviews to be maximised in scope and so will permit a greater degree of generalisation necessary for the formulation of a potential model.

It is intended to obtain a deeper understanding of the impact of the management of roles and responsibilities on implementation outcomes. It will do so by examining how critical ERP factors suggested by prior research may influence implementation results and improve the return on ERP investment.

Due to the holistic nature and of this study, and the fact that ERP sponsors are top executives who have challenging priorities, their dedication to ERP in terms of

investment of time should be kept to the minimum. For those reasons, an approach with three implementation phases has been chosen to structure the data collection and analysis. This approach of dividing ERP implementation into three phases is supported by the work of Parr and Shanks (2000), which includes only three phases of planning, project and enhancement, and that of Shao *et al.* (2009), which has primary adoption, secondary adoption and assimilation.

The three implementation phases are used as a guide to gather the related data from each implementation stage.

The study by Finney and Corbett (2007) forms a useful starting point for setting the agenda for the interview questions. Besides its stated intention to find the CSFs, it has identified gaps in the CSFs literature. These factors were then divided into two main sections; strategic and tactical (Finney and Corbett, 2007: p. 331). The basis for the interview discussions were then derived from the 26 factors suggested by the study. The list provided guidance for the development of the necessary interview questions, by providing factors around which the questions could focus.

The use of secondary data that include empirical surveys and published case studies takes place after the completion of the process of data collection. The role of the secondary data is to assist in enriching the analysis and to externally validating the primary data. The proposed model is produced after a comprehensive discussion and interpretation of data. The model is centred on the effective management of roles and responsibilities among ERP stakeholders.

Figure 1.1 displays the conceptual framework that illustrates the concepts and relationships analysed that guide this study. These concepts were derived from the literature review concerning the critical success factors of ERP implementation. The operationalisation of the conceptual framework was accomplished by developing interview questions and conducting a comprehensive analysis of the captured data.

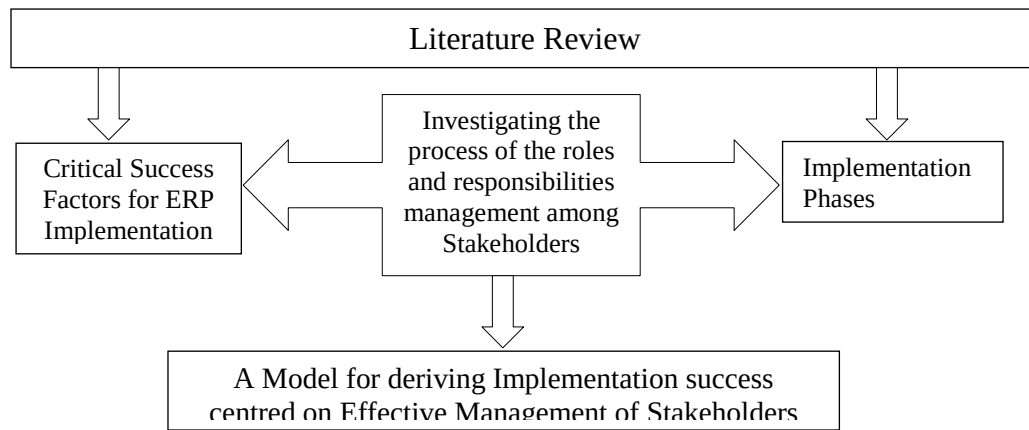


Fig 1.1 Research Framework

1.5 Organisation of Thesis

This research thesis is divided into eight chapters. The first chapter is an introduction to the thesis and organisation of chapters. It highlights the research problem followed by a brief description that defines the research aims and objectives. It also highlights the importance of the study and provides a brief overview of the research methodology and the contribution of the research.

The literature review is the logical starting point of such academic research projects; therefore a comprehensive assessment of all related issues to the research topic is crucial to assure solid and accepted outcomes by research communities. On that basis, all relevant literature was surveyed in order to gain a) a full understanding of background issues related to ERP definitions and benefits, b) ERP implementation failures and existing ERP CSF(s) models, and c) the identification of ERP stakeholders and their roles and responsibilities in the implementation. This forms the main content of Chapters Two and Three. Chapter Two includes an introduction to theories associated with existing ERP implementation models. Chapter Three focuses on the roles and responsibilities of various stakeholders in an ERP implementation context.

A number of different sources have been consulted as part of the literature review. These sources include, but are not limited to, academic papers published in refereed journals, conference proceedings papers and academic books. Business communities' feedback represents a valuable source especially independent consulting firms' statistics, market research and reviews that relate to the research themes.

Chapter Four describes the reasons for selected methods of data collection and analysis. The use of case studies as part of this research aims to investigate how stakeholders are attracted, involved and interrelated, and how they participate and contribute to either the success or the failure of the implementation. Issues of interest to the case studies are related to the operationalisation of key elements of ERP implementation, from a stakeholder perspective, in real organisational settings. It is the role of the case studies to explore various elements including how these factors relate to maximising business benefits from ERP implementation. Those elements are extracted from the critical factors that prior research found to be significant to implementation success.

This involves a study of ERP evolution drivers within organisations, either internally or externally, ERP strategies, stakeholder identification, implementation approach and the details of implementation plans and results. A greater focus will be placed on the soft elements that include human aspects, structural and cultural changes. These elements, and many others, will be scrutinised in the context of ERP implementation. In this study, organisations selected as case studies were intentionally chosen to permit different issues surrounding ERP implementation to be explored. As data richness was an aim of this study, it was considered of interest to study both success and failure experiences. This provides explanations of how certain elements of ERP implementation in the context of the management of stakeholders' roles and responsibilities can contribute to the success or otherwise of the efforts. To have such insights, it is necessary that the organisations selected agree to share the details of their ERP implementation related matters and allow the researcher to have access to documented data that might support the study. Research interviews with relevant personnel at different levels of the organisation are also essential.

The selected organisations for case studies must fulfil certain criteria. 1) The selected ERP product must be one of the top 10 ERP packages (based on world class consulting ERP indices, such as Gartner, Meta); 2) a minimum of three core ERP modules must be implemented; 3) the 'go-live' stage should have been reached for at least three modules. 4) two years must have passed since the 'go-live' stage and 5) ERP remained as the main business application system.

Different perspectives have been considered in selecting the organisations for the case studies to ensure diversity. Firstly, the nature of the business was important, and the studies selected included project manufacturing, discrete manufacturing and retail, a mixture of contracting, retail and manufacturing and services and utilities. Secondly, the ownership varied from a limited liability company, to holding company (shares traded publicly), family business and government ownership. Thirdly, in terms of size, three organisations are classified as large corporations but a fourth one is classified as medium to large. Fourthly, three organisations implemented one of the top two ranked ERP software packages while the fourth implemented one that ranked in the top ten. Fifthly, from a cultural perspective one of the companies was heavily influenced by western business culture, whereas three others had only experience of local culture.

Chapters Five and Six present a description of the four cases that highlight the most relevant elements to the research theme. This includes a complete review of how ERP evolved in the organisation throughout the selection and implementation process. The description is also extended to cover as many related activities that emerged during this stage as possible. Through this presentation of the full description of the cases a strong basis is prepared to support the analysis stage.

The analysis of the case studies addresses the preliminary findings of the cases investigated and key lessons learned. This is conducted via a number of sources used to inform the case studies. After collecting data, analysis of the transcription of interviews was undertaken. All data taken from interviews, observations and document assessment will be consolidated and linked together to create a holistic and comprehensive picture of the entire process of ERP implementation from the roles and responsibilities management perspective. The analysis will focus on distilling factors of success and failure in each case study in the context of the management of roles and responsibilities among stakeholders. The comparative analysis of the four cases is represented by the second part of Chapter Six.

Case studies data will, therefore, be analysed in further detail through the large quantity of secondary data that includes published surveys and case studies from ERP literature. This is to provide more explanation, and facilitate comparison and analysis

for the success and failure elements in the stakeholder context. They would also enable further analysis and discussion of the qualitative findings. Chapter Seven provides a comparative analysis between the selected cases and validating surveys and studies derived from the secondary literature. A proposed framework can gradually be assembled as a result of the analysis of the case studies before it is further refined and shaped, and finally presented as the proposed framework in the second part of Chapter Seven. Final conclusions, limitations of the research and recommendations for further study directions are addressed in Chapter Eight.

CHAPTER TWO

CSF(s) Models

2.1 Introduction

The considerable investment that organisations devote, in an effort to leverage business performance and hence retain or enhance competitive advantage, very often fails to meet their expectations (Lau *et al.* 2001).

Teittinen *et al.* (2013) discusses the fact that ERP systems have changed, forever, the way in which business data is collected and the ways in which data is stored, shared and used across a company. ERP have made companies more efficient and more informed as to the state of affairs within the company. The implementation of ERPs, therefore, has drastically improved the ways of doing business and the potential that businesses have for success, given the unique information and perspectives that ERPs can afford to companies. This is not to say that ERPs are only positive. They are not – ERPs have many challenges and problems, which will be discussed in later sections of this Chapter.

This chapter of the Literature Review is divided into two parts, 1) literature review of a number of ERP issues, and 2) a review of existing models of ERP critical success factors.

The first part starts by defining ERP, its benefits and drawing up a list of obstacles that hinder its success. It also highlights the issue of measuring ERP success, with a discussion and analysis of its failure.

The second part of the chapter reviews the existing CSFs models that can assist organisations to leverage ERP benefits. Each model represents a different perspective of (on)ERP implementation.

2.2 Literature review of ERP issues

Al-Mashari (2003) discusses how the continuing, and continuous, development of enterprise resource planning (ERP) systems for businesses has been one of the major innovations in IT in the last few decades. The benefits of ERP are that it allows the integration and streamlining of business processes and the associated workflow and information flows, meaning that businesses can become more efficient as a result of the ERP being implemented in their day-to-day business (Al-Mashari, 2003). The fact that the ERP technology can integrate with advanced mobile and e-commerce technologies is appealing to companies as it can allow them to offer customers what they want, via the modes they want to use to shop, whilst still enabling the business to have complete control of their accounting systems. Legare (2002) discusses how ERP systems represent the fastest-growing sector of the business software industry, with ERPs offering an efficient and effective way of linking all business operations, such as planning, manufacturing, sales, vendor relations, inventory control, human resources and all the accounting needs and systems (Legare, 2002). As Legare (2002) notes, ERPs are, therefore, important for business in terms of the streamlining that they offer across many different business and operational areas and systems.

2.2.1 Implementation Phases

Peslak et al (2008) refer extensively to the work of Boudreau & Robey in suggesting the importance of a phased approach to implementation of ERP, in order to ensure success of the latter. They highlight that if the system is not implemented in a systematic and phased fashion, then there is a significant risk of stakeholders simply ‘working around the system’, so that the project is doomed to ending up as 'costly duplication'.

Peslak et al draw parallels between the structured phased approach to ERP implementation and systems development theory. Such theory evokes the concept of lifecycle and ‘stages’ in dramatising the evolution of information systems. Traditional systems development theory models include: i) the waterfall model ii) the incremental model iii) Rapid Application Development (RAD) and iv) spiral model. Newer systems development approaches address ‘component based development, agile development and the unified process for object oriented software development’ These approaches tend to reduce the number of developmental stages. All of the approaches de-emphasise the implementation and post-implementation stage.

In the context of ERP implementation, there are different views on the number of stages of implementing ERP which vary between three to six phases.

Tsaia et al (2010) refer to three 'implementing guidelines' which correspond to three different models of implementation.

a) SAP provides the implementing guide 'ASAP', which identifies 5 stages of implementation: i) project preparation phase ii) business blueprint phase iii) realisation phase iv) final preparation phase v) 'go live' and support phase.

b) Oracle provides the implementing guideline AIM, which provides 6 implementing stages: i) definitions ii) operations analysis iii) solutions design iv) build v) transition vi) production.

c) Cooper & Zumd (1990) identify a 6 stage model of implementation which is identical to the Six Stage Implementation model discussed by Peslak (2008): i) initiation ii) adoption iii) adaptation iv) acceptance v) routinization and vi) infusion.

d) Tsaia (2010) opt in their own study for a four stage implementation model based on Markus and Tannis (2000): i) charter ii) project iii) shakedown iv) onward and upward.

The approach of choosing the three stages is supported by the work of Parr and Shanks (2000), which includes only three phases of planning, project and enhancement, and that of Shao et al. (2009) that has primary adoption, secondary adoption and assimilation.

In his research, Tsai et al (2012) elaborate upon the ASAP (Accelerated SAP) five phase model of implementation:

i) **project preparation phase:** this involves the establishment of project goals and scope, high level timelines, project charters, implementation strategy, the project team, office and equipment preparation, in addition to the arrangement of an induction meeting.

ii) **business blueprint phase:** this involves establishing a common understanding of how ERP will support the businesses objectives. At the end of the process a 'signoff' is required which signals a consensus amongst the project team on the scope of the project.

iii) **realization phase:** this involves the establishment of a 'baseline' configuration, which is subsequently tested and modified as necessary to ensure optimal functionality. A final configuration is produced as a result of the testing.

iv) **final preparation stage:** this involves ensuring the production system environment is optimal, completing all user training, resolving all critical open issues.

v) **go live and support phase:** new system is declared 'live' and starts to be used by stakeholders.

2.2.2 Impediments of ERP Success

However, this does not mean that ERPs are without their problems. As Stewart (2013) notes, despite the widespread adoption of ERP systems, it is a fact that only a minority of companies are able to reap the full benefits of the ERP system. Many companies, after having installed and implemented the suggested ERP, fail to gain the significant benefits that the ERP promises, however well their initial implementation process went (Stewart, 2013). Stewart (2013) looks at the factors that influence the performance of the ERP at this stage, with the research that was conducted looking at six Korean firms and their experiences of implementing and using an ERP system. This research found that there were six factors that were found to be influential in determining the success, or failure, of ERPs. These six factors included, support from top level management, the competency of the internal ERP team who handle the implementation and maintenance of the ERP, the level of training of users, the level of communication and collaboration across departments in the company, continuous process improvement and continuous systems integration and extension (Stewart, 2013). These factors were used to create a model that describes the critical success factors of the ERP following its implementation, with the model suggesting that there are two main factors that influence the ongoing success of an ERP, namely continuous improvement efforts and on-going organisational support (Stewart, 2013). Without these two basic success factors, the full range of benefits of the ERP cannot be realised.

2.2.3 ERP benefits

This section will provide an exploration of the various ERP benefits and the various models that have been developed to describe these benefits. The section will focus more on exploring the non-technical advantages of the ERP implementation, including increased in overall business efficiency through streamlining business processes via inventory control, for example. As Bingl et al. (1999) discuss, implementing an ERP system can set in motion a series of massive changes that need to be managed adequately, in order to ensure that the changes do not come too quickly and that, as a result, the changes are not rejected. There are several key issues that affect the benefits of the ERP that can be gained, including

commitment from top management, the re-engineering of existing processes, smooth integration of the ERP with other parts of the business, the selection of appropriate staff, including management, consultants and employees, and the training that is provided to employees in the use of the new ERP system (Bingl et al., 1999).

Lin (2010) discusses the fact that ERPs are usually developed, and implemented, in order to help businesses to manage and to integrate their business processes, across all of the functions of the business and across the various departments of the business. Yet, as Lin (2010) notes, despite the fact that ERPs are becoming widespread across the business world, there is little agreement, in the literature, as to what constitutes a recipe for successful ERP implementation. The research conducted by Lin (2010) was, therefore, intended to allow a better understanding of the factors that lead to the successful implementation of ERPs. It was found, following the research, that many factors influence the successful implementation of ERPs, including information and system quality, user perceptions of the ERP, and satisfaction with the ERP system. Top management opinions of the ERP system and its use are also highly influential on the successful implementation of ERP systems. On this basis, Lin (2010) noted that a model could be developed to describe the successful implementation of ERP systems, including several of the above-mentioned variables.

As Tsai et al. (2012) discuss, in their analysis of the link between performance and enterprise as a result of the implementation of an ERP, found that earnings management decreases as the ERP begins to perform better, with this leading to better earnings across the company as a whole following the implementation of an ERP. This is one major success for companies implementing ERP systems, in that they tend to see positive results following the implementation of the ERP. As Tsai et al. (2012) note, the DeLone and McLean model of information systems and their success can be applied to the implementation of ERPs, allowing the successful implementation of an ERP to be a key factor in the subsequent economic success of the company. It was found, following this modelling, that the relationship between the performance of the ERP and the earnings management of the company is dependent on the system quality following implementation, with the greater the quality of the implementation, the greater the earnings of the company (Tsai et al., 2012). This research shows, therefore, a clear link between the implementation of an ERP and the earnings of the company.

Hooshang and Beheman (2010) discuss the fact that measuring productivity is considered to be one of the main efficient utilisation of organisational resources, with productivity being measured in terms of the efficiency of the worker, or the organisations long term success and competitiveness. As Hooshang and Beheman (2010) note, however, the measurement of productivity in these terms can be harmful as it can corrode expectations of success and productivity in terms of operational productivity and performance productivity (Hooshang and Beheman, 2010). ERPs have enabled companies to focus more on the use of measures of many business characteristics to give a more holistic picture of productivity, this meaning that, aside from all the other positive aspects of ERPs, they can also be used to keep a check on productivity business-wide. As Hooshang and Beheman (2010) note, the ERP can be implemented as a way of reducing transaction costs but also as a way of improving, business wide, the productivity across the company, the levels of customer satisfaction and, as a result, profitability.

Sumner (2009) conducted an analysis of various ERP implementations, finding that it is possible to develop a grounded theory of EP-supported processes, as this can allow companies to find the correct fit between the ERP system they think they need and the actual needs of the company. As Sumner (2009) notes, alignment strategies that support the best practices as revealed in the case studies presented by Sumner (2009) note that several factors are influential in determining the success of an ERP, namely functional expertise, knowledge integration, liaison mechanisms, the governance of the project and the scope and integration of the ERP company wide. If any of these factors are lacking, then it is probable that the implementation of the ERP will fail, as this can mean that the ERP is not supported as much as it could be, within the organisation, this meaning that the ERP is not as successful as it could be. The success of an ERP is, therefore, highly dependent on various factors.

Kanellou and Spathis (2013) discuss how, over the past decade or so, ERPs have been adopted as a way of allowing better and more streamlined approaches to business. The research, however, has not looked in any detail about how accounting systems benefit from ERPs. Kanellou and Spathis (2013) look, therefore, at the advantages and disadvantages of ERP systems for accounting, with the research exploring, specifically, the impact that an ERP system can have on accounting information and accounting practice. It was found, following the research, that there were differences in the perceptions of the ERP system by accountants

and IT professionals, and that there are, despite these differences, a number of highly relevant accounting benefit that result from the implementation of ERP systems. These benefits include streamlined of processes, increasing efficiency, and lower costs associated with accounting, meaning that the accounting is more efficient and more cost effective. The overall benefits of the ERP system for accounting are, therefore, numerous and ensure that the efforts required to install and implement an ERP system is worth it.

2.2.4 ERP failures

Hawari and Heeks (2010) look at the fact that ERP systems are being increasingly used in organisations across the world, particularly in developing countries. These organisations are often, however, offset by high rates of failure, which has the effect of decreasing confidence in the idea of implementing an ERP system. The Hawari and Heeks (2010) research looked at why ERP failure occurs and how the failure rate can be mitigated. It was found, though the development of a case study from Jordan, that there are high rates of failure for ERP implementation as ERP implementation is time consuming, complex and often misunderstood across companies. Failing to address these perceptions, which negatively affect the successful implementation of ERPs, can lead to the failure of the implementation. It is clear, then, that when a company makes the decision to implement an ERP, the company must clearly communicate this to all staff, must ensure that the goals and aims of the ERP are clearly defined and must ensure that the system put in place works to ensure that these goals and aims can be met. Hawari and Heeks (2010) look at the issue of good practice in ERP implementation, finding that, actually, good practice is easy to define theoretically but not so easy to define practically. As Hawari and Heeks (2010) note, there should be a series of risk assessments and risk mitigation measures implemented prior to the ERP being implemented, as this would reduce the risk of the ERPs implementation being unsuccessful. Identifying risks in this manner, prior to the implementation process, can allow the implementation to go smoother and can lead to less rejections of the implementation process. As Hawari and Heeks (2010) discuss, however, despite this recommendation, there are limitations in some developing country contexts that may continue to limit the effective use of enterprise resource planning systems, as these factors can lead to unsuccessful implementations and prejudice towards and barriers against the implementation of ERPs.

Sumner (2000) identifies the risk factors that are present for ERP implementation, finding

that there are many risk factors associated with ERP projects. These risk factors include the lack of experience of the top management team in implementing such a system, a lack of investment in staff training, a lack of software support members, and a lack of technical expertise. These factors can all mean that the implementation of ERP can be less effective than expected, as without the full support of all members of the business, and without full technical support, the system is likely to be rejected before it has even had a chance to be set up. Negative perceptions of the ERP system can mean that its implementation will be damaged, and that the ERP system itself will be less effective than it could be. As Sumner (2010) notes, mitigating the barriers to the successful implementation of an ERP system can lead to a situation in which the likely success of the ERP implementation is increased. By recruiting and retaining IT staff and other employees who are comfortable with the ERP system, for example, the company can ensure that the chance of success are maximised.

2.2.5 Measuring ERP success

Zhu et al. (2010) discuss the fact that ERP systems are now implemented globally, with their implementation having been the subject of research for over a decade now. Part of the interest that researchers have in ERP systems is the fact that whilst ERP systems can have proven benefits, there are still many companies who have tried to implement ERPs and which have struggled to see the benefits of the ERPs following their implementation. The Zhu et al. (2010) research aimed to develop a model to describe the post-implementation success of ERP systems, this being necessary because of the fact that there are so many factors that can, potentially, damage the successful implementation of the ERP. These factors include, but are not limited to, project management, system configurations, organisational readiness, leadership involvement, organisational fit and external support will all positively affect the success of the ERP system post-implementation. Using data from the Chinese retail industry, it was found that the ERP implementation quality and organisational readiness significantly affect post-implementation success, with external support, from the implementer, for example, having little effect on the success of the ERP post-implementation.

Loh and Loh (2004) discuss the research that has looked at the implementation of ERPs in small and medium sized companies. The particular challenges facing such companies are different to those facing larger companies, meaning that it is more difficult to know how to measure the success of the ERPs. Loh and Loh (2004) discuss the elements that are critical to

the success of ERPs in small to medium sized companies, with the objective of the research being to identify the main constituents within the critical elements. To this end, a literature review was undertaken as to the critical factors for success, this review showing that there are three main critical elements that are fundamental to the successful implementation of an ERP system, namely critical success factors, critical people and critical uncertainties. It was found, following further analysis, that ten critical constituent factors are important, namely staff characteristics and uncertainty characteristics. As Loh and Loh (2010) conclude, the successful implementation of ERP systems depends on the identification and management of these critical factors and their constituents, as it is these that will determine the degree of success of the ERP implementation.

Fui-Hoon Nah et al. (2001) discuss the fact that ERPs have emerged as one of the most important and potentially useful backbones of any organisation. Whilst the factors that are related to the failure of ERPs are widely studied, the factors responsible for the success of ERPs are not so abundant. Fui-Hoon Nah et al. (2001) look, therefore, at the factors important in determining the success of ERPs and the constituent factors that comprise a successful ERP. It was found, following the research, that relevant factors could be identified. These relevant factors include, ERP teamwork and composition; change management program and culture; top management support; business plan and vision; business process reengineering with minimum customization; project management; monitoring and evaluation of performance; effective communication; software development, testing and troubleshooting; project champion; appropriate business and IT legacy systems" (Fui-Hoon Nah et al., 2001, 285). Given the wide variety of factors identified, it is important that companies focus on several of these at a time in terms of attempting to improve the chances of a successful ERP implementation.

Verville et al. (2006) identified ten factors that influence the successful outcome of ERP implementation. These ten factors were identified as including, but not being limited to, clear and unambiguous authority, a structured, rigorous and user-driven process, its planning, the establishment of criteria, and the sense of partnership that the team works to establish not only with various user commitments, but also with the potential vendor (Verville et al., 2006, 665). Overall, then, the research found that there are many factors that influence the success of the ERP implementation, these factors each having a role to play in the success of the ERP

system within any particular company. Take the sense of partnership variable, for example. It is necessary to ensure that the company has clear communication regarding the aims and objectives of implementing the ERP and that, during and post its implementation, the staff are constantly monitoring the ERP and reporting on any blips in the system that are affecting its efficiency. Failing to establish a strong sense of partnership will fail the efforts to implement the ERP. This is counterintuitive, as the company should work, as a whole, to ensure that the ERP is efficiently and effectively installed.

2.2.6 Analysis of failure – reasons

In relation to how many attempts at implementing ERP have failed, Garg and Garg (2013) undertook research looking at the use of ERPs in India and the reasons behind their failures. As Garg and Garg (2013) note, many ERP implementations fail simply because implementing an ERP is hard and takes a lot of intensive hard work. ERP implementation is a demanding task that can take hours an hours of intensive work across many different staff and departments. Sustaining this level of commitment is hard. This explains why an estimated 75% of ERP implementations are doomed to failure.

Following research across Indian companies, nine factors were identified as being influential in the failure of an ERP implementation. These factors include having insufficient resources, having poor levels of user involvement, having users that are resistant to change, having high attrition rates across team members, having poor project management skills, having unreasonable attitudes to change an poor change management procedures in place, having poor team compositions and having unrealistic project management expectations (Garg and Garg, 2013). Any and all of these factors can lead to the failure of the ERP implementation with the more factors being present, the higher the likelihood of failure.

Zabjeck et al. (2009) discusses the fact that ERP systems are imperative for companies, as they can allow companies to be more competitive. As has been discussed, however, despite these benefits, the success rate of implementations is very low, standing at only around 25% of all implementations. Three main mitigating factors were identified as support from top management, effective change management policies and procedures and effective human resource management. As Zabjeck et al. (2009) note, these three factors are the basis of positive change in the company, through the successful implementation of the ERP, with the

more factors in place, the more likely the success of the endeavour. As Zabjeck et al. (2009) argues, companies should, ideally, treat ERPs as a secure basis for business change and should, therefore, increase the usage of ERPs in order to increase the possibility of the successful use of ERPs to encourage benefits for the company.

In this regard, Momoh et al. (2010) found that there are nine factors that are critical to the long-term failure of ERPs, including excessive customisation of the software, leading to problems with its usage, and a lack of cohesion in terms of the internal integration of the software. Additionally, it was found that a poor overall understanding of the business implications of the ERP system, across the company, is linked to a higher failure rate, as failing to recognise, and work towards, the proper usage of the ERP system, as a tool to improve the day to day workings of the business, will mean that the ERP itself will fail. Poor data quality, for example, can damage the potential benefits of the ERP for the company, with misalignment with IT and accounting systems meaning that the ERP would be doomed to fail (Momoh et al., 2010). Aside from the aforementioned factors, limited training in the use of the ERP can mean that the ERP will be doomed to fail, as the lack of top management support for training can, essentially, damage the implementation of the ERP.

Kim et al. (2005), similarly, looked at the factors associated with failure of ERP systems, finding that most of the critical impediments to ERP implementation and functioning are from inadequate support systems being in place and to the coordination of functional units which negatively affects the ability of the staff responsible to effectively implement, and manage, the ERP. This, in turn, affects how the staff respond to the change, for if the ERP is not implemented adequately, then users will come to have negative perceptions of the ERP which will lead to a general dislike for the system which could, ultimately, doom it to failure. Gargeya and Brady (2005) identify six factors that have been suggested as important in determining the success or failure of ERP implementation. These six factors include the lack of an appropriate culture and organisational readiness, which was identified as the main factor, and a lack of adequate project management, which was identified as another main influencing factor.

Barker and Frolick (2003) discuss the fact that while it is true that successful implementation of an ERP is a mammoth task, not all ERP implementations fail. This gives some glimmer of hope to those companies interested in implementing an ERP. If an organisation is really

committed to ensuring that the implementation of the ERP is successful, then the staff and management will ensure that all is done to develop a plan for success. Implementing ERP should, therefore, be seen as a necessary step in the implementation of the ERP, as a team mission that is of fundamental importance to ensure that the ERP system is implemented effectively. For this to work, companies must involve all employees and must instill in the employees the fact that the ERP is a worthy and necessary tool that will improve business operations. ERP is not simply another software installation, far from it, and this should be relayed to all staff at each and every opportunity. Through this reinforcement, it should be possible to maximise the chances of success and to minimise the chances of failure.

2.2.7 Soft issues hindering ERP success

Maditinos et al. (2012) discuss the fact that ERP systems can help to enhance productivity and to improve working quality, through the integration, standardisation and simplification of multiple business transactions. Maditinos et al. (2012) attempted to design a framework through which to look at how human inputs are linked to communication problems, which are, in turn, linked to the success of the ERP. The research found that, through questionnaires of 361 Greek companies, assistance from external consultants is essential, as they can provide their expertise knowledge in this area and, as such, avoid potential faults in the implementation of the ERP and its usage. Aside from this, it was found that knowledge transfer is extremely important in the success of an ERP, as it determines how well the ERP will be accepted and, on this basis, how effective it will be in terms of allowing the ERP to be utilised as the useful tool it is, enabling the company to reap the full range of benefits that the ERP offers. The research found that top management was not so influential in hindering the effectiveness of the ERP, as the users themselves were the ones who stopped the ERP from being fully implemented and fully effective. There is, however, clearly a role to be played by top management in terms of the management steering staff as to how they expect the ERP to be used and what benefits are expected from the implementation of the ERP.

Parry and Graves (2008) discusses the fact that ERP provides a coherent and integrated approach to business planning and that, as such, the company as a whole should be aware of this and should, therefore, work towards the company as a whole and all is staff adopting a positive attitude to ERP. If this is not achieved, then the ERP is likely to fail. It is not acceptable for the power of the ERP to be underestimated, given the fact that this power has

great potential in terms of improving business performance and increasing the likelihood of the company going to greater and greater highs. As Parry and Graves (2008) note, the importance of knowledge management in ERP systems is clear. Failing to recognise this will limit the potential of the ERP for improving the business potential. It is clear, then, that the 'soft' factors such as human resources and knowledge management are clear threats to the success of the ERP in the short- and long-term.

Lapiedra et al. (2011) discusses the fact that the ERP implementation has been, in many companies, a huge learning experience. The ERP is a critical investment for many companies as it can significantly improve the company's performance but, due to its cost, if the implementation is not successful, it can leave a clear dent in the company's finances, which can, at times, be impossible to recoup. As the research made clear, whilst management consultants are necessary for the successful implementation of ERPs, management consultants are often responsible for the failure of ERPs, this meaning that the company should be careful when choosing a management consultant, as the implementation success depends highly on the consultant in place to walk the company through the process. A poor quality management consultant will provide poor quality advice, which, in turn, will lead to problems with the implementation and failures in the ERP system. This soft issue does, therefore, need to be considered as it can make or break an implementation process.

As Kraemmerand et al. (2003) discuss, soft factors such as the accumulation of incremental issues, such as poor communication or poor change management culture, can lead to a situation in which the ERP implementation fails as a result of these factors. Caution should therefore be used with these so-called 'soft' factors as they can have negative cumulative effects on the implementation and use of the ERP system.

2.3 ERP Implementation Models

Failure in the post implementation phase is the most frequent and, as a consequence, there is increasing interest in identifying the aspects that represent success or failure. The research studies that have been conducted focus to ERP failure generally fall under the following categories:

1. Lessons learned from ERP implementation.
2. Failure case studies analysis.
3. Success stories analysis.

Since the late 1990s, researchers have suggested several models or frameworks for successful ERP implementation. Those models/frameworks have investigated ERP implementation from different perspectives. The three main perspectives are generic, process-based models and learning-based models/frameworks. The studies that are included were sourced from online databases of academic journals and other reliable publicly available texts, using search words such as 'frameworks for ERP implementation', 'critical success factors in ERP implementation' and 'models for successful ERP implementation. This search confirmed a number of existing models that enable the success or failure factors regarding the post implementation phase; these are discussed in this section. The models vary from those that consider a collection of critical success factors (CSFs) to specific factors such as change management and knowledge of implementation objectives; there is, therefore, some overlap between the range of frameworks considered, which will either reinforce or may cast doubt on the generalisability of some aspects that are considered in those that comprise a large variety of factors.

The first frameworks considered are those that provide a general view of CSFs and then move on to six other models of a more specialist nature.

2.3.1 Generic Critical Success Factor Implementation Models

The models considered in this section address ERP implementation without specific focus; all of the factors that could contribute to ERP success are included. As a consequence these are related to process, people or technology and their purpose is to identify and report any factor that could represent success or failure of the ERP project in the post implementation phase. The literature review study by Nah et al (2001) sought to bring together the findings of the fragmented, and relatively rare academic research, on the post implementation phase at that time; their literature search revealed just ten studies relating to CSFs in ERP implementation. The eleven factors found were then categorised into four life cycle phases as defined by Marcus and Tannis (2000); chartering, project, shakedown and onward and upward. Chartering was described as the phase in which decisions were made as to how the project was funded, comprising of activities such as idea generation, business case development, project feasibility, selecting software and project planning. The project phase was concerned with project planning and personnel, whereas shakedown referred to the period from the project going 'live' to the system being considered to operate normally, the

activities for which were, for instance retraining, finding inconsistencies (bugs) and rectifying them; the shakedown phase could be lengthy since it continued until all of the system issues are resolved and it runs error free. The final phase, onward and upward was concerned with improving and maintaining the system until the time when it was upgraded or changed (Marcu and Tannis, 2000).

Table 2.1 Life Cycle Phases and CSFs (Nah et al. ,2001)

Life Cycle Phases and Critical Success Factors	
Chartering	Project
• Appropriate business and legacy systems • ERP teamwork and composition • Top management support • Business plan and vision • Effective communication • Project management • Project champion	• Change management programme and culture • Business process reengineering (BPR) and minimum customisation • Software development, testing and troubleshooting
Shakedown	Onward and Upward Phase
• Monitoring and evaluation of performance	• Business Vision

In this study, ERP implementation concerned all phases, including the post implementation phase, as the newly implemented EPR system, whereas shakedown would appear to represent this in other perspectives. It is evident that earlier phases will considerably influence the post implementation phase and, such a view would justify their being included, as seems to have been the approach taken by Lau *et al.* (2001). Although Lau *et al.* (2001) identified eleven factors, they appeared to consider some more important than others, for instance, ERP teamwork and composition, which should be of a cross functional nature and team should collaborate in an environment of trust. The change management programme was interdependent on there being an organisational culture, in which employees had a shared vision of the firm's objectives, were committed to its values and were change orientated. Change agents were considered to be a key element of ERP success since they were the vehicle to transform the current culture, so as to embrace the new aspects that ERP drove.

While Lau et al (2001) suggest that these are three separate factors, change management guru's, such as Kotter (2012) would suggest that these aspects were integral to a successful change management, rather than being separated this manner. The third area of most critical importance was suggested as on-going learning and support, although this had been included within the change programme rather than specifically highlighted. The findings may not

represent a high degree of generalisability, since they resulted from ten academic studies but this many have been a consequence of lower interest in ERP implementation at that time.

A similar study of 70 articles, 45 of which were considered to contain CSFs, conducted by Finney and Corbett (2007) intended to find the CSFs, but also to identify gaps in the literature. The authors identified 26 categories, although they report difficulty in describing them accurately; the factors were then divided into two main sections; strategic and tactical (Table 2.2).

Table 2.2 Critical Success Factors in ERP Implementation (Finney and Corbett, 2007)

<i>Strategic Factors</i>			<i>Tactical Factors</i>		
Seq	Factor Description	No of studies	Seq	Factor Description	No of studies
1	Top management commitment and support	25	14	Project team, the best and brightest	21
2	Visioning and planning	15	15	Balanced team	12
3	Build a business case	3	16	Communication plan	10
4	Project champion	10	17	Empowered decision makers	3
5	Implement strategy and time frame	17	18	Team morale and motivation	6
6	Vanilla ERP	6	19	Project planning and management	4
7	Project Management	6	20	BPR and software configuration	23
8	Change Management	25	21	Legacy system configuration	5
9	Managing Cultural Change	7	22	IT infrastructure	8
10	Troubleshooting/crisis management	6	23	Client Consultation	4
11	Data conversion and integrity	5	24	Selection of ERP	7
12	System testing	5	25	Consultant Selection and relationship	16
13	Post implementation evaluation	7	26	Training and job redesign	23

Many of these factors are similar to those mentioned by Lau *et al.* (2009), as might be expected in a literature review study that does include that earlier research; the categorisation into strategic and tactical suggests a broader view over the length of the project, rather than a phase based one, which has some merit as a stage by stage approach to CSFs could lead to reducing focus on some areas that remain critical, such as on-going organisational learning after implementation, and post implementation evaluation to assess return on investment (ROI), as well as the system's effectiveness regarding all elements of the business activity. The authors purpose in categorising in this was that the factors listed under strategic were the 'larger picture' elements but broken down into 'do-able' parts whilst the tactical factors were the elements that required skills and finer detail (Finney and Corbett, 2007, p 335).

The factors identified that appear to be additional to those of Lau *et al* (2001), include Vanilla ERP, although this actually refers to software with minimum customisation as was included in the earlier study, and empowered decision-making, a factor not often cited separately in

many research findings but one that Finney and Corbett (2007) justify, on the basis that unless this is the case, implementation can be severely hindered. A particularly useful aspect of the findings of this review was the regularity with which each of these factors had been cited in the literature, which suggests a potential hierarchy. The study also provides some additional detail about key aspects for instance job re-design is partnered with training, and is a separate factor, whereas it was included in change management by Lau *et al.* (2001). The requirement to examine how the ERP implementation will change the work task emphasis and job description is stressed, as well as IT development training, in addition to user training and project team training; training of the project team is the aspect most frequently mentioned. The complementary aspect of Finney and Corbett's (2007) study was their critical approach to the aspects that the studies omitted, for instance, the lack of depth about what tactics change management should embrace and how it should be implemented, were highlighted. This omission is surprising considering that this is the most frequently cited CSF in the studies that were reviewed. The authors commented on the diversity of the definitions used regarding change as well as how rarely the stakeholder perspective was considered; the comment about stakeholders presumably referring to client consultation in just four studies. However the need for cultural change could also be inferred in stakeholder perspective, since this is a critical aspect of change management programmes (Kotter, 2012).

The studies examined were stated to have generally explored just one CSF in detail, very few even considered the most critical ones as a group and no major research was found that considered ERP implementation from the perspectives of key stakeholders. The study's conclusion stated that it was evident that general CSF frameworks for ERP implementation had been derived from reviews of the prior published literature or limited numbers of case studies and therefore significant duplication of factors occurred.

The research conducted by Francoise *et al.* (2009) had the stated purpose of narrowing the gaps in the general CSF literature mentioned by Finney and Corbett (2007). Initially a review of the relevant literature was conducted and 13 major CSFs reported, which are suggested as factors to guide project managers to the types of intervention needed to enhance the chances of project success, but also emphasising that, without the practical means to implement them, there would be little effect. Hence the study continued by attempting to identify and record the practical solutions to these issues from other academic research findings that focused on

the difficulties actually encountered, and found a total of 107 of those. Two methods were employed to suggest the practical steps needed to enable the CSFs to be supported, in a way that would enhance outcomes, firstly previous studies directly or indirectly focused on ERP systems, and secondly professional texts and journals; 73 activities were identified, which were then validated by carrying out a Dephi Survey with those professionals that had experienced ERP implementation. The survey revealed that the detailed list of activities was not carried out to solve the known key issues with ERP implementation. As a part of the model of generic CSF factors, this study provides a useful and practical support to implementing the accomplishment of the CSF factors cited.

The quantitative research by Sun et al. (2005) focused on five CSFs in six organisations, contrary to the customary single focus identified by Nah *et al.* (2001); the findings reinforced the relative importance of some factors above others, inferred by the frequency of those factors in the Nah *et al.* (2001). The five factors, which represented 22 sub factors, were derived from a previous study by Cantu (1999) who had described the main factors as: management/organisation, people, data, process and technology, no mention of culture or change management in this framework. The findings were that people factors should be given the highest priority followed by data and technology; the high priority of people aligns with Lau *et al* (2001).

The models of generic CSF factors cited tend to complement each other providing the opportunity for a researcher to use the findings to create a more holistic model from these as appropriate to the specific ERP implementation system concerned

2.3.2 Cross Cultural Generic CSF Models for ERP Implementation

The generic CSF factors that influence ERP implementation in a cross cultural context, provides a complementary framework to that of the generic factors included in 2.3.1; the number of such studies is limited but growing. The research conducted across ten countries by Ngai *et al.* (2008) provided such a model; the literature review used diverse sources that had been published in 2006 and 2007: journals, conference proceedings, doctoral dissertations and academic texts. The range of sources was justified as a consequence of the subject matter being relatively new; 299 articles were identified but only 48 were used, these met three specific criteria. The criteria used were that research must be; empirical studies published in English, specific location of study and how CSFs were selected; duplicates were

identified such as conference proceedings and papers with same source, for instance in the case of journal articles based on previous version, only the latest version used. The countries included varied from USA (17) to China/Asia (9), South America (2) the Middle East (2) and Denmark; studies examined often compared practice in two countries. The analysis was based on the eleven factors that were identified by Nah *et al* (2001) but seven new factors were found, hence 18 CSFs existed, of which 12 comprised of at total of more than 80 sub-factors related to the main factor. Specific new factors were data management, country related functional requirements, national culture, ERP vendor and organisational characteristics.

The conclusion focused on some of these additional factors in particular, suggesting that ERP implementation was more successful in developed countries, which this researcher suggests could be regarded as an additional CSF generic factor itself. Another cross cultural CSF factor that Ngai *et al.* (2008) did not state from their findings, but that this researcher suggests is inferred, is the relative importance of the CSF factors according to specific global region in which the ERP implementation takes place and that the importance ranking was influenced by government factors, the norms of business practice, national and organisational culture, levels of expertise and resources; reference was also made to national cultural dimensions as envisaged by Hofstede *et al* (2010). Ngai *et al* (2008) suggested a west-east divide, describing the Chinese, for instance, making decisions based on experience and intuition, as well as on personal relationships rather than the standardised approaches used for planning in western developed countries. In addition knowledge sharing is not a cultural norm in China but rather knowledge relates to levels of power, so that Chinese managers do not tend to favour implementation of systems, such as ERP but control information to retain power, which has hindered ERP implementation in China. Another potential inhibitor to ERP implementation was government standards, which tended to influence business practices, so that existing data models and system functionality developed in western developed business, might not be appropriate in other countries.

A survey study carried out in China by Zhang *et al.* (2003) also examined the cross cultural differences between western based organisations and those in the east, specifically China; five factors were examined based on a literature review search, carried out prior to the survey. These five factors were: organisational environments (management support BPR,

company wide support; people skill levels and degree of involvement; technical issues (software, hardware and data accuracy); ERP vendor commitment; culture. The most important CSF was found to be BPR and the related people factor; the findings mirrored those of Ngai et al (2008,) in that these were inhibitors owing to fear of loss of power through widespread knowledge of key information and the cultural reluctance to learn new procedures. However the study was very limited, with only 43 respondents and a return rate below 35% so its generalizability is low. A third study, conducted in Sri Lanka by Wickramasinghe and Gunawardena involved 74 organisations that had implemented ERP systems, three broad factors were examined to discover their impact on successful implementation. The findings were that two of them were critical and embraced the many of the eleven factors suggested by Nah et al. (2001) but as found in the study by Ngai *et al.* (2008) the second factor, which comprised on business planning and vision, clear roles and responsibilities and monitoring/evaluations, in other words standardised systems was not a factor in ERP implementation success.

Hence implementation of ERP systems in a cross cultural setting has additional specific success factors that relate to national and organisational cultures and, in some cases the concept of ERP, which has the goal of sharing information is alien to the senior management of the organisations concerned.

2.3.3 Critical Failure Factor (CFF) Models

An alternative to examining critical success factors is to devise critical failure models, examples of which are discussed in this section. The rationale for this approach, according to Momoh et al. (2010), is that it provides organisations with the reality of the problems that do occur and the potential consequences regarding human and financial resources.

In identifying CSFs, the authors propose that these focus on the actions an organisation is advised to carry out to avoid failure and that CFFs incite a more urgent focus, since they provide direct description of the failure that ensues if all the CSFs are not appropriately implemented. Nine critical failure factors (table 2.3) were identified by means of an in-depth review of published research from 1999 to 2007, conducted by Momoh *et al.* (2010) and a description of each one from a live perspective.

The factors were identified in large organisations and SMEs; 109 studies in all, with 18 conducted in developing countries, 36 in USA and 13 in UK.

The studies were conducted across multiple industries, so that Momoh states that failure factors should be a considerable concern to all organisation types, and that the reliability and validity of the study is very high owing to the multiple approach; manufacturing was identified as the highest implementer of ERP. The authors are critical of some of the studies owing to the lack of depth apparent in the research; they also state that more in-depth study is required on each factor as well as the methodology to resolve it.

The ERP implementation in a large Chinese manufacturing group of 14 companies was the subject of a study on CFFs by Pan *et al.* (2011); 37 failure risk factors were identified. The study focused specifically on post ERP implementation, rather on any risk factors that would cause ERP implementation failure. The risks were rated and seven suggested as most serious of the CFFs, all of which were related to the organisational or people characteristics, rather than the technology (table 2.4). An 'exhaustive' literature review was conducted that identified 40 potential risks and formed the basis of two questionnaire surveys, to gather the different perspectives of ICT users and experts, to provide an operational view, and business managers, to capture the managerial and strategic opinion.

The findings of this study may not all be generalisable to western developed organisations, for instance the loss of knowledge is likely to be more critical in the eastern nations owing to their lack of knowledge management systems, exacerbated by the cultural aspect of not sharing knowledge, and it being at highest levels in senior managers, which infers that when such individuals leave an organisation there is a significant drop in organisational knowledge; this factor aligns with findings by Zhang (2003).

The findings of this research tend to complement rather than duplicate Momoh *et al.* (2010); there is less attention to the technical and financial issues, although technical aspects of the seven CFFs align such ERP system failing to generate suitable materials and generation of MPS, as a consequence of data quality.

Table 2.3: Critical Failure Factors Adapted from data: Momoh et al. (2010)

No	Critical Failure Factor	No of Studies	Description of Failure (examples)
1	Excessive customisation	13	Increases implementation from months to years, confuses users, software and user specifications change, high cost implications, restructure organisation's business processes to fit software.
2	Dilemma of internal integration	8	Inflexibility in software forces of firms to change business processes to fit software if end to end process design is not utilised. Many failures.
3	Poor understanding of business implications and requirements,	7	Organisation not organized in a manner that enables all benefits to be experienced, organisation not ready for integration, departments with own agendas, conflicting objectives
4	Lack of change management	12	Failure to recognise the impact that the change would have on entire organisation, lack of communication with employees, cultural lack of readiness, inadequate user training so do not know how to use and maintain, unplanned cost
	Poor data quality	9	Inaccurate, incomplete data and lack of timely data provision has substantial business and social consequences, data misfits when organisational requirements and ERP package do not align
	Misalignment of IT with business	3	Changes in environment not taken into account, since rare for technology and business needs to match, approach is not dynamic to accommodate
	Hidden costs	3	Underestimate hidden costs particularly those for training and data conversion, as well as consulting cost and the perception of project end date
	Limited training	4	Managers and users cannot use functionality, do not understand the objectives of the ERP implementation
	Lack of top management support	5	Complex organisational issues not addressed, technology regarded as the solution, managers cannot adapt to change,

Table 2.4: Critical Post ERP Implementation Factors (Pan et al. ,2011)

No	Critical Risk Factor	Relative Score
1	Lose critical IT or ERP expert	164.4
2	MPS generated by the ERP system is inappropriate	132.3
3	Operational staff unwilling to use the ERP system	129.5
4	Loss of accumulated organisational ERP knowledge over time	127.8
5	Not enough technical support from ERP vendors	127.3
6	ERP system fails to generate the appropriate material	127.2
7	Seamless Integration between ERP modules not accomplished	123.8

A study of CFF by Hawari and Heeks (2009) and conducted in Jordan, found that failure to close specific gaps represented a significant CFF; its methodology was based on comparing the specific factors in the organisation before and after ERP system implementation. The assumptions and requirements that comprised the original system design, as compared with the organisational reality, were not addressed during implementation and caused failure. The seven gaps identified between the assumptions made and the existing organisational features

before implementation, were categorised according to how likely they were to cause failure; four were found to be very likely, those of objectives and values, staffing and skills, technology and process, in decreasing order of importance. Information and management systems and structures gaps were less likely to cause failure and other resources rated as possibly influencing failure. An example of a gap description is that of technology, in which the infrastructure that existed was far more basic than was assumed. Post implementation, the gaps in each factor had changed little, some not at all, particularly the highly rated failure factor of objectives and values, with staffing and skills reducing marginally.

The CFF model that results is the design-reality gap model, which the researchers suggest to mitigate failure risk and to focus attention on the interventions to move away from failure, by highlighting the gaps and then designing actions to minimise them. The authors apprise the issue that, as a developing country, these factors may be exacerbated by the culture, again making reference to Hofstede *et al.* (2010), and demonstrating similarity to Chinese studies, such as Pang *et al.* (2011) and Zhang (2003). For instance, the authors discuss uncertainty avoidance manifested in resistance/fear of changes in job design, and suggest that closing gaps relating to a specific related failure factor may be more of a challenge than anticipated. It would appear therefore that issues that seem to be specifically related to developing countries may be generalisable over those eastern countries, in a similar manner that 'best practice' appears so in developed countries.

2.3.4 Change Management Model for ERP Implementation

The importance of the Change Management Process as a success factor in ERP implementation has led to a few models based on this factor alone, for instance Francoise *et al.* (2009) proposed one that incorporated culture and had a number of specified steps:

- Opinion leaders should be lobbied to support the change
- Commitment of senior personnel must be secured
- The organisation should be assessed as being capable of accepting the change
- Training should be completed for the whole organisations
- Risk management and actions to mitigate risk should be completed
- Scope of change evaluated to meet the challenge of its impact and risks
- Communication to all of the benefits and limitations
- Communication of the system functionality

- Ensure organisational readiness prior to implementation
- Regular communication sessions to review progress
- Pilot systems available in large conference type areas so that personnel can learn about system
- Project leader receives specific training on handling problems of change effectively

This list is comprehensive but appears to give little detail or rationale for cultural aspects, which are important those implementing to understand, to organisational and individuals beliefs and values (Schein, 1986; Kotter 2012). Since these activities could be processed without considering the softer change side related

The change management model suggested by Kemp and Low (2008) was based on an innovation model devised by Klein *et al.* (2001) and was a consequence of the findings of research into a large Australian multinational firm. Two hypotheses were devised to discover whether specified change management activities (figure 2.1) influence the environment in which the ERP system was being implemented, and that the environment was therefore positively influenced in terms of feelings, awareness and intention to adopt the system. The methodology employed surveys, interviews and organisational documents.

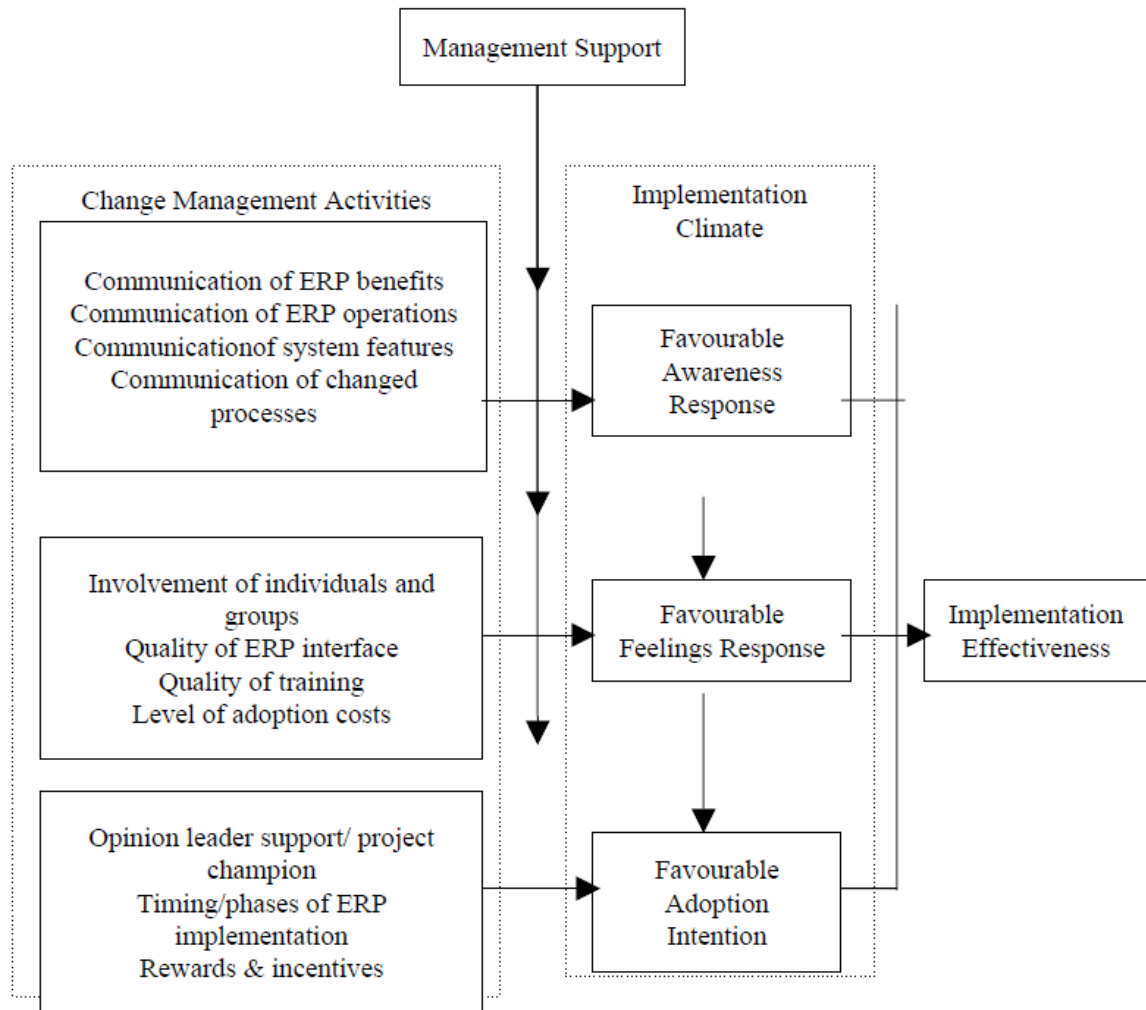


Figure 2.1: Change Management Model (Kemp and Low, 2008)

The findings confirmed the important nature of the change management process on the environment and hence the success of the ERP implementation process. The key activities were: communicating information about the system to users; ensuring that user skills were appropriately developed; the involvement of personnel in the change. In cases in which this process did not occur there was a more negative attitude to the change. However the shortcomings were found to be cases, in which managers publicly supported the change but were not convinced of the benefits of the system to the company, that users did not understand the reasons why the change was required, since they considered the new system less efficient and offered lower functionality than the previous system. Additionally, the new system did not meet their expectations, indicating low levels of communication and employee involvement. Hence Kemp and Low (2008) highlight an important aspect of the process, that managers must be better informed of the corporate purpose and objectives of the new system. Another aspect of the change process that had an unexpected outcome for the organisation,

was the activities allocated by the change management team; this team chose different activities for each department, based on their assessment of what was required, and with the purpose of providing the best outcome for reasonable effort. The consequence was that, contrary to the team's belief that all employees would experience the same feeling/climate during the process, there was wide variation; the lower the number of activities provided for a group, the greater the resistance to change. Although generalizability is limited, since only one organisation was studied, the results are likely to be generalisable to many large corporates, in which teams for managing change or similar decisions may be made, to decide on what activities should be conducted in each department, owing to size factor of total employee involvement (Momoh, 2011).

A similar model was found to be appropriate, according to the findings of the survey study conducted by Ahmed et al (2006), in which 69 Malaysian manufacturing companies participated. The research particularly focused on the resistance to change, and findings strongly suggested this resistance should be acknowledged and maximum attention given to interventions that were designed to minimise employee concerns; participation in the change by all employees, regular, open communication and development of knowledge and skills. The study outcomes emphasise the soft factors that were neglected by Francoise *et al.* (2009), that the resistance is a consequence of anxiety of the unknown such as loss of pay, status and habitual working patterns with which they feel secure.

A three stage model for the specific involvement of users to minimise resistance to change was proposed by Aldwani (2001):

- the first stage was identify and appraise the attitudes to the change of individual users and influential groups, by asking specific questions;
- then in the second implementation phase predetermined strategies can be included that build awareness, influence feelings by interventions such as training and gaining support of those whose opinion is most influential;
- the third stage is an evaluation of the change management efforts in which feedback from users enable the senior management to appraise the degree of resistance remaining and to then to adapt activities as necessary

In the second phase the authors emphasise the soft factor of feelings, and therefore the need of group leaders to have significant involvement in the ERP implementation planning.

These studies all focus on managing the change through employment of a planned process, but the degree to which there is practically based attention to the reasons for employee resistance based on the anxieties experienced, is somewhat varied but generally acknowledged as the core issue. As a group of perspectives there is significant practical perspective that aids leveraging the change management process in ERP implementation.

2.3.5 ERP Implementation from a Training Perspective

Training has been identified and further appraised as a key influencer on the success or failure of the ERP implementation by a number of studies. One of these describes the Learning Requirements Planning (LRP) model, which focuses on integrated learning for ERP success; this focuses on the assumption that in ERP system implementation, the lack of enterprise-wide training is the core reason for failures (Kapp *et al*, 2001). The model considers training from a wider perspective, in that it involves six-step enterprise levels. Each level comes with a detailed checklist. Those checklists can be integrated together to form the LRP CSF(s) model. Table 2.5 briefly explains the LRP model.

Table 2.5: The Learning Planning Requirements Model

No	Stage	Description
0	What is LRP?	LRP is the transformation of corporate strategic goals into discrete, measurable ERP training and implementation objectives, combined with proven feedback methods and systematic performance analysis
1	Analysis	The purpose of this process is to identify learning objectives based on the strategic business needs driving the organisation's ERP implementation.
2	Diagnosis	In this stage the gap between the existing skills and competencies and the skills and competencies required to obtain the stated strategic and ERP implementation goals of the organization is identified.
3	Design	This stage aims to design training and development programme, including. the best training method, ways of presenting of information and of distributing the information to the learner.
4	Implementation	Implementation involves utilising LRP process to effectively implement the ERP system
5	Evaluation	The focus is on the evaluation of the training and learning that occurs in relationship to the ERP implementation.
6	Continuation	This last stage addresses building an organisational mechanism to continuously develop employee skills as they relate to the ERP system.

This integrated process is necessary since, according to Kapp *et al* (2001) training typically takes on a lower priority than the ERP process, it is often conducted in isolation from the ERP implementation, not relevant to the specific job roles held by the employees and/or training offered by the ERP Vendor does not support the employee to understand the integrated nature of the system, since it is based around technical training only. In addition the lower priority given to it, means that that employees fail to complete all training sessions;

what was required, and rarely happens is the development of a systematic training and development plan. The applicability of the LRP model was appraised by Shahin *et al.* (2010) in a survey study based on ERP implementation in a large Iranian steel company employing 8000 people. This researchers evaluated the learning that employees received by benchmarking it to the stages recommended in the model, and confirmed Kapp *et al.* 's (2001) conviction that generally, the training programme related to the ERP implementation did not represent continuous learning; the organisation had not been in an appropriate state for learning at the outset, and relatively scant attention was given to this aspect of implementation, since user learning and development had not been considered an important part of it. As a consequence the implementation had been hindered.

Another framework for learning related to ERP system implementation, was proposed by Dorobat and Nastase (2012), which has the purpose of identifying problems relating to training, as well as reducing resource consumption in other ways, such as time and money. The model was accomplished by a literature review, in which 9 CSFs related to training in ERP implementation, were identified:

1. Top management support
2. Project management in which an initial step is to identify the user needs
3. The Training Curriculum, designed to give significant user support including system command language and new business processes
4. Users commitment training, achieved by explaining the objectives of the training and its benefits.
5. Personnel skills and competencies: so as to plan and deliver appropriate training individual users/groups
6. Training schedule, which is synchronised with the implementation project, so that time lag between training and use of the ERP module is minimal
7. Training budget, which is usually the most underestimated cost in ERP and is high, since new processes must be learnt, it relates to existing employee competences and extra training and support for new employees must be factored in
8. Training evaluation to ensure knowledge transfer has been effective, including cost effective, and that acceptance of the associated organisational change has taken place and benefits are seen

9. Training methods should be varied and appropriate to the difficulty of the issues concerned; the most difficult should take place in a classroom setting and the training should be available in all the languages that are relevant to the company's operation (those spoken by employees).

The training is delivered by means of CBT (computer based training methodology) which can be customised for individuals; it is called the ERPT training model which used ULM (Unified Language Modelling) technology. The key features of the model are that: the user's individual learning preference is determined at the outset; the training method is selected to match this preference; a training scheme is then produced for each business process user; when the user deviates from the schema, for instance in generating data, this is detected automatically. The ERPT model can also calculate the time and cost associated with each user's learning and provide the Training Manager with reports on individual user progress. The ERPT model was successfully tested with Romanian SMEs, which suggests that it has satisfactory applicability but requires more widespread application to objectively judge its effectiveness. However the nine CSF factors that emerged show some similarity to Kapp *et al* (2001), reinforcing that model and the ERPT model is focused on individual learning, which is a strength that Kapp *et al* (2001) do not emphasise.

2.3.6 ERP implementation framework from a process change perspective

A Process Change Management (PCM) for successful ERP implementation is suggested as an important one, according to a number of researchers. An example is one that was developed by Al-Mashari *et al.* (2003), the main features of which are shown in table 2.6. The various PCM constructs are described in the context of SAP R/3 (a leading ERP application) implementation. The evidence of how these constructs are operationalised in practice is drawn from a large collection of R/3 case studies, which represent various organisational experiences. This model is linked the PCM framework provided by Grover (1999), which embodies five facets, each of which corresponds to the key ERP issues to be considered. In essence each step of ERP implementation is closely integrated to the related business process that takes place.

In order for this model to be successfully implemented Al-Mashari et al (2003) emphasise the requirement of a well-defined vision and close involvement of a business director, with an IT strategic process integrated into the business strategy for the short, medium and long term.

Table 2.6: Process Change Management CSF(s) (Al-Mashari ,1999)

No	PCM facet	ERP Factors
1	Change management	1. People 2. Communication 3. Tools and methodology 4. Interactions
2	Project Management	5. Team formation and development 6. Roles and responsibilities 7. External entities 8. Measurements of progress
3	Continuous process management	9. Process redesign 10. Process performance measurements 11. Continuous process improvement
4	Strategic planning	12. Performance gap analysis 13. Change justification 14. Projects strategies
5	Technology management	15. Software selection 16. Technical analysis and design 17. Installation

A value chain is created by focus on the business processes in this manner. As with other models discussed in this Literature Review, there is a lack of detail about practical accomplishment of the steps, even though this researcher appreciates that each ERP system implementation is relatively unique.

An alternative business process model, called the Composite BPM approach was devised by Stemberger *et al.* (2009) shown in figure 2.2. Essentially it is a seven stage model in which the steps do not necessarily have to be followed in the order in the diagrammatic representation; the concept of composite is that some business processes need adaptation to the ERP system while others can be custom built.

The first stage is to examine current business process models, which are stated to be rarely as conducted in practice and need some adaptation, but a critical factor is matching the system capabilities to the business needs, stages two and three can occur at the same time as the initial stage. Stage four is considered critical since it involves making key choices about processed to adapted to the ERP system, and those that need to be specifically designed to the business needs; the core processed such as accounting will probably be categorised under

group one but those processes that lead to the organisation's competitive advantage should be customised. The business process change is integrated with the implementation in stage five, which requires change to managed and appropriate interventions in place to accomplish this successfully; changes in organizational structure and culture are specifically mentioned as crucial at this stage. Stage six is only required non-standard modules are required by the business, using standard modules makes the implementation simpler but for new modules in this stage, development time will be required.

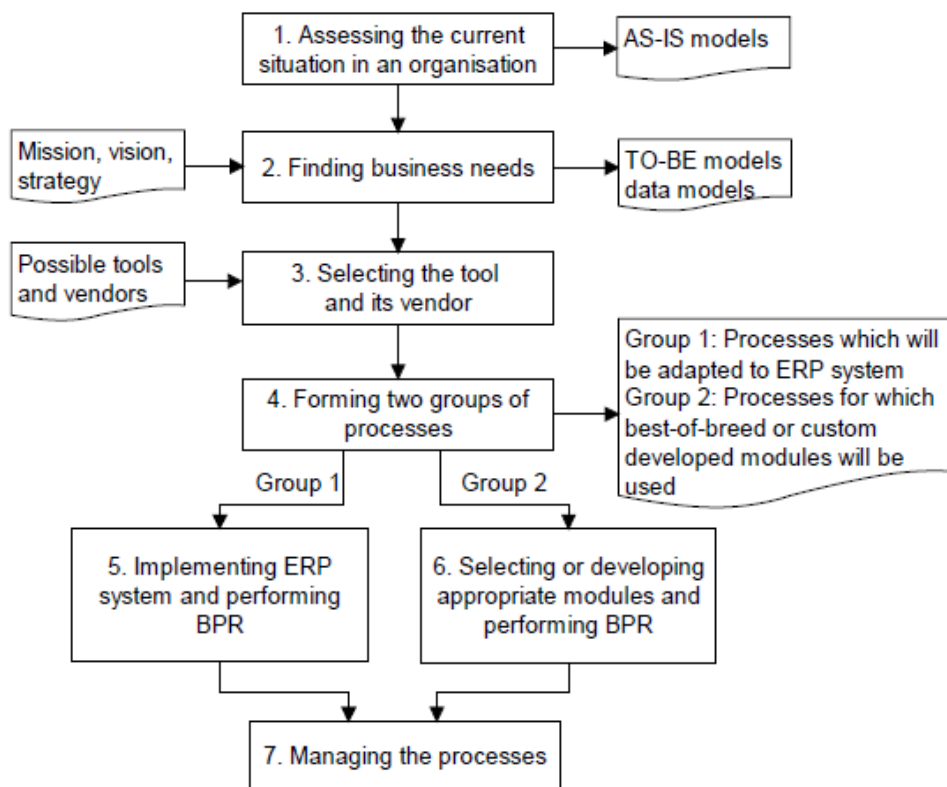


Figure 2.2: The BPM Composite Model (Stemberger et al., 2009)

However Stemberger et al. (2009) suggest that steps five and six should occur together because the processes will be highly connected. Step seven is the continuous monitoring process, one that does not end, since process changes need to be documented. The processes need to have this flexibility, in order for organisations to adapt to changing requirements from the external environment. The authors stress that ERP is not about technology but about business process change and that many ERP system implementations fail because the BPM is not afforded the required attention. Although this model lacks the detail of the integral links that are represented by the ERP factors in Al-Mashari *et al.* (2003), it provides an outline

framework that ensures that the firm considers the business process change adequately and could be used in a complementary manner with Al-Mashari *et al.* (2003) model.

2.3.7 ERP Implementation and Knowledge of Implementation Objectives

A framework for ensuring knowledge of implementation objectives is offered as being one that will influence success. Essentially Wei (2008) offers an eight stage framework to identify key factors and to construct performance indicators (PI) for stages of the ERP process, as well as the means to evaluate outcomes at those stages. This approach enables continuous performance monitoring and, if the performance indicators are well designed, can support development of desired attitudes, for instance shared vision and lower resistance to change. The ERP objectives are aligned with the business goals; considerable guidance is given on how to accomplish the final list of PI from the larger number that will be initially generated from a dedicated team that generate an initial list (table 2.7)

Table 2.7: Knowledge of Performance Indicators Model (Wei et al. ,2008)

No	Step	Detail
1	Form ERP PI Content Development Team	Critical managers, user representatives and ERP system experts
2	Expand the Implementation Objectives to appropriate ERP PIs	Develop PIs linked to ERP objectives and strategic objectives
3	Survey and add other appropriate PIs on the ERP output view	Survey other PIs on expected usage and outputs from the adopted system
4	Reduce the number of PIs	Rate as essential, important but not essential and not important
5	Construct PI structure based on the knowledge of ERP Implementation Objectives	Categories into project management factors, system factors (functionality, user friendliness, reliability etc), vendor factors and impact factors (customer, user, organisation)
6	Develop the detailed evaluation performance method	Team decide on what data to collect and how to collect it
7	Evaluate the performance of the ERP PI	Provide rating scores
8	Undertake the periodic measurement	Changes in system inevitable so new PIs will be required

This model is detailed, logical and relatively easy to implement and appears to represent a robust procedure for continuous monitoring of the ERP system implementation and minimising the probability of failure. Its limitation will be the quality of the PIs generated and the measurement criteria.

2.4 Summary

This review of the literature on factors, which impact on the success or failure of ERP system implementation, demonstrates the degree of interest in the issues of implementation and the continuing difficulty that practitioners experience. The breadth of recommendations that have been made suggest that from the very outset of considering ERP, a detailed roadmap needs to be configured that is reviewed several times before any activity begins. This would assist organisations to better assure that key issues such as change management, cultural aspects and business processes are carefully; the perspective of identifying and developing appropriate PIs for each stage of the ERP process, together with robust measurement of them at regular intervals represents a fundamental framework for ensuring that the other interventions happen and their progress is measured.

CHAPTER THREE

The role of stakeholders in effective ERP implementation

3.1 Introduction

An issue which has been highlighted by many researchers concerning the existing research is that the majority of these studies conceptualise an information system purely as an abstract and material factor, and fail to consider the extent to which the success of the system implementation may be affected by human factors (Ifinedo & Nahar, 2009). In other words, there have historically been relatively few studies which examine the extent to which the process of organisational change is linked to the establishment of an ICT system, and which analyse the impact that the role of different stakeholders can have on the success of such a system.

Despite this, Tiwana and Keil (2010) suggest that the studies which have been conducted in this area during the last decade have started to place greater emphasis on the relationship between an ERP system and organisational stakeholders. This represents a significant transition from the traditional attitude of viewing technology within a deterministic framework which dates back to research which was conducted in the 1980s.

This literature review aims to provide an overview, and a critical analysis, of the research which has been conducted into the relationship between the implementation of an enterprise resource planning (ERP) system and different stakeholders within an organisation. Specifically, the literature review aims to ascertain the extent to which the actions which are taken by different stakeholders within an organisation are likely to affect the success of an ERP implementation. The review focuses in particular on the extent to which the roles played by ERP sponsors, senior managers within an organisation, ERP managers, organisational customers, organisational suppliers and specialist ERP consultants are likely to affect the success of implementation.

3.2 The role of stakeholders in effective ERP implementation

3.2.1 ERP Sponsors

The success of ERP is greatly influenced by the morale of the sponsor. The role of the sponsor should be clear and consistent from the first day to the completion of the project. The project sponsor must provide strategic ownership of the project and ensure that the top level management are made aware of the goals and expected outcome of the project. The sponsor of the project is instrumental in ensuring that the top level management is committed to the implementation of the ERP system.

The sponsor has the ability to set timelines and goals to be achieved during the implementation of the project and compel the senior executive to work towards realising these goals. The sponsor should also be a member of the steering committee that is mandated with the duty of ensuring that the project is successfully completed. Various authors have documented the roles and definition of the project sponsor or champion. Roure (1999 p.4) defines a project champion as “any individual who made a decisive contribution to the innovation by actively and enthusiastically promoting its progress through critical stages in order to obtain resources and/or active support from top management”. Based on this definition, a project sponsor should evaluate the information, choose to install the system, motivate the top level managers to support the system and provide a guarantee that all materials and resources will be availed during the implementation of the project. According to Kale (2000), a project sponsor is the a member of the steering committee who is actively involved in the process of maintaining the project credibility and is committed to supporting the implementation of the ERP system through all the phases. The role of the project sponsor differs from that of a manager in that, his role is mainly that of steering committee chairman while the manager oversees the implementation of the day to day activity during the implementation phase.

The main functions of the sponsor are that of ownership of the project and leadership of the steering committees to ensure that the implementation process is successful. The project sponsor is also the final budget authority and is responsible of ensuring that the ERP project is funded as per the requirement. Lack of the sponsor commitment may result to underfunding, lack of resources and delayed payments which affects the success of ERP systems. The

change management process which results to business disruptions must be authorised by the project sponsor and hence, he plays a critical role in the development of the project.

3.2.2 Senior organisational managers

Much of the empirical research which has been conducted in this field suggests that instances of failed ERP implementation can be linked specifically to the inadequate views of strategy which are held by many senior managers within companies. In particular, Grabski et al (2011) argue that the actions and viewpoints which are adopted by senior organisational managers often have a serious impact on the likelihood of whether an ERP system implementation will be successful or not. It is argued that the majority of senior managers tend to visualise the process of strategy as a linear process; as a result, their view of organisational change is highly mechanistic and they are more likely to conceptualise change using traditional project management models. As a result, many senior organisational managers are unlikely to accurately consider the impact of organisational change on individuals within the organisation. According to Koh, Gunasekaran and Cooper (2009), this failure to consider the welfare of individuals within the organisation is indicative of a failure of senior managers to utilise relationship based and processual models when evaluating change; as a result they are unlikely to achieve the best possible results of the new ERP system since they are essentially clinging to ideals which are associated with the linearity of industrial age thought. This is expanded upon by Dorobat (2009) who criticises senior organisational managers by stating that they generally assume that the implementation of a new ERP system will in itself be sufficient to bring the required benefits to the organisation.

Typically, only limited attempts are made to ensure that the new technology which is implemented is fully understood and integrated within the social context of the organisation. This is contrasted with an example of a successful ERP implementation by Dezdar and Ainin (2011) who claim that an organisation which is able to successfully manage a new ERP system does so because they ensure that all of the stakeholders within the company have shared goals. Furthermore, successful managers take the time to ensure that all of the stakeholders have a clear understanding of the business model of the overall organisation, and of the way in which the technology which is encompassed within the new system fits into this business model. This is further underlined by Madhani (2012) who conducts a survey of different ERP implementation projects and concludes that a key issue which prevents many

organisations from reaping the benefits of ERP projects is the fact that the interactions which take place between different stakeholders, or ‘change agents’ within the company are poorly managed. Most of the senior managers which are in charge of organisations where a new ERP system is being implemented tend to view themselves as being a single leader who is responsible for unilaterally imposing a linear process of change. Dorobat (2009) contends that this perspective is fundamentally mistaken and suggests that it is actually more realistic to assume that there are a number of different groups which are associated with any type of organisational change – these groups include middle managers, teams, senior leaders and external consultants. The different interests and motivations of these groups meant that there is significant potential for conflict between these different cohorts, and it is the failure to effectively manage the different interests of these groups which is likely to contribute the problems concerning the issues which arise with the implementation of ERP systems.

Indeed, if one examines the prescriptions of the empirical studies which have been published in this area with regard to the key factors which determine the success or the failure of ERP systems, one immediately notices that these factors are closely intertwined with the roles and strategies which should be adopted by the senior managers within an organisation. For example, Bezawada (2012) argues that the success of an ERP implementation is closely dependent on extent to which the senior management team of the organisation displays long term commitment to the project. This is expanded upon by Koh et al (2009) who argue that the success of an ERP project relies heavily on the quality of communication which is implemented by the senior organisational team with the rest of the stakeholders within the organisation.

Aside from this, however, the consensus within the secondary research appears to be that the most important quality which needs to be exhibited by the senior manager of an organisation implementing an ERP system is the quality of good leadership. In other words, it is essential for senior managers to be able to effectively convey to the stakeholders within the organisation the way in which the change which is related to the new system is related to the company’s overall goals and to the mission statement of the organisation. In other words, it is necessary for the senior manager to emphasise the fact that the change which will ensue is ‘institutional’ in nature rather than being confined to a single area of the organisation (Arlbjorn & Haug, 2010). Furthermore, it is necessary for the senior manager to demonstrate

that the implementation of the ERP system is related to business' needs to respond to changes in its market environment and that it is not merely the product of business requirements which are related to technological issues. The need to emphasise the fact that the establishment of a new ERP system is an issue which affects the entire organisation, it is important for senior managers to ensure that the responsibility for the management of technological change is not relegated to the technical divisions of the organisation, but that it is something which is managed on an organisation wide level in order to support the idea that it is an organisation-wide change. A study which was conducted by Silva, De Silva and Gunawardana (2011) suggests that, in order for the implementation of an ERP system to be effective, it is also necessary for the high level of commitment which senior managers give to an ERP project to be clearly visible to the rest of the organisation. When other stakeholders within the organisation see the level of commitment which is being associated with the project from such a high level they are more likely to see it as a more holistic initiative which affects the whole organisation, and are likely to reciprocate. The importance of ensuring a high level of visible commitment from the senior organisational team is also reflected in a series of case studies which were conducted by Alsalem (2009). In particular, the case study of a finance company which was located in China indicated that the ERP implementation initially failed due to the fact that the senior managers perceived it to be a purely technical issue; rather than adopting a holistic view of the system implementation, there was little commitment to the project from the senior organisation and the management of it was wholly left to the IT division. However, the poor beginning of the project was reversed when the senior managers adopted a clear strategy of signalling their commitment to the implementation of the project by talking about their enthusiasm for the project within corporate newsletters and by talking about the benefits of the new project with the employees, retailers and suppliers of the company.

In addition to displaying high levels of commitment to an ERP project, research suggests that it is also essential to ensure that the senior managers establish clear desired outcomes and clear outcomes in relation to the implementation of an information system. This can be achieved by ensuring that a new mission statement is developed by senior managers which outlines the shared values of the organisation, the way in which these values are met by the implementation of the new system, and the various roles and responsibilities which need to be fulfilled in order to increase the effectiveness of the project (Arlbjorn & Haug, 2010). The

aim of taking this action is to ensure that all of the stakeholders within the organisation fully understand the value which is associated with the implementation of the ERP system. This is described by Ifinedo and Nahar (2009) as a form of 'symbolic management' since its key aim is to provide the rest of the stakeholders within the organisation with a rationale for the changes which are taking place as a result of the ERP implementation, and also to establish a strong foundation for change. In order for such symbolic management to be effective, it is necessary to ensure that senior managers are involved in all stages of the implementation of the ERP system and that their contribution to the ERP project is visible within all ranks and throughout the entire hierarchy of the organisation. Research which has been conducted by Koh et al (2009) suggests that one way in which the commitment of the organisation could be effectively displayed would be by ensuring that there are regular meetings which are organised between the senior managers, the employees and the mid level managers, in order to ensure that everyone working at all levels of the organisation is fully apprised of the progress which is being made within the ERP project and of its likely benefits.

A second key issue which must be dealt with by the senior managers within an organisation in order to increase the likelihood that an ERP project will be successfully implemented is for managers to effectively manage the different concerns and motivations of various groups of employees. This is due to the fact that, as outlined by organisation behavioural theory, the majority of organisations are essentially loose conglomerations of individuals who all have very different interests and preferences. It is therefore likely that the advent of a fundamental change to an organisation, such as the establishment of a new ERP system, is likely to constitute a severe threat to the status quo which may result in the emergence of conflict between different interest groups in an organisation. This is confirmed by Ghazanfari et al (2009) who argue that the most common cause of a failed ERP project is actually due to the failure of the senior managers within the organisation to manage conflict between different employees. In order to manage these issues, Spitzley and Kumar (2012) suggests that it is necessary for senior managers to obtain strong approval for the project from prominent people within the organisation. These individuals can then act as opinion leaders by encouraging other employees within the organisation to embrace the new ERP project with greater enthusiasm. This is effectively summarised by Silva et al (2011) who suggests that it is the responsibility of the senior managers in a company to make it easier for the stakeholders in the organisation to more easily 'bid farewell' to the former status quo which

existed prior to the new ERP system, and to enable them to successfully adapt to the new system. If this role is not effectively fulfilled by the senior managers, it is likely that the introduction of the new system would be met by feelings of employee demoralisation and demotivation; this is likely to have long term effects in reducing the likelihood that the new ERP system will be full heartedly embraced by members of the organisation. If such feelings of employee demoralisation persist, it is possible that this could have a significant negative effect on employee turnover and, consequently, on organisational profitability in the long run.

A third area in which the actions of the senior managers are likely to have a significant impact on the success of an ERP system implementation is in the nature of the communication which they have with their employees. As has been stated by Ganesh and Mehta (2010), employee acceptance of a new ERP system, and consequently, the overall success of the ERP system, is significantly more likely if there is a high level of understanding, acceptance and approval of the new ERP system among all organisational stakeholders. In order for such a condition to exist, however, it is necessary for there to be continued close communication between the managers and all relevant stakeholders. As part of this communication, it is necessary for all organisational stakeholders in the new ERP system to be regularly updated with the progress of the new information system implementation – this will help to significantly reduce the level of confusion which is experienced by stakeholders concerning the new system and will also make them feel like they are playing a more important role in the change (Dezdar & Ainin, 2011). An empirical study which was conducted by Grabot, Mayere and Bazet (2008) on the case of a US company which was in the process of implementing a new ERP system found that the failure of the communications strategy which was implemented by the organisation's senior managers meant that employees were not fully convinced of the need for the new system. The failure of communication in this case had a long term impact on employee morale, resulting in the annual rate of turnover among staff within the financial and accounting divisions of the company increasing to 100 per cent three years after the new system was fully implemented.

The need for senior managers to embark on a clear strategy of communication with their stakeholders is emphasised as being crucial for the overall success of the ERP project by Wenrich and Ahmad (2009). This is due to the fact that all of the stakeholders in the new project need to be fully informed of the benefits which are likely to accrue to them as a result

of the changes in order to obtain their 'buy in'. Research which has been conducted by Ifinedo and Nahar (2009) suggests that senior managers need to begin to communicate effectively with their organisational stakeholders from the very beginning of the process of implementation.

Furthermore, as the communication with stakeholders continues, it is important to ensure that it is consistent in nature, that it provides stakeholders with continued regular updates, that it explains to stakeholders the way in which such change is integrated with the overall vision of the business and how this change will be underpinned by existing systems.

The process of communication with organisational stakeholders needs to be structured in such a way that is sufficient time for stakeholders to get used to the idea of the new system and the changes that it will produce before it is actually implemented.

In addition, senior managers need to ensure that the transition to the new system is eased by providing adequate training and support documentation to all of the relevant stakeholders. Such training would help to increase the level of confidence of employees with respect to their ability to use the new system and help to increase the likelihood that the new system will be fully accepted. Indeed, the failure to provide adequate training to employees has been cited by Wagner and Antonucci (2009) as being an issue which is likely to significantly reduce the likelihood of ERP success. It is therefore necessary to ensure that senior managers within the organisation take charge of the staff training process. In a study which was conducted by Tsai and Hung (2008), it was suggested that those companies which are more effective at implementing new information systems facilitate effective communication by providing their employees with a single point of contact whom they can ask for any particular information. This system of communication is likely to be more effective within larger corporations where it is not always possible for employees to contact senior organisational managers for information.

One way in which regular communication could be ensured in such cases would be for an intranet to be established which would provide stakeholders with access to relevant sources of information. Kuhn and Sutton (2009) suggest that it would be useful for all status updates, company presentations and meeting minutes which are related to the ERP implementation on the intranet so that they can be easily accessed and help to decrease feelings of employee

insecurity and uncertainty. This is expanded upon by Silva et al (2011) who argues that an effective strategy of communication needs to rely on using a range of different forms of media to promote the same message. If only one form of media is used to convey the desired messages about the new ERP system, it is likely that employees will simply be indifferent to the message which is being conveyed, and this is likely to do little to reduce the resistance that employees are likely to have to launch of the project.

Research which has been conducted by Singh (2009) suggests that senior managers within a company which is implementing a new ERP system should also ensure that they prepare their employees for the change in culture which is likely to result as a consequence of the new system. According to Wenrich and Ahmad (2009), the extent to which senior managers deal with cultural change is likely to predict the likelihood of success of the overall ERP system implementation.

Organisational culture is defined by Williams and Pollock (2009, p.18) as the ‘sense of belonging’ which exists within an organisation where ‘people share a common history’; it is arguably the nature of the culture which exists within an organisation which determines the way in which the stakeholders within that organisation will react to a new system and thus decide its overall success. This is due to the fact that the changes which result from the introduction of a new ERP system are so far reaching that they are likely to trigger fundamental changes within the culture of an organisation. This is expanded upon by Kuhn and Sutton (2009) who go so far as to suggest that organisational culture, and the way in which it is managed, is a key determinant of the success of any form of technological change within an organisation.

Indeed, Nair, Reddy and Samuel (2011) claims that the adequate management of organisational culture is instrumental in determining whether the implementation of a new ERP project will be successful or not. Specifically, it is necessary for a senior manager within the organisation to ensure that the necessary incentives and rewards are established within the company in order to mould the prevailing culture of the organisation to the features of the ERP system. It is important for the employees within the organisation to fully internalise these new behaviours and to use these to contribute to the development of a new organisational culture in order for the introduction of the ERP system to be effective. This is

an issue which is explored by Singh (2009) who claims that one of the most important roles which should be played by the managers of an organisation is obtaining the support and the trust of the employees for the new ERP project.

In various case studies into corporations which have experienced failed ERP implementations, Tsai and Hung (2009) demonstrate that the failure of the project could be directly attributed to the fact that the managers of the organisation were not effective in their attempts to build up a level of trust with the stakeholders within the company. As a result, there was a high level of insecurity which was experienced by employees who felt that their existing positions within the organisation were being threatened and who were therefore resentful of the new ERP system. This lack of trust also manifested itself in longer term negative effects on the organisation as the senior managers struggled to recruit suitably qualified people to work on the project. Again, the consensus which has emerged in the existing research is the fact that the need to adequately prepare employees for the introduction of a new ERP system is closely related to the need to maintain open channels of communication (Longinidis & Gotzamani, 2009).

In the previously cited company, the failure to establish trust among employees is directly attributed to failures of communication. The communications which were provided to employees were often inaccurate or completely erroneous; many of the new features and benefits which had initially been promised to employees failed to materialise once the ERP system was actually implemented, and highly disruptive changes to the system were introduced after employees had already become used to using the new system.

A fifth area which falls within the responsibility of senior organisational managers and which they need to deal with effectively in order to increase the likelihood of ERP success is the need to conduct regular change reviews. Specifically, it is necessary for a series of regular reviews to be carried out which enables the organisation to evaluate the extent to which they have been successful at fulfilling their various goals. Examples of goals which can be reviewed include whether or not the company has been successful at meeting their timelines.

In response to such evaluations, Williams and Pollock (2009) suggests that such reviews can be useful at allowing the organisation to utilise various process mapping tools for the implementation of the new system and to formulate various contingency plans which can be established in the event of unforeseen circumstances which may affect the implementation.

Nair et al (2011) suggest that it is essential for senior managers to utilise tools such as process mapping because it will be a way of adopting a more holistic perspective of the entire ERP system implementation. This will be achieved by making it possible for different employees to understand the way in which the new processes which are related to the ERP system will interact with the prevailing processes in the organisation.

In order for such a methodology to be used, it is important for senior managers to form the relevant teams of people with the necessary expertise, to develop key cycle times, to identify different areas for improvement, and to formulate a clear plan for implementation. The effectiveness of such an approach towards reviewing the progress of ERP implementation has been appositely summarised by Wagner and Antonucci (2009) who argue that such an approach is a 'common language' which can be embraced by both managers and employees alike.

Finally, it is commented by Morris and Laksmana (2010) that the success of the ERP project is dependent on whether the senior managers within the organisation adopt a long term view of the benefits which are likely to accrue as the result of a new ERP system. In particular, research suggests that those companies whose senior managers have a more long term view of the ERP project which is being implemented are significantly more likely to enjoy the desired benefits of a successful ERP implementation. In particular, it is necessary for senior managers to adopt a perspective in which the implementation of the ERP system is not perceived to be the end point, rather it should be interpreted as the beginning of a new process of getting the organisation to adapt to cultural change.

The advantages which are associated with the adoption of a longer term view is due to the fact that those senior managers which only emphasise the short term 'have lost opportunities to drive cultural change and online value from the organisation' (p.290). The value which is associated with adopting a longer term view of ERP implementation is emphasised in a survey which was conducted by Longinidis and Gotzamani (2009) which claims that there are essentially two phases in the process of implementing an ERP system. The initial phase of implementation refers to the period during which the relevant tools for ERP implementation are utilised and culminates in the 'going live' of the ERP system. The mistake which the majority of senior organisational managers make is to focus unduly on the initial stage of the ERP implementation process and to see the going live of the project as their end goal. As a

result, Bharat (2012) comments that this failure to see beyond the short term means that the ERP systems which are implemented are very generic in nature and are not adequately tailored to the specific requirements of the company.

It is important to note that while the adoption of such a short term view may have short term advantages, namely, in ensuring that the implementation of the ERP system is completed on time, in the long term, it is likely that this will have negative results as employees will fail to adequately embrace the new system and more experience feelings of demotivation as a result. Furthermore, an emphasis on the short term implementation of the ERP system is likely to encourage companies to take short cuts in order to accelerate the implementation process; such short cuts may have the effect of limiting the effectiveness of the final ERP system and of resulting in a generic 'vanilla' system being implemented.

The short term view of ERP implementation which is commonly adopted by senior managers is also criticised by Morris and Laksmana (2010) who argue that such companies typically fail to obtain the expertise and the knowledge which is necessary for an effective ERP implementation. The pressure to complete the implementation within a certain amount of time and the emphasis on short term cost constraints acts as a factor which serves to deter many managers from recruiting specialised ERP consultants. As a result, such managers have a tendency to rely on using in house expertise for ERP implementation even if such expertise is essentially inadequate. This tends to result in the implementation of an ERP system which is substandard and which fails to meet the requirements of the company.

Research tends to identify the second phase of an ERP implementation as beginning from the point at which the new ERP system is actually implemented live; Bharat (2012) emphasises that this phase is as, if not more, important than the initial phase of ERP implementation. However, the second phase of ERP implementation relies on the maintenance of continued efforts by managers to ensure that the any deficiencies, breakdowns or general flaws with the new system are promptly identified. Managers should continuously monitor the outcomes of the new system and ensure that they are effective in providing the desired benefits to system users by continuing to invest in training of users. In addition to the simple maintenance of the ERP system, the continued long term success of the system is dependent on the reengineering of existing functionality and the continued integration of the ERP system by means of future

third party products. Thus, the success of the system is essentially contingent on ensuring that it continues to evolve in response to the changing needs of the business.

3.2.3 ERP managers

Research which has been conducted by Longinidis and Gotzmani (2009) suggests that one of the most important roles which are played by ERP managers is project management, and that on a basic level, the success of an ERP project in terms of its budget and its timelines is dependent on the effectiveness of such project management. This is specified by Wagner and Monk (2008) who argue that ERP managers need to ensure that they have a suitable plan in place for available resources, the desired objectives of the project, a work plan and that the progress of the project is subjected to continuous monitoring. In addition, the ERP manager needs to ensure that the structures which are in place within the specialist team who is responsible for overseeing the ERP implementation is structured in a way which is likely to result in successful implementation. Specifically, key change concepts need to be fully understood by all members of the implementation team, progress reviews need to be scheduled, as do reviews and time scales, while the efficiency of the implementation is also dependent on the existence of a pre-defined hierarchy of decision making (Ganesh & Mehta, 2010).

Furthermore, the relevant people within the team need to be provided with the empowerment that they require to be able to make the necessary decisions. This is reiterated by Grabet, Mayere and Bazet (2008) who comment that one of the key roles of the ERP manager should be to ensure that all of the core business processes which typify the business are closely realigned with the requirements of the software and that there is a high level of integration between the technical division and the rest of the departments within the company. Furthermore, it is essential to ensure that, in his project managing capacity, the ERP manager establishes a realistic timeline for completion in order to ensure that employees are reassured about the time which will be taken for the completion of the project and to ensure that they have a higher degree of trust in the process.

The significant extent to which the ERP manager's role as a project manager is likely to affect the success of an ERP implementation is emphasised by Peng and Nunes (2008) who argue that it is not sufficient for an ERP manager to be simply 'organised' in their approach to an ERP implementation. Rather, the success of system implementation requires the ERP manager to follow a very specific process. Firstly, it is necessary for the ERP manager to clearly decide upon what the scope of the ERP project is and to determine the way in which

the outcome of the ERP system will fit into the strategy of the overall organisation. This should then be followed by the appointment of relevant teams of individuals who have the expertise necessary for the implementation of the system. These teams should be responsible for outlining the key training needs and the requirements for documentation which are associated by the company which can be determined by an analysis of the existing systems of the company. These requirements can then be used as the basis for the development of a prototype system which will help to crystallise the key requirements of the organisation from the new system. The constructed prototype should incorporate all of the company's business processes which should be mapped onto the various functionalities of the ERP software; in order to ensure that the ERP system will be effective, it is suggested that the ERP manager should instigate field testing which will play the role of validating the relevant conversion programs and technical interfaces. This process of field testing will also be useful in highlighting any problems which arise with the system, and can proceed to form a useful basis for further amendments to be made to the system on the basis of feedback which is received from employees (Wagner & Monk, 2008). It is also suggested that the ERP manager should ensure that a wide range of quality assurance testing is carried out in order to produce different configurations of the ERP system; training of end users should also be provided and after the insertion of real data onto the system, it then should be implemented.

Aside from the need for efficient project management, Peng and Nunes (2008) argue that an important role which should be played by the ERP manager is to effectively manage the teams who are responsible for the project. Such team management is essential to ensure that people feel that they have ownership of the ERP project. This is reiterated by Pabedinskaite (2010) who argues that it is the responsibility of ERP managers to ensure that the way in which various teams are assembled is such that the differences between the employees working in the non technical and the technical areas of the organisation are bridged effectively. This will contribute to the sense of creation of a more holistic sense of ownership in the project and essentially signals a shift from a traditional, linear conceptualisation of IT project management which proceeds on the assumption that the only requirements for ERP success are clear budgeting, controls and planning.

Stair and Reynolds (2011) go so far as to argue that effective ERP managers need to embrace a new paradigm of management where they are expected to perform the role of moderating,

managing and interpreting organisational change. As a result of this new paradigm, ideally, the ERP manager should select teams which are comprised of people who are used to adopting more flexible modes of thought, who are able to effectively interpret different change related scenarios and who are adept at being able to communicate change to existing stakeholders. This could arguably be achieved by ensuring that the ERP managers select a range of key individuals who can act as project managers and who can use their influence to simultaneously obtain much needed support from the senior managers of the organisation while also ensuring that the end users of the system buy into the project and are suitably motivated. This will require such project champions to be able to fulfil a range of different roles, and most importantly, the ability to assume an empathetic role of counsellor when reacting to the concerns of employees and encouraging them to buy into the process (Stair & Reynolds, 2011). While the suggestion of electing project champions appears to be a useful way of bridging the gap which exists between the senior managers of the organisation and the end users, the extent to which these findings can be generalised to apply to all organisations is limited by the fact that all of the companies which featured in the secondary research are large corporations and are therefore more likely to have access to the necessary resources. The same issue applies to the role which is played by ERP consultants. It is eminently more feasible for larger corporations to be able to afford to recruit a specialised, external ERP consultant who is able to produce multiple configurations and prototypes of the ERP system. It is highly unlikely that a smaller organisation with more limited resources would have the capability to recruit such a consultant and it is more likely that they would be forced to rely on in house expertise.

3.2.4 ERP consultants

Empirical research suggests that there are close links between the effectiveness of ERP consultants which are recruited to implement ERP systems within corporations, and the overall success of the ERP system. The majority of companies which choose to implement a new ERP system do not have suitable levels of in house expertise and are therefore forced to rely on the expertise which can be obtained by recruiting an external ERP consultant. Wang et al (2008) comment that the effectiveness with which a company is able to engage external expertise is a fundamental attribute in determining the success of the ERP implementation. According to Wang et al (2008), the key roles which are played by an ERP consultant is the provision of technical expertise, the provision of business expertise, the configuration of the

ERP systems which are deemed to be most appropriate, and the training of the eventual end users of the ERP system. The overall effect of fulfilling all of these functions is to lessen the learning burden of clients which is typically associated with the adoption of a new system. A survey which was conducted by Li, Xu, Tjoa and Chaudhry (2009) examined a sample of 85 corporations within the Taiwanese manufacturing industry within which ERP projects were implemented. The results of the research revealed that consultants who were more effective at resolving conflict and at enabling communication within the process of ERP consultation were significantly more effective at increasing the quality of ERP system which were implemented. Indeed, the results of the multiple regression which were conducted in this study revealed that the role which was played by ERP consultants in determining the success of the ERP implementation was even more significant than the role which was played by senior organisational managers. The outcomes of the study also revealed that the extent to which continued support is provided by the ERP consultant to the organisation after the initial go live of the project is likely to have a significant impact on the effectiveness of the new system, suggesting that in order to ensure the effective implementation of an ERP system, the engagement of the ERP consultant with the company needs to be long term in nature.

Aside from outlining the desirable factors which need to be present in any ERP consultant in order to ensure an effective ERP implementation, much research has been conducted which examines the various instances of companies in which the actions taken by ERP consultants have restricted the success of the ERP implementation. In particular, Ifinedo and Nahar (2009) comment that the key reasons why many companies are not satisfied with the outcomes which are associated with the hiring of an ERP consultant are related to the fact that the ERP consultant did not properly understand the requirements of the client; the ERP consultants failed to provide a solution for the company's needs which adequately reflected their requirements, and was instead a generic package; the ERP consultants did not properly understand the organisational culture of the client company and failed to provide an ERP solution which took into account such key cultural factors; and many consultants simply aimed to get more work from the client company rather than genuinely trying to address their needs.

In summary, therefore, it appears that in many cases ERP consultants have not fully focused on the needs of the company and have failed to act in the interests of the client – rather, they

have simply provided clients with a standard solution which is not adequately tailored to the client's needs. Wenrich and Ahmad (2009) claim that the reason for the disappointing contributions which are made by many ERP consultants can be explained by means of agency theory – in particular, it is suggested that the aforementioned issues arise as the result of a fundamental conflict which exists between the goals of the client (the principal) and those of the consultant (the agent). Essentially, the way in which such conflicts of goals is to be managed is only through the implementation of control mechanisms which can act either to increase the extent to which managers are able to supervise the actions of the agents, or which can act to incentivise the consultants to work more closely to meet the desired objectives of the client. This is emphasised by Li et al (2009) who argues that, in order to result in the effective implementation of an ERP system, it is essential to ensure that the relationship between the client and the ERP consultant is such that they are able to closely cooperate in order to meet all of their specified objectives. It is therefore important to ensure that controls are in place which enforce such cooperation – an example of such controls could include the introduction of greater coordination between the client and the consultant so that they can come to a common agreement about the goals that they are both working towards.

An effective way of solidifying such coordination could be through the formulation of a contract between the client and the ERP consultant which outlines the terms which have been agreed upon, although empirical research which has been conducted by Partharasathy (2010) suggests that such client consultant contracts are rare.

Research which has been conducted by Stair and Reynolds (2011) also comments that the role which is played by the ERP consultant should also reflect the fact that ERP systems are implemented in a variety of interdependent models. It is important for the ERP consultant to ensure that they effectively coordinate and manage the interdependencies which are related to the various ERP modules, especially given their disparate nature. Indeed, Pabedinskaite (2010) goes so far as to suggest that the effectiveness of ERP implementation is directly correlated to the extent to which integration between these different modules is achieved. It is also argued that, in most cases, instances of failed ERP implementation can be traced to the lack of suitable coordination and communication between different modules of ERP which is in turn due to a failure of the ERP consultants to fully acknowledge the complexity which is associated with the implementation of an ERP system.

Finally, a study which was conducted by Stair and Reynolds (2011) suggests that a key error which was made by many ERP consultants when they are recruited to implement a new ERP system is to focus solely on the technical issues which are related to the implementation. In contrast, it is advisable for ERP consultants to focus equally, if not more, on building a consensus within the organisation about the new ERP system, and getting the stakeholders within the organisation to commit to change.

Indeed, Lytras and Ordonez de Pablos (2009) argue that being able to achieve functional coordination within the company is a task which it is significantly more important for the ERP manager to undertake than issues which are related to the functionality and configuration of the ERP system itself. This is emphasised by a case study which was conducted by Lytras and Ordonez de Pablos (2009) focusing on the case of a Mexican company which had recently implemented a new ERP system. It was found that the new ERP system failed to result in the expected benefits for the company due to the fact that the organisation was not adequately prepared for the change which was related to the new system, so that, even though the technical issues which were related to the implementation of the information system were managed adequately, this was not sufficient to result in an effective system implementation. Indeed, those companies which were most likely to experience successful ERP system implementations were those companies in which the initial specifications of the ERP project were continuously modified in response to various obstacles and organisational changes which occurred over time. Those companies which were less successful in the implementation of their ERP systems were typically characterised by the ambiguity of their objectives, the lack of commitment and support by senior managers, and the failure of the ERP managers to unite the objectives of the ERP project with the values and motivations of the employees working within the organisation (Olson & Kesharwani, 2009).

3.2.5 Organisational Customers

A quantitative methods survey study by Yeh et al. (2005) to investigate the impact of ERP implementation on service quality, and hence customer satisfaction, in the Taiwanese semiconductor industry revealed that ERP systems had been recognised as providing a better service. However the findings also revealed that the organisation had underestimated the level of service that customers had expected from ERP implementation, and that customer requirements should be carefully considered in the ERP planning and implementation, if

customers were to receive appropriate service quality. A complementary influence concerns the marketing of products and services to customers, for instance a study by Pan et al. (2010), that found 39 ERP failure factors, discovered that poor implementation impacted on the organisation's ability to provide the required level of customer service. Specifically these were, if use of the systems fails to predict new product demand, sales forecasts, and to support the work of salespeople to conduct special offers to existing customers, which is a key factor in generating more sales with the highest profit margins (Wilson, 1998).

An ERP implementation study of five companies, describes one of the cases as focusing on the role and influence of customers in ERP (Skok and Legge, 2001). The feedback was that when another supplier had introduced such a system, a decline in levels of communication had occurred. This company therefore set up a number of interventions to avoid a repetition when it was planning and implementing its own ERP system. Firstly it arranged internal workshops for employees in a customer facing role, so that agreement could be reached on how to inform customers of the changes. As a part of that workshop, the employees were familiarised with the key elements and concepts of the intended SAP system. Following that intervention, Account Manager Teams held presentations for their most important customers and also met with smaller accounts to sustain customer confidence with the implementation. In addition the Account Managers collaborated with their key contacts in the companies during the go live phase, so that panic purchasing did not occur prior to this point and the company devised contingencies, in case there were any supply issues at the time of 'go live'. The fact that the interventions made are stated in this study makes it useful as an example of practical actions and preparation that organisations might employ to recognise the importance of their customer as a stakeholder when implementing ERP systems.

In Customer Relationship Management (CRM) software is described as an example of ERP by Maleki and Anand (2008), whose study revealed that sales of CRM software had risen by 23.1% from 2006 to 2007, representing US\$6.6 billion market value (Gartner, 2008). The key factor in the implementation is to derive competitive advantage by offering a superior service to the consumer, inferring that this primary stakeholder has a key role in the manner in which the CRM system is implemented, and on the functionality of the implemented system. The superior service takes the form of identifying, recording and manipulating data on the personal preferences of each individual, so that even unperceived needs can be

predicted and delivered. In addition greater competitive advantage is a result of an ability to forecast the outcomes of these interactions with the end-consumer; hence CRM is a fundamental business performance strategy tool (Piercey and Lane, 2009; Maleki and Anand, 2008).

Both ERP and CRM manage business processes but have different core purposes: ERP has traditionally been concerned with business operations and functions, whereas CRM has focused on contacts, opportunities and individual accounts. When the two systems are merged and ERP vendors offer the integrated package, customer activities and related operations are more effective and the integrated system is expected to have the same CSF factors as ERP (Maleki and Anand, 2008). However there is evidence that the CRM focus would need substantial attention its own CSF factors, even though there is similarity with those of ERP, such as the requirement of setting quantifiable targets and therefore these drive the functionality that the system must possess, consideration of the factor that it is the customer relationship that derives from the technology that makes the technology crucial. In the case of customisation of CRM, over customisation within the ERP context can have a damaging effect on the customer focused outcomes, and the functionality of the CRM software should be examined carefully to establish how well it matches that required for optimum customer relations outcomes (Maleki and Anand, 2008).

The researchers suggest that the CRM aspect should be considered carefully in the early planning stage, and that organisations should conduct customer surveys to measure the impact of the CRM on attitudes and buying behaviours. The loss of customers is a crucial cost factor for companies, not only owing to the decline in reputation but also the high cost of replacing those lost with new ones; a new customer can represent up to ten times the cost of retaining the existing one (Piercey and Lane, 2009; Wilson, 1998). The lack of marked improvement in customer services levels when the ERP system was implemented was suggested as being the consequence of a failure to integrate a CRM package, in an ERP case study of an Egyptian branch of a global chemical company by Elragal and Al-Serafi (2011).

The branch firm considered itself more akin to an SME (Small-Medium Enterprise) and, although the parent had implemented SAP, it had chosen a system considered more appropriate to an SME. In addition the ERP materials module had been rejected partly as a

result of there being no accurate sales data from the sales people so that material planning could be effected, and the job costing module was not implemented since there was no existing system for that purpose. However there had been some positive aspects related to customer service from the modules that were implemented, which were described as being derived from the logistics module implementation; shortened delivery time, reduction in stock that enable quicker response time, better communication with the customer and reduction in shipping errors and return of goods. However there was disagreement between key personnel, the logistics and operations managers, as to the degree of customer service improvement with the operations manager stating that not all customers had experienced an improvement in service. The findings suggest that the role of the customer as stakeholder was secondary to the main thrust of the implementation and the improvements made to customer service were a by-product, indicating that more attention needed to be focused on the customer at the planning stage. The study also implies that operating a different ERP system from the parent also impacted on expertise with ERP, which could have been leveraged by parent's input, and therefore on the functionality that could be achieved

One of the most important and contemporary business issues concerning the customer is linked to the influence that customers have as stakeholders in ERP implementation, in the form of consideration when implementing corporate governance policies. The external stakeholder is better served if organisations implement ERP, according to the findings of a study in China by Jidong et al. (2010), as a consequence of better information flow that serves to enhance corporate governance. The findings also suggested that companies with weak corporate governance policies were most likely to implement ERP for this reason, as well as state owned companies, which had few independent directors. The rationale was that ERP would provide consistent data about the operation to external stakeholders, instead of the high risk of internal managers providing shareholders and customers with incorrect data.

This factor was particularly critical in companies in which there were few or a low percentage of independent directors, as was typical of state-owned Chinese companies (Jidong and Liyan. 2010). The findings of this study also infer that cultural and historic factors need to be considered when the customer stakeholders influence of role in ERP implementation is examined. Hence the insinuation is that ERP is considered vital to create

an effective communication of corporate integrity to consumers and other external stakeholders.

Although there are several ways in which ERP implementation appears to impact on customer relationships, as is evident from the studies described, there appear to be very few studies that consider that factor to any significant degree, that the role of customer stakeholders should be a core factor when planning and implementing ERP in organisations.

Since effective ERP implementation is acknowledged as representing competitive advantage, hence organisational profit levels and credibility with customers, at minimum there should be customer facing personnel involved from the very early stages. Critically appraising customer feedback on the types of improvement in service that would increase their loyalty to the organisation should be a core factor in system functionality, whether it is collected from an existing CRM system or by means of customer surveys or meetings between key customers and the sales teams. The lack of attention to customers as stakeholders in ERP implementation represents a big gap in the existing literature.

3.2.6 Organisational Suppliers

A review of the literature on critical success factors for ERP refers specifically to the role and influence they have on ERP success, and also suggests that organisations, which use the vendor's tools are likely to reduce the costs of the project. The study by Somers and Nelson (2001) sets the scene for an overview that makes the case for the supplier being considered as an important stakeholder in the effective ERP implementation. The studies reviewed identified the nature of the relationship, which they stated should be one of strategic fit so that vendor and organisation collaborate to ensure the end of goal of leveraging the organisation's effectiveness and hence competitive advantage. This could be further enhanced by employing supplier's development tools, technologies and programs, which would ensure that implementation was quicker and accomplished at lower cost. The transfer of knowledge, such as understanding how to use the software and employing industry acknowledged best practices was a further success enabler.

The vendor as key stakeholder for SMEs was investigated by Poba-Nzaou and Raymond (2011), using an in-depth case study approach from the perspective of risk associated with

ERP system implementation. The findings were, that in cases in which the vendor was of a similar organisational size and structure, had a strategic approach mirroring that of the SME, was flexible and demonstrated compatibility of a personal level with the senior managers, there was substantial reduced risk of failure. Hence the researchers suggested such factors were 'mission critical'; the outcomes of study are in agreement with Somers and Nelson (2001).

The vendor influence as a single factor on ERP success, was examined by Teo *et al.* (2009); the views of ten with ERP consultants, developers and project managers in a multinational consulting company based in Singapore, were gathered using semi-structured interviews, which resulted in valuable descriptive information. The research focused on what the vendor believed were the key factors in success and hence the inference is that this findings of the study will permit the organisation to devise a framework for assessing the vital on criteria which to select a vendor, as well as articulating why the supplier should be considered as an important stakeholder that has substantial influence on outcomes. If the supplier's input was to results in the optimum outcome, the supplier would need to work with a competent project team, who have the requisite experience, rather than new graduates, which is often the case; the speed and effectiveness of implementation is strongly influenced by this factor.

The manner in which knowledge is managed and retained within the supplier organisation is also critical, if there is a turnover of staff during the project this will extend the time horizon for completion, since new personnel then have to learn about the organisation before making a satisfactory contribution. Another factor was managing relations between stakeholders, which should be collaborative and professional despite their different focus; consultants were concerned with organisational functions, whereas developers focus on the technical aspects and effective co-working produced quicker and more effective solutions. Excellent communication was a core factor in this, and extended to all users as well as the vendor's team of consultants and developers, since it enabled visibility as to how each group's contribution complemented those of the others. Project management must embrace all variables and uncertainties relating to the project and fair allocation of workload to retain motivation and productivity levels. The vendor would also look for detailed and accurate user specifications, and that resources allocated were sufficient including the budget and that the users were committed to the transformation.

The importance of vendors as stakeholders in ERP success was approached from the perspective of the negative aspects of organisations not selecting the vendor carefully by Skok and Legge (2001), who proposed that these external staff often represented a substantial source of conflict, especially if the experience of such personnel was limited, knowledge transfer was poor and self-interest high; the first two factors concurring with other studies (Teo et al. 2009) but third highlighting a possible additional negative stakeholder supplier role if vendor selection occurred. If the organisation allowed the vendor's team to take too much control then this would also impact on the outcomes, since the organisation was not able to guarantee the outcomes it desired from the project, potentially leading to failure.

The influence of ERP implementation on the supply chain and its consequences for efficiency and cost reduction were one of the findings of the Elragel and Al-Serafi (2011); improvement in communication between departments, partners and customers, reduced stock levels and better response times. A study of the link between supply chain management (SCM) improvement and ERP implementation in Malaysian companies was carried out by Shatat and Udin (2012). Of the 123 companies, approached 80 returned the questionnaire survey which focused on SCM and ERP in terms of integration, materials management, production planning and workflow management; participants, which were IT/MIS experts employed by the organisations, were asked to rate each of these on a five point Likert Scale. The research revealed that the relationship between SCM and successful ERP implementation was substantial in all four of the areas examined; hence effective use of ERP enhances SCM outcomes. The specific SCM features that improved were better internal information flow, flexibility, more integrated business processes, collaboration with suppliers, SCM partners and customers, product quality, stock levels and organisational costs.

The researchers also highlighted the additional benefit of avoiding use of redundant data and being more responsive to changes in the environment, particularly if there was a CRM module complementary to the SCM module.

Reinforcing this link, the investigation by Stratman (2007) into manufacturing firms that had implemented ERP, found that those, which had goals for ERP that strengthened the supply chain, only began to realise them after an effective internal user performance had been accomplished. This finding strongly infers that, at the core of success, is the selection of the appropriate vendor by the organisation, the fit between them and those vendor characteristics

that were mentioned by Teo et al., (2007), Somers and Nelson (2001 and Skok and Legge (2001), in other words the finding suggests the supply chain management and the related customer service, competitive advantage and cost efficiencies, will only be realised if the supplier, the vendor is regarded as a core stakeholder and its influence and role appropriately acknowledged so that the appropriate module and their configuration and functionality are selected and implemented.

3.2.7 ERP Users

The user as a stakeholder is considered in a variety of studies and reasonably well documented in the literature, both from a perspective of what causes resistance to the ERP implementation or factors that enable effective implementation. A selection of prior studies is documented, which focus on a variety of perspectives. The meaning of user satisfaction as a measure of the success of ERP implementation has been framed in a number of ways in previous studies, for instance as the aggregation of attitudes and opinions to the manner in which information is delivered (De Lone and Maclean, 2003) and their perception of how it meets the user's workplace needs and/or that of the organization, in terms improved performance (Somers *et al.* 2003; Wu and Wang, 2007; Anjum, 2011).

The satisfaction levels of users in the healthcare sector, such as doctors and administrators, was the subject of a study that aimed at producing a model for implementation of ERP in a Dutch hospital (Boonstra and Govers, 2009). The purpose of the research was to understand what the expectations of user stakeholders were, in diverse departments, were to ERP and the nature their attitudes to its adoption; hence this study was most concerned with the user role and influence at the pre-planning stage and the need to establish the barriers and enablers to agreeing to consider an ERP system. The model for ERP implementation that was ultimately derived from the findings, paid significant importance to the power positions of the players in this type of institutional environment, and their perceptions of the importance of implementing ERP. Specific aspects, such as the meaning the stakeholders associated with ERP, their interest in the concept, and the issues they perceived ERP will raise.

These were important factors that need to be considered and understood, in addition to the technical and financial ones. Firstly understanding the organisational philosophy was essential, since this might not match the types of management philosophies integral to ERP.

A second factor was the doctors, who were described as having the freedom to implement their personally preferred systems, and so choose the practices they wished to employ; this factor could result either in a final system that was not integral, such as one in which a doctor or group of medical practitioners used a parallel system, or rejection of an ERP implementation plan. It was therefore crucial that powerful end-users were involved from the outset and their influence understood and considered adequately. The findings of this study revealed that failing to appreciate the attitude and interests of key users resulted in high levels of resistance after implementation, such that a crisis ensued.

Two other findings are important to this researcher's model: that users' views may change over the implementation period, that those opinions may be a result of politics, self-interest or perception, for instance if problems with implementation arise; the overoptimistic expectation of the system benefits by those who supported implementation, since they failed to understand the social, historical and cultural environment in which the changes would occur. The study's findings infer that key users need to be represented at every stage, from the moment the potential of ERP as a system to improve operational performance and communication is raised, and then continuously until the post-implementation phase and beyond so that changes in opinion are made visible and commitment to the successful implementation is retained. This political or power perspective is also emphasised by Elragal and Al-Serafi (2011) and mirrors the position of doctors in Boornstra and Govers (2009).

In this case ERP modules were implemented for most key operations but there was resistance by a key group, the plant managers in the Chemical Company. As a consequence, the material requirements planning module was not included in ERP implementation, because they did not wish to use it. This factor restricted the potential outcomes from the software.

The users of ERP in a contact centre of a large energy company were studied by Davis (2004); the ERP package adopted had integrated a customer service module. The users were asked to appraise the success of the module, eighteen months after its introduction ('go live'), in terms of changes in the level of services to internal customers that resulted; diverse attitudes and opinions were found. There appeared to be no shared vision about the way in which the ERP functioned or by what means its success was evaluated, for instance whether by the increase in call volumes handled, which was concerned with work processes or by

customer satisfaction levels, which related to work performance levels by the users. There were also strong user objections to suggestions that the technology was responsible for improvements in customer satisfaction, rather than human effort, since it was attitude to the customer that was in the hands of the customer service agent not the technology. Negative views also included having little control over own work operations since the system dictated them, that there was little opportunity to improve processes and that ERP was basically a management control tool. It also became evident that the users were not adequately involved in the functionality design, since they raised ideas to increase the effectiveness of the software, but the modifications were stated as being too difficult to implement Davis (2004).

This study is of limited value since just 25 participants were interviewed but its value is in the fact that it is likely to be generalisable to other organisations, in which the communication of the end goals of the ERP implementation are not well understood, leading to a sense of dissatisfaction, particularly if the user's ability to produce enhanced outcomes is not acknowledged. The study also highlights the possibility that the potential to create better 'buy in' by key users was lost early in the ERP process, since their contributions to improving the outcomes from the systems that might benefit the customer were not fully appraised. The findings in Davis (2004) are similar to the recommendation by Maleki and Anand (2008), who stated that, in the case of ERP system in which CRM software is integrated, all users of the CRM system, all personnel and managers, are key stakeholders in implementation and should be involved in the implementation of ERP from the very earliest stage to post implementation and beyond.

A survey study by Desder and Ainin (2010), in which there were 384 participants with diverse working roles, lengths of service and educational backgrounds, working in Iranian companies, stressed that both ERP vendors and those responsible for ERP system implementation must elicit user feedback on aspects such as system reliability, appropriate functionality, degree of user friendliness. The first reason was that if the system did not meet user and organisational needs, there would be lower commitment to its use and secondly, if the system needed modifications then these would be difficult to complete and that vendors were not happy about making such changes. These findings are very similar to those stated by users of CRM packages integrated into ERP software.

A review of the literature conducted by Shang and Su (2004) found that user resistance to ERP implementation could be embraced by five categories:

- self Interest such as potential loss of status, influence, career advancement or job loss;
- lack of understanding of the benefits or nature of ERP and how it will be used;
- assessment of the benefits does not align with those perceived by others;
- unwillingness to change, as a consequence of insecurity, potential loss of valued social relationships at work or the need to develop higher levels of skills;
- the perceived need to make more effort potentially combined with the being more heavily monitored.

The review also emphasised the effects of this resistance, in terms of lower work performance and service, which could be categorised, related to the system itself as being non-destructive, proactively or passively destructive (Shang and Su, 2004). All three categories are detrimental to the organisation, if not directly to the system, since the resistance type that is non-destructive results in lost performance represented by leaving the company, absenteeism and/or communicating negative attitude to others. Examples of proactive destruction include direct damage to the system, as well as deliberately making mistakes, whereas passive destruction is refusing to collaborate with the ERP consultants or work colleagues. This study is just one of many that could be cited but is included because it brings together many symptoms of resistance and provides examples of their potential effects on ERP implementation success. It provides concise evidence for the need to involve all personnel in the project as stakeholders that have a variety of ways to influence the outcome.

3.3 Summary

This literature review chapter focuses on the extent to which the roles played various ERP stakeholders affects the success of implementation. Firstly, the role of the ERP sponsors is discussed including a demonstration of the significance of the commitment and support of senior management. Secondly, the different roles played by senior and functional managers within the organisation in the success of the implementation are reviewed. Thirdly, the nature and the critical role of ERP managers are articulated. Fourthly, the review of the literature also shows the impact of the organisational customers and suppliers on ERP implementation. Finally, the link between the effectiveness of ERP consultants who are recruited to implement ERP systems within the organisation and the overall success of ERP implementation is demonstrated through the review.

CHAPTER FOUR

Research Methodology

4.1 Introduction

The previous chapters formed the Literature Review and placed this study in the context of previous research, focusing on the key elements that were fundamental to informing this study and providing a conceptual framework to assist the researcher in his core objectives. This chapter will describe and justify the research methods that were selected to critically appraise the research problem. The appropriate choice of research approach is critical to achieving the desired outcomes of the investigation, and must take into consideration the specific requirements of the area of research. In this case, the scarcity of comparable studies, and the fact that the investigation focused on ERP implementation and stakeholder management, required a hybrid approach to the research philosophy, data collection and analysis.

This chapter will firstly discuss the research philosophy and overall approach of the researcher in the context of different approaches to research in IS. It will then describe the manner in which the research problem evolved from the review of the ERP literature and set out the research aims and objectives. The research design, strategy and methods will be critically evaluated and justified, and the data analysis process described in detail. Finally, this chapter will identify and critically assess the limitations of the research and areas for further improvement.

4.2 Research Philosophy

The fundamental research philosophy, or paradigm, used in this thesis was interpretivism, due to the fact that both facts about ERP implementation and the relationships of humans, with process and each other, were taken into consideration. However, an additional element of this research compared findings from the case studies with those from other organisations that had implemented ERP, which meant that a positivist cause and approach effect was also integrated. As a consequence the research paradigm bridged interpretivism with positivism (Ritchie and Lewis, 2010).

The interpretivist philosophy enabled the required focus on facts that were informed by the published research in the Literature Review chapters, in addition to the vital opinions and beliefs of the participants, who were involved in the ERP implementation phases in varying roles, a factor which also diversified their experiences considerably. These experiences had substantial impact on the extent to which they considered the ERP phenomenon as an integral part of the environment in which they worked. A purely objective approach to the facts surrounding ERP implementations, often referred to as the linear management view, has been proven to result in failure and was not deemed appropriate in finding a solution to this research problem; cause and effect infers logic but human reaction to a phenomenon varies and is therefore uncertain. Therefore, ignoring the human aspect would have lost the rich insights regarding the environmental setting and the manner in which the individuals made choices as they interacted with their work environment (Johnson *et al.* 2009).

The use of interpretivism in research into information systems and their management has increased substantially in recent times (Walsham, 1995) and is particularly relevant to this thesis, since Klein and Myers (1999) suggest that it assists researchers working in this specialist area to better comprehend the human thoughts and actions in the social and organisational environment in which they occur. This is reinforced by De Villiers (2005) who states that since IS research is primarily concerned with interactivity, the user centred approach, empowerment software and the usability of systems, interpretivism captures the human aspects of system design when developing IS solutions based on objective criteria.

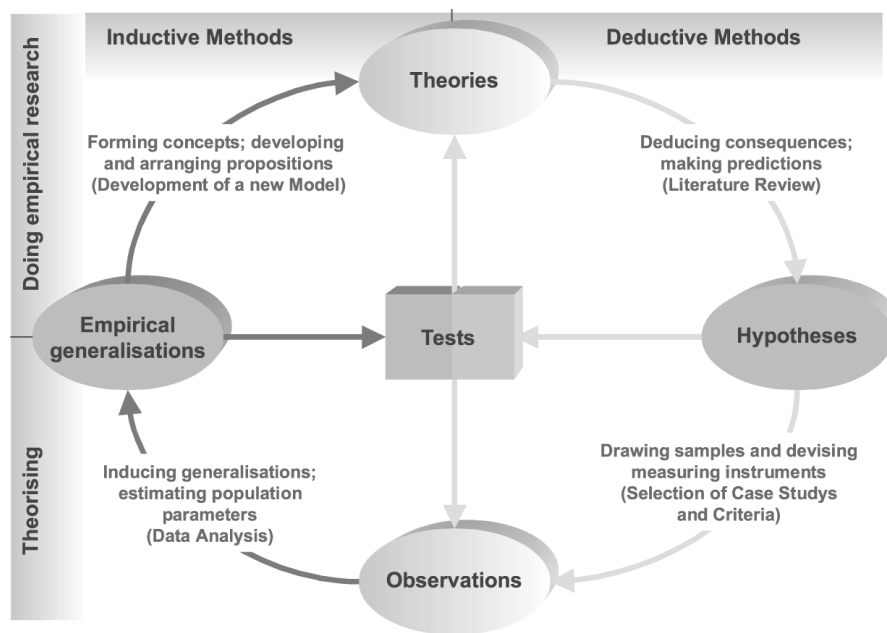
The researcher in this thesis considers the human aspects as being described as by a normative epistemology and an ontology of subjective idealism, which infers that each person constructs his own reality but also that there are objective criteria or facts. Reality is independent of an individual's conception of its meaning (Walsham, 1995). Hence interpretivism enables an approach that acknowledges an individual's freedom of choice to make moral judgements and decisions; this unpredictable human factor is at the core of this research problem. Qualitative research methodology and data gathering was founded on these principles since it focused on human interpretation of knowing about the social world (Ritchie and Lewis, 2010).

Bridged interpretivism with positivism is a further extension of this, conceived by Weber (1864-1920), cited in Ritchie and Lewis (2010), which enables the positivist cause and effect approach and the subjective, human value/belief approach to be combined. In this way, it became possible for the researcher to gather direct understanding, resulting from observation, together with the motivational understanding resulting from the unique value set of the individual. According to Walsham (1995) when conducting research in the IS field, the researcher should choose the combination of epistemologies and ontologies that are most appropriate for his specific research. For this reason, bridged interpretivism with positivism is the selected research philosophy of this study.

Both of these aspects were respected when the interview questions were designed and when the researcher interpreted the participants' responses (Ritchie and Lewis, 2010). An empathetic approach to the working environment of the various groups of stakeholders in the group was adopted by the researcher, with the purpose of being able to view the world as the participants did; this was supported by the researcher's own professional background and experience in this specialist sector. Business and management research studies often involve a focus on unique, complex contexts of this nature (Saunders *et al.* 2009).

Deduction and Induction

This thesis involved using two distinct approaches to enquiry, deduction and induction. The deductive approach is fundamentally concerned with testing a theory, whereas induction is a process involving the identification of patterns and trends and appraising the way in which they connect to specific views of the world held by participants. Induction, therefore, is associated with theory building rather than testing theory (Ritchie and Lewis, 2010; Saunders *et al.* 2009). The comparison is represented in figure 4.1.



Source: Derived from Deshpande (1983)

Figure 4.1: Induction and Deduction Source: Emerald Insight

This thesis relied substantially on induction since its fundamental aim is to build a new framework for stakeholder management in the ERP implementation phase. This was based on a consideration of the views and beliefs of the diverse stakeholder groups, aiming to draw conclusions from the specific observations made and then draw further conclusions that would be used in framework design.

The combination of inductive enquiry with exploratory research is one that has been used extensively (Naden and Lewins, 2010). The process of inductive inquiry is described by Creswell (2008) as having the five steps that are characteristic of the approach in this thesis: gathering initial information, the researcher employing open-ended questions in interviews, data analysis that focused on identification of patterns, examining themes identified to define patterns or theories and taking a broad view, to make suggestions and theories based on his past experiences and the literature.

Deduction was used predominantly after the main study findings had been analysed since the researcher had used a small number of cases and sought to compare these to the findings from previous studies, looking for patterns of convergence or divergence (Taylor *et. al.* 2006). The model used to accomplish this followed Robson (2002),

which began with deciding which variables to compare with the previous studies, how those variables would be determined, then to compare the two sets of findings and amend the existing theoretical base as necessary. In deduction the researcher must remain independent of the phenomenon in order to make objective comments; in this case his written study findings and those of previous researchers were the only criteria considered (Saunders *et al.* 2009).

Although deduction was associated closely with quantitative methods it also presented a valuable tool in qualitative research, in cases in which prior academic studies informed the developing thesis, in order to extend the existing knowledge and build a framework, which was a fundamental purpose in this case. If a deductive approach is incorporated into qualitative methods, Ritchie and Lewis (2010) emphasise the need for the researcher to retain an open mind and to take a multi-directional approach to design and data gathering.

The case study research strategy and interpretivist philosophy used in this thesis were frequently combined with deduction (Ritchie and Lewis, 2010). The use of deduction and induction together combined the benefits of each type of enquiry, at the same time as minimising the risks associated with them, provided such an approach is relevant to the research (Creswell, 2008). Induction represented significant time invested to complete the field research and there was significant potential that patterns would not be identified, but the advantage was that changes in research emphasis could be incorporated as the thesis progressed. On the contrary, deduction was often quicker, based on one set of activities and time schedules were therefore predictable. In addition, those who assessed the quality of the research tended to favour the deductive approach; the inductive enquiry was not so widely accepted (Saunders *et al* 2009).

The two approaches also enabled triangulation of the data between the findings established by this investigation with those of other studies (Kirk and Miller, 1986).

4.3 The Research Context and Approach

An Enterprise Resource Planning system is one of the most complex information systems to implement because it may touch practically every employee and process in an organisation (Usher, 2010: p.7).

Recent statistics indicate significant room for improvements to assist organisations in achieving the highest possible ERP implementation benefits. Figure 4.2 and Figure 4.3 from Panoramic Consulting's 2013 report on ERP usage indicates negative trends; 60% of ERP customers received 50% or less from ERP benefits, 61% from the customers suffer from time over run and 53% were adversely affected by the overrunning costs.

YEAR	COST	% OF COST OVERRUNS	DURATION	% OF DURATION OVERRUNS	% RECEIVING 50% OR LESS BENEFITS
2012	\$7.1MM	53%	17.8 months	61%	60%
2011	\$10.5MM	56%	16 months	54%	48%
2010	\$5.5MM	74%	14.3 months	61%	48%
2009	\$6.2MM	51%	18.4 months	36%	67%

Figure 4.2: ERP risk factors (Panorama Consulting Group, 2013)

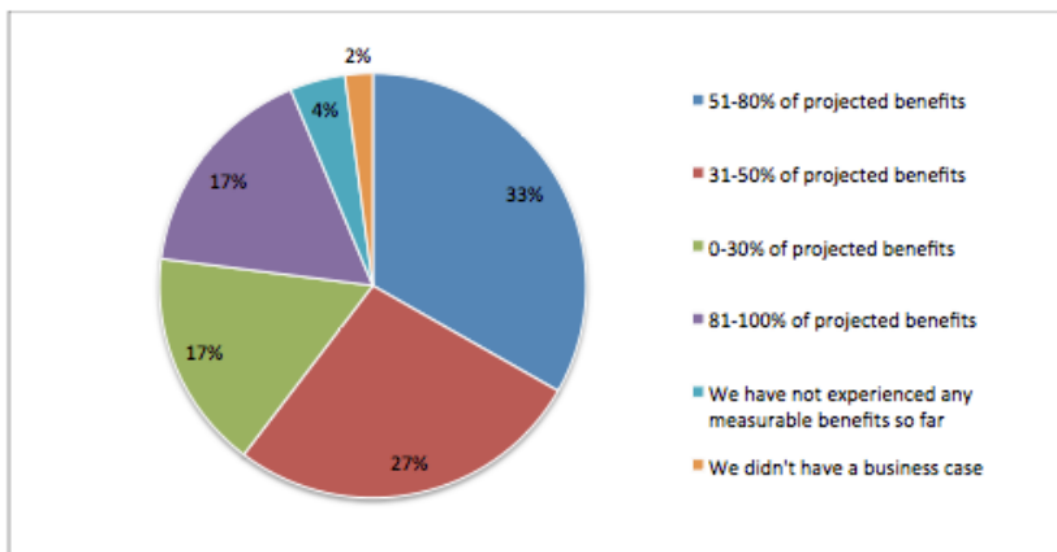


Figure 4.3: statistics on the realised ERP benefits (Panorama Consulting Group, 2013)

ERP projects were adversely affected by the lack of clarity in defining the roles and responsibilities of stakeholders involved in the implementation process; a major concern that contributed positively or negatively to ERP implementation was the management of stakeholders.

A study by Burns (2008), that sought to discover the ten most frequent selection and implementation mistakes of 2007, found that (clearly defined) roles and responsibilities were amongst the key factors vital to the success of ERP implementation. An article by Burns (2011) continued to stress the high cost and failure rate of ERP implementation, owing to the specific absence of effectively planning the people involvement; key people in the organisation should be taken away from their normal roles to take specific critical ones in implementation. A recent survey study of ERP implementation in the retail sector in India, conducted by Garg and Garg (2013) found evidence that the management of stakeholders roles and responsibilities was crucial to success; although this is evident from the description given in the findings it is not fully articulated in the conclusions. Despite the limitations of the study, which was limited to 175 participants, it represents a valuable addition to the sparse literature of the field. The absence of a reference to management of stakeholder's roles and responsibilities indicates that researchers may also underestimate its significance. However, a study of Sri Lankan firms conducted by Wickramasinghe and Gunawardena (2010) involving 74 organisations that had implemented ERP systems, appraised the impact of three broad factors on successful implementation.

The findings revealed that the factor of roles and responsibilities was not critical to success. The paucity of studies in this area, and the conflicting results of the little that has been published, illustrates the lack of understanding of the impact of management of stakeholder's roles and responsibilities on implementation success. In fact, a review of the literature regarding critical success factors (CSF) in ERP implementation, conducted by Finney and Corbett (2007), resulted in a key finding being that there was a huge gap in the literature regarding what key stakeholders perceived as the CSF that resulted in implementation success, which suggests that their views are not considered valuable, much less effective management of their roles and responsibilities.

As discussed in the introductory chapter (see page 1-2) a developing country like Saudi Arabia faces additional challenges in maximising the organisational benefits from implementing ERP systems.

Based on the above, the problem of the research has been defined (see section 1.1). The inference was that there remained significant opportunity to introduce a new CSF(s) perspective, which would assist organisations in defining the research aims and objectives (see section 1.2).

What is a model?

As the aim of the research is to develop a model, it is therefore necessary to define its meaning.

A situation (problem and solution) is presented using a model to show the understanding of the problem, how the solution addresses it and the relationship between them (March & Smith 1995). Some researchers like Bjekovic B and Handerek A (2013) believe that a model always has a purpose; this purposefulness dimension is explicitly present in most of the model definitions. Models help us to comprehend the world by representing only those major features of the world that are important for our purposes. Often they provide only an approximate account of the complexity that exists in the real-world phenomena they cover. They compromise precision to achieve cognitive economy” (Weber 2012, p. 5).

Modelling is the field of ERP and its interrelated themes addressed in the literature. Business modelling is a central activity to many different areas, including Business Process Reengineering, Organizational Development, Enterprise Modelling & Integration, Business Process Management, Enterprise Application Integration, ERP System Configuration, E-Commerce, Software Development and Information System Planning and Development (Montilva C and Barrios A, 2004).

ERP Return on Investment

The term ‘return on ERP investment (ROI)’ will be used frequently in the three parts that cover the analysis and discussions, and in deriving the intended model. It is therefore necessary to it is therefore necessary to define its meaning.

The ROI in this research is a single term that refers to the degree of success in achieving most of the ERP benefits that have been discussed in section 2.2.3. Most of those discussed benefits are intangible in nature, which has led to the inclusion of a wider span of elements in the measurement ERP success. The intangible elements represent the majority of the comparative attributes in the measurement of ERP success as discussed in section 2.2.5.

4.4 Research Design

Research is described by Petre and Rugg (2012) as the process of exploring phenomena in order to improve knowledge and understanding of them, which implies that the researcher finds something that is new, whether it is totally new to him or in a general sense. Primary research is a result of finding something not yet known, as is the primary aim of this thesis, where the researcher, in discovering something new to him, refers to the secondary research that he conducts to find gaps in the knowledge and to create a conceptual framework for the thesis (Petre and Rugg, 2012).

This infers that research is a two stage process, which embraces empirical research and theory, which can occur by doing empirical research and then building theory, referred to as induction or examining current theory, and then conducting empirical research referred to as deduction; some theses contain elements of both (Saunders *et al.* 2009). Research is, however, more than merely gathering information. It involves critically analysing that information and asking questions about it, by comparing different findings and relating sources to each other and then using it to develop, understand and test theories. Three characteristics of good research are that it is based on keeping an open mind, examining data critically and being able to discover something that has generalisable application, within specified limits (Phillips and Pugh, 2010).

The research design is the overall plan of the approach to finding a solution to the research problem discussed in 5.1. The purpose of the research is reflected in the types of study that would be appropriate; there are three major types of study, exploratory, descriptive and explanatory, which could be used separately or in combination (Saunders *et al.* 2009). Exploratory research concerns uncovering new knowledge about a known phenomenon in order to generate better understanding of

that phenomenon; it often employs three distinct methods to accomplish this, namely interviews, focus groups and literature searches (Phillips and Pugh, 2010; Saunders *et al.* 2009).

Explanatory research seeks to examine specific variables and their relationships; for instance why individuals or groups behave in a certain way in a given context (Saunders *et al.* 2009). Descriptive research attempts to find new insights into a phenomenon and is used for purposes such as creating profiles and making predictions; its purpose is usually to answer questions such as ‘how’ or ‘why’. However the fact that the outcomes are purely descriptive makes its use limited to gathering initial information that would be gathered prior to an exploratory or explanatory study (Saunders *et al.* 2009; Richey and Klein, 2007; Petre and Rugg, 2012).

The purpose of this research is exploratory, since it seeks to consider ERP implementation from the stakeholders’ perspective. Research concerning this topic is in state of relative infancy and as a result of the inadequacies of existing theory, an exploratory approach was considered most appropriate. The process of exploratory research necessitated a review of substantial published academic studies and other materials, with the purpose of gathering extensive data, in order to develop a holistic and integrative understanding of the management of roles and responsibilities of the stakeholders involved in the implementations of ERP. Consequently, the scope of the thesis is extremely broad. This approach is also sufficiently flexible to enable the researcher to adapt, as required, to changes that might be needed as the research progressed; new data might be found, requiring a different focus or additional elements (Saunders *et al.*, 2009). Data gathering is also relatively unstructured, owing to the lack of published research and the requirement to change approach or focus as participant views are established.

In this study the fact that participants had joined the ERP implementation at later phases of the process, and some who were present at the initial phases had left the organisations involved, inferred that the researcher would have to attempt to fill gaps in knowledge gained from interviews by other means such as secondary data. The data gathering tools, which were interviews, observations and published

documentation, are typical of the exploratory approach (Ritchie and Lewis, 2010). In this study, critical appraisal and synthesis of the data gathered was vital to solving the research problem and, since people were involved, whose views were diverse and not subject to simply cause and effect relationships, the purely descriptive or explanatory study was inappropriate (Saunders *et al.* 2009). The components of the research design figure are briefly explained in table 4.1:

Table 4.1 Research Design Components

Stage	Detail
1	Reviewing existing ERP literature
2	Identifying research problem(s) and setting research objectives
3	Conducting qualitative research through case studies
4	Complementing and confirming the findings externally through secondary data
5	Deriving a framework for ERP implementation from a holistic stakeholder perspective.

The purpose of these components is as follows: Part 1 reviewed literature that identified ERP implementation phases and ERP stakeholders; Part 2 ascertained gaps in existing CSF(s) models or frameworks and the introduction of the Stakeholder perspective identification and significance; Part 3 is the research methodology, qualitative data collection; Part 4 is the preliminary analysis of the qualitative findings and comparison with secondary data regarding other published case studies; and finally, Part 5 is to develop a framework for managing Stakeholders ERP implementation. The Literature Review, figure 4.3, stage 1, comprised the following components:

- An investigation into whether the investment on ERP Implementation generates a higher return to organisations.
- An exploration of the significance of stakeholders and the management of roles and responsibilities in an ERP implementation context.
- ERP Implementation failures and existing ERP CSF(s) models.
- Stakeholders' significance and identification.
- Identification of ERP Stakeholders and their roles in the implementation process
- Identification of implementation phases

The composition of the design plan is diagrammatically represented as a number of tasks, figure 4.4. These tasks will be discussed further during the course of this Chapter

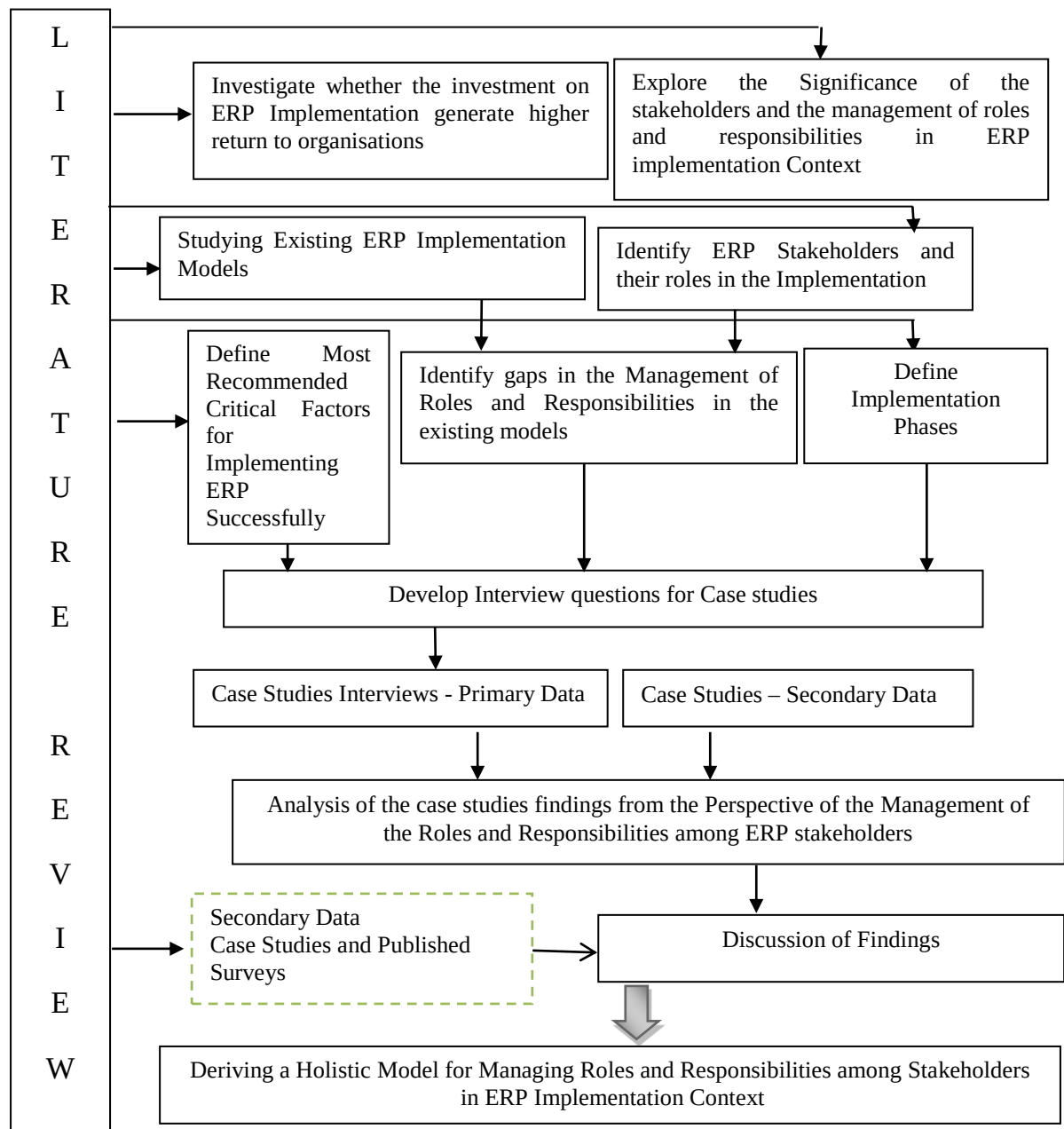


Figure 4.4 Research Task Structure

4.4.1 Research Strategy - Case Study

The case study strategy was selected since the phenomenon under examination is investigated in a 'real life' context and its purpose is to gain a highly in-depth understanding of the links between processes and behaviours in organisational environments. This method is frequently adopted in IS research (Walsham, 1995).

The case study strategy was particularly appropriate in this case, due to the fact that the number of organisations to be investigated is small, (just four companies), and the research aimed to answer questions such as 'what', 'why', 'where' and 'how' by employing multiple data sources (Saunders *et. al.* 2009; Yin, 2009; Creswell, 2008; Ritchie and Lewis, 2010). The strategy is frequently preferred when studying complex phenomena (Yin, 2008).

Since the key objective of this thesis was to develop a theoretical framework as the research progressed, it commenced with an under developed theoretical base, gathered data and then interpreted it, as is frequently the context for theses using qualitative methods. This process led to the emergence of a theoretical lens that could then be used to provide meaning in particular circumstances, but that would also have a more general application. The case study enabled the researcher to place the emphasis of the research in the context in which it happened and, hence, to ensure that the framework would embrace the key aspects, about which little was known. As a result, the research focus is on the context, which could be represented by an interpersonal relationship, for instance between a business unit manager and an IT manager, or an organisational issue in which multiple stakeholders were involved. The range of potential contexts along this whole continuum, is a feature of the ERP implementation phenomenon.

The researcher was, therefore, tasked with gaining understanding of the various contexts in each organisation, in order to select the sample for carrying out the primary research in such a way that the contributions of all parties could be recorded and compared (Ritchie and Lewis, 2010). The case study strategy was flexible and adaptable, ideal for an exploratory study with limited numbers of organisations and, in which, the evidence gathered revealed patterns and themes that could either show similarity to existing theory and/or enable the emergence of new knowledge/theory. It

was the role of the researcher to determine which facts and views that emerged were most relevant and from which, inferences could be made that would support development of the appropriate framework (Yin, 2009).

This emphasis on the researcher focusing on the key aspects, whilst being prepared for the totally unexpected to emerge, is the basis of rigorous, high quality research, according to Stake (1995). In addition, this thesis emphasised its intention of taking a holistic view to the ERP implementation process, which the case study strategy embraced owing to its 'live' nature and use of multiple data sources (Yin, 2008; Creswell, 2008). Case study designs were comprised of five distinct elements, which in the case of ERP implementation were: the research questions (for instance why, how and when); the influencing factors and their links with success and failure in ERP implementation; the unit of analysis, which was each organisation; the link between data gathered and its interpretation; the criteria used to interpret the data, for instance building explanations, matching diverse views.

4.4.2 The Sample - Selection of Case Studies

The interpretivist philosophy and the case study strategy did not rely on large samples, as a consequence of the investigation comprising an in-depth examination of the phenomenon.

A non-probability purposive sample model was therefore appropriate to this thesis (Yin, 2009; Saunders *et al.* 2009). The participants were employed in roles at different organisational levels in the companies implementing ERP systems, were consultants advising those companies and ERP software vendors supplying the firms; the participants also had diverse lengths of service or relationship with the organisations on which the cases were based.

The case studies aimed to investigate how stakeholders were attracted, involved and interrelated, and how they participated and contributed to the success or the failure of the implementation process. The issues of interest to the case studies were related to the operationalisation of key elements of ERP implementation; a major focus was placed on the soft elements that included human aspects, structural and cultural change. A further focus was placed on the way in which these elements interrelate

with roles and responsibilities management to achieve a higher return of the ERP investment.

The organisations selected had different ERP implementation issues from a stakeholder perspective, which could be assessed and, since accomplishing data richness is an aim of the thesis, success and failure experiences had to be embraced.

In order to ensure strong bonds between the potential data that are to be gathered from the case studies in achieving the research aims and objectives, a number of dimensions have been suggested that should differentiate the selected organisations for case studies. On the other hand, to allow proper comparative analysis after gathering adequate data from the cases a number of criteria have been also suggested, that each organisation must meet in order to be selected for the study.

Dimensions to differentiate chosen organisations

Firstly, as the main user of the targeted model is the ERP sponsor, the nominated cases need to have different types of ownership. Such variety in the nature of ownership is expected to cover a wider span of the issues that can face ERP sponsors in different ownership setups. The authorisation power in family businesses for example is not expected to be similar to the power that ERP sponsors have in publicly traded organisations. Such variety from the ownership perspective can be expected to cover more of the issues the ERP sponsors face during the ERP implementation, leading to better findings that can enrich research results. Secondly, the nature of business also plays a remarkable role in exposing the issues that affect the process of managing roles and responsibilities among stakeholders. If all chosen organisations fall into the same business sectors, the findings from the research might be viewed as industry-specific, which is not the intention of this research. The diversity in the business sectors of the chosen organisations can lead the research to address a wider and more varied range of scenarios in the management of roles and responsibilities among the stakeholders. It is expected to highlight different areas where ERP success can be increased and to suggest common areas where the management of roles and responsibilities can either be defined or amended.

Another dimension in nominating organisations for the case studies is the size of the organisation. It is widely cited in the literature that SME's face different problems in implementing ERP in comparison to large ones.

Last but not least, the culture of the organisation in terms of the influence by western business practices has been taken into account while nominating the samples. This is due to the fact that it has been widely cited that in the literature that western organisations in Europe and US faces fewer problems compared to the organisations in developing countries.

Common criteria for the nominated organisations

Eight cross-industry companies were identified as meeting the criteria and four were selected for the study based on fulfilment of the following criteria:

- The selected ERP product was one of the top 10 ERP packages (based on world class consulting ERP indices, such as Gartner, Meta)
- A minimum of three core ERP modules must be implemented
- The 'go-live' stage must have been reached for at least three modules
- Two years must have passed since the 'go-live; stage
- ERP remained as the main business application system

The Selection of Case Studies

In order to gain such insights and meet the aims of the case studies, the organisations selected agreed to share the details of matters related to their ERP implementation and to allow the researcher access to documented data that might support the study.

In addition, permission had to be granted for research interviews with relevant personnel at different levels of the organisation.

Hence self-selection was the fundamental approach, rather than a particular industry, product, or service (Saunders *et al.*, 2009).

These conditions facilitated the examination of the elements that the research required, but each case had unique features, which represented the opportunity to enrich the research findings by exploring several scenarios and practices that could be subject to further investigations and discussions. This strategy, which mirrored the

exploratory, inductive enquiry, was expected to lead to valuable outputs for the proposed framework.

The differences between the selected organisations are exemplified by:

1. Nature of the business: the first organisation is a project manufacturing company; the second a mix of discrete manufacturing and retail; the third company is a mixture of contracting, retail and manufacturing and the fourth organisation provides services and utilities.
2. Ownership varied, ranging from a Limited Liability Company, to Holding Company (shares traded publicly), family business and government ownership.
3. Size: three of the organisations are classified as large corporations. A fourth corporation is classified as medium to large.
4. ERP software: three companies had implemented one of the top two ranked ERP software while the fourth implemented one of the top ten ranked ERP
5. Cultural influences: one of the companies was heavily influenced by Western business culture, whereas three others had only experience of local culture

The diversity of issues represented by the four case studies had the advantage of enriching the data collected (Swanson and Beath, 1989; Yin, 1989). This richness of data facilitated comparative analysis between the cases, and led to theory improvement. The family business case study was expected to demonstrate how local, family owned and medium size organisations tackled ERP initiatives; facilitated by observing how implementation issues arose and were handled in their cultural context. The agriculture company had almost executed three implementation projects at the time of this study; the first was a total disaster; the second was highly successful, and the third was partially successful. The service company also experienced varying success rates: of the three implementation projects executed, the first was a failure and the other two were very successful. The service and agriculture companies shared similar experiences, particularly in terms of turning the difficulties and failures into success, which represented a substantial opportunity to enrich the research observations and findings. The electronic manufacturing company, which was based on western culture and standards, did not experience implementation failure. However, many other aspects of interest were observed in this case which were expected to add value to this thesis.

Since the researcher had worked in the ERP field for many years, he utilised his strong network to reach the best contacts, those individuals who had key roles in ERP implementation. The researcher sent an initial informal request for participation before making an official approach, as this process met the ethical procedures of requesting research data. Initially one company was reluctant to participate, since it would have preferred an approach after its ERP application had been enhanced but the researcher convinced the CEO that the issues and errors represented a major opportunity from a research perspective. The demonstration that the university's ethical procedures would underpin the information gathering from participants, provided the company with the assurances required to agree to be one of the cases.

4.4.3 The Structure of the Cases

The presentation of the data collected from the cases follows a flexible structure that includes both a common data element and special elements for each case.

From the common data element perspective, each case followed the high level structure of description, analysis, and further analysis represented by chapters Five, Six and Seven. This is followed by a comparative analysis between the four cases. Within each part, namely the description, analysis and further analysis, each case displayed common elements. For example, all cases included a brief to explain the organisation background that aims to describe the organisational aims and which customers it serves. This is followed by a description of the ownership type and the nature of its shareholders, its current state in terms of its competencies and market position versus its competitors. The organisation background is followed by a brief detailing how ERP implementation was first initiated in the organisation. This includes an adequate description of all necessary details that may assist in later analysis. The organisation background and the ERP evolution are followed by a review of the implementation process. This review begins from the point where ERP has evolved, and continues until a number of years after the implementation is complete.

The second perspective considers the distinctive elements of each case. Within the standard structure that has been described, each case has its own nature by which it represents itself in terms of the description and the analysis through its own elements.

Those elements are extracted from the exploratory review without any preconditioned structure. It highlights the most critical issues that are found to be significant to the implementation description and analysis.

The further analysis which is represented by the first part of Chapter Six aims to scrutinise both the preliminary as well as the further analysis and extract most relevant findings to the research objectives. This is believed to be critical to allow the comparative analysis to produce as interesting findings as possible, which will in turn assist in the production of the model outlined in Chapter Seven.

4.5 Data Collection and Analysis

4.5.1 Data Collection Method

Data collection was conducted using qualitative methodology, which was most frequently employed in cases in which the inductive enquiry was the major approach. This consisted of an assessment of what was occurring in the environment, with interpretation and analysis conducted in the context of paucity of knowledge and/or research. The prime aim of qualitative research was innovation/invention, interpreting meaning in what was observed, reflecting on that meaning and making sense of it, so that greater understanding of the phenomenon emerged to support new learning (Ramanathan, 2009). It was based on open-ended enquiry methods, in which participants provided a wide range of views that resulted in the collection of rich data (Saunders *et al.* 2009).

The qualitative data obtained comprised words and phrases, in addition to non-verbal communication observed directly by the researcher, which significantly assisted in understanding the ‘how’ and ‘why’ phenomena. Qualitative methods have been regarded as weak by some academic experts, owing to the fact that the knowledge gained may not be generalisable to other groups or situations, particularly in studies in which few cases were investigated. However, this study attempted to increase the generalisability, or external validity of the findings by comparing them with those of other studies that had formed the secondary research as part of the data collection methodology (Kirk and Miller, 1986; Saunders *et al.*, 2009).

4.5.2 Primary Data Collection

Primary data was collected using semi-structured interviews with a variety of stakeholders from the organisations, the software vendors and the consultants involved in the implementation of the ERP system; observation through visits to the organisation was an additional element of primary data collection (Ritchie and Lewis, 2010). In order to fill gaps in the information, secondary evidence was gathered from the companies; for instance when participants were unable or unwilling to provide full details of certain aspects of the implementation or individuals initially involved with the ERP implementation were no longer employed in the organisation concerned.

The primary data was collected predominantly by means of semi-structured interviews rather than other alternatives of a structured or unstructured nature. Structured interviews have been frequently described as formal discussions, in which a set of predetermined, mainly open questions could be prepared by the researcher. In the meeting the researcher would adhere to the specified order and control the interview. Conversely, unstructured interviews enable the participants to take control in initiating the discussion; this form of interview was considered a difficult task for an untrained and/or inexperienced researcher and inappropriate in this context.

The semi-structured interview utilised in this study represented a combination of the two approaches; the researcher was able to plan the questions in a logical sequence thus creating a prepared framework for the discussion. Furthermore, it permits the ad-hoc omission of questions that have been answered or rendered inappropriate by an earlier response. Similarly, additional questions could be added to gain further insight and, therefore, semi-structured interviews were considered more valuable for the type of rich data required for the research problem to be fully explored (Ritchie and Lewis, 2010). A pre-prepared meeting plan assisted both the researcher and the participant, prompting the researcher to remain focused on the key questions and enabling a confident approach, which is particularly important when interviewing new people in unfamiliar circumstances and focusing on technical input, in addition to opinions and feelings (Ritchie and Lewis, 2010; Creswell, 2008; Jonker and Pennink, 2010; Saunders *et al*, 2009). The format, timing, content and location of the interviews varied according to the personnel concerned.

A preliminary interview was sought with the key person who had the most information about the implementation history, documentation and details; this enabled the researcher to gather published documents, in order to achieve a basic understanding of the implementation details and to gain any clarification necessary before question design and interviewing began (Jonker and Pennink, 2010). The interviews with executives were scheduled towards the end of the interview period for two reasons; firstly the executives' busy schedule required the appointment to be made well in advance, and secondly it was considered that greater value could be gleaned from the executive interviews after capturing and studying the most important findings from those with the non-executive participants.

The interviews were all conducted on the organisation's premises, face to face wherever possible. Telephone interviews supplemented these, but were limited to cases in which the participants were not considered key personnel or a face to face interview was not possible. The time period allocated for the interviews varied, depending on the availability of the interviewees and the time slots they could dedicate. Wherever possible, the researcher requested interviews to be divided into sessions: the first was to collect preliminary data from the individual, whereas the second was to discuss and develop a dynamic conversation after the researcher had developed a preliminary, holistic understanding of the entire implementation. Therefore the maximum time for interviews requested did not exceed three hours, with breaks; the minimum interview time was not less than forty-five minutes. A location that was convenient to the participant and that allowed sufficient privacy was selected (Ritchie and Lewis, 2010; Jonker and Pennink 2010; Creswell, 2008).

Interviews were not recorded since the researcher considered that this may be perceived as inappropriate to the local culture; and may have had the consequence of inhibiting interviewees from expressing their honest opinions and beliefs (Johnson *et al.* 2009). The researcher took notes using pencil and white paper only. Since the companies had different approaches to the design of ERP implementation, the number of participants interviewed varied, ranging from three to six people from the customer side, a minimum of two from the consulting side and one representative from the vendor side. During the interviews, the interviewees were allowed to raise any topic or idea of interest to the study. Follow-up phone calls were also made to seek

clarification or more information regarding the data collected; this process added to the reliability and validity of the study (Kirk and Miller, 1986).

The consistency that was evident in the responses from the participants in each case was a measure of the reliability. The researcher sought to improve the level of reliability by ensuring that the psychological environment in which the data was collected was appropriate to gaining accurate data in terms of facts, feeling and attitudes; the lack of recording techniques, the fact that researcher's native language was the same as that of the participants and the familiarity of the locations used for the semi-structured interview locations were likely to have provided a feeling of privacy, security and confidentiality (Ritchie and Lewis, 2010; Jonker and Pennink, 2010). Reliability was also improved by retesting of qualitative data against the transcripts (Creswell, 2008).

4.5.3 Question Design

The researcher was aware that question design was an important success factor for the thesis and so he followed the techniques suggested by acknowledged research methods experts, such as Jonker and Pennink (2010), Ritchie and Lewis (2010), Creswell (2008) and Saunders *et al.* (2009).

Every attempt was made to frame questions so that they did not contain double meanings or lead the participant to a particular response; these questions were tested by interviewing academic peers and amended appropriately. This process also improved the validity of the thesis. Prior to designing the questions the researcher developed a document that summarised his basic understanding of the implementation so that he could highlight the specific issues that were of interest to solving the research problem. Questions were also informed by the content of the literature reviews of Chapters Two and Three.

The preparation and conducting questions and interview settings are based on two findings from the literature review namely 1) Implementation phases; and 2) Critical success factors.

4.5.3.1 Implementation phases

Prior research suggests a number of implementation phases for implementing ERP. The total number of the phases varies between three and six (See section 2.2.1). The targeted model this thesis aims to achieve has two characteristics; first, it is a holistic in nature; second, ERP sponsors are the primary users of the model. Due to the holistic nature and the fact that ERP sponsors are top executives who have challenging priorities, their dedication to ERP in terms of investment of time should be kept to the minimum.

For those reasons, an approach with three implementation phases has been chosen to structure the data collection and analysis. The first stage refers to period from planning stage until the starting of the implementation project; the second stage covers the implementation stage until the go-live. The post implementation and continuous improvements are covered by the third stage which starts from the go-live point.

This approach is supported by the work of Parr and Shanks (2000), which includes only three phases of planning, project and enhancement, and that of Shao et al. (2009) that has primary adoption, secondary adoption and assimilation.

4.5.3.2 Critical Success Factors (CSFs)

Prior research is rich in establishing critical factors that can lead ERP to successful implementation. More recent studies have provided classification of such factors based on the number of studies that support each factor. Other efforts also classified those factors based on the nature of its effect on the implementation. The literature review chapter has included a number of those studies that review the most critical factors affecting ERP implementation among the various CSFs.

The literature review chapter presents three CSF(s) reviews (Table 2.2) by Finney and Corbett (2007), (Table 2.3) by Momoh et al. (2010), (Table 2.4) Adapted from Pan et al. (2011) and (Table 2.5) by Kapp *et al* (2001).

The factors obtained from these studies have been used as a starting point for setting agendas for the unstructured interview questions.

4.5.3.3 Question types and samples

Open Questions

Open questions used in semi-structured interviews aimed to gather facts, views and feelings and represented the majority of questions. The six key types: who, why, where, when, how and what were employed to encourage the recipient to be as open as possible. Table 4.2 include examples from each element.

Table 4.2 Samples of the six key questions: who, why, where, when, how, what' were

No	Type	Example
1	Who	<i>Who</i> has promoted the notion of implementing ERP in the organisation?
2	Why	<i>Why</i> it took the organisation such long time to realise that it has a serious implementation problem in this specific area?
3	Where	From <i>where</i> finance department adopted this business practice that they claim it is the best practice?
4	When	<i>When</i> the implementor completed the configuration of the manufacturing modules?
5	How	<i>How</i> did the new HR director successfully manage to tune HR modules implementation from failure to success while his former peer failed to do this in two years?
6	What	<i>What</i> are the primary reasons that led the organisation to choose implementing planning module?

The researcher did not interrupt and actively listened to the participant's answer. An additional tactic used in questioning was to ask the interviewee's opinion about the degree to which an intervention had been successful as well as to ask him/her to describe or explain a certain scenario, in order to elicit substantial detail on an issue (Jonker and Pennink, 2010, Ritchie and Lewis, 2010).

Closed Questions

Closed questions were used, as required, to check understanding of the points made by the participants, or after summarising what the researcher had recorded as the main points (Ritchie and Lewis, 2010; Saunders *et al.* 2009). Examples of this type of questions are provided in table 4.3.

Table 4.3 Samples of closed questions used in the interviews

No	Example
1	Can we conclude that the only justification for deciding to implement ERP that your primary competitor announced his initiative in implementing ERP?
2	Do you main that because there were no pressure on the project manager to bring the project closer stage it kept dragging all these months?
3	Can I understand from this that finance has no bench mark reference that justify adopting this business practice?
4	Would it be fair to say that such revolution in HR behaviour towards ERP implementation is simply because the new director has much more experience in dealing with information systems in comparisons to the former HR director?

4.5.4 Secondary Data Collection

External validity was high in this study, owing to the measures taken, particularly regarding triangulation but also by attempting to increase generalisability of the findings by comparing them with those of other published case studies after the main study had been concluded (Ritchie and Lewis, 2010; Kirk and Miller, 1986)

The secondary data was gathered from a variety of reliable, published and publicly available sources; for instance data on the organisations was sourced from their individual websites, Chamber of Commerce databases and the stock-exchange, in the case of the company that was listed in the stock exchange. In addition more specialist documentation was requested from senior personnel in the organisations involved in the ERP implementation; to include reports, power point presentations, progress reports, and minutes of meetings. Once interviews had taken place, the researcher obtained further written documents from the personnel concerned (Johnson *et al.* 2009)

4.5.5 Data Analysis

Following each interview, the researcher summarised the interview findings and arranged a second interview to confirm or to clarify the points he had recorded. In addition, after completing all interviewees for a single case, in cases in which there were contradicting results, either between two different interviews or between an interviewee and other sources of data, the researcher sought additional interviews or advanced secondary sources to ensure that the information was accurate. The researcher also summarised the interview outcomes and sent them back to the interviewee to confirm his understanding, to ensure accuracy of written data and to enable a better collection and use of evidence, as well as to enhance the level of reliability (Kirk and Miller, 1986; Ritchie and Lewis, 2010; Creswell, 2008).

Once all the data had been collected, the researcher transcribed all of the data gathered for each case from interviews, observations and document study. He organised the words and phrases and made notes on associated non-verbal behaviours, and began the process of coding the data, line by line, seeking patterns. This was followed by the division of the findings into themes or trends and transferral to tables or matrices using Miles and Huberman's (1994) model. The researcher iterated over the data

several times to ensure the accuracy of the themes and to enhance reliability, as suggested by Creswell (2008). The revisiting and rechecking data was also intended to minimise the personal interpretation bias, which could be a significant limitation generally, and in IS qualitative research (Walsham, 1995). A process referred to as bracketing was employed, which involved the researcher separating his views and beliefs from those of the participant; this process was supported by the researcher not making quick judgements based on the first transcript and hence keeping a more open mind about the findings (Bernard and Ryan, 2009). The matrices assisted the researcher in the comparison of the four cases in addition to providing a diagrammatic representation of each one.

The Ranking Approach

For a better presentation of the comparative analysis of the implemented ERP projects within the four cases, a ranking approach will be used. Using this approach, the results of the qualitative analysis of the eight implemented projects are classified as 'excellent, very good, good, fair and poor'. These five values have been given a numeric value '80-100, 60-80, 40-60, 20-40 and 0-20' respectively. This ranking approach allows us to present presenting the qualitative data in a graphical form so as to suggest various relationships between comparative elements. These potential relationships can be further tested in a quantitative manner to improve the theory in managing roles and responsibilities in ERP implementation context.

Secondary data was also sourced from prior academic research studies, in order to supplement the findings of this study, to provide a basis for comparison, and to enhance the validity of the findings through triangulation. This was particularly effective in the stakeholder context, providing deeper explanations, facilitating comparison and assisting in the analysis of success and failure elements.

Limitations of Data Collection and Analysis

Studying stakeholders of ERP throughout implementation phases required choosing the longitudinal case study approach, in order to capture organisational experience from initiation to the post implementation phase, including the close monitoring of organisational behaviour during this latter phase. However, time constraints did

emerge that inhibited this study from capturing more details and suggesting more detailed and solid recommendations (Johnson *et al.* 2009)

The small number of cases that were employed to investigate the manner in which the 'soft' issues of implementing ERP effectively, which centred on the roles and responsibilities of the stakeholders involved, and the fact that the experiences of different organisations varied meant that generalisability towards all organisations was limited.

The scope of the study was somewhat limited by the number of people-related issues that could be uncovered and explained during the field and desk research. This reflected the greatest limitation, which was the time that the researcher had to plan and complete the thesis, as well as the restrictions on organisational documentation that was made available by each firm involved. The time that participants in the study were able to devote to providing their views and understanding of the ERP implementations process, was also a limitation on the accomplishing a truly representative view, even within the confines of the four organisations. The participants' experiences were restricted to the period in which they had been employed by the firm; some employees had left during the implementation phase so that experiences could not be accessed and others had joined the organisation at some stage during implementation and could therefore provide time-limited data.

The openness of some participants was likely to have been limited by fear of revealing certain feelings and opinions that might be detrimental to the organisation in which they were employed, or with which they were associated for the completion of the project, as well as to their position within it. In other cases participants may have provided restricted input in terms of what they felt the researcher wanted them to say or what he should be told. There was also the potential agenda that admitting any misjudgements in any stage of the ERP process would be viewed as critical of certain personnel as well as the danger of revealing confidential information. The researcher also had inherent bias, owing to his knowledge and experience in the sector and hence his values and beliefs (Walsham, 1995).

The principle of an ethical approach to research was that participants should not be negatively affected, as a consequence of their involvement in it. Hence the participants in this study were ensured confidentiality regarding their input and that no individual could be recognised from any comment made in this thesis. The researcher did not name the companies, which agreed to take part, nor did he reveal details that would make them recognisable.

The researcher obtained permission from the companies who agreed to participate in the study and he made no contact with potential participants prior to that permission being granted. The researcher also made the senior personnel of the companies aware of the university's ethical guidelines that he was obliged to follow. The locations for the interviews were chosen to ensure privacy.

All participants were provided with written details of the purpose of the study and the confidentiality of the information that would give to the researcher. Participants were informed that they could withdraw from the study at any time and refuse to answer any question, which they did not feel comfortable to discuss. Participants were requested to sign a written declaration concerning these points. All notes and documents related to the thesis were retained locked cabinets and the associated electronic data was securely, password protected (Ritchie and Lewis, 2010; Saunders *et al.* 2009).

4.6 Summary

This chapter aimed to describe and justify the research methods chosen during the course of this study, and to establish the aims and objectives of the investigation. The primary objective of this study is to establish a holistic framework for ERP implementation and to enable ERP decision makers to enhance the management of key stakeholders. As a result, the purpose of this research is exploratory, as it considers ERP implementation from a stakeholder perspective. As described above, the relative paucity of available data and previous studies in the field of ERP implementation demanded a particular research philosophy and approach to data collection. The adoption of both interpretivist and positivist approaches enabled a focus on the diverse opinions and beliefs of the individuals under study to be combined with the positivist cause and effect approach. This hybrid method provided

the necessary flexibility demanded by the research problem and permitted the researcher to adapt quickly during the course of data collection, as the need arose.

Furthermore, the use of case studies permitted the researcher to conduct an in-depth analysis in a genuine 'real life' context, drawing on multiple data sources across each organisation. By focusing on four specific cases that exhibited significant common factors in addition to profound differences, the data gleaned from interviews was maximised in scope and permitted a greater degree of generalisation necessary for the formulation of a potential model. The data collected was primarily subjective, which, as acknowledged above, is problematic in the formation of general models. However, it is expected that by setting this research in the context of other studies, sufficient validation may be established to draw effective conclusions.

In conclusion, it is suggested that the primary demands of this study required a holistic, flexible approach, which justifies the methods adopted. It should be noted, however, that a more expansive study accommodating more cases studies is desirable to validate the conclusions drawn from this investigation. In addition, this study must be situated in the context of other available data regarding ERP implementation, which may provide further validation of the conclusions drawn in subsequent chapters.

CHAPTER FIVE

Description and Analysis of Case Studies

5.1 Introduction

This chapter presents the description and analysis of the four case studies that form the basis for this investigation. It will address each case study in turn, providing a detailed description of the implementation process and experience, and outlining the particular circumstances affecting each case. In addition to this, it will also provide a deep analysis of the ERP implementation in each case, discussing the various successes and failures experiences by each company, positing reasons for some of the outcomes that were realised.

5.2 The description and Analysis – Case DiversCo

5.2.1 Case Study Description - DiversCo

5.2.1.1 DiversCo background and ERP evolution

DiversCo is a family business that celebrated its 30th anniversary in the year 2010. The DiversCo group started as a number of small isolated establishments before it gradually became a larger group consisting of eight companies and establishments across three different industries, namely contracting, retail and manufacturing. Seven out of the eight units serve the construction sector, with one unit specialising in fashion. The organisation started to generate profit from 2005.

In 2002, the owners appointed a consulting firm to recommend actions that could prevent a repetition of such financial crises. After the consulting firm was hired, policies and procedures were recommended in several business areas. The owners recruited a new general manager (GM) who holds an MBA and who has a successful record in leadership and information systems. The new GM joined the consulting team at the last stage of preparing their final report. It consists of clear recommendations, including the adoption of ERP as a prime solution for the organisation.

5.2.1.2 Preparation Process

5.2.1.2.1 Engagement of Supervisory Consultant

Two months after joining, the GM hired a part time consultant that he had worked with previously, to assist in the selection process. In a couple of short meetings, the GM shared his thoughts with the consultant regarding what he thought was required in the company. The message from the GM was clear in that he urged the consultants to not get trapped by endless functionality comparisons in order to save energy for the implementation itself. The consultant took the lead in this process, as per the directions from the GM. He also stated clearly that, as GM, he was not interested in becoming involved in selection discussions until the consultant had shortened the vendor list to three vendors only for the final comparison.

5.2.1.2.2 Demo Sessions by ERP vendors

After the consultant shortened the list to three vendors, the GM requested the nomination of various end users from different departments and units to attend the demo sessions. The GM attended the first session with each vendor to stress the importance of end user feedback in the decisions to be made. He also noted that attending these sessions represents valuable knowledge and an increase in the market value of the member who was actively involved in the process.

During demo sessions of the first product, the vendor consultants admitted that standard features of the system do not comply fully with the local rules and regulations according to labour law. Additionally, they mentioned that despite the fact that the project module is not part of the remit, labour costing data of the projects will need to be captured with alternative solutions needing to be provided. Demos and the discussion of these consequences revealed that the employee master had poor details, and was missing important fields like GOSI (General Organization for Social Insurance) and was very weak in manipulating employee benefits such as tickets.

During the demonstration phase, it was understood that there is no issue at all in running the system remotely. Therefore, since its inception, all ERP servers for all companies and branches have been located in the head office. After the demo sessions were completed, only two vendors were requested to submit their proposals. The first vendor was ranked as the top ERP product that year, while the second is known as the

best fit for medium organisations; it was largely cited as an easy to use and easy to implement product.

5.2.1.2.3 Selection Final Decision

A meeting was called by the GM, with the Vice Chairman of the group, the Finance Manager and the ERP consultant. The GM summarised the discussion, which concluded that the comparison has been limited to two products:

1. The first one satisfies the long term plans of the organisation as the product has advanced functionalities that covers not only the existing practice and business but can also meet future advanced requirements.
2. The second product is likely to satisfy the short to medium term plans only. The product functionalities meet the existing and probably the midterm business requirements.

The Vice Chairman supported the first choice. A letter of intention was sent to the proposed ERP vendor. DiversCo decided not to purchase any add-on software applications and rely only on ERP modules. The selected modules include finance, distribution and HR. Project and manufacturing modules were not included in the project scope.

5.2.1.2.4 ERP Project Announcement

The general manager directed the supervisory consultant to prepare a presentation on what has been accomplished in the ERP project so far. The general manager requested the administration manager to book a large meeting room in a professional area such as a hotel or a convention centre for a full day. The main agenda was to present the ERP project to the entire DiversCo companies and branches. The invitation was extended to all executives, middle managers, senior staff, salesmen, accountants and personnel. The agenda included one session presented by the supervisory consultant to demonstrate the basic ERP concepts and the progress made to date. All the remaining sessions were presented by the GM.

The GM developed and announced two more strategic initiatives alongside the ERP initiative. These are summarised in the table below.

The event concluded that all organisational members are expected to extend their support to ensure that the ERP project is a success. Further emphasis was placed on end users, and as such, these end users will need to attend full demo sessions and contribute positively in these sessions, with their honest feedback.

Table 5.1 Three initiatives in parallel with ERP – DiversCo

No	Initiative Name	Description
1	COMMUNICATION	A project name for implementing electronic email services
2	BASE	ERP project name. The name “Base” was chosen to establish that this is the foundation of the information systems infrastructure
3	VIAGRA	To spin-off companies and branches in to limited liability companies managed by a holding company; each company has its own operational management and legal identity. The name "VIAGRA", inspired by the medicine, aims to inspire an immediate and massive impact of the project to the business

5.2.1.2.5 Final Negotiation and Contract Preparation

The selected vendor sent a draft agreement to DiversCo, whom, under the direction of the GM, forwarded it to the DiversCo lawyer for review. The GM forwarded a copy of his previous ERP contract, that he implemented before joining DiversCo, to his consultant. A few days later the DiversCo lawyer sent his suggested agreement to the GM who forwarded it to his consultant. The consultant found that the revised version of the contract did not include any issues related to core implementation activities, such as training, testing, data migration, etc. The GM directed the ERP consultant to draft his own version that incorporated related clauses from the three available agreements (i.e., Vendor master agreement, DiversCo lawyer agreement and the agreement brought from the other client). A few weeks later, the DiversCo ERP consultant prepared the draft contract and sent it to the GM for review and comments. The GM requested a fixed price contract and to tie payments for the system with the rate of progress of its implementation. A couple of negotiations took place between DiversCo & ERP until the best and final offer was provided by the ERP vendor, the final contract was prepared and was then signed by both parties.

5.2.1.3 Implementation Issues

This section describes the key issues involved in the implementation process. The ERP supervisory consultant suggested hiring a new IT member to the DiversCo team to specifically handle the ERP software and implementation matters. This was suggested as DiversCo had only one IT technical member who handles all PC,

network and technical matters. The GM formed an ERP implementation core team headed by the ERP consultant along with the finance manager, senior accountant and the IT technical member. The GM headed a couple of meetings with the ERP core team, assuring them of all the support and resources that they would need to make the project successful. It was suggested by the supervisory consultant that the new member should be able to work with the consulting team hand in hand to facilitate the implementation process.

The ERP team observed that the company suffered from cash deficits once again, before it was announced that sanitary division has been sold. The ERP team was disappointed by this announcement, as the purchased license includes sanitary users and the system configuration was almost completed.

5.2.1.3.1 HR Implementation

The contract specifies that the implementor must develop an add-on software application to meet HR requirements that can be summarised as follows:

1. Generate a pay-slip from the system including all necessary details, which complies with the local labour law.
2. Generate various statistic reports of employees for costing and non-costing purposes.

The original plan was to complete the HR add-on features in one month, with a view to asking end users to test the system over a period of one month. Following this, a request would be sent to end users for them to use the system in the test server. Following this process, the end users, administration and finance staff provided their findings to the ERP team for rectifications, before a new version was developed for the next end user trial in the new test version.

The coding was completed on time but the add-on part always failed during the test stage, as it failed to generate target reporting details. The supervisory consultant looked at this issue several times until he found that not all taskforce movements between various projects were being updated in the system, which led to inaccurate project costing reports. The Chief Accountant criticised the HR system as it did not track worker movements between DiversCo construction projects. The Chief

Accountant explained the ERP HR module's failure in tracking workers movements between DiversCo construction projects. The HR representative explained two issues in this regard. First, personnel can only identify worker movements from the following monthly sheet, and second, a lot of DiversCo workers were not yet registered under DiversCo sponsorship and therefore personnel cannot register them in the employee master.

DiversCo Decision to Suspend HR Implementation

A couple of follow-up enquiries revealed that no progress had been made in resolving the HR requirements. The general manager asked the team to provide an honest and clear answer to the following question: "Does the team believe they can implement HR module successfully? If the answer is yes, the following question is, would they be able to identify precise completion date? And the third question was, could you provide a checklist of the remaining tasks? The team responded with a "No" for the first question. Both the chief accountant and the personnel team confirmed that the HR module cannot be implemented successfully due to the huge amount of data and the pre-requisite administrative procedures that have to be followed, strictly, to ensure accurate outcomes. The General Manager thanked the team for their clarity and honesty and promised them to make a decision shortly.

The next day, the general manager asked the ERP consultant for a one-to-one meeting to take a decision. At this meeting, the consultant explained the existing obstacles that prevented the HR module from going live. The general manager, in return, confirmed to the ERP consultant that some of the existing obstacles are corporate obstacles that the personnel section cannot resolve, and he confirmed that it could not be resolved, at least in the short term, because the cost of meeting the HR pre-requisite data outweighs the benefits identified from HR implementation. After the discussion, both the general manager and the ERP consultant agreed to stop the HR module implementation. The GM directed the chief accountant to find alternative stand-alone software packages that could be quickly implemented and contain only standard features to avoid any complexity, which might cause extra delays.

5.2.1.3.2 Fashion & Electro-Mechanic Issues

A number of issues within the fashion and electro-mechanic divisions are explained across the following sections.

The Struggle of Automatic Invoice Generation

The implementation started in the fashion branch in the head office. Requirements were gathered, followed by the creation of a chart of accounts and preparation of the system configuration. When the fashion manager asked to start using the system, he was distressed that the point of sales facility was not ready. He made it clear that the system would be of no benefit if this service was not ready. The implementation team informed the fashion team that it would be done at later stage, with a view to starting to key-in customer invoices into the new system whilst the point of sales facility was completed. The fashion accountant had to work overtime for a long period of time in order to enter the manual invoices in the legacy system and in the ERP at the same time. A back-log of two months of un-entered data accumulated due to this work load.

The testing process of the system was very slow, also, due to unexpected and enormous number of support calls from the sales task force. Most of the support calls related to networking, PC set-up and basic data entry mistakes, as most of the salesmen were first time PC users. The technical team had to provide hands on training for several salesmen in basic data entry and computers skills to enable them to use and test the system properly. Several meetings were held between the fashion manager and the implementation team in order to expedite the implementation of the automation of customer invoice generation from the system, in order to eliminate the high costs of manual entry. At a later stage, the fashion manager urged the ERP management team to expedite the automatic invoice generation and to enable the enquiry feature of all stocked items, from any showroom, whether they were in the store or in outlets. He further explained that if the customer was interested in buying an item but either the colour or the size was not available, then the system should be able to advise in a timely manner if other show rooms have it in stock or not.

The GM requested a one-to-one meeting with the fashion manager and the ERP consultant to develop a firm decision for the fashion business unit and requested them to provide their final feedback in no more than one week. One week later, the ERP

consultants met with the DiversCo general manager who divided his feedback into the following points:

1. Fashion requirements maybe more easily met by implementing point-of-sales software packages.
2. The ERP vendor does not have such point-of-sales software solutions.
3. Most of the point-of-sales software products can fulfil all the fashion requirements with no need for full ERP implementation.

The GM approved the purchase of the point-of-sale software application under the condition that fashion to continue use ERP financial modules to manage their financials.

Final Reporting Problem for Electro-Mechanic Retail Company

Due to the pressure from the GM to go live, one of the accountants reported that an important report could not be generated in the electro-mechanic retail company. The DiversCo technical team reported the issue to the ERP local support member who could not resolve the issue before he requested the vendor support assistance. No reply was received from the ERP vendor, which meant that the going live cut-off date was dramatically delayed. After a lot of pressure from the DiversCo team, one member from the ERP local vendor admitted, informally, that they lacked the experience to resolve such problems, and they didn't receive the expected support from the ERP head office.

5.2.1.3.3 Restructuring from ERP Vendor Side

A few weeks after the first launching of the finance module in the contracting unit, DiversCo received a generic e-mail from the ERP vendor head office that they had delegated a new Second Implementor that has been recently established, to complete pending projects. DiversCo obeyed this instruction and processed the due implementation payments to the second implementor, while the license and maintenance fee continued to be paid to the ERP vendor.

The backlog of ERP support that had not been attended or resolved by the ERP vendor increased in several areas until the GM decided to put the ERP vendor

payments on hold. A few days later, a representative from the second implementor visited the GM and explained to him that the ERP vendor spun off implementation consulting to several partners. At this point, the second implementor became the official partner in the country. Following that meeting, and for the next few weeks, no progress was made by the second implementor to resolve the issue of the pending ERP logs.

A couple of months later, the GM was invited for a promotional event arranged by the ERP vendor, at which he managed to coordinate a side meeting with the regional manager of the ERP vendor and the second implementor. The regional manager implicitly stated that resolving existing DiversCo ERP issues is the responsibility of the second implementor. The GM of the second implementor, on the other hand, stated that he was unable to recover the implementation due to unpaid bills. The GM asked how they could request for bills to be paid while the work associated with those bills has not been completed. The GM of the second implementor replied that, as per the handover document between the ERP vendor and us, the implementation parts were completed and, as such, the payments were due.

The GM invited the supervisory consultants who investigated the matter and found out that most of the implementation consultants who used to work with the ERP vendor were dismissed as a result of this spin-off process. The GM decided to motivate the in-house team to fill this gap where, slowly, most of the ERP logs were resolved. A couple of weeks later, DiversCo received a letter sent by a law firm, requesting the bills to be paid, for services that the second implementor and the ERP vendor claimed had been completed. DiversCo refused to pay, continued to handle ERP support internally, and the relationship with the ERP vendor was terminated.

5.2.1.3.4 Discarding Legacy Systems vs. Launching ERP Modules

Finance modules were successfully launched in contracting, constructing and maintenance, as planned, by Dec 31st. For construction, the accountant did not stop the parallel run, to enter transactions in both legacy and ERP system. A few weeks later, the GM discovered that practice before he insisted on the definition of a cut-off date for the exclusive use of ERP for the entry of financial transactions.

For the Fashion Company, the backlog for the dual entry was found to be too difficult to be entered to the ERP. It was decided, therefore, to start another parallel run, with the cut-off date postponed till the end of the next year.

The electro-mechanic retail company reached the go-live stage three years after the original completion date. The electro-mechanic retail faced several problems in the parallel run stage. A number of problems were related to the discrepancy of data. The parallel run focuses on checking and validating the data between the legacy system and the new system. In any data discrepancy case, a support request was made to the local support team who, in most of the cases, sent the request directly to the implementer consulting firm. Although this is the support cycle process across all the companies, for the electro-mechanic retail, the responses to the support requests were very slow. According to the feedback from the implementor support company, bad quality data represents the root cause of the majority of the problems.

When the factory reached a point when they could start using the system, the network communication link could not be established properly and the ERP data could not be accessed from the factory. The implementation in the factory lagged behind the rest of the companies and branches until the network issue was resolved. After investigation, it was found that the telephone line link was poor, as it was established for voice service only. The local telecommunication company could not commit to a date for changing the communication link. Several months later, the local IT team suggested installing the complete ERP applications within the factory itself. A local server was installed inside the factory premises. After a couple of experiments, the ERP system was ready for use in the factory. The original ERP delegate from the factory transferred to the main office. His replacement was trained for the system during idle time while waiting for the data communication link problem to be fixed. He then resigned and a new member of staff had to be trained completely from scratch. The factory did not resume entering data in the system and continues to use the legacy system, claiming that they have no time to start the parallel run. Top management urged the factory team to discard the old system starting from the next fiscal year (i.e., three years from the original completion date).

5.2.1.3.5 The Creation of the Application Support Department

Before the go-live stage, chief accountant accused the ERP vendor implementation team of inaccurate system configuration. To strengthen his stand, the chief accountant showed the GM several unattended support requests to the ERP consulting team. Such ignorance, in the opinion of the chief accountant, confirms that something was wrong in the configuration itself. The GM called for a one-to-one meeting with the ERP consultant to discuss the issue. After his investigation, the ERP supervisory consultant explained that this is not the first time that such complaints have arisen. The scenario is frequently repeated, where the chief accountant blames the system configuration; when the investigation takes place, wrong data entry or misuse were the common causes of such problem, which has nothing to do with the proper configuration. The GM states that it is the role of the in-house application consultant to handle first line support requests in order to avoid unnecessary escalation to ERP vendor. He further requested an assessment report regarding the performance of the internal ERP consultant performance. The team provided a semi-consensus opinion that he did not meet the job requirements and the GM decided to ask him to resign. To fill this gap, the senior technical member who was responsible for networking and technical matters, requested to handle application matters as well.

Shortly after, it was noticed that one of the accountants took the initiative of developing informative reports based on self-initiated learning and practice during and after working hours. The GM took the decision to create a new department for applications support. He decided to dedicate the newly discovered, and talented, accountant to that department, with a new, fresh, IT member being hired. Within a year from the discarding of the legacy system, the GM delegated most of the operations to the maintenance manager who was promoted to the position of vice-general manager.

After this organisational restructuring, the GM worked closely with the newly created unit to monitor the company performance through continuous IS reporting, brainstorming sessions and round the table meetings. Throughout this process, the leverage of ERP increased through continuous follow-up from the unit to operational staff, who defaulted to using the IS system properly. Through the use of reporting

tools, the unit managed to develop reports that allowed the viewing of the entire organisation's performance and cash position in a timely manner.

5.2.1.3.6 The GM Resignation

Within two years from the set-up of the internal support department, the GM resigned from the organisation. The GM of construction took over and urged the team to find a better ERP solution that suits the current growth of the organisation. He mentioned that through substantial revenue increases, the organisation was able to allocate an adequate budget to purchase the best ERP product. A few weeks later, DiversCo announced that it had purchased a license for the number one ranked ERP, to achieve efficiency, increase productivity and to provide solutions for exchanging information. Furthermore, it provided solutions for internal operations that include finance, accounting, purchasing, HR, sales, manufacturing, project management and maintenance. The announcement further states that the new ERP will maintain corporate data, support more accurate decision making, develop infrastructure, strengthen data security, continuity of technical services and develop human resources that are able to provide necessary support with highest quality for all users. In addition, the project aims to manage the entire organisation in a professional manner that meets the existing and future business requirements, which will enable DiversCo to achieve its development targets and to implement international standards, as part of its efforts towards performance excellence, quality and the best utilisation of their financial resources.

5.2.2 Analysis - DiversCo Case

5.2.2.1 The Role of Information Systems

This section addresses the investment on the information systems before and during ERP implementation. It discusses how this investment correlates with the business growth and profitability of DiversCo.

5.2.2.1.1 Introducing E-mail Services

Most of the DiversCo task force had never worked in professional organisations that used modern business practices and tools, including the use of e-mail. Using e-mail as a communication tool at the time the GM had been hired was considered a very advanced step among organisations in the construction business. Once they activated their e-mail accounts and started using them, the task force found it a very effective tool to attract attention, as they can reach the GM, for example, without the traditional communication barriers. Shortly, the number of staff who started to actively use e-mail exponentially increased. The GM viewed the e-mail initiative not only as being able to speed up communication, to reduce the cost of unnecessarily paper distribution, but also to break the barriers between the task force and their use of technologies.

5.2.2.1.2 Development, Hiring, Promoting and Retaining IS Staff

IT has, as a department, in terms of staff, practices and skills, has developed through several phases until it reached an advanced maturity level. Building local IT capabilities was one of the early initiatives that was started before adopting and starting the ERP implementation. From the beginning, the decision was made to hire an in-house application consultant to maintain the ERP implementation and any potential existing and future enhancements. The analysis of how and why this position was opened indicates various goals from this initiative. First is to ease the communication process between the consulting implementer and DiversCo implementation members. Second, his involvement in the communication process represents an excellent educational opportunity at the business and the application level. Third, it was intended that he act as a first line support layer for DiversCo implementation matters. The GM approved the request and informed the supervisory consultant that his involvement is not only needed to achieve the project plan goals,

but also to sustain the ERP knowledge within DiversCo, so it can manage ERP support internally without depending on external consultants.

When the GM joined the organisation, there was only one member in the fashion business unit who voluntarily handled the limited and basic technical services that mostly relate to PC configurations, maintenance and accessories. Once the GM realised the potential and positive attitude towards IT self-learning by the fashion accountant, he made a decision to move him from fashion to the IT department. This was followed by continued allocation of budget for IT related matters, that included buying and upgrading PC's, laptop and the maintenance and upgrade of the computer network and the purchasing of software applications and tools. The GM hired new fresh graduate members who demonstrated very positive attitudes towards learning and supporting the development of IT systems and practices. Gradually the information systems skills became gradually an essential competence that one has to obtain in order to get promoted.

Promotion	IT Achievements
1. Accountant in the fashion company.	1. Successfully implements ERP in fashion.
2. Promoted as a prime accountant at the group level	2. Initiative of developing executive reports from ERP.
3. Promotion plus extending role to support ERP modules.	3. More influence and support more ERP modules to reach go-live.
4. Promotion with official assignment to develop and supervise IS projects.	4. Initiative to motivate and supervise the quality of data entered to ERP.
5. Extension with promotion to become audit member at the board level.	

Figure 5.1 Impact of developing IT skills on employee incentives – DiversCo

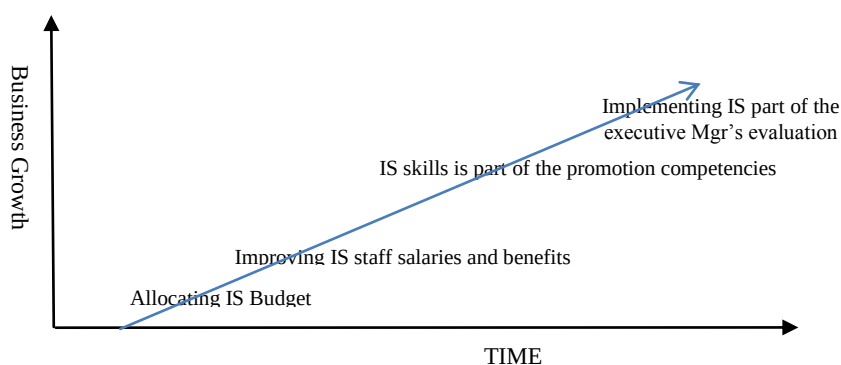


Figure 5.2 Relationship between IS investment & Business Growth – DiversCo

Financial analysis indicates that from the ERP starting point until eight years later, DiversCo had seen exponential growth in terms of growth, profitability and diversity. The revenue has increased by 600% and the return on equity exceeds 30%. Various IS initiatives, projects and plans developed at the early stage of this success journey, where DiversCo was seen as one of the advanced organisations, in the contracting business, in terms of adopting modern technological practices, such as e-mail and ERP system. Despite the ERP difficulties in some areas, it can be seen that the progress in developing IS based resources and initiatives was always one step ahead of the progress made in the financial and financial growth and improvements. In the beginning, DiversCo announced three major IS initiatives at the beginning of the year; the organisation celebrated its first year of making profit after several years of generating losses. The go-live stage of the finance modules preceded a few months of generating 40% per cent profitability growth. Last but not least, within two years of the creation of the IS department, the company significantly achieved exponential growth in revenue, profitability and market share, after the go-live stage.

5.2.2.2 Positive Effect of Appropriate GM selection on IS Project Success

ERP implementation is one of several initiatives in DiversCo's transformational journey. It has been demonstrated that DiversCo advanced its name in the market among its competitors by adopting such IS based initiatives. The implementation cost of these initiatives compared to its influence and realised results are minimal (Figure 5.1). It can be suggested that such cost optimisation resulted in 1) proper selection of the GM, and 2) adequate authorities that are granted to him. Such empowerment did not only lead to massive change, but also the budget allocated to the various change initiatives can be seen as very small compared to the change initiatives' size and effect.

The case shows that the GM was the prime initiator, governor and supporter of the change through his previous experience in initiating and leading change through ERP implementation. The main lesson that can be learned is that proper selection of the GM who possesses IS based change management knowledge and has the right attitude towards nurturing IS based change programs can not only ensure that such change will succeed but can also ensure that the budget allocated for the change can be minimal, which increases the ROI of the change investment.

5.2.2.3 Appropriate Usage of the Supervisory Consultant

The optimal value of the supervisory consultant can be seen as another extension of how DiversCo saves tremendous consulting costs through the proper selection and optimal use of supervisory consultant involvement and services. This can be seen from the great benefits achieved from the supervisory consultant's involvement and the low consulting rate. Both the GM and the supervisory consultant acted as two faces of the same coin regarding ERP sponsorship and support.

The critical success factors of the supervisory consultant (SV) are summarised in Table 5.2. , which provides a summary of the success factors of the (SV) engagement.

Table 5.2 Success Factors for Supervisory Consultant

No	Description
1	Clarity of assignment scope.
2	Adequate empowerment
3	Positive attitude of SV toward making ERP a success.
4	Mutual understanding of ERP requirements between GM and SV.

5.2.2.4 Selection Process Analysis

The selection process analysis can be divided into the following subsections:

5.2.2.4.1 Smooth and Cost Effective

The selection process was completed in timely manner with a very low cost. This can be inferred from the following:

1. The supervisory consultant started before the end of the second month of the GM employment.
2. The selection report was completed within two and a half months from the date of starting the consulting assignment and within four and a half months of the official joining date of the GM.
3. Although there was a small gap between contract signing and the implementation starting date, which was related to an external financial difficulties faced by DiversCo, which had nothing to do with the steps of the selection process by itself.

It can be inferred from the GM's attitude towards ERP implementation that he believes dedicated effort should be put towards execution much more than the

selection. Moreover, the expected value from implementation execution focus outweighs the attempts at obtaining perfect functionality comparisons between ERP products.

The supervisory consultant states:

“The major factor that allows completing the selection process in a timely manner is that I was instructed clearly by the GM not to exaggerate the comparison in product functionalities. It gave me more people focus by which I could better identified real obstacles that hinders implementation from succeed and suggest developmental plans to resolve them”

The general manager believes that the comparison between ERP products in terms of the functionalities should not dominate the selection process for two reasons. First, more coordination will be required from key end users, especially when they cannot dedicate enough time to do a comprehensive functionality comparison between the ERP products. Second, people tend to resist change and they are normally afraid to make clear recommendations on certain products, so they will always prefer somebody else to make the ERP decision. The GM offered the following description:

“From my experience, I see management invest a lot in terms of both resources and time in the selection process much more than what they do in the implementation and post implementation. Therefore, I took a position that we need to complete the selection process in a timely manner and save our budget and energy for implementation and post implementation challenges”

5.2.2.4.2 Product Selection Mistakes

ERP was first suggested in DiversCo through the recommendation by management consultants who reviewed and assessed the organisational systems, procedures and organisational structure before the GM took the lead on the ERP journey. The GM developed a strategic plan based on the input received from the management consulting process. The proposed strategic plan stated clearly that DiversCo was a diversified organisation that aims to gradually spin off its business into independent business units responsible for its growth, financing and profitability.

The ERP selection process started under the light of the strategic plan developed by the GM before the supervisory consultant took the lead in nominating and recommending the best ERP vendor who fits the strategic direction of DiversCo.

Figure 5.3 explains the link between forming the corporate strategy and ERP selection.

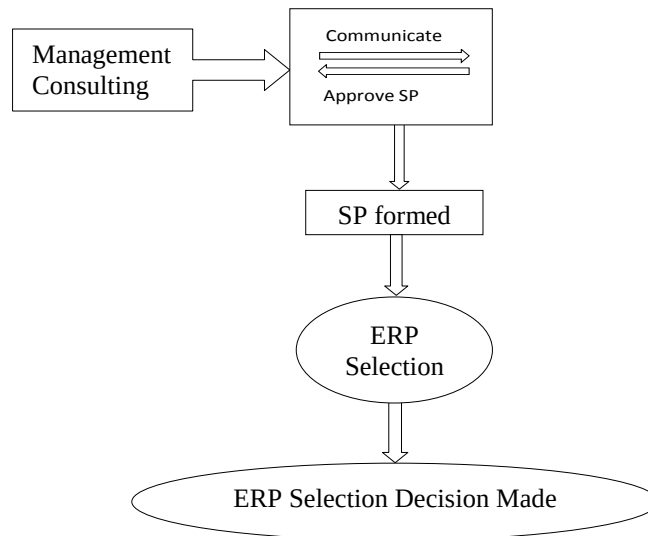


Figure 5.3 Impact of Strategic Plan (SP) on ERP Selection - DiversCo Case

From the point of forming and finalising that strategy, GM communicated the strategy in a clear manner to internal and external stakeholders which focuses on two simple facts:

1. DiversCo will undergo a transformation plan from one establishment owned by one owner to a multiple limited liability companies managed by a holding company.
2. DiversCo will remain a diversified company.

The execution of the overall strategy can be seen as successful. The VIAGRA project mission was achieved, as five business units were successfully changed to limited liability companies. The COMMUNICATION project initiative also succeeded as the manual memorandum circulations dramatically decreased and e-mail became the predominant communication tool. The transformation process was being done in parallel with the ERP implementation.

Inappropriate Selection for Contracting Needs

The cost incurred in implementing ERP in contracting exceeded its original budget. Contracting managers suffered heavily in order to generate meaningful reports from ERP to facilitate timely decision-making. Only a few years after going-live, through

intensive effort from the IS team, were proper financial reports prepared through tools outside ERP.

The legitimate question to be asked is why were such ERP product complexity and limitations not discovered or raised during the demo sessions?

The stake-holders being involved in the selection process were:

1. The general manager.
2. Supervisory consultant.
3. Pre-sales and sales consultant from the ERP vendor side.
4. Contracting accountant.
5. Finance manager.
6. Functional managers.

The contracting accountant pointed out that he noticed at an early stage that contracting requirements were not clearly addressed in the system, but he was not aware of the full consequences or repercussions of this observation. Furthermore, the pre-sales consultant responded to the requirement gaps and shortages with answers like "that will be addressed elsewhere in the systems" or "we can provide solution for this particular case". The construction accountant explained:

"I have noticed that the selected ERP product lacks meeting standard construction requirements but I could not convince my management. Consultants always confirm that the system can meet all requirements until we realised at very late stage of the implementation that it was not true"

The finance manager who used to be the electro-mechanic contracting senior accountant points out that he felt that management was pushing to implement the ERP system regardless of the requirements shortages. The senior accountant stated:

"Although we have been requested to provide our feedback on the product functionalities, pre-sales consultants provides rosy pictures about what they can do to bridge the gap. Furthermore, the supervisory consultant and the general manager stood by their side at least most of the time"

It can be seen that, during the selection process, DiversCo identified itself as a diversified organisation without a priority preference for contracting. Management

underestimated the effect of those limitations for the advantage of implementing a single product from all business units.

After DiversCo shifted its focus to contracting business, however, the effect of requirements shortages from ERP product expanded and the problem was exposed, as it was clearly found that the selected product and its configuration is too complex for contracting. This complexity resulted from the nature of the contracting business, as being solely a project base by nature. This mistake is connected also to the effect of not maintaining consistency between corporate strategy and ERP plans which will be discussed in the strategy section.

5.2.2.5 ERP Vendor & Implementor(s) Issues

5.2.2.5.1 A Good Beginning

The analysis shows that the ERP vendor made a good implementation start-up. This can be seen from their enthusiasm during the demo sessions preparation and their offering of free training before implementation starts. Unlike the traditional practice, the ERP vendor was directly involved in playing, initially, a dual role as an ERP vendor and a consulting implementer. The ERP vendor communication, before and during the early phase of the implementation, can be seen as dynamic and effective with both DiversCo team as well as with the supervisory consultant.

The general manager stated

"The ERP vendor was a greater partner to us during early implementation stage. They have put us on track and guided us to lead in the start-up phase with confidence"

5.2.2.5.2 Poor Handover to the Second Implementor

This strong bond between the implementation consulting team and the ERP vendor ensured that the implementation progressed smoothly until the ERP vendor ownership evolved. The support channel between the ERP vendor and consulting firm was completely lost and, as a result, the DiversCo ended up completely puzzled as to who they should contact for the ERP support they needed. The remarkable observation is that there was no consideration for DiversCo requirements during the merger process between ERP vendors. In other words, they were not considered as an influencing

stakeholder in such a process. This can be noticed from the method the ERP vendor used to communicate such change, which was only an e-mailed letter sent to DiversCo pointing out that implementation invoices need to be directed to a new firm as they had become the official representative. The consulting team members who had been involved from the vendor side disappeared from the implementation scene.

The reasons for merger and acquisition between ERP vendors can be seen as legitimate, including strengthening their financial position, gaining more market share, improving operations efficiencies and meeting the global expansion needs. However, despite these benefits, it also created adverse effects to the DiversCo implementation. There was no proper hand over or formal transition of the project between the new and the old implementation team from the vendor side. The lack of transparency and the complete ignorance of existing ERP customers' obligations is a fundamental ERP vendor mistake. The absence of proper coordination between the new and old consulting teams who handled the implementation was a complete responsibility of the ERP vendor, as they should have ensured that targeted acquisition benefits should not come at the expense of jeopardising on-going implementation projects. The general manager commented:

"It's a complete ERP vendor responsibility to communicate with us a client with transparency and honesty any organisational changes that has direct effect on the implementation"

The main lesson learned is that the ERP vendor should have developed a transition plan that removed the risk of negative impact on the on-going implementation projects. The behaviour of the ERP vendor was not ethically acceptable. A former ERP consultant from the ERP vendor side chose to resign to avoid being involved in such practice. He explains that he had either to hide the truth to the customer, which is non-ethical practice, or was to tell the customer the truth, which would offend his employer. He also refused to join the customer as an independent consultant out of respect, as the customer was still part of his former employer customer list. The former consultant from the vendor's side expressed:

"I walked away because I couldn't watch my previous customer suffering from such inappropriate practice but in the same time it's going against my ethical values if I make business from my former employer customers, therefore I decided to change my job completely and transfer to a new post not related to the same ERP vendor applications"

The transition between the first and the second consulting teams created adverse effects for the implementation. There was a roles and responsibilities gap between the implementation parties, which resulted from the disengagement of DiversCo from the transition process. Such a gap and its subsequent conflict would have been avoided if DiversCo was engaged fully in this transition, including a proper verification of unpaid bills and pending technical support issues that not resolved. Unfortunately, such a transition was not dealt with by the consulting firm as a process; only generic e-mails were sent to the anonymous list, including DiversCo, informing them that a new implementor had been appointed to receive the upcoming payments and inquiries. At the time of this announcement, DiversCo had several unclosed technical support requests for several months until DiversCo decided to freeze the ERP payments. The new implementer, thereafter, requested to meet with DiversCo not to resolve those pending support issues but rather to chase what they considered as due bills. It was expected by the new implementer to arrange a meeting with ERP vendor and DiversCo as a client to determine precisely the implementation status including all due bills and pending implementation problems, however, the new implementer chose to penalise DiversCo by ignoring all pending support requests as a silent punishment for not paying the perceived due bills.

The CEO of the new implementor offered this description:

"Once we realised that DiversCo was not willing to pay due bills, we decided the turn off the tap i.e. to discontinue the delivering the consulting services"

The situation could have been much better if the new implementor has communicated, at the time of accepting the task from ERP vendor, their understanding of considering the implementation as complete, where both the new implementor and the ERP vendor, along with DiversCo as a client, would have reached a mutually beneficial agreement. The finance manager explained:

"If both ERP vendor & new implementor were clear to us from the beginning that ignoring resolving implementation problems is connected to payments; or if they stated clearly that they will discontinue the support, we could have developed fair solutions that assures a win/win type of agreements and saved considerable cost; and huge implementation delay would have been avoided"

5.2.2.6.3 ERP vs. Off-the-Shelf Software Packages

ERP is, by nature, a long-term investment by the organisation, where the relationship with its ERP related vendor is expected to be long-term. The software license represents only a small part of the value that ERP customer pursues. The more critical parts include the services, processes, best practices and the global network of ERP vendor support agencies. However, the ERP vendor behaviour in DiversCo case demonstrates very low consideration of what they have sold to the customer. The long-term commitment from the ERP vendor side seems to be missing; in fact, the transition between the old and new consulting team of confining their relation with the customer to chase invoices for in-completed ERP tasks demonstrate that the ERP vendor is not considering that they are selling a strategic solution that calls for long-term services and enhancements and the software license represents only a small part. The GM of DiversCo offers the following explanation:

"This claim by ERP vendor and its consequences uncover to us as a client the fact that ERP vendor, through the newly appointed partner, deal with ERP as if it is an off-the-shelf type of product rather than a providing strategic IS solution".

5.2.2.6 Go Live Review

The project follows the phased-implementation approach where not all modules or companies reached the go-live at the same time. The go-live stage varies from module to module and from one company to another. At one extreme, some modules and companies failed to reach the go-live whilst some reached the go-live within time. The companies and modules in terms of reaching the go-live can be divided into the following categories:

Three companies reached the go-live before the end of the first year. These companies are electro-mechanic contracting, construction contracting and maintenance. The go-live dates, in the case analysis context, can be defined by the discarding of the legacy system and relying solely on the ERP, especially in terms of the finance data. Three companies struggled till they reached the go-live stage due to different reasons namely the fashion-retail, electro-mechanic retail and the factory. The fashion company reached the go-live stage thirteen months after the project original completion date. One of the reasons for such delay was that it was rescheduled to start

with the official beginning of the DiversCo fiscal year. The factory faced a unique obstacle among other branches and companies within DiversCo in that it is in a very remote location. The factory reached the go-live stage four years after the original completion date.

5.2.2.7 Can the Case be Considered a Success or a Failure?

It may be argued that the case demonstrates several aspects that can be considered as successful (partially or fully), while others can be considered as a failure (partially or fully). From a pure ERP implementation perspective, as a project implementing finance module, it may be considered successful as the entire group successfully discarded all fragmented applications and now rely only on ERP. DiversCo succeeded in unifying technical infrastructure of software application, operating system and database. The chosen ERP application, however, could not be implemented fully in key areas including in fashion and HR. The effort made in implementing the system in the sanitary business was discarded as the whole unit was sold out. In some areas, integration could not be leveraged to unresolved issues at the process level such as the practice of including sales invoices of non-stock items.

Despite the ERP partial failures, there were side-effect gains achieved. It is argued, for example, that ERP implementation within the company positively changed the underlying organisational culture. Through ERP implementation, the organisation advanced its development of various skills, experience and practices. Several lessons were learned in project management and regarding teamwork. The organisation prior to the ERP implementation is completely different from where it is a few years from the go-live point in terms of attitude, work practices, skills and knowledge. If these significant improvements were to be measured in monetary terms, this would definitely outweigh the ERP partial failure. The culture of moving from a departmental to process-oriented thinking has emerged, for example, and has improved through integration and sharing resources. The professional level of staff members has dramatically improved.

5.3 The Description and Analysis – Case ElectCo

5.3.1 Case description – ElectCo

The company was established in the late 1980's in a developing country under the directives of local government to create local capabilities in strategic areas such as advanced manufacturing technologies, communication systems, and product support. It is currently a leading company in the region, which is capable of manufacturing sophisticated military and commercial electronics exceeding the most demanding military and commercial standards. The company is certified and accredited by international suppliers.

The main legacy system since 1988 is a business application (manufacturing, distribution and finance). Not all system modules and functionalities were in use, especially in manufacturing. The system was used mainly for bookkeeping; most of the analyses and decisions were made outside the system, with the spread sheet being the dominant tool. Other applications were run in a completely isolated manner using different platforms (Oracle, dBase, Access, etc.). The IT department, at the end of each month, performed integration activities manually to consolidate financial and project costing data. IT and end users (especially in finance) were completely frustrated by such a lengthy process. This practice was consistently criticised by auditors. Some areas like human resources, shipping & MRP were not using any system. Most of the administrative staff especially secretaries, data entry clerk, data entry processing staff were eager to have a new system to ease their day-to-day work. Executives were expected to have necessary information for decision-making under their fingertips, as easily accessible as excel. Furthermore, the ElectCo business plan showed enormous projected sales in the pipeline in various sectors. The Executive Vice President shared the business plan with the IT director and requested that the IT systems and infrastructure be ready to meet the growth requirements.

5.3.1.1 Selection Process

5.3.1.1.1 Product Selection

The director of IMIS department took the lead in selecting ERP solution for the organisation. He nominated four ERP vendors that could potentially fit the needs of ElectCo. Starting from Feb 1997, an RFP was developed in-house and was sent to

vendors. Two vendors showed serious interest in contributing. The two vendors were given a chance to demonstrate their packages to ElectCo staff based on a show-me list prepared by end users. After the demonstration, a detailed question list from each department was sent to each vendor. It took ElectCo around one year to decide on the package until a letter of intent was sent to an ERP vendor. It took the company another seven months to develop an ERP contract. Upon signing the contract, ElectCo received a report showing rapid negative financial performance of that selected vendor. The decision was put on hold until the vendor proved better financial improvements.

During this gap, the computer systems manager who handled the ERP project resigned from ElectCo. Most of the IMIS members started to resign and the IMIS performance and attitude went down. The management decided to promote a young programmer analyst to handle the management of ERP and the computer systems department. As soon as he was put in charge, the newly appointed computer systems manager took the lead and invited a third ERP vendor to go through the same process used by the previous two vendors by submitting a proposal, conducting demo sessions and answering end user questions. In three months, ElectCo took the decision of selecting ERP vendor and instructed IMIS to start the process of to select the implementor partner.

5.3.1.1.2 Implementer Selection

The selection process went slowly during the third and the fourth quarters of 1999, as the company was busy with Y2K. Three consulting firms were considered during the implementer evaluation (one local and two from the top six leading consulting firms). The reason behind considering the local implementer was because the expected flexibility and potential support after the implementation was completed. An external consultant from the vendor side was assigned to support the implementation by conducting infrequent visits during the implementation. The appointed implementor agreed on the tough fixed price contractual clauses requested by ElectCo. The company implemented the latest ERP vendor release, which had just been released.

5.3.1.1.3 ElectCo Project Structure

Figure 5.4 explains the ERP project structure. The CEO is the sponsor, the COO is the chairman, the IMIS director is the vice chairman while the applications manager is the project manager. ElectCo PM in coordination with the Implementor PM developed an official document to explain implementation guidelines (Table 5.3). The project structure was designed to adopt ERP as a process oriented application in the existing departmental structure.

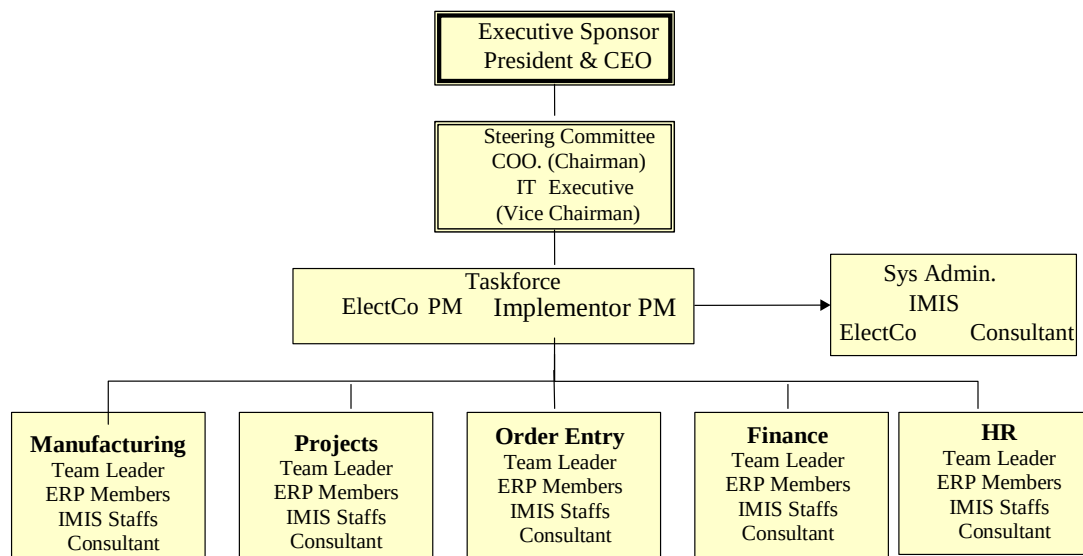


Figure 5.4 ElectCo Project Structure

Table 5.3 ElectCo Implementation Guidelines

No	Description
1	ERP is a high priority project that will transform ElectCo from current legacy systems to the state-of-the-art system. ERP is a platform on which we can add more functionality, such as e-business.
2	No compromise for the target date. This tight schedule is full of critical and parallel tasks, which leave no room for anybody to delay his responsibilities.
3	The ERP project may transform the way we do business towards a more process-oriented organization. Thus, full cooperation between departments is a fundamental requirement.
4	Customization is extremely discouraged unless there is a fundamental need for it. (COO approval is required for any customization). We should be flexible and cooperative to change our procedures rather than to customize.
5	Avoid using multiple systems (reduce the fragmentation) even if we have to do workaround solutions within the ERP framework.
6	60-70% success of the project depends upon the ElectCo. The whole staff is expected to extend their full support and cooperation to make this project successful.

The project manager was a computer systems manager from the IMIS department. Five team leaders were assigned to each main module (Figure 5.4). The main key areas were manufacturing, material and finance, the three team leaders in these areas

had between approximately two to three years of experience and they all held a university degree. Most of the implementation issues came through these channels and they are the coordinators with other areas and fully assigned to specific modules. For example, the material team leader was fully assigned to inventory management, shipping and the prime coordinator for purchasing because both purchasing and material fall under the responsibility of the material director. Each team leader is fully supported by an IT member and consultant. Other ERP members were identified to support each group.

Those three team leaders in those key areas in addition to the related IT members were responsible for most of the critical milestones. Two additional consultants were hired on a need basis (one consultant for manufacturing and distribution and the other for defence requirements). Several replacement decisions of ERP members were made due to internal movements of staff or due to attrition. Main examples were the change of the costing manager and a number of HR employees. In the case of HR, three members assumed the team leader responsibility, one after another.

5.3.1.2 Implementation Process

The COO started the project by an informal meeting followed by issuing the implementation guidelines (Table 5.4). Most of the important documents (guidelines, instructions, memos, forms...etc.); were posted in the outlook bulletin boards, and 95% of the written communication was done via e-mail. Most of the training plans 'other than ERP' were suspended, and new system development requests put on hold as well.

Each module was managed as a sub project. Each team leader was assigned to provide consultants with necessary feedback to their questions, inquiries and data preparation. If team leaders did not have answers, they were to escalate the matter to the department head for decision. The department head decisions vary among modules, being fast in finance modules, moderate in the project and distribution modules, and extremely late in HR modules (Figure 5.4). Some interdepartmental issues that could have been resolved in a week took the company several months to close. In many instances, the decision that had been agreed at the operational level, was changed completely at the executive level.

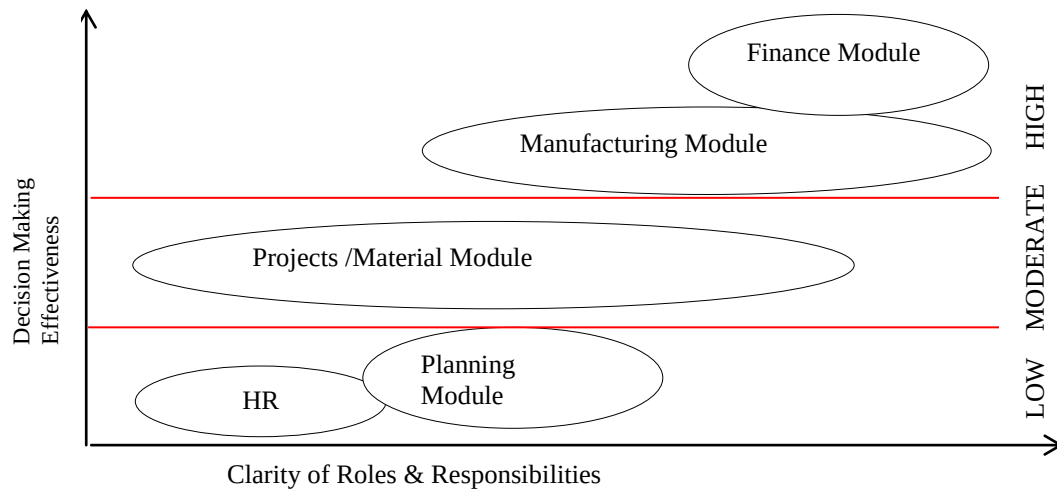


Figure 5.5 Impact of roles and responsibilities on decision making effectiveness – ElectCo Case

Managers, including the COO himself, knew many stories like FoxMeyer and Nike failures in the mid and late 1990's. Whenever a project manager put extra pressure on ElectCo users, project team, they were accused of meeting the date at the expense of quality or jeopardising the core business. The purchasing module was the first module to be completed after the finance modules. During the weekly executive meetings, the CEO used to raise several inquiries on the purchasing modules. The CEO questions advocated several debates that turned into improvements requirements in the system. The purchasing manager was the focal point of the purchasing module and demands for a full automation of the PR and PO process. After reaching the go-live stage of the purchasing module, an appreciation letter was prepared by the ElectCo project manager and signed by the ERP chairman sent to the concerned team members by the ERP chairman. The implementation was done in eighteen months, no extra funding was allocated for the project (some savings were achieved from the external consulting budget) and IT and team leaders were considered at bonus time and most of them were promoted even before the completion of the project.

5.3.1.2.1 Project Management at a Glance

The implementer project manager submitted an initial implementation plan in a task list form. This plan was handed over to the ElectCo project manager. The ElectCo project manager could not manage the project using this master schedule for two reasons. First, several activities would arise on daily basis that were not shown in the plan. Second, the dynamic nature of the project made it difficult to update and to communicate this schedule to the relevant team. Alternatively, a project management

software tool was used heavily to manage sub-activities such as rolling out and cut-off plans. Meetings, workshops and one-to-one discussions were conducted on a need basis within a maximum of one week's notice. It was common to call ERP members to attend meeting even after the meeting had started without advance notice.

The implementer declared that they would use the standard implementation methodology of the ERP vendor. ElectCo did not make any customisations during the implementation apart from few customizations that were allowed in reports only. Regular reviews used to be conducted at all levels of the project structure. The task force group met and decided on operational issues. Both project managers were close to each other in resolving all project issues. Several steering committee level meetings took place and were attended by both senior executives from the implementor side COO from ElectCo.

5.3.1.2.2 Executive Review

As part of the contract, ElectCo requested an external consultant to conduct a quality review in several areas in manufacturing and distribution. During the second visit after launching the manufacturing and distribution, the consultant conducted a presentation in front of the CEO where he criticised some behaviour from the ElectCo side. The CEO felt that the external consultant stood by the implementor side so he intervened aggressively. The CEO requested an internal meeting after the external consultant presentation. The ElectCo project manager stood up and commented to the CEO that he was responsible for the completion of the project provided he was allowed a ten minutes presentation every week in front of the CEO and the executive staff. The ElectCo project manager, thereafter, started to brief the company on the status in front of the CEO. Comments and directions were gathered and applied accordingly. During this briefing, the ElectCo project manager was allowed to report any issues either to ElectCo or to the implementer members. Key milestones like Item master migration, Bill of Material and Routing were dealt with as high priority in terms of communication, follow-up and attracting the management attention. The team morale increased after finance went live and launched the purchasing module.

5.3.1.2.3 Conflict & Conflict Management

Three incidents of conflict made a steering committee meeting necessary. The chairman was approached several times to resolve interdepartmental issues. In many instances, there was friction, hard discussions and very emotional conflict, either between ElectCo members themselves or between ElectCo and consultants. There was no single case reported that was considered as a conflict between the two PM(s). The IMIS director who assumed the vice-chairman position in ERP structure handled all formal communication to the implementer management not the ElectCo project manager.

5.3.1.2.4 Policies & Procedures

At the end of the project, the CEO instructed the QA department to start the process of updating the procedures. Several departments resisted addressing such requests as they believed that ERP implementation was not completed, although their connected modules passed the go live stage. It was always a back and forth communication between departments, QA and IMIS. The QA director took the lead on assigning a process owner for each module to review and redesign the process when required. Before ERP was introduced not all business areas had legacy systems. In those areas, there were a lot of changes in business requirements, which in effect caused a lot of rework effort.

5.3.1.2.5 Planning Module

At the analysis stage of the project, the external consultant recommended a slight change in organisational structure by combining the material planning along with the production planning in order to leverage the MRP module. The COO did approve the merge to be under the production side. A long discussion took place inside the organisation about the justification, timing and the position of this merge. The material department did complain to the president who decided to hold on the decision. It was agreed that module ownership would be placed with the production planning section and to postpone the merge after the implementation. The planning module failed many times to generate MPS (Master Planning Schedule) due to nonstop problems that included, but were not limited to, some items where master attributes were not defined properly.

5.3.1.2.6 Training

Finance did express that they needed to attend all the training sessions in order to ensure all areas do not conflict with finance roles or requirements. IMIS was the first line support for end-users during the implementation. IMIS provided a small set-up of a help desk to streamline the support process. Both the implementer and in-house staff developed many training guidelines, user manuals and hand-outs. It did happen infrequently that training facility was occupied for more than one session at the same time. In many cases, training was repeated several times. At the beginning of the training it was suggested by one of the executives to conduct an exam at the end of each class, however, the team leaders and consultants discouraged the suggestion.

5.3.1.2.7 Technical Issues

The payroll module was supposed to be modified according to the local rules and regulations of the country (as the standard product was designed for the western taxation systems). The localisation of the new release was found to be incomplete by the product vendor when it was expected, which had an adverse effect on the implementation schedule. When the localisation was completed, the ElectCo Company was not ready, which created another delay. After the fixing of the employee master bugs, it was discovered that missing attributes were not completed in the employee master table, which resulted in a further delay in the payroll site.

The system possessed the feature of capturing time sheet data on-line. After announcing the launch of the time sheet, the support helpdesk received many complaints. After the investigation, it was found that the new release was not installed in the production system, whereas the problem did not exist in the production. In order to fix the newly discovered bugs, the ERP vendor requested to install technical patches. After some time, the consultants decided to synchronize the two instances. One area requested to re-enter some data after migrating the TEST server without sufficient coordination. The user department was frustrated.

Customisation

The only approved screen-customisation was done in the WIP (Work In Progress) module. After one month of the pilot run, the screen was launched in the Repair facility (six miles distance from the head office) and the screen failed at launch due to the slow pace of system performance. Lucky enough, ElectCo was in the process of upgrading the connection line anyway, but that was not in the ERP original master plan. However, it did delay the WIP implementation for about three months, which had an adverse effect on the remaining activities. After the stock migration was completed, the material team leader started his vacation. After going live, his replacement could not handle the support load and the material manager got confused until he decided to go back to the old system. It took ElectCo two months to fix the problem until they could complete a physical inventory at the end of the year.

5.3.2 Analysis – ElectCo Case

5.3.2.1 ERP Evolution Analysis

Expansion requirements

The three years sales forecast of ElectCo before considering ERP anticipated that sales would increase 300%. This forecasted increase involved ElectCo executing a new type of project that had different customer requirements. The forecasted sales alerted the COO to ensure that ElectCo would be equipped with all the necessary development plans and resource allocation to capture and execute those forecasted projects successfully. The COO stated to the expats computer systems manager:

"The sales forecast indicates that we expect 300% increase in sales in addition to implement new type of projects so I want our information systems to be ready to support this substantial sales increase"

Internal Pressure to Discard Legacy Systems

Key and end users were, in general, perceived by the legacy system as the root cause of the inefficiency. The two main key users from both the production and projects side had always complained that the legacy systems were the root cause of several business process inefficiencies. The IMIS technical supports also were not happy about being restricted to support business applications that were built on outdated technologies.

External consulting Advisors

ElectCo periodically received reports prepared by independent consulting firms such as Gartner group and many others. Those reports promote ERP as a candidate information systems solution for the business.

ERP Vendor's influence

ElectCo used to receive several reports from advisory group services that promote ERP as a business and information systems solutions. Both the IMIS director and the COO attended several ERP conferences and user forums in Europe and United States where they have attended several activities that increase their level of interest and confidence in the expected gains from adopting ERP as business and an information systems solution.

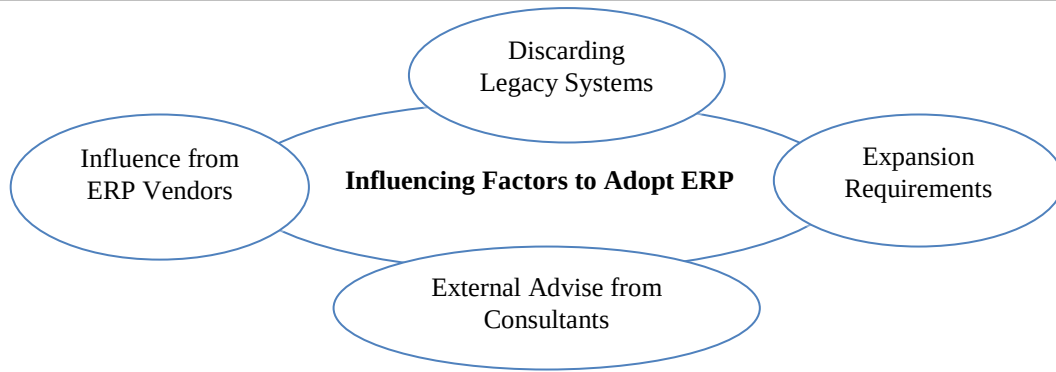


Figure 5.6 Driving Forces for Adopting ERP – Electco

5.3.2.2 The Intensive Focus on the Product Selection

From the analysis of the time duration of the three implementation phases it may be observed that approximately fifty per cent (50%) of the time was dedicated in the selection process of ERP product. This unnecessary delay had an adverse effect on team morale and IMIS strategic directions. There was no accurate figure on the cost associated with the selection process but it can be easily confirmed that the cost of that process was high since it contains the following cost attributes:

1. Business trips attended by several executives and managers.
2. The cost in working days for those members during their business trips and internal meetings and discussions can make this figure much bigger and higher.
3. The cost of working days of the fully or semi fully dedicated team members for the selection process especially IMIS members.

The selection process took ElectCo a much longer time than the implementation (Figure 5.7). At one end, this reflects the fact that ElectCo considered this project as important and essential, but at the same time, it implicitly reflects that the dominant perception remains, namely that ERP implementation is as akin to an off-the-shelf software application. It would have been more efficient if ElectCo had diverted part of product selection budget and focus to develop a change management program that goes in parallel with the ERP implementation process.

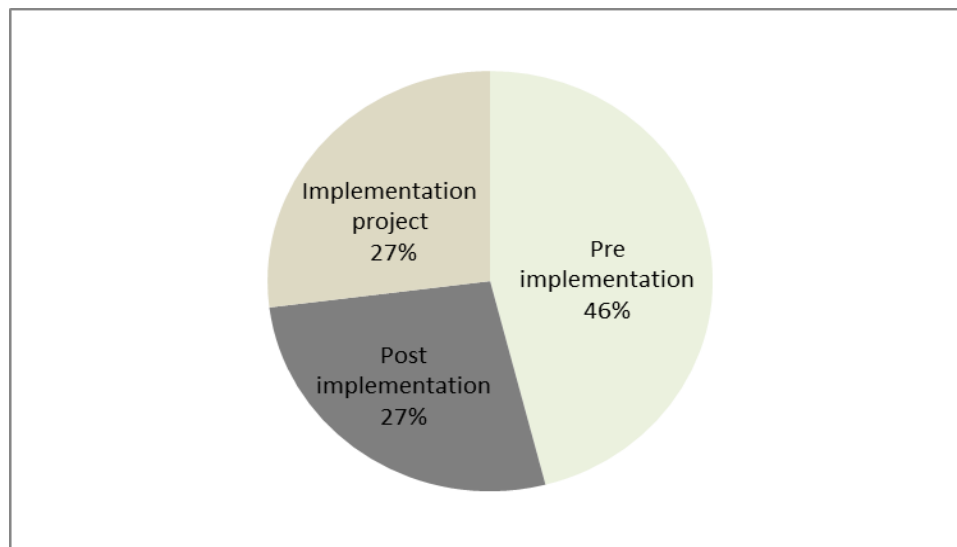


Figure 5.7 Analysis of the Implementation Activities – ElectCo Case

5.3.2.3 HR Modules Implementation Analysis

HR, in comparison to other modules, failed to reach the go-live stage until the third year of the implementation. All other modules passed the go-live milestone within two years. The company started realising ERP benefits as early as nine months from the implementation starting date. Figure 5.8 demonstrates the main stakeholders involved in HR implementation.

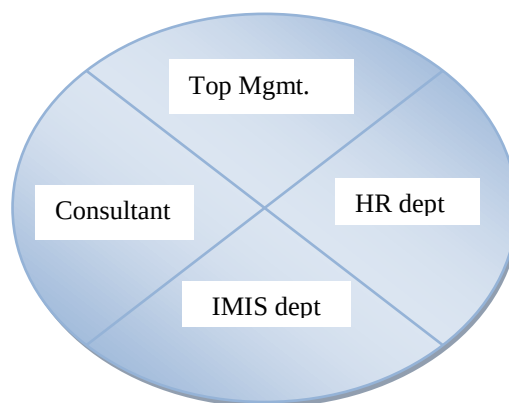


Figure 5.8: The four stakeholders of HR modules

The feedback received from the interviews demonstrates that the HR consultant possessed the minimum technical and application understanding of HR modules. He had, however, the following deficits:

1. He lacked understanding of the complete picture of HR implementation. This may be inferred from his inability to explain the effect of how detailed configuration choices of certain HR module part can affect the HR processes.

2. His communication skills in general were weak, so ElectCo members including PM, key and end users usually faced difficulties in understanding the current position of HR module implementation.

The project manager from the implementer's side admitted this fact and he further explained that since he, personally, has no experience in the HR area he could not complement and fill the deficits of the HR consultant. The implementor PM stated:

“Our general manager and I possess a variety of competencies in technical, applications and business knowledge in all most all business areas over an experience of nearly twenty years. However, HR is a very specialised area that require specific knowledge which we do not have so we could not, in effect, provide a very close or hands on support to the HR modules implementation”

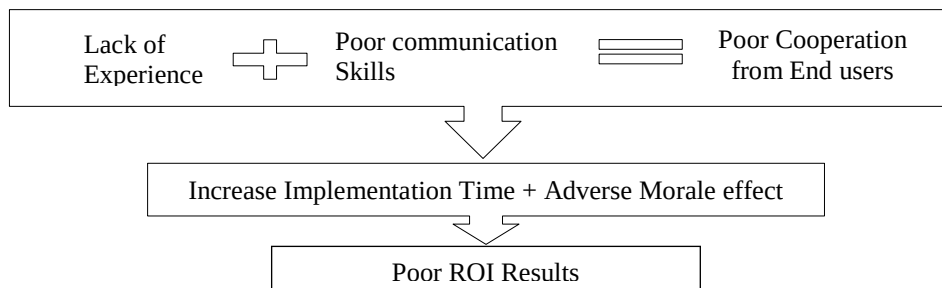


Figure 5.9 Impact of consultants incompleteness on ROI results – ElectCo Case

The ElectCo project manager explained that the HR department took advantage of the weaknesses of the HR consultant in order to hide their own weaknesses. The PM states:

“Unlike other modules; the immediate support I used to get from implementer PM has assisted me to fight internally to resolve all deficits inside ElectCo. However, I failed to do this in HR since no adequate support received neither from the implementor nor from the vendor”.

Table 5.4 summarises the HR implementation steps until it was finally completed.

Table 5. 4 ElectCo HR Implementation Summary

No	Description
1	Both PMs worked hard until the localisation of the payroll module was completed.
2	More pressure from the ElectCo PM on ElectCo HR to expedite completing the back-log activities of HR implementation.
3	Internal conflict developed and exposed between IMIS and HR management.
4	The COO intervened and managed to cool the internal conflict and advise to place further pressure on the implementor.
5	After introducing the post implementation presentation, the CEO received the message that poor progress was made in HR due internal reasons.
6	The CEO took the lead and placed further pressure on HR.
7	A few days later the VP-HR resigned; another executive took over and he managed to complete pending activities successfully.

5.3.2.4 Planning Module Failure Analysis

Before the implementation started, the perception persisted on the part of many ElectCo members that MRP process was not automated because of the deficits of the legacy system.

Few members of ElectCo have expressed a contrary opinion to that of the failure of automating the MRP was not because of the legacy system; other internal issues needed to be resolved to automate the process.

The material control manager, for example, stated before the implementation started:

“If I am in a position of the computer systems manager before I decide to replace or change the system I will do a proper assessment to investigate why we fail to automate the MRP as I am personally not in agreement that the legacy system is the root cause for not successfully implement MRP using the current legacy system”

The IMIS senior member stated during the demo sessions of ERP planning modules:

“End users admired several features of ERP planning modules; most of those features are already exist in the current legacy MRP modules but not used”

It can be argued that if the organisation had paid adequate attention to those stated views and analysed thoroughly why MRP function failed to run by the legacy system, a significant ROI saving would have been achieved from the unnecessary on-going attempts to make ERP planning module more successful.

Recalling the historical evolution of ElectCo may shed light on why such a merger decision could not go through. ElectCo started as a manufacturing company of hi-tech and sophisticated industry in a developed country. ElectCo had been viewed as a unique business model case. The operations department had always earned the full credit of ElectCo success, especially as the operations VP had been promoted to be the COO then the CEO thereafter. From this point onwards, it became embedded within the organisational culture that operations is the most important department in the company. Therefore, it should always get the highest priority of power distribution, allocation of resources, etc. The logistics, supply chain and similar core back-office operations that are crucial for improving efficiency and effectiveness continued to be considered as a secondary priority. What had complicated that cultural

difficulty was that most of the former operations members transferred to the projects departments who gradually became as important as the operations. Both departments started to compete over resources and the attention of top management at the expense of the back-office logistic and supply-chain operations which, in effect, created unseen problems including failure to assign clear ownership of an important process such as planning. The absence of such badly required ownership led to fragmented planning bodies among different units under different departments where expensive and extensive coordination effort could not fill the lack of integration gap between, more specifically, material planning, which was owned by the material department, and the manpower and equipment which belonged to the operations department.

In conclusion, it can be argued that ElectCo suffered from a cultural problem that hindered the company from assigning proper ownership of the planning process. This legacy problem did not only lead to the ERP planning module failure but it also can be seen as the main reason of the failure of using the MRP module of the legacy system.

5.3.2.5 Smooth Transition to the Post Implementation Phase

The case reveals that the ElectCo project manager had excellent timing and a good approach in terms of introducing the post-implementation plan. He succeeded in setting their expectations properly by drawing attention to the fact that there is always an expected temporary performance dip after reaching the go-live stage. This message had successfully communicated to the CEO that they should take successful actions, as summarised in table 5.5.

Table 5.5 Positive Actions as a result of proper Post Implementation plan presentation ElectCo Case

No	Description
1	A package of reward and incentive schemes was approved for the ERP core team to reward and retain them.
2	The CEO clearly understood his role in placing more pressure on department heads to complete pending ERP tasks.
3	A subcommittee headed by the CEO was formed to recover the HR implementation failure. The analysis revealed that VP-HR was the source of the failure where he had no choice other than to resign.

5.3.2.6 The Ownership of the Project

The case demonstrates that ElectCo owns the project. This can be inferred from several behavioural acts demonstrated by executive management. Table 5.6 summarises different examples of the sponsorship by the CEO, COO, CFO and project manager.

Table 5.6 Ownership Practical Examples by Executives – ElectCo Case

	No	Description
CEO	1	The CEO placed strong emphasis on ensuring the selected ERP product meets ElectCo requirements and he took always a challenging position to the team to proof it. More emphasis from his side was made on the contract preparation to ensure ElectCo side is fully protected.
	2	His active participation during the self-service feature of purchasing parallel run sent clear message to the entire team that CEO is behind ERP and will not allow its delay or failure.
	3	He demonstrated excellent leadership and decisive interference to recover HR module.
	4	Finally, he demonstrates excellent leadership in the transition period between the go-live and post implementation stage.
COO	1	He empowered the project manager for all ERP decisions.
	2	Based on the request of the project manager, the COO interfered to support and lead pieces of task in the project as needed
	3	His heavy involvement in the selection process enriched his understanding of how ERP implementation works and how it can be implemented successfully.
CFO	1	Expedite and lead finance module implementation. The Go-Live of finance modules motivated other module owners to proceed to the Go-Live.
	2	Urges other module users to expedite the implementation and increase their awareness, readiness and educational level towards ERP.
	3	Advice, support and mentoring the PM in driving module managers to cope and complete ERP tasks.
Project Manager	1	The PM (who was appointed in the middle of the selection process) led the effort to finalise the selection process decisions.
	2	Whenever end users blamed the implementor for underperformance, his attitude can be seen to fix the problem, not the blame.
	3	To use the Implementor criticism to motivate ElectCo to build its local experience and competencies so the organisation can be completely independent from relying on the implementor for ERP support requirements.

5.3.2.7 Identification of ERP Stake-holders

This section focuses on the identification of all external and internal stake-holders involved in the implementation.

5.3.2.7.1 External Stakeholders Analysis

There were a number of external stakeholders involved at different levels during the course of implementation. The implementer represents the major external stakeholders; his involvement is discussed in the following section. Other consulting stakeholders include:

1. The external consultant.
2. The law office.
3. The external auditor.

The involvement of the law office was very minimal. The legal service was requested in the beginning of the contract preparation to provide general agreement terms. Most of the contractual reviews and activities were handled internally between IMIS, the purchasing manager and the internal contracting department. Since the CFO was heavily involved in the entire implementation, he insisted on engaging the external auditor to assure full compliance between ERP configuration and the leading financial and accounting practices.

The External Consultant

The notion of hiring an external consultant was initiated to assure ElectCo that the ERP could be fully complied to by the Aerospace and Defence requirements. The below observations can be made regarding the involvement of the external consultant:

1. ElectCo aimed to find a consultant to assist in two areas, Aerospace and Defence, and in the project manufacturing.
2. The hired consultant had experience in project manufacturing only, although the implementer contract specified clearly that external consultant must have Aerospace and Defence experience.
3. The contractual relationship was between the implementer and the external consultant. He was expected to assess and review the work of the implementer; therefore, it would have been much better and more appropriate

if the payment and the contractual relationship was formed directly between ElectCo and the external consultant.

4. His major impact can be seen in raising the assurance and satisfactory level of ElectCo top decision makers (primarily CFO, COO & CEO). His presence increased the pressure on some executives to expedite their ERP related activities.

5.3.2.7.2 Internal Stakeholders Analysis

A representation of the stakeholders is provided in the following tables and graphs. Table 5.10 indicates that the total number of stakeholders involved in the implementation was fifty four. Figure 5.7 shows that the distribution percentage for those stakeholders between business departments, IS departments and executive staffs are 67%, 18% and 15% respectively.

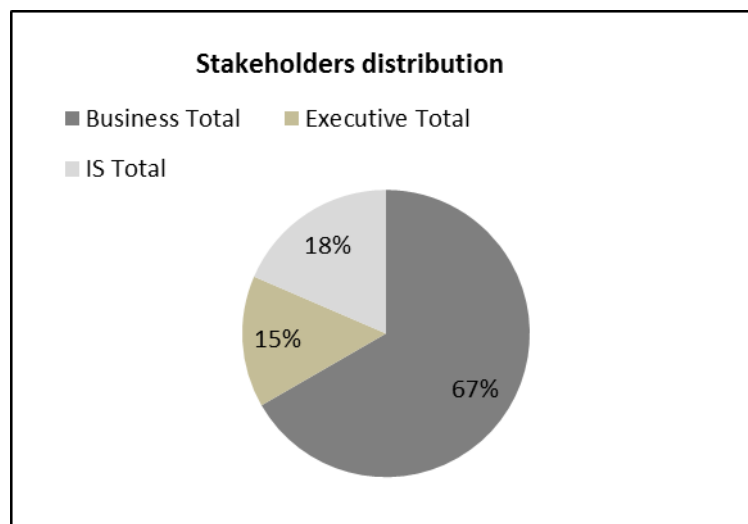


Figure 5.10 Stakeholders Distribution – ElectCo Case

Table 5.7 Stakeholders Distribution (business, IT and executive)

No	Name	# Occ.	Type
1	President	1	Executive
2	COO	1	
3	IMIS Director	1	
4	Senior executives	5	
5	Internal Auditor	1	Business
6	Contracting department	2	
7	Purchasing Manager	1	
8	Key users	7	
9	End users	25	
10	ERP Project manager	1	IS
11	IMIS Focal points	5	
12	Data base administrator	1	
13	Networking & data canter team	3	
	Total	54	

Figure 5.11 provides a graphical representation of the number of stakeholders in different positions and departments. Table 5.9, on the other hand, represents the same from the implementer side.

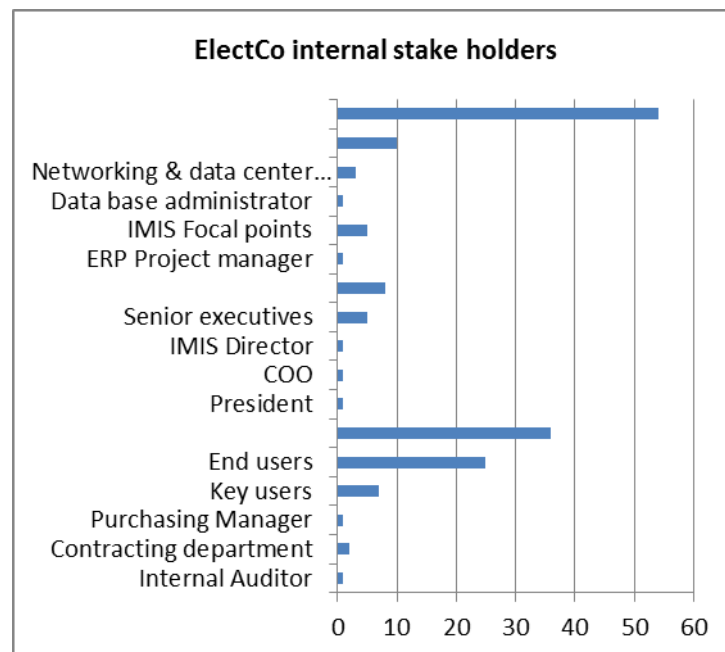


Figure 5.11 Stakeholders in different positions and departments – Implementer side

Table 5.8 Implementor Stakeholders List - ElectCo Case

No	Name	# Occ.
1	President	1
2	EVP	1
3	General manager	1
4	Project manager	1
5	Applications consultant	4
	Total	8

5.3.2.7.3 The Implementer Analysis

The Implementer is the main and major consulting stakeholder in the project. The analysis of their involvement can be divided into the following points. Firstly, being a local firm, the implementer demonstrated strong understanding of the culture, which assisted in proper project and conflict management.

The project manager from ElectCo states:

”Flexibility represents the major advantage of the implementer; my major challenges as a project manager was with my internal team of ElectCo so I was in a bad need for a flexible consulting implementor who is flexible and can easily cope with any changes that might be required”

Secondly, the implementer project manager can be considered as a prime success factor of the implementation success. He possessed a comprehensive mix of technical, functional and depth business background. The implementer GM had less technical expertise but they both shared a strong ERP and business background, which enabled them to attend promptly and resolve immediately all implementation issues. Thirdly, the competency level of the functional consultants varied between modules. The finance consultant can be seen as highly competent; the supply chain consultant can be seen as between average and above average but there were almost consensus agreement that the HR and manufacturing consultants were seen as weak. The implementer project manager seconded and supported the supply chain and manufacturing consultants, however, no backup support was provided to the HR consultant. The interference and support of the project manager to the consultants of all modules other than HR consultant led ElectCo members to view the implementer as a one-man show consulting organisation.

5.3.2.8 Can the Case be considered as a Successful or a Failure?

It can be suggested that several case aspects can be considered as successful (partially or fully) while other aspects can be considered as a failure (partially or fully). The achievements acknowledged by ElectCo at the end of the implementation are displayed below:

Table 5.9 ElectCo ERP benefits as per the post implementation plan Presentation

No	Benefit Description	No	Benefit Description
1	Unify and standardize the technical environment for OS, data base and tools.	6	Transform ElectCo from being a Month end processing to access data in real time.
2	Substantial decrease of the fragmented systems (islands).	7	Develop E-business infrastructure.
3	Streamline, design and revise various processes.	8	Automated non-automated processes like Order entry, recruiting, training, planning, warranty, ...etc.
4	Adequate experience developed that used to implement other e-business total solution initiatives like CRM, SCM, etc.	9	Centralized critical ElectCo data for consistency, accuracy and security control like Employee Master, G/L accounts, ..etc.
5	Develop local capabilities to maintain and leverage ERP features.		

5.4 The Description and Analysis –AgriCo Case

5.4.1 Case Study Description (AgriCo)

AgriCo is the biggest national share-stock company in the agricultural and dairy food processing industry in one of the developing countries. It has played and is still playing an efficient role in supporting national agricultural development. It won the national first prize for the ideal food processing plant in the country and has an International ISO 9001.

5.4.1.1 Initial Situational Climate

AgriCo has two main local competitors in the agriculture and food processing industry. One of the competitors is managed by a western team and they have more advanced systems and business practices than AgriCo. The second company is also part of a very successful and famous group and they have gained several international awards of excellence in several initiatives that they adopted and achieved. Before ERP evolved within AgriCo, the company was under pressure because of the Y2K problem. Data was fragmented among islands of heterogenic systems such as COBOL, MS Access and Ingress data base. The total number of personal computers in the company was only twelve. It was suggested to move directly to Oracle as a database.

AgriCo board decided before 2000 to appoint a new general manager to take the lead towards transforming the company to be profitable, successful and to become a leader in its industry. A few weeks after his joining, the new CEO started to hire a complete management team including the hiring of new IS director who assigned to take the lead in implementing the ERP system. ERP was among several initiatives in all business areas, including a tremendous effort and enormous budget for promoting AgriCo as remarkable brand.

The IS director took the lead in the ERP selection process, with ERP product competition not taking a lot of time to evaluate between vendors but more effort was taken for selecting proper implementor before a non-famous consulting firm from India was hired to manage the project offshore. The scope was to implement what was named as “as-is approach” which means that ERP applications will be installed ‘as is’ and data will be migrated without any changes. In the early days of announcing the

ERP projects, consultants claimed that the integration feature of the new system would automate all business processes. They further claim that all processes and services will be managed by the system so there will be no paper processing. Some end users describe their perception by stating that ‘upon the project completion by only pressing a button by an accountant, the salary will get transferred to the employee pocket’.

5.4.1.2 The Implementation Process

The implementation consultants started to capture the user’s requirements through interviews with the presence of translators most of the time as there is no common spoken language understood by end users and consultants. The CEO was active in developing several strategic initiatives in parallel with ERP in various areas in sales, marketing and public relations. A few months from the project starting date, the consulting implementation team requested end users to start testing the system; all the feedback was negative and none of the modules could be used in production. Apart from the ERP project, the board expressed their frustration, since most of the various initiatives led by the CEO could not generate tangible benefits to recover the huge costs connected to these initiatives. This was followed by the decision to dismiss the CEO. A senior engineer was promoted to become the new CEO. Most of the line managers who had been hired by the previous CEO started to leave gradually, including the IT director.

The new CEO took the lead in assessing the underlying reasons of ERP failure and he hired a new IS director to look after ERP implementation. The newly appointed IS director suggested to the CEO to coordinate with the ERP vendor to conduct a health check by ERP vendor to assess the ERP project status and to determine what was required to turn its failure to success. The health check team started their investigation assignment by examining key elements of the implementation such as the methodology used, review of the project management attributes and data migration.

5.4.1.3 The Health Check

The Recover Consulting Team (RCT) consists of seven consultants from ERP vendor from different modules for the health check. The consultants conducted interviews with the AgriCo management team, key-users and the information systems team of

each module. Several visits were arranged at sites and sales centres. The health-check process had been conducted over the three phases demonstrated in table (Table 5.10).

Table 5.10 The phases of the First Health check

No	Phase One	No	Phase Two	No	Phase Three
1	General Ledger	1	Planning & MP	1	Sales Analysis
2	Accounts receivables	2	Production	2	ERP express
3	Accounts Payables	3	Inventory		
4	Fixed Assets	4	Assembly		
5	Cash Management	5	Quality Control		
6	Purchasing	6	Manufacturing and financial integration		
7	Payroll and personnel	7	Cost analysis		
8	Self service	8	Order management		
9	Financial Analysis	9	Asset maintenance		

A complete review was conducted for the implemented modules status including the contract, inputs and outputs of the modules and the modules hand-over procedures. The health-check process considered eleven attributes to be examined during their investigation, with each examined item result falling into one of three results (adequate, inadequate or needing improvement). RCT started to review all documents available that included the contract with the implementer, the minutes of meetings and all circulated documents. Specific questions were asked relating to how the implementer started the implementation, how the requirements definition had been captured, testing procedures and go-live preparations. Other questions related to the project being managed in terms of defining its milestones and deliverables. Detailed investigation was also undertaken to assess whether and how data had been migrated. Functional managers and end users were asked if and how the ERP training should be delivered. Finally, the servers and network specifications setup and installation had been reviewed including the verification of the basis of how specifications and configurations been requested and configured.

The details of the health check findings contained four parts. The first part addressed the remarks and recommendations of the methodology including the remarks that must be followed by the implementer. The second part focused on the existing modules implementation status at each implementation phase, including the requirements that had not been fulfilled. The third part was concerned with general

remarks and recommendations including the change management and expected outputs that the implementation partner should produce. The fourth part addresses the overall project issues, including risk assessment that the project might face. The findings of the eleven attributes are explained in Table 5.11.

Table 5.11 The first health check elements

No	Element	Result
1	Project Management.	In-Adequate
2	Project Infrastructure.	Need Improvement
3	Requirement definition	Need Improvement
4	Applying requirements on the system	In-Adequate
5	System configuration	Need Improvement
6	Customisation	In-Adequate
7	Data transfer	Need Improvement
8	System documentation	Need Improvement
9	System inspection	In-Adequate
10	Training	Need Improvement
11	System use in the real scenario	In-Adequate

This was followed by several meetings with the CEO and key executive members, to understand future directions for the company and set-up a priority list of the most important business areas where implementation is badly and urgently needed. Before the final report which consisted of their finding and investigations, a detailed question list was circulated to explore specifically how different business units would react if the system went down, the implementation was delayed or the data was lost during the migration process. During a one-to-one discussion with key business managers those what-if findings were included in the report.

The health check analysis process concluded with a specific remarks and set of recommendations demonstrated in table 5.12.

Table 5.12 Generic Remarks & Recommendations first health check report

No	Description
1	Apply the monthly closing procedures including all financial statements.
2	Obtain income statements of all divisions, profit centers and projects.
3	Obtain product and unit cost.
4	To make the system bilingual.
5	Capitalise the cost of cows and plants to be dealt with as assets.
6	Implementing financial module alone without implementing other supporting modules will not meet all requirements of AgriCo as most transactions that affect financial modules is entered manually to the system through financial constrains or sales invoices.
7	The implementation process should take into consideration the connectivity and the integration between systems during capturing user requirements even if the implementation process conducted over phases to ensure all requirements covered and to avoid major changes for the early implemented parts of the system.
8	The sign-off step should be done after the successful completion of all implementation phases as specified by the approved methodology and after the review and approval of all inputs of implementation phases by AgriCo executive managers. Moreover, the final handover sign-off is obtained after the completion of all modules specified in the contract and the completion of the technical support and maintenance period.
9	Resolve the internal sales.

The health-check analysis process was followed by a development of a new plan including risk assessment.

The consultants advised AgriCo to consider two phases of new plan as per Table 5.13 below.

Table 5.13 The two phases of the new plan advised by the first health check
Project management

No	Phase One	No	Phase Two
1	Complete the modules of Finance, HR, purchasing, material management, financial analysis.	1	Implement manufacturing, order management, asset management and MRP.
2	Study the requirements of the new phase.	2	Apply necessary changes of phase one.

The RCT team strongly recommended assigning dedicated project teams as per the suggested organisation structure (Figure 5.12), to be responsible for the project planning, day-to-day follow-up and problem solving activities. The RCT also strongly recommended the following sequence of execution:

1. Move inventory system to the first phase to be connected with the G/L.
2. Suspend the implementation of phase two until the completion of phase one modules.
3. To complete the first phase in the following three months.

4. After one month of the real use of the system, AgriCo is to implement the manufacturing module in three factories, namely asset management, the order management and MRP.

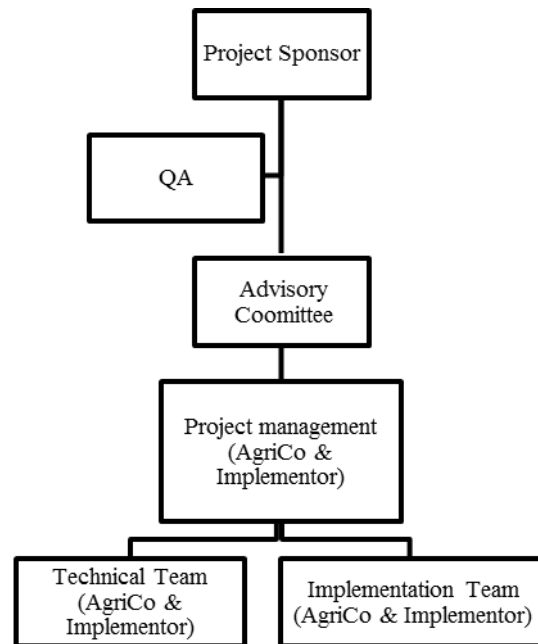


Figure 5.12 Suggested Organisation structure of Phase II

A few days later, the CEO approved the organisation structure that included full dedication of the team to the project. In addition, the plan that was suggested by the RCT was officially approved.

The implementation led by the IT director was supported by two key members in the IT department. The first member was a very senior application specialist who served the company for several years. The second member was a high calibre application manager who had just completed a successful ERP implementation before joining AgriCo. The CEO used to attend the weekly meetings of ERP reviews in addition to one-to-one short meetings with the IT director on a need basis. The IT director delegated most of the implementation tasks to his two assistants. He spent most of his time and effort with business managers to discuss ERP issues. The implementation was completed as planned within three months; ERP assistants received three months bonus for the outstanding ERP results.

5.4.1.4 The Future of AgriCo Project

A few years later, AgriCo has made significant organisational changes that include a new hiring of several executive positions, most of them hunted from competitors. The

new executives criticised information systems in AgriCo: more specifically they accused the existing ERP product of not meeting business needs compared to the ERP product that was used by competitors.

A few executive members discouraged the notion of implementing another ERP product. Alternatively, it was suggested to invite an existing ERP vendor to conduct a comprehensive health check, which would ensure that the existing ERP could fill existing requirements gaps and resolve all issues. The outcome of the health check confirmed that there was no need to change to different ERP vendor. Alternatively, it was suggested by the health check team to combine all deficits and issues to be tackled under new project. In addition, it was suggested that this team was not led by IT and the PM should be appointed from the business side. “AgriCo future” was the chosen name of the project to reflect its strategic importance. The project was led by the general manufacturing manager who held a degree in industrial engineering, majoring in operations research. He had five years of experience in a competitor company to AgriCo. Table 5.14 summarises the project objectives, while Figure 5.13 explains the project structure.

Table 5.14 ‘AgriCo future’ objectives

No	Objective
1	Monitor company performance.
2	Reduce the cycle times.
3	Capture more revenue opportunities.
4	Improve inventory visibility and accuracy.

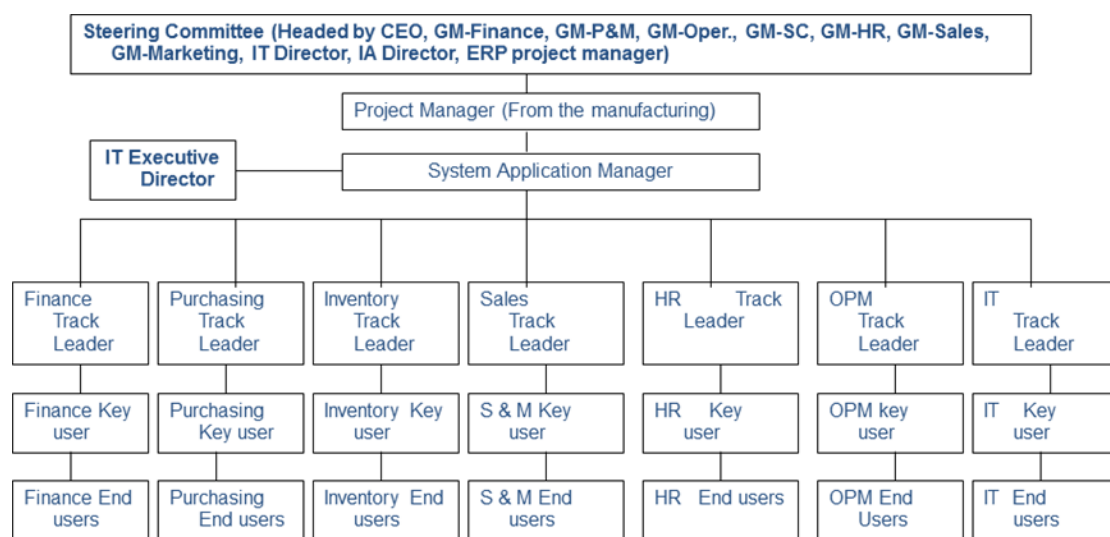


Figure 5.13: AgriCo future organisation

The PM assumed his responsibility along with his normal day-to-day activities. He led the coordination efforts among the various stakeholders including IT department, ERP consultants, functional managers and the CEO. Project tasks were divided in to three phases, based on their priority and urgency as per the Table 5.15 below.

Table 5.15 Priority list of the AgriCo future project

No	Phase	Activity
1	I	Identify and finalize all the company KPIs that will be measured and monitored in the ERP
2	I	Address and solve all the issues raised in the assessment report (100 issues)
3	I	Arrange for ERP training to refresh the end-users knowledge and maximize the system usage effectiveness for the current implemented functions
4	I	Identify and finalize all the company KPIs that will be measured and monitored in the ERP
5	I	Address and solve all the issues raised in vendor assessment report (100 issues)
6	I	Arrange for ERP training to refresh the end-users knowledge and maximize the system usage effectiveness for the current implemented functions
7	II	Implement Process Manufacturing and Mobile Supply Chain Applications
8	II	Implement Business Intelligence
9	III	Implement Advanced Procurement Modules (i-supplier, i-procurement, Sourcing and Services Procurement)
10	III	Implement Projects and Project contracts
11	III	Implement i-Recruitment

All deficits, issues and problems were combined in a complete list. The PM, with the assistance of IT and ERP consultants, started acting on items in the list where the PM had to obtain the approval from the functional managers and resolve their issues if they still had any. The PM faced continuous difficulties in convincing functional managers to accept implemented ERP parts. Functional managers always claimed that they need proof that developed changes reflect best practices. It was a norm that functional managers always requested new ERP changes before accepting previous ones. Sometimes the PM accepted these unplanned changes for the sake of obtaining acceptance from users for completed tasks.

The implementation record does not show formal acceptance for all implemented parts, although it was in production for long time. Several challenges evolved during the implementation process; the first challenge was the costing method that the company should agree to use for the system configuration. It took the team more than four months before they took the decision.

Sales Invoices - Asset Management

One of the key challenges noted was that software needed to be developed to capture sales data before it could be entered into financial modules. It was found that sales outlets were not interlinked with any computer system and there is no mechanism to aggregate sales transactions from sales points. As a result, a new software application had to be developed to capture all sales transactions from sales outlets to ERP in a timely manner to eliminate the off-the-record manual entry.

Asset management can be seen as another challenge due to the surprising discovery that enormous assets were not recorded in the system. It was found that the practice only to record basic asset data without a breakdown.

Status Review

Executive reviews detailed the implementation status of each module and provided updates of the deadlines and the issues faced by the team. Table 5.16 demonstrates an example of the status review.

The main comment made by the CEO during the project review meeting is the availability of system reports that allow him to visualise the company overall performance. The project reviews were attended by the CEO and all executive staff.

Table 5.16 Sample Status Review Report		
Applications	Current Status	Remake
AR	Completed by November 2009	It required a lot of customization to reach to end user satisfaction
HR	Completed by December 2010	The reason for extending the deadline is the late approval of HR policy
Inventory	Completed by August 2010	It was ready since February 2010, but business owner doesn't start
OPM	Setup completed, Dairy Processing Go Live 1 st December 2010	- Unexpected long setup time - Some delay from the Implementer - Date Factory setup is completed, just need new go live date 1 st Jan 2011
Budget	Completed	- General enhancement requested from Budget team - The setup completed according to finance view.
Agriculture Project	Pending/Postponed	No available application can fit with our requirement without a lot of customization, The best available application is very expensive and requires a new license
OM	Completed, Started from 1 st of August till mid of August, then postponed till 09 th October 2010	- Unexpectedly long setup time - Long-time taken from sales to test Auto order through Rout pro (then cancelled). - Need to setup another solution. - Then, final setup is completed
EAM	- Supply Chain EAM: completed. - Dairy Plant EAM postponed till Q1 2012	- IT team advise us to start the implement EAM for the dairy plat after upgrade to next release. - Expect to complete by Q1 2012
DBI	HR – Completed. Finance – Completed Supply Chain : – Purchasing – completed. - Inventory – completed - Order Management (Standard) – Completed - Order Management (Standard) – On going	- There was an error in the application (delayed the project 4 months) - Also, there is a delay from the implementer

There was no formal closing for the “AgriCo future” project, however the IT department announced that the 2012 plans consisted of ERP improvements including complementing parts of the “AgriCo future” project activities. The status of the implementation is demonstrated in table 5.18. The overall technical and application set-ups were completed for all tasks but the use of the system varies due to different reasons that may be summarised in table 5.17.

Table 5.17: The final Status Review this research Investigated			
Applications	Request	Current Status	Remake (Reason/ completion Time frame)
AR	Aging Report	Completed	
AR	Manuel Daily Receipt (standard)	Completed	
AR	Auto Daily Receipt (customize)	Completed	
Budget	Control on Purchase Requisition	Completed	- The setup completed according to finance view. - Hold by purchasing and requested new setup which can't achieve by the application. - Need final agreement between both departments.
Fixed Asset	Improving the existing Application in Dairy Processing	- General analysis done. - Data Sheet completed - Ready for implementation with R12	Q1 – 2012
Purchasing	Improving the existing Application)	Many issues solved and improved	
Agriculture PR	New approval hierarchy	Completed	
DBI – GL	Cash Flow Statement	Completed	
Agri – OM	Implement OM for Daily Agri sales activities	Completed	Go Live from 7 th May 2011
ROUTPRO/ERP		Completed	
General	There was too many reports requested from different users get developed in the system	Completed	

5.4.2 Analysis - AgriCo Case

5.4.2.1 ERP Drivers

It is obvious that the new general manager was full of enthusiasm to make remarkable changes in all areas including the information systems by adopting ERP solutions. The other two main competitors of AgriCo started ERP implementation before AgriCo, which can be seen as an extra motive for AgriCo to adopt ERP to cope with competition. The other two main competitors both are less affected by government practices which enables them to minimise bureaucracy in advancing business practices, which left AgriCo behind in terms of new technologies and business practices. The general manager who came from the private sector was under pressure to make total and massive change in a very short time, including ERP implementation.

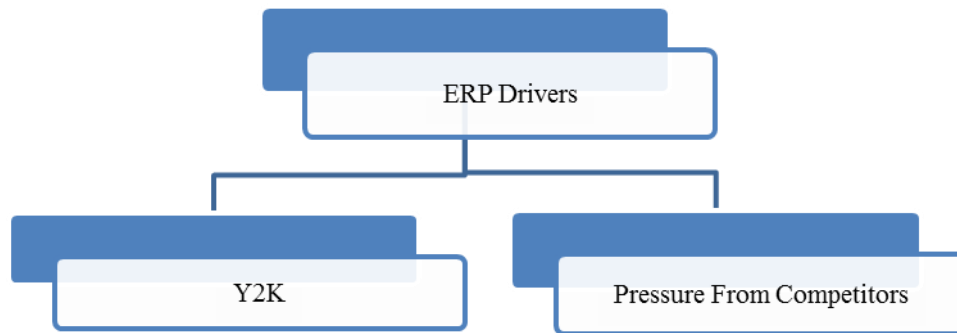


Figure 5.14 ERP drivers - DiversCo case

5.4.2.2 Gap Analysis between Implementation Phases

The first implementation started in the year 2003 and the case was reviewed until the end of year 2012. These nine years of implementation efforts can be divided into different phases (Table 5.19), based on the analysis of the case history into four phases:

1. The first “as is” implementation: this phase covers the period from 2003 until 2004 where the first failure exposed.
2. The second “as is” implementation: this phase covers from 2004 until 2005 where AgriCo has successfully implemented the “as is”.
3. The third phase “the future of AgriCo” that includes more modules and an expansion of the “as is”.
4. Y2012 plans that covers extension of the previous phase.

Table 5.18: Agrico Implementation Phases

Year	Implementation phase
2002-2003	The failure As IS
2004-2005	The successful As IS
2006-2008	Continuous improvements
2009-2011	Process based implementation
2012-....	Continuous improvements

It may be observed that there was a three years gap between the successful “as is” and the process based implementation phase. The senior applications consultant refused to consider this period as unnecessary delay as he considered it to be a continuous improvement of the “as is” phase. The senior applications consultant stated:

“I refuse to consider the so-called gap between the second and the third implementation phase to be considered as unnecessary delay; in fact it’s part of the continuous improvements process within each module without enabling the integration”

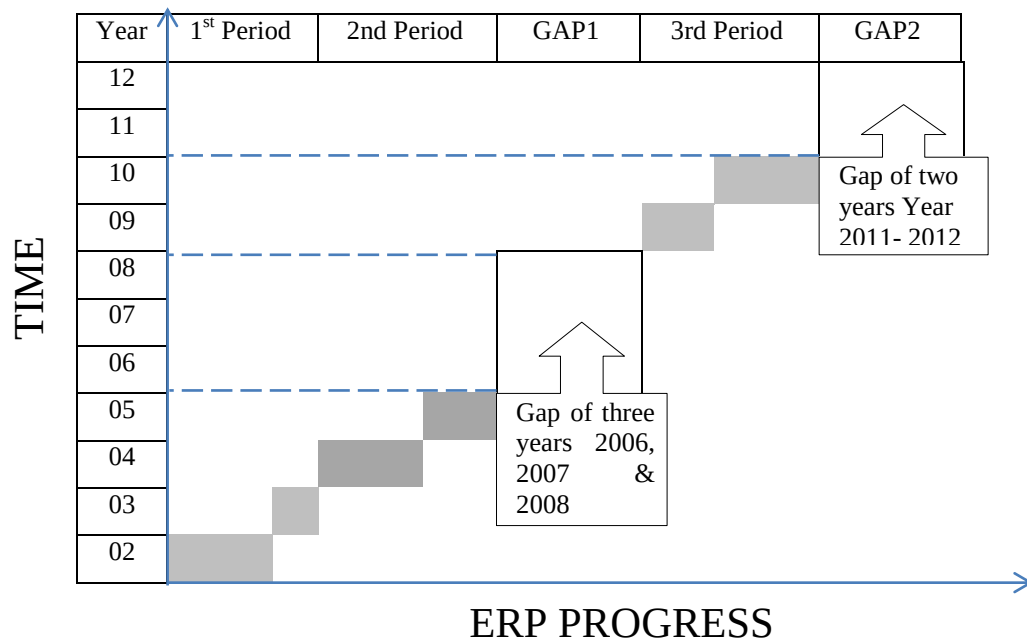


Figure 5.15 - Agrico Implementation Gaps

5.4.2.3 Analysis of the First Failure

The implementation was a complete failure in its first implementation cycle. This is obvious from the fact that not a single module was successfully implemented. A fundamental mistake that can be identified is that the first implementer did not engage AgriCo in the process of building and configuring the system, which, in effect, created an adverse implementation effect. The RCT described that deficit:

"IS team members of AgriCo had been disengaged from the process of building and configuring the systems that adversely affected the knowledge transfer process which in negatively affect the support and maintenance of the system after the implementor leave AgriCo site"

The disengagement adverse effect increased through the absence of good documentation. There was no reference to the necessary documents and various activities were not documented. The RCT describes the documentation deficit:

" There is no unified reference for all necessary documentation for ERP project as it is difficult to get an access to it in a timely manner. Required documentation, as per the contract, was not completed as per the contract with the implementor"

Poor training management represents the third major failure factor. Training was not only poorly managed, but it was also limited to specific areas, was inadequate and ignored major important implementation aspects. The RCT described those shortages in the training process:

"No training plan in place and the training material that had been handed over to end users is limited to demonstrate how to navigate and access the system. All end users explains that training was in-adequate, un-planned and very limited to specific parts"

From a project management perspective, the absence of real project sponsorship, especially after the previous project manager left, represented a major finding in the project failure. There was, in addition, inadequate documentation of the agreed actions and solutions between AgriCo and the implementer.

From a requirements definition perspective, the implementer had prepared four documents recommended by the approved ERP vendor methodology for that purpose, including existing business scenario definition document, the application of implementation of the requirements, the documentation of the future business procedures and the configuration and building of the system. The implementer, however, had ignored necessary documentation of the acceptance of AgriCo end users.

The health check process found that no proper testing was conducted. The AgriCo end user should have tested the system configured by the implementer to ensure that the solutions suggested by the implementer were appropriate and to ensure that all

activities and special AgriCo requirements had been considered during all phases of the implementation. Previously highlighted issues drove the go-live to inevitable failure.

The RCT describes such expected results despite the failure to reach the go-live stage; ERP integration strength was lost through such inappropriate plans. The RCT report states:”

1. No clear plans for AgriCo when to move to the production version.
2. By the narrow focus of implementing modules in isolation, AgriCo lost the integration strength of ERP system.
3. We cannot consider that AgriCo has reached the go-live stage as while using the system in real data changes are still going on.”

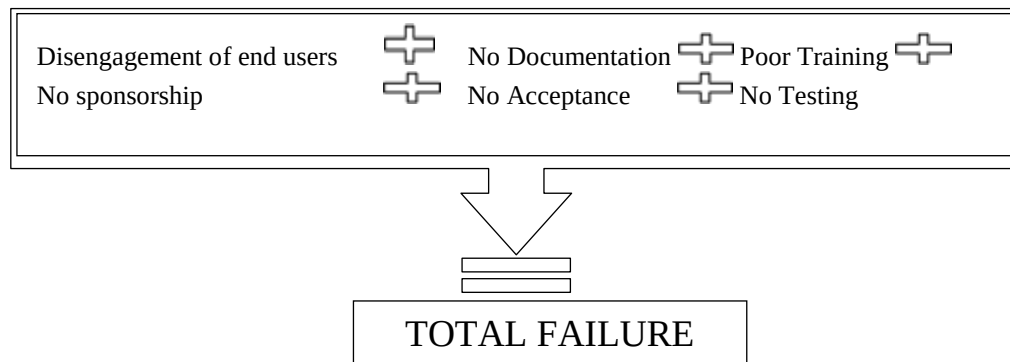


Figure 5.16 Failure Analysis of the first Implementation Cycle

5.4.2.4 The First Health Check Analysis

5.4.2.4.1 Proper Methodology & Scope

The use and the process of the health-check by the ERP vendor can be seen as a prime factor in the success of the second implementation cycle. The logical sequence of steps followed through the process proof were found to be comprehensive and should have led to success. This began with studying and analysing the existing position, followed by a review and evaluation of the infrastructure and implementation procedure before concluding with a risk assessment and recommendation. The methodology of the health-check is demonstrated in Figure 5.17.



Figure 5.17: Methodology of the 1st health-check

The methodology had been complemented by comprehensive and clear scope that details task list that can be easily understood and measured. The task list of the health check scope is aggregated into Table 5.20 below.

Both the comprehensive use and execution of methodology and proper management and execution of the task list led the PM to make the very wise recommendation to split the implementation into two phases as detailed in Table 5.19 below. This split allowed AgriCo to focus and prioritise specific tasks that could generate quick wins by demonstrating a quick ROI from ERP investment.

Table 5.19 The scope of the Health Check

No	The scope of the health check
1	The application of the suggested implementation methodology by the ERP vendor.
2	Review of the project management attributes.
3	A comprehensive review of the entire documentation.
4	A review of the customisation made on the system.
5	The data migration process.
6	A review of the process of the system acceptance by end users.
7	A review and evaluation and in particular the acceptance of the new system from end users.
8	Review and evaluation of the end user training.
9	Review and evaluate the status of product implementation.
10	Review and evaluate the project infrastructure.
11	Review and evaluate the Go-Live plan.

5.4.2.4.2 The Clarity and Focus in the Roles and Responsibilities

The role of the health check process in turning the implementation from a failure to a success is obvious. While examining its nature, the health check can be seen at its core as a comprehensive roles and responsibilities management process. The CEO found the health-check outcome as a tool that is easy to understand that is presented to him in a form of detailed definitions and identifications of the roles and responsibilities between various ERP stakeholders. The roles and responsibilities within the first health check process covered (Table 5-20) all necessary areas that affect the implementation. This included the investigation of the documentation, system testing, the actual use of the system in production, the systems building and configuration, data migration and customisation.

Table 5-20 First health-check Roles & Responsibilities Summary

Documentation	
AgriCo	Implementor
AgriCo is requested to explore all documentation material and save it with the program management office either in a printed or electronic form with a proper filing. Furthermore, access to these files needs to respect the table of authorities	1. Complete necessary documentation as stated in the contract. 2. To coordinate with AgriCo for procedures and authorities to review and approve documents and outputs from authorised bodies.
System testing	
1. Emphasis that Key users to test the system as per each business cycle while taking into consideration to ensure the integration testing. 2. Ensure that Implementor amended system documents and all test issues and problems being addressed and resolved.	1. Develop testing procedures and scripts in detail, regarding what is agreed with AgriCo in the To-Be-Processes. 2. Discuss testing results with AgriCo and amend inappropriate parts and re-conduct the testing by AgriCo end users that ensures issues exposed during the test are being considered. 3. Change documentation as necessary especially the document of the future procedures, build and configure the system as per the agreed testing results.
The actual use of the system in production	
1. Identify business requirements of all systems and financial reports for middle and top management. 2. Work closely with Implementor to find solutions for unresolved remarks.	1. Complete unimplemented modules. 2. Apply, for each module, all remarks stated in the detailed health check report. 3. Apply all other generic remarks stated in the detailed report.
The systems building and configuration	
1. Ensure that IS members are fully engaged with IMPLEMENTER consultants in the system building and configuration process. 2. Ensure that Implementor made necessary update of the business requirements process to be fully compliance with the real system development and configuration	1. To ensure full engagement of AgriCo IS members and key users of the modules that not implemented yet and to ensure proper training of this process for the modules that had been built and configured already and to ensure that they are able to maintain it before IMPLEMENTER completed their assignment. 2. To validate, review and make necessary changes of the business requirements document during the system building and configuration process till they become consistence and fully compliance with each other.
The customisation	
1. Agree on principal and types of customisations. 2. Agree on preparing reports to be developed. 3. Agree on the customisation cost. 4. To test and double check the customisation and not rely only on the test done by the Implementer. 5. Knowledge transfer to AgriCo to ensure a continuity of developing future customisation when required	1. It is imperative to clarify the meaning of customisation and exclude other activities that should not be understood as customisation such as data transfer considering generating financial statements as customisation. 2. The customisation approval should come from department and program managers and approved by the AgriCo ERP project manager who should be the focal point to follow-up those approved customisation requests all the till its completion. 3. Those customisations need to be completed by Implementor before AgriCo start using the system in real data. 4. The contract states clearly data migration is IS responsibility so they should not consider it as customisation.
Data Migration	
1. Review the plan of data transmission and migration. 2. Review and verify data that migrated to the new system	1. Data and information that need to be migrated and transferred to the new system, testing and verifying that data is transferred correctly. 2. To link the migration date of the data along with the cut-off date. 3. Tools and types of data transmission and migration and equip IS department with tools used by Implementor of data migration.

5.4.2.5 “AgriCo future” Analysis

The second implementation cycle, in terms of a pure project management perspective, can be seen as more successful than the ‘AgriCo future’ project. This can be seen from the compliance with the project time line and the completion of the tasks assigned in each project. That perspective alone, however, is not a fair comparative factor between the two projects. The “AgriCo future” project scope is connected with business performance and efficiency while the second implementation cycle is limited to the “As IS” implementation approach.

The analysis of the third implementation process can lead to an extraction of the factors that led to its success. One of the positive findings of the third implementation cycle comes from the proper selection of objectives to be achieved that are linked with comprehensive KPIs. This has enabled the PM to divert the effort and resources against specific performance targets to be achieved. Not only were the objectives well defined, but each objective was linked with as precise KPI setting as possible, Table 5.21 demonstrates objectives and KPIs of the third implementation cycles).

Table 5.21 : “Future of AgriCo” project Detailed Objectives

No	Objective	Description	KPI
1	Shorten the financial closing times.	Shorten the month-end and year-end closing times, while increasing the accuracy. This will give the management faster and more accurate information about the company performance to speed-up the decision making process and corrective actions.	1. Shorten the month-end closing time to be (month-end+2 days) (compared to month end+6 days now) – more than 50% enhancement 2. Shorten the year-end closing time to be year-end+3 days
2	Reduce the cycle times.	To reduce the major business cycle times. More specifically to reduce the overall procure-to-pay cycle by 20% compared to the existing one including the following KPIs.	1. Reduce the Purchase Requisition to Purchase Order Cycle 2. Reduce the late Payments number and % compared to the number of payments 3. Produce Supplier evaluation reports based on commitment to delivery and quality of supplied goods.
3	Capture more revenue opportunities.	1. Increase the order fulfillment rates (number of placed orders against fulfilled ones) and product availability 2. Study the factors that are affecting the processing time including the system processing time, distribution systems and procedures.	
4	Improve inventory visibility and accuracy.	This will help in achieving a better planning and delivery for the right stock at the right time including	1. Under Process inventory 2. Finished product at Factory, Sales Centers, Sales Persons and Customers.

Another success factor is that the health check consultants supplemented AgriCo with very specific critical success factors to be considered to derive most of the success listed in table 5.22.

Table 5.22 “AgriCo future” success factors

No	Success Factor	No	Success Factor
1	Clear Strategy and Vision	5	Readiness of AgriCo current business process
2	Executive and management strong sponsorship	6	Effective partner project management capability with clear implementation and project management methodology
3	Allocation and dedication of project team with proper qualifications	7	End User, Middle Management Buy-in
4	Business management commitment and ownership		

Clarity on setting implementation goals allowed the CEO to dedicate necessary support and resources to the project to achieve the desired success. This included the strong sponsorship, allocations and dedication of project team.

Other factors that the organisation could not handle were pure people related issues. More precisely, the combination of the knowledge gap and the absence of proper documentation of existing processes and business practices developed together a resistance to change from key business areas which in effect had lengthen the implementation schedule, reduced the targeted performance targets and eventually reduce the bottom ROI from ERP. These findings can be further demonstrated through a review of the underlying reasons of the major sources of the project delay, as per the project review, is summarised in table 5.23.

Table 5.23 Main Reasons for The “Future of AgriCo” delays

No	Sources Of The Delay
1	A/R integration with the stand alone sales software package.
2	The costing method decision took the business owner more than four months although it could have been made in no more than a week time.
3	Order management dispatch.
4	Enterprise Management (EM) delayed because of the absence of recording assets in the system “a project of multi-million recorded as one item in the system without any break-down of any assets.

Because of the absence of proper documentation of the business process and business practice, the PM faced serious issues regarding how to integrate the standalone sales system with the ERP back-office. The problem was not limited to how to integrate that standalone system with ERP only, but also the legacy practice did not provide

integration of sales data as each sale outlet was as if it is a separate unit within the system. A further complication resulted from the legacy practice that allows changing accounts receivable (A/R) balances after posting to general ledger (GL), which is considered as bad practice from an audit and process management perspective. ERP team discovered that in order to rectify this surprise finding, they needed to develop a software application to integrate relatively thirty-five sub systems into the new application to be posted, after aggregation and integration, to finance modules.

If the sales as process was defined clearly at the starting point of the project not only would this defect have been discovered, but proper alternative and cost effective solutions would have been suggested and implemented while maintaining ROI from ERP through proper control on the implementation schedule. In order to resolve the costing method issue, the PM had to extend his role to develop the existing process and business practices as they were managed in the present time but the business owners still refused to acknowledge that this reflects the current practice. However, business owners neither agreed to accept nor amend necessary changes.

The analysis shows that business owners lack key pre-requisite understanding of ERP and process improvements fundamental which seemed advocate their resistance of change attitude. Such resistance demotivates them to document existing processes and business practices. It was also found to be difficult to convince executive managers to go through basic orientation and training program for ERP and process management to handle the change facilitated by ERP implementation. The manufacturing general manager describes the resistance to change by some business owners that they need more training and need, also, to increase their level of awareness in order to know what the systems can provide and solutions that can be offered. The manufacturing general manager describes this resistance:

“It was difficult that some business owners need to attend classes and increase their awareness level but it was more difficult to explain that fact to them without an adverse effect to their Ego”

Despite the challenges the GM had faced, the CEO seemed neither satisfied nor to appreciate the progress made as compared to the hidden resistance of change inside the organisation, as his expectations were very ambitious in terms of managing the whole company from his key board through complete, comprehensive, accurate and

up-to-date information. The manufacturing general manager described the CEO expectation:

“The CEO still waits for the time where he can view the company performance from a keyboard fingertip without any delay”

In conclusion, improper awareness of the importance of the business process management and a lack of understanding of how business process was to be documented before ERP was present. Requests to be better advised about processes and business practices led to confusion in developing clear roles and responsibilities among ERP stakeholders in this aspect. Perusing the implementation, while this roles and responsibilities gap in the business process management led to an atmosphere of resistance to change, extraordinary implementation delay and very slow decision making and conflict between stakeholders. These subsequent issues decrease ROI from ERP by increasing the implementation cost and reducing ERP returns.

5.4.2.6 Can the Case be Considered Successful or Failure?

There is no straightforward answer to this question. A number of observations can be recalled which can collectively extract whether the implementation is to be successful or a failure. Firstly, the first implementation cycle is an utter failure. This is because there was no single module that successfully reached the go-live stage. End users were completely disengaged and the whole implementation process was badly designed and poorly managed. Secondly, the second implementation phase was very successful. This is can be demonstrated by the fact that modules were implemented successfully according to budget and according to the project plan. The implementation was properly designed and effectively managed. All mistakes that were apparent in the first implementation cycle were avoided. However, the scope of the implementation was limited to the ‘as is’ approach were ERP implementation effect to the business efficiency was very limited. The third implementation cycle was adopted to address business efficiency, however there were two problems associated with that. The first problem was that there is an unnecessary gap between the second and the third implementation phase which had weaken the return on ERP investment as the most benefits were realised at very later stage. The second problem is that the third implementation cycle can be seen as an open ended project and could not achieve all targeted benefits. In brief, it can be said for the sake of simplicity that the implementation achieved only moderate success.

5.5 The Description and Analysis – Case ServCo

5.5.1 Case Description – ServCo

5.5.1.1 Privatisation Background

The water services in the country are served in a typical government manner operated by the Ministry of Water. Serving water in this manner continued until a government decree was announced for developing the mechanisms, frameworks, and necessary arrangements in the private sector for investing in the Water Sector in terms of financing, implementation, operation and maintenance. The Ministry of Water had started the development plans for establishing a national company after another government decree, providing for the approval on the license to establish the National Water Company. The company issued capital amounts to \$ multi-billion figure. The decree stated further approval for establishing the new company board.

5.5.1.2 ERP Evolution

The Ministry of Water took the lead in facilitating the necessary for the newly company that was to be established. The aim was to complete all necessary preoperational foundations for the national water company before it was officially established, so that once the official decree was released and the legal entity existed, the organisation could be in a more mature position, both financially and administratively. This included the information systems services.

The Ministry of Water also governed the sewage service which has its own independence through a form of general organisation. The sewage organisation had just implemented an ERP solution and the newly appointed CEO for the new water company was also heavily involved in implementing ERP in the sewage organisation. After a few discussions, it was decided to adopt the same ERP as the Sewage organisation, using the same implementer. The tendering and awarding process followed the existing purchasing and tendering regulations followed by the Ministry.

5.5.1.3 The Engagement of the First Implementation Partner

The deputy minister, who assumed the CEO role of ServCo at later stage, hired a consultant from the University to assist in all the IS requirements of the new company. Before his role as a deputy minister, he was the ERP sponsor of ERP

implementation at the water desalination organisation which represented as a prime entity of the ministry of water. The purchasing department in the Ministry produced a public tender for ERP service where a number of IT companies applied. The technical committee has awarded one implementer 'I-a', who had just completed ERP implementation in the water desalination organisation. The contract had also been developed by the ministry contracting department which stated that 'I-a' should complete the implementation in eight months in the centralised region only. The implementation started after one month from the signing date. Within three months and a half 'I-a' received a formal extension of ten per cent from the project value to extend the implementation to cover another region that had recently fallen under the ServCo responsibility. During the requirements definition, 'I-a' demonstrated its frustration for the incomplete and the slow response from end users who always defend their position that they have provided all known details to the consultants; for the unanswered parts they could not answer because they have no clear directions from their line managers. After six months from the date of when the implementation started, 'I-a' received an official request from the Ministry to suspend the implementation.

Seven months after that suspension date, 'I-a' received a formal request from the Ministry to resume the implementation. The date of the letter is one day after the announced decree, stating that the water company was officially formed. This was followed by a detailed decree that stated that all government assets, infrastructure and properties of the water services are transferred to the newly established water company. Three months later, a formal extension to 'I-a' received for eight months work to complete the implementation in the two regions. A month later, ServCo announced that it had signed an Operations and Maintenance agreement (O&M) with a technical partner to manage the operations of the second region. Gradually, 'I-a' raised its frustration that they struggled to configure some modules and they were unable to complete the requirements definition of other modules due to the incomplete and slow response from end users. After a number of escalations to higher ERP management authorities, 'I-a' received another official suspension letter. Two months and a half later, 'I-a' received another official letter to resume the implementation.

5.5.1.4 The Operations & Maintenance Partner Involvement

Six months after the signing of the contract between ServCo and the O&M partner, the ERP teams received several inquiries on the ERP implementation status. The ERP team discovered that the lead time for O&M agreement is seven years and it includes by the technical partner to be compensated based on the saving made from water leakage and consumption. For this claim to be made, the ERP and associated systems should be completed before the billing can be made by O&M. The ERP project manager explained that he had absolutely no idea that O&M requirements were to be included in the current ERP scope. A formal report by O&M submitted to ServCo stated clearly that ERP implementation significantly delayed the O&M plans. The report includes specific rectifications and road map includes several alternatives for ServCo to recover the situation by aligning ERP with O&M plans. One week later, ERP project manager circulated a memo that states clearly a fast-tracked ERP release which includes business applications that should have been completed five months earlier to fulfil the partnership agreement with O&M partner. The memo stated that the fast-track is divided into two phases where end users are requested to use the system intensively and strictly register all comments in the support registry log. The ERP support team will implement, thereafter, all necessary changes to the system until phase one is fully stabilised. The same process will be repeated for the second phase as well.

5.5.1.5 The Emergence of the Second ERP Implementer

During the ERP fast-track release implementation, a new CIO was hired to manage all information systems requirements. The first priority assigned to him was to assure complete information systems fulfilment of O&M partners that include necessary integration and consistency with ERP implementation. The CIO took the lead in capturing all necessary tasks needed to meet this mission and started a new discussion with the implementer 'I-a'. The implementer responded that these requirements are major and completely new where it requires a new implementation assignment. The CIO took a firm stand towards 'I-a' to include these changes within the existing implementation with no extra cost. The discussion between the CIO and 'I-a' reached a semi dead-end position. 'I-a' become a black-listed supplier and CIO refused to

release their remaining payments. This conflict with the existing implementer created an urgency to find an alternative implementation partner.

A new implementer (I-b) was approached and informed that ServCo had recently completed an implementation and rollout of Phase 1 of ERP in two locations, that the application has not been utilised or used satisfactorily, and is still undergoing changes to cater to the business requirements. The approached implementer requested to submit a proposal for providing services to rectify existing modules and to provide post-implementation maintenance and support services for ERP modules Finance (AP & GL), HRMS (Core HR & Payroll) and supply chain modules (Inventory & Purchasing) application environment at ServCo. The new implementer (I-b) was awarded after eight months from the ERP fast-track plan for a six months contract.

5.5.1.6 The Emergence of the Third Implementation Cycle ERP

In parallel to the assignment of 'I-b', the CIO was developing a long-term plan that could ensure the full integration and fulfilment of O&M requirements and information systems applications. The CIO had experience with different ERP applications before his joining ServCo. He suggested implementing another ERP product that was implemented by his former employer. He supported his view by an offer from one of the top five consulting firms and he requested a budget to arrange for ten executive members' site visits to Europe to review how the newly suggested ERP vendor had successfully integrated ERP with O&M requirements for similar organisations. The internal auditor refused to approve the budget of the site visits as this fund is for an on-going investment where higher approval is required. The CIO started obtaining approval for the site visits several times however his attempts ended to failure where the CEO took a firm stand not to change to another ERP vendor. Alternatively, international implementer 'I-c', who had been requested initially to submit his offer for implementing the new ERP product, had been requested to conduct a total assessment review of the existing implementation gaps.

5.5.1.7 The Assessment Review

The international consulting firm started the assessment process by stating a number of objectives that include evaluating the actual modules/functionalities installed in ServCo to assess the current usage of the system, functions activated but not used,

functions not used and recurring issues. The assessment also included evaluation of the completeness of current implementation for the implementation of the new module requested for Phase II. The final objective was to evaluate the requirements for the implementation of new modules in Phase II, taking in to consideration the contents and plan of the new implementation project. The assessment started to check the setup documentation related to the existing modules, conducted four meeting sessions with the key reference of both business units and the headquarter in the three main areas of Finance, Supply Chain and Human Resource (Table 5-24). This process was targeted to verify the detailed requirements in each specific area, compare the setup in the production environment with the setup documentation and evaluate the integration flow designed for the ERP modules with the other systems in the to be solution (Phase I, Phase II and the new phase to be started.)

Table 5-24 : Scope of the second assessment Review

Areas	AS IS Modules
Finance	<i>General Ledger</i>
	<i>Account Payable</i>
Supply Chain	<i>Inventory</i>
	<i>Purchasing</i>
Human Resources	<i>HR</i>
	<i>Payroll</i>

The assessment concluded with a detailed report that was submitted and discussed, with ServCo stating clearly the current position in addition to a detailed plan of what is required for the new implementation phase.

5.5.1.8 The Launch of the Third Implementation Project

Two months after ServCo discussed the assessment review, the implementer ‘I-c’ was awarded to implement the third cycle. ServCo & ‘I-c’ who was announced as the strategic partner in information technology, celebrated the new project, which will significantly contribute in raising the efficiency of the services quality in ServCo. The ServCo CIO and the director of ‘I-c’ said that project started its activity four months ago and would be fully implemented in the upcoming nine months. The new project is introduced as a global initiative that seeks to transform and enhance the way ServCo operates its business and delivers service to customers. More specifically, the

transformation was claimed to arrive through unified, lean and robust business processes and state-of-the-art technology. Customers were expected to benefit from the project, thanks to the new Customer Service processes and the implementation of the Customer Care & Billing system. Employees were also promised that they would benefit from the project, thanks to the new Maintenance processes and the implementation of the enterprise asset management system. It was, also, stated that project would link all the mentioned systems with the latest techniques of geographic information and control system and networks and resource planning system which is currently under establishment, and would be linked to a call centre in order to enable the ServCo to take maximum advantage of all these systems to serve its customers. The CEO of ServCo asked for the development of the services to be enabled through the use of the technical programs that are offered by the strategic partners of the company, and called everyone to redouble the efforts in next phases. At the end, the CEO rewarded 38 employees for their contribution to preoperational project in the Plan & analyse phase, in both headquarter of the company and business units.

As part of the implementation activities, it was decided to dedicate a team to look after the training requirements. That team differs from the ERP implementation team and consists of members who had experience of how to set the training curriculums and how to assure the quality of the training. The consultants do not train end users directly but they do train key users who will be training end users thereafter.

5.5.2 Analysis – ServCo Case

5.5.2.1 High-Level Stakeholders Analysis of the Privatisation Process

The case analysis indicates that the ERP plans started at a very early stage of a large privatisation process. A number of key decisions and supporting regulations from different government agencies were still to be developed and approved. In fact, the royal decree of the forming of the company was not yet made at the time of finalising ERP plans of the first implementation cycle. The high level stakeholders involved in the overall privatisation process is discussed briefly in the below sections.

5.5.2.1.1 The Ministry of Water

The Ministry of Water was, at the time of adopting ERP, the sponsor of water services in the whole country. All business operations therefore followed government practices and strictly adhered to government policies and procedures. The existing culture in the Ministry dictates that water services are not provided under the commercial conditions. This culture places only weak emphasis for cost versus profitability. Although the Ministry is charging citizens and business for the water services, in reality these services are very much subsidised and the charges do not cover the cost of operations.

5.5.2.1.2 The Ministry of Finance

The Ministry of Finance governs all financial transactions across ministries. Its mandate includes the management of all ministries expenses and revenues. All ministries requested to adhere to the unified purchasing rules and regulations no matter what type of project or services the ministry is in a need for. This can justify why the contract and the scope of the first implementation can be seen as inappropriate to the nature of ERP implementation. This can be connected to the fact that the standard purchasing system that is governed by the Ministry of Finance should be strictly followed. In Ministry of Finance practices there is no room for asset depreciation, the cycle count or commercial stock valuations. These deficits remained unfilled during the first ERP implementation adoption where the mandate to the implementer was confined to configure ERP for ServCo as a pure commercial organisation.

5.5.2.1.3 The O&M Partner versus ERP Implementation

As part of the privatisation process, the government encouraged the development of a relationship in the form of PPP (Public Private Partnership). The two PPP agreements were signed after the ERP implementation project started where the operating and maintenance partner requirements were not considered in the first implementation cycle. Recalling this fact, it is important to evaluate and understand the results of the first implementation cycle. It is believed, also, that it is important to develop further insight to understand and measure the outcomes of the second and the third implementation cycles. Legitimate questions need to be asked, for example, why was ERP started before signing these agreements? Why ServCo did not engage ERP management team in the execution of the recently signed agreement with operating and maintenance partners? The answers to these questions are tightly connected with the roles and responsibility management of various stakeholders of ERP implementation. Each stakeholder has his own reasoning to defend his position and can easily drift from the responsibility of such ROI deficits that have not only adversely affected ERP investment. In fact, the losses hit the corporate results as well, since the whole purpose of the operating and maintenance agreement is to incentivise the technical partner by the measures of the consumption reduction of water which could not achieved.

Conclusions

ERP implementation started at very early stage of the corporate privatisation process. The stakeholders involved in the beginning lacked basic ERP knowledge, which adversely affected the management of the first agreement with the first implementer. The limited results achieved from the first implementation cycle did not, therefore, come as a surprise. The ERP implementer could not capture necessary requirements in timely manner. Key users and team leaders hired after requirements been gathered and after the implementer started the configuration process. In fact, the first implementation cycle started before the formal legal foundation of ServCo as the royal decree is announced at later stage. End users, functional managers and ERP consultants were not involved in the process of the agreement between ServCo and the O&M partner. More specifically, the relationship between the contract signed with the O&M and ERP readiness was not communicated in a timely manner. During the preparation for the go-live; end users received contradicting instructions from two

parties. The first party consisted of their line managers who tried to comply with ERP implementation instructions and guidelines while the second party is the operating and maintenance partner who used their power from the mandate obtained from the contract.

In fact, the ERP implementation was shocked by the magnitude and critical nature of the operations and maintenance partner requirements that should have been thoroughly considered at very early initial implementation phases. Such a head start left no room for functional managers to amend ERP plans to accommodate their detailed requirements. It was too late for ERP consultants to accept those requirements after completing the configuration process. In effect, the scope of the ERP modules decreased gradually as it was found, through the implementation process, that significant requirements deficits had not been considered.

The holistic view of the implementation indicates, on the other hand, that the second and the third implementation cycles produced better results. The success is directly correlated with proper identification of stakeholders and the effective management of roles and responsibilities between them.

5.5.2.2 Policies & Procedures Focus

The Ministry hired a consulting firm to develop all necessary policies and procedures for the new organisation before it was officially formed. When functional managers were hired at a later stage, they had significant comments to make about those written policies and procedures. A number of deficits were found which makes it incomplete and difficult to cope with in several areas. This adversely affected the implementation, since these policies and procedures represent the main source for the implementer in configuring the system changing.

The driving forces for the head start of developing policies and procedures are well-understood. However, approving those policies and procedures before giving HR and functional managers adequate time to review those policies and procedures and advice their feedback can be seen as irrational decision. This finding is seen from the tendency by several end users to manage core business operations outside the system as much as they could which defeated adopting an advanced system such as ERP.

5.5.2.3 Implementation Phases

The analysis of the implementation history suggests that it can be divided into three phases. The first implementation phase covers the stage prior to forming the company when all planning activities were being performed by the Ministry. The second implementation phase is when the implementation is physically started after forming the company until the decision to dismiss the first implementor. The third implementation phase addresses the engagement of the second then the third implementers (i.e. 'I-b' and 'I-c'). The first phase includes the selection process and all other preparatory activities that include developing policies and procedures for the new company. The second phase covers core implementation activities that have been built around the policies and procedures developed in the first phase. The third implementation phase covers the hiring of a temporary implementer to provide necessary support and renovate existing implementation. The fourth implementation phase covers the second implementation project, which addresses all findings and the tasks that could not be completed in the second phase.

Table 5.25 Implementation phases of ServCo case

Implementation Phase	Implementation Description
First Phase - A	1. Preparation activities that include the development of the policies & Procedures, selection process and contract development.
First Phase-B	2. Core implementation of the As-Is of ERP modules based on the policies & procedures developed in the first phase
Second phase	A new implementor hired to provide support and to renovate the existing Implementation
Third Phase	The advance implementation that covers all user requirements and the operations and maintenance partner considerations.

5.5.2.4 Project Management Review

The IT department assumed the predominant role for of project management. However, a different project management style using IT was utilised in managing the ERP project (Table 5.26). An external consulting firm who assumed the responsibility of developing policies and procedures was requested to act as project management operations (PMO).

Table 5.26 Project management forms used in the Case

No	ERP Project Management	Roles and Responsibilities
1	Hiring external consultant from the university	To assume the full responsibility of ERP project preparation, planning, coordination and management.
2	Assigning international consulting firm to assume the project management	To document all meeting conducted, managed or requested by the CEO
3	Hiring of a new Consultant from the industry	To assume fully the project management responsibilities of ERP transitions, development and support of existing implementation.
4	Assigning IT member	To manage the recently announce project

While examining the PMO role it can be seen (Table 5.27) that their services cannot be considered as a full project management operations rather than a supporting office for the CEO and their primary role was to handle the coordination and the documentation of the ERP project management activities.

Table 5.27 Project Management Summary – ServCo Case

Cycle#	1 st Cycle	2 nd Cycle	3 rd Cycle
Objective	implement ERP As IS	implement ERP As IS	Align business process
Results	Failure	Success	Survival
Project Management Description	A number of PM techniques and tools used but in a typical task list format assuming a full ignorance of the change process and the end user engagement. In result, good pieces of project management practices did not lead to ERP success.	PM management tools and practices used in a more realistic and rational view of the nature of ERP project. The project management process places a lot of emphasis on the coordination of activities that ensure quality of results.	This stage touches more insights of the underlying business processes and real ERP implication on business activities. However, it shows minimal use of project management practices, formalities and tools.

5.5.2.5 Can the Case be Considered a Successful or a Failure?

The holistic review of the implementation process includes the various implementation cycles and leads to the conclusion that deciding whether the implementation is successful or not is problematic. The second and the third implementation cycles can be considered successful. Both projects were completed on time, according to budget and the objectives were achieved. On the other hand, the experience of the first implementation cycle was one of failure. The project was not completed; the cost and the time over-ran. The combination of three cycles indicates that, ultimately, the ERP achieved most of its target benefits, however, ROI is significantly less than what it should be as ServeCo invested in two extra unplanned projects to achieve the same objectives.

Despite these implementation deficits, the ERP implementation produced supplementary gains. First, the hard lessons from the first implementation cycles motivated the company to focus significant attention on change management. Second, the organisation learned the significance and the importance of managing roles and responsibilities to ERP success; which can be demonstrated in the examples shown in the following tables (Table 5.28 and Table 5.29).

Table 5.28 Roles & responsibilities examples: ServCo -2nd phase

Role/Responsibility	No	Activities for the Role
ServCo Project Sponsor	1	Provide management sponsorship and direction to the project
	2	Provide limited time for executive interview and review project progress
	3	Chair the steering committee meeting
ServCo Project Manager	1	Conduct reviews and weekly status meeting
	2	Engage with I-b support manager in decision making process around – support processes
	3	Facilitate management decision and approvals.
	4	Single point of contact for I-b team from communication perspective

Table 5.29 : Roles & responsibilities examples: ServCo – 3rd phase

Team	Role	Time	Description
PMO	P/D	20%	Project Director will be involved also in planning and mobilising Finalisation (leverage Compass resource)
PMO	PM	60%	SERVCO PM in Plan phase is assumed high level of involvement based on the nature of the phase
PMO	PMO/A	40%	Support of PMO (leverage Compass resource)
Functional	BL	30%	Usually he is a selected and trusted representative of Business Users Functions, with corporate visibility and authority – He will act as gateway with BU for Planning of Workshop to be held in Analyse phase. He will act as the gateway for the user's community, facilitating communication and decision making.
Techno Team	IT	30%	Specific Skills in current IT capabilities supporting such processes. Able to discuss/ report/ communicate on current practices, and act as a catalyst/ change agent on future practices. In this phase, there is just one at the HQ level
Change Team	C/M	20%	Representative of the HR department - To cover also the Change Management part – He will be assumed to be the gateway with Business Users for Training needs and schedule finalization and for the Communication Plan (leverage Compass resource)
Change Team	BA/C	40%	Assist the Change Manager in his daily work

5.6 Summary

This chapter has presented the description and the individual analysis of the four case studies.

The description of DiversCo case shows that the organisation started as a medium-sized organisation at the inception stage and become a large organisation by reaching the implementation completion. The description includes a review of key incidents such as the selling of the sanitary business, the change of the implanter at the middle of the implementation, the creation of the information systems department, the difficulties in the point-of-sales in the fashion company and the struggle in resolving the invoice generation in the electro-mechanic company. A number of extracted dimensions used to analyse the case that include 1) the role of information systems, 2) the positive effect of the proper selection of the GM in implementing ERP, 3) the appropriate usage of a supervisory consultant, 4) the selection process analysis, 5) ERP vendor and implementer issues and 6) the go-live analysis.

The description of the ElectroCo case started with describing pre-implementation activities. This is followed by highlighting a number of issues that include 1) the project management, 2) executive review, 3) conflict management, 4) policies and procedures, 5) planning module, 6) training and 7) various technical issues.

The analysis of the case has been divided into the following parts, 1) ERP evolution, 2) the intensive focus on product selection, 3) HR implementation, 4) planning module failure, 5) training and 6) technical issues.

The ServCo case started by describing the ERP evolution within the transition challenges at the organisation the resulted from the privatisation process. The engagement process of the operations and maintenance partner has been described including its effect to the implementation. The analysis started with a review of the ERP stakeholders in the context of the privatisation process. The second part of the analysis covers the management of developing policies and procedures in an ERP implementation context. This is followed by a review of the implementation phases and project management review.

The analysis of each case has been concluded with a discussion on whether the case be considered a success or failure?.

CHAPTER SIX

Comparative Analysis of Case Studies

6.1 Introduction

This chapter will build on the results of the previous chapter by extending the analysis of each individual case study discussed in Chapter Five. It will consider the lessons learned through the experience of ERP implementation across all four companies, covering the different phases of implementation in each case, the roles of stakeholders, effective management and leadership strategies, and will isolate recommendations for improvements that emerged from the key case studies. The second part of this chapter will provide a comparative analysis of all four case studies, focusing primarily on critical success factors and analysis of the post-implementation phases.

6.2 Further Analysis

6.2.1 Further Analysis - DiversCo Case

6.2.1.1 Essential Business Strategy Changes

The analysis indicates that contracting became the main line of business. This can be inferred from the fact that all credit facilities are connected with contracting projects and that contracting generates around eighty per cent of the total revenue and represents around ninety per cent of the total task force. This unplanned strategic change from being a diversified organisation to become primarily a contracting one led to various adverse effects during the implementation (Table 6.1).

Although most of those issues were resolved at later stages of the implementation, the ROI from ERP implementation is adversely affected as a result of both time and cost overrun and the failure to achieve the projected efficiency targets.

Table 6.1: Impact of Strategic decisions on ERP Implementation - DiversCo Case

No	Business Unit	ERP adverse effect
1	Factory	The local factory could not start using the system until five years after the starting date of the implementation. The second factory of the manufacturing was not completed until four years after the implementation starting date.
2	Sanitary	The whole branch was sold in the middle of the implementation.
3	Fashion	Utilises very limited system functionalities. This is due to the fact that there was no point-of-sales solution provided, despite of the enormous effort to integrate ERP with third party software applications.
4	Electrical retail	Uses very limited functionalities due to the fact that customer invoices could not be generated from the system due to several problems related to both networking and communication obstacles and to the inefficient business practice which requires changes in the sales process.

ERP was first suggested in DiversCo due to a recommendation by management consultants who reviewed and assessed the organisational systems, procedures and structure before the GM took the lead in initiating the implementation of the ERP. The scope of the ERP and the selection process were designed based on the assumption that there was neither funding nor a financing deficit at DiversCo that might fundamentally change the business structure that aims for equal growth without any priority preference towards specific sectors.

During the implementation, the weak financial state of DiversCo was about to explode. This fact, which was discovered late in the implementation process, led DiversCo, by necessity not by choice, to change its original business strategy, followed by snap decisions such as selling the sanitary business and diverting resources from this to contracting. From a role and responsibilities perspective, who is to be held responsible for these unplanned changes that adversely affected the ROI of the ERP implementation? Is it the GM, owner or the management consulting company?

DiversCo had prepared a good strategy beforehand, which facilitated a strong basis from which to develop a proper ERP scope and plans. The GM took the lead in developing a corporate business strategy that indicated substantial growth through diversification across retail, manufacturing and contracting, where most of the financial support was expected to come from banks through the securities provided by the owner. As per Fig 6.1, the GM inferred the strategy from the management consultant before he articulated the received inputs into a corporate strategy. In effect, by necessity and not by choice, the strategy had been dramatically changed through tight cost reductions and by shifting the focus to contracting.

This sudden change in strategy created an adverse effect for the whole ERP initiative. For example, a few weeks before reaching the go-live stage, a sanitary business was sold. All the effort that was allocated to implement ERP in the sanitary business was considered waste; not only the loss of the money spent but also the adverse effect to the team morale as staff witnessed their efforts wasted. Shifting the focus to the contracting unit led the non-contracting business units to be considered low priority in terms of funding, resource and importance. If this was made clear at early stages of ERP implementation, it would have changed completely the basis for the selection process. What went wrong was not related to the strategic decision itself but rather the lack of appropriate coordination on how this decision is affected the existing ERP plans. The inadequate communication of this strategic change has also adversely affected ERP implementation outcomes. The main lesson from this case is that ERP plans must include a thorough review of the strategic plan. This review should include clear communication to senior executives and board members regarding the direct effect of the chosen strategy on the ERP plans. This includes a need to engage ERP planners regarding any major strategy changes during the ERP journey to assure continuous consistency between the static plan and the ERP plans. Selling the sanitary business unit at the heart of the implementation, after incurring enormous license and implementation cost, demonstrates how poor consistency between corporate business strategy and ERP plans can adversely affect ROI of ERP implementation.

6.2.1.2 Point-of-Sales: Learned Lessons

Implementing point-of-sales software is considered one of the highest priority requirements for the fashion company. This is based on the fact that it represents a fundamental requirement for both fashion retail and electrical retail. The technical staff members from DiversCo's side, after four years from the starting date of the project, successfully implemented a solution. What is the significance of this?

The in-house technical support member, without being officially instructed, found a solution to the problem. A small software application is being used as a communicative layer between the remote warehouses and the show rooms, eliminating the need to implement a complete point-of-sales application. The question to be asked, here, is: Why did it take so long to resolve this critical task? This delay cost time and money and, more importantly, it adversely affected staff morale towards the ERP system.

6.2.1.2.1 Roles and Responsibility Analysis

The stakeholders involved in the problems indicated above are as follows:

1. Pre-sales and sales consultant from ERP vendor side.
2. ERP consulting implementor.
3. Supervisory consultant.
4. Functional managers.
5. IT section members from DiversCo.
6. General Manager.

Although pre-sales and sales members admit that their ERP product does not have a point-of-sales module, they both confirm that either a third party application or a so-called work-around solution can be integrated. On the other hand, neither third party applications nor so-called work-around solutions were precisely defined. Several attempts to implement third party applications failed.

The sales executive from the ERP vendor side explains:

"We represent a specific ERP vendor product. Our primary role is to explain what our product can and what it cannot handle. For the requirements that our product cannot handle we are only suggesting alternative solutions for our potential customers and thereafter we cannot be held responsible for third party software applications that we do not own or represent"

The supervisory consultant admitted that it is part of his responsibilities to play a significant role in this case but he is constrained by the limited alternatives in the market and the humble support from the vendor side. The supervisory consultant explains:

"I understand that it is part of my responsibilities to work with both ERP consulting and ERP customer till this issue is completely closed. I was constrained by the limited knowledge the ERP vendor has and support ability they can provide. I expect them to search from their international customer base to find previous customer faced similar problem to avoid reinventing the wheel and inventing solution from the ground level."

The functional manager of fashion retail commented that he was aware that the ERP does not support the point-of-sales functionalities but he was given assurance that he would be able to generate sales invoices from the systems and to search the entire inventory across all show rooms. The fashion manager explains:

"The sales consulting made it clear that there is no point-of-sales module but I was not aware about the implication of such shortage. Since the beginning, the two

major requirements from our end was clear automatic generation of sales invoices and on-line inventory viewing"

The case analysis shows that the supervisory consultant's contract expired before the point-of-sales issue was resolved. The general manager explains that the supervisory consultant's contract was not renewed as the local team could handle the outstanding issues. The general manager explains:

"The aim of hiring the supervisory consultant is to assure that the implementation plan is consistent with the leading practices. Since most of the outstanding issues require a more sort follow-up effort and hands-on investigation we took the decision not to renew his consulting contract"

The question to be asked is why did such a problem remained unresolved for four years from the starting date of the implementation? The case can be considered as problematic in terms of determining among the stakeholders, who should be blamed or be held responsible for such a failure and such a delay, whilst recalling the following facts:

1. From the customer's side, it was made clear that this was a major requirement.
2. The ERP vendor made it clear that the ERP product does not include point-of-sales.
3. On the other hand, the sales representative from the vendor side and the supervisory consultant confirmed that alternative solutions can be found and implemented.
4. Two solutions failed after considerable waste of time and money.
5. The IS member from the DiversCo side eventually successfully implemented a solution.

The sales and presales members and the supervisory consultants stated clearly that DiversCo requirements could be met through alternative solutions. However, they also stated that approving such an alternative solution is the responsibility of DiversCo. However, there was no support, neither from the vendor nor from the consulting firm, to find the right alternative solution. The supervisory consultant contract expired before resolving this critical matter. Eventually, this critical ERP deliverable remained unresolved. Although the DiversCo team members eventually managed to resolve the issue, the solution was costly in terms of time and attitude, which adversely affected the potential ROI from the ERP system.

6.2.1.2.2 Suggestions and Recommendations

Based on this analysis of the issue, suggested recommendations could be adopted to avoid such problem to emerge. Table 6.2 summarises the recommended steps to ensure proper

identifications of critical processes, along with more detailed instructions that can govern smooth implementation.

Table 6.2 Recommended roles and responsibilities for effective definition of missions critical process

No	Step Description
1	The client should identify clearly all the critical requirements of the mission.
2	Sales and pre sales members should provide definite answers if the standard functionalities of the ERP product cannot handle some or part of the mission's critical requirements.
3	If the shortages of the functionalities do not affect the selection decision, the consulting firm needs to document the mission critical requirements in a separate section of the requirement definition.
4	The consulting team needs to aggregate all mission critical requirements that cannot be met by the standard system functionalities in a separate list supported by an action plan.
5	The ERP project managers from customer and implementor sides need to link these actions with the ERP implementation master plan.
6	The supervisory consultant should always ensure that all mission critical requirements are marked as milestones in the master plan.
7	The supervisory consultant should always integrate, validate and embody the implementation of the third party or the work-around software solutions within the ERP implementation master plan.
8	The go-live cut-off date should not be determined or approved before all completing all mission critical requirements.
9	The ERP executive management should not discontinue the supervisory consultancy agreement without obtaining a document that states clearly all outstanding or incomplete solutions for mission critical requirements.
10	As part of customer service and quality assurance, the ERP consultant is expected to review the ERP master plan and advise the customer if there is no plan in place for implementing solutions for mission critical requirements that cannot be met by standard functionalities of the ERP.

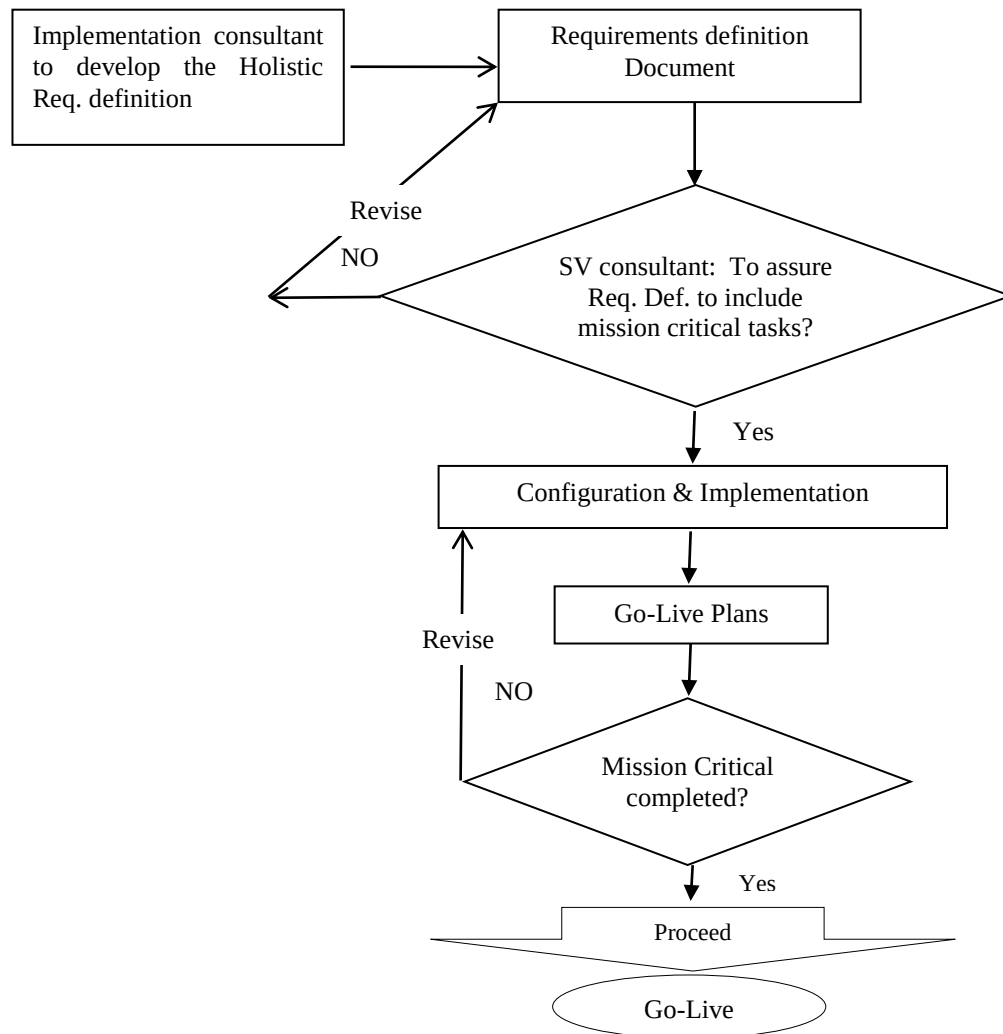


Fig 6.1: Relationship between roles, responsibilities and mission critical process – DiversCo Case

6.2.1.3 Preparation for ERP Implementation

The case description demonstrates that the GM has emphasised preparation of the organisation for ERP implementation. There are, however, a number of areas that seem to be missing from these efforts, which led to adverse effects for the implementation outcomes.

Firstly, a significant delay in implementing ERP in the factory business unit evolved because of the problem that there was no network link between the factory and the head-office. This problem was only discovered after the implementation reached the test stage. Secondly, the testing of ERP in the fashion business unit failed several times due to the fact that most fashion sales members were found to be computer illiterate. Due to this, the standard ERP user training was not adequate to enable them to use the system. Unplanned hands on training had to be provided by the support team, which adversely affected their resource priorities and their committed deadlines. Thirdly, in the electrical retail business unit, the need to issue the

sales invoice before receiving purchasing invoices adversely affected the completion of the three way matching process (purchase order, invoice and receiving). The situation would have been completely changed if this process was carefully reviewed and optimal suggestions were developed and implemented at an earlier stage of the implementation process.

The stakeholders involved in the problems indicated above are as follows:

1. Functional members.
2. ERP consulting implementor.
3. Supervisory consultant.
4. General Manager.
5. Technical Support member from DiversCo side.
6. Technical support members from the implementor side.

The analysis of the case shows that the challenges identified were not discovered during early contracting or planning stages. The senior consultant from the consulting implementor states:

"During the demonstration sessions or early planning stage none of the mentioned issues were raised by DiversCo members"

The DiversCo members, including functional and technical members, defended their position, arguing that they were unable to identify those issues in the first place because they did not anticipate its adverse effect on the implementation. The technical member from DiversCo, for example, denied the responsibility for the delay that was caused by the absence of the communication link. He states:

"It was known and I felt that I had not to inform that there was no communication link between the factory and the head office. If I was asked I would have explained"

The electrical retail functional manager explained that the practice to include items in the sales invoice before the item is registered in the inventory is an inherited process. On that basis he denied taking the responsibility of the adverse effect of this practice to the implementation. The electronic retail business unit states:

"We cannot be held responsible; the practice is being used for quite long time based on our customer needs and requirements. We had never and ever refused any alternative solution to facilitate the integration requirements with other modules"

The fashion manager also defends his position, arguing that the fact that the sales men were computer illiterate was well known. He states:

"Most of sales-men expected to be computer illiterate. It was the first computer system they have been asked to use; the entire team knows this as a fact"

On the other hand, at least for some of the issues, the implementor consultant denied some of the responsibilities. He explains that their scope is limited. Although they acknowledged that they have a role to play in all the three aspects mentioned in the examples above, the role they have is an advisory one. The senior implementor states:

"Our scope, as specified in the contract, is limited to configure the system according to the agreed requirements and we were not hired to do open-ended task list nor resolve all organisational issues"

For the issue of the poor communication link between the head office and the factory, he states:

"It is a common sense that network and communication link need to operate between the factory and head office to leverage the integration. If we were asked to handle we would have provided necessary details and awareness but it was completely outside our scope of work"

From his end, the supervisory consultant did not completely deny responsibility but at the same time he defended his position that the consulting agreement with DiversCo covers basic supervision activities. The supervisory consultant states:

"My role is to supervise the implementation and to intervene as needed between the implementor and DiversCo. But the magnitude and dedication level suggested by the consulting agreement cannot cover beyond basic and generic supervision scope"

From the aforementioned examples, it may be concluded that the failure to explore and identify hidden issues that might adversely affect the ERP ROI represent a risk factor. Such hidden problems might have different natures, which includes either technical, people, structure or process. The adverse effects of such issues are represented in the form of an implementation delay, increased consulting cost, reduced employee efficiencies and the morale of the ERP team and the end user's attitude towards ERP.

Proper Timing for Announcing the ERP Project

The GM announced the ERP formally to the entire team twice. The first announcement came after the supervisory consultant completed the first draft of candidate ERP vendors to be

invited. Secondly, the core team was invited after the awarding of the ERP implementer. These announcements created a positive impact on the key users behaviour towards promoting and making the ERP a success. One of the key users states:

“The two gatherings that I attended raised my motivation towards ERP significantly. After the first one I took the demo sessions very seriously and after the second one I prepared myself to dedicate enough time for ERP implementation”

It is important for the organisation leader to motivate the team for ERP. The effect of the motivation is strongly connected to choosing appropriate timing for the motivational efforts.

6.2.1.4 The Lack of Identifying Mission Critical Process

The point-of-sale issues in the fashion business unit and the invoice generations in the electro-mechanic retail business represent a high percentage of the total failure across all parts of the implementation. While examining the nature of the difficulties that the organisation went through during the implementation, this may lead to a conclusion that both business units, i.e., fashion and electro mechanic retail, have very basic requirements that need to be met. For fashion, the system needed to achieve two goals: first, to generate the customer invoice instantly via the bar-code reader; and second, to provide online inventory inquiries across all the outlet stores at any point of sale, so that sales persons could verify, online, an item's availability, colour, size, etc.

For electro mechanic retail, the generation of invoices was only required for the showrooms. If these basic requirements were met successfully in timely manner, the ERP ROI would have been dramatically increased. Most of the difficulties faced in these two areas would have been avoided if such issues had been carefully studied, analysed and examined at an early stage so that proper solutions could have been prepared and forwarded to the ERP team to implement. For this to happen, segregating key processes that can be marked as mission critical for further review, understanding and analysis could have led to the development of necessary solutions.

6.2.1.5 Leadership Through Effective Decision Making

The case analysis shows that the DiversCo management showed an excellent model of leadership through a series of effective decision-making processes. This can be inferred from decisions such as:

1. Discarding HR module implementation and purchasing of other add-on software applications.
2. The decision to dismiss the internal application support member.
3. The decision to change the main key user.

If such critical decisions were not made in a timely manner, it would have created an adverse impact on the implementation results.

6.2.1.6 Significant Influence of Supervisory Consultant

The case review indicates various significant roles played by the supervisory consultant during the different implementation stages and levels. He facilitated proper communication links between DiversCo members themselves; between consultants and DiversCo members at operational level; and between the implementer and DiversCo at the executive level. The sales manager of the ERP vendor explains:

"It was one of the most efficient and successful sales process we ever done; the third party consultant hired by DiversCo made it easier, efficient and to the point discussions and meetings"

His presence and contribution enabled effective decision-making process at the first, second and the third stage of the implementation. His involvement led to the resolution of conflicts, either between DiversCo members or in cases where a conflict emerged between DiversCo members and consultants.

A number of success factors can be drawn from the effective engagement of the supervisory consultants. Firstly, it can be seen from the case study that DiversCo selected the best consultant. The general manager explains:

"I looked around to find a qualified assistant to assure a success to the ERP project as I have other challenging and competing priorities so I might not be available to resolve ERP issues. I am lucky that I found the right candidate who fits exactly for the purpose"

Secondly, the roles and responsibilities given to the supervisory consultant were clear and well-defined. As per the following quote from the supervisory consultant, he was given a clear task to do, including well-defined roles and responsibilities. Thirdly, the supervisory consultant has the required knowledge and experience of the area where his consulting scope is defined. Prior to assuming his responsibility in the project, the supervisory consultant was involved in two successful implementation projects. The supervisory consultant explains:

"My involvement succeeded because I have been clearly informed what am I expected to deliver; and the task being requested was something I am good at and have the previous experience"

Fourthly, since the roles and responsibilities had been well defined to a great extent, it reduced the need for an excessive number of formal meetings. E-mail was an efficient communication method between the supervisory consultant and all stakeholders. In some cases, conference calls were arranged for the issues that might require dynamic conversation, persuading, explaining, etc. This point not only enabled DiversCo to maximise its benefits from the consulting service, with a low cost, and also affected, in a positive manner, the decision-making process. Furthermore, it underpinned, from an early stage of the implementation, the DiversCo ownership of the implementation. The general manager explains:

"With full respect to the consulting services; most of the cases they tell us something we already know but we lack either the courage or the ownership to do it. Therefore, involving consulting services when it's not necessary is as if we encourage a spoon feeding alike type of services"

Fifthly, the supervisory consultant was empowered by the DiversCo management to lead the implementation to pass further steps towards going-live stage without a need to go back to DiversCo management to obtain authority. Even if obtaining authority is required, it was in a simple form, such as an e-mailed approval request, or an around-the-table meeting between a few members of the team.

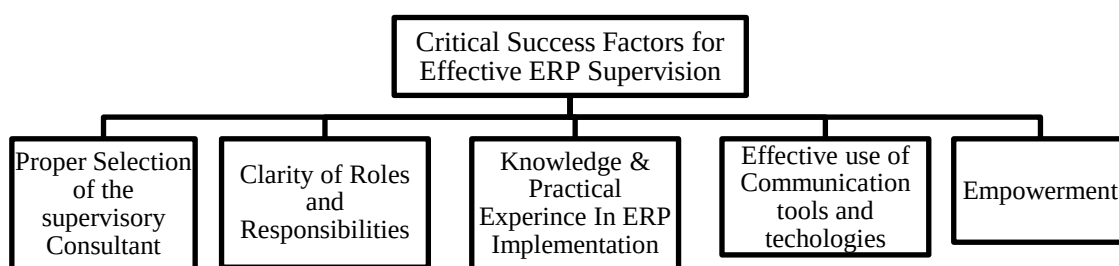


Fig 6.2 CSF for SV - DiversCo Case

6.2.2 Further Analysis – ElectCo Case

6.2.2.1 Information Systems Prior to ERP Adoption

The description of the case demonstrates that the ElectCo management and end users were frustrated about the legacy systems. On the other hand, the three-year business plan shows that projected turnover was significantly increased. The management and end users frustration towards legacy systems led the performance of the IT department to be considered as dissatisfactory. This perception of the performance of the IT department led executive management to blame the IT department for not having a written strategy. The absence of a written ERP strategy does not come as a surprise, due the fact that the ElectCo organisation itself does not have a written strategy. The former IT manager offered the following description:

"When I joint ElectCo I found the IMIS director was completely depressed since he was always in a blame position for not having an IMIS strategy. But when I investigated the matter I found surprisingly that ElectCo itself does not have a strategy! So on what basis we shall develop an IMIS strategy for a company who does not have a strategy!!"

ERP, thereafter, was regarded by end users and the executive management as a fast-track solution to satisfy information systems requirements. This may justify ElectCo's insistence on purchasing one of the top-listed ERP products, as end users and management seemed convinced that purchasing the best ERP product would automatically resolve the deficits of the legacy systems. Fig 6.3 demonstrates perceptions towards ERP by ElectCo, which indicates that by choosing a top class ERP product, business efficiency can be achieved. The main finding is that management, along with end users, have not studied why the legacy systems failed to achieve business efficiency.

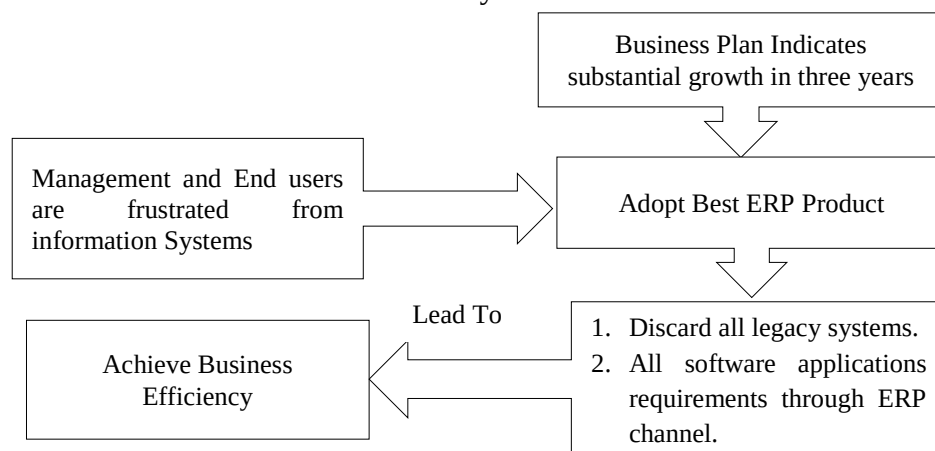


Fig 6.3 Managing expectation - ElectCo

6.2.2.2 Business Process Efforts

Table 6.3 describes examples of the activities performed by ElectCo prior to adopting the ERP implementation. This reflects the level of awareness regarding the importance of business process management whilst adopting ERP implementation.

Table 6.3 Business Process Activities prior ERP Implementation - ElectCo case

No	Process Activity
1	ElectCo conducted a comprehensive internal process review exercise conducted by manufacturing and the IMIS team, three years prior to the implementation
2	Thirty two members from all departments attended a training course in process management a few weeks before starting the implementation
3	Two IMIS members attended international advanced process management courses
4	As part of the implementation guidelines, it was made evident that in case existing ElectCo processes are in consistence with ERP standard processes, then the processes were to be streamlined to avoid customising the system.

Moreover, the implementation indicates that there are some processes that were seriously considered during the implementation. This is followed by continuous follow-up and full cooperation until these processes are finally streamlined through ERP implementation. Table 6.4 describes a number of processes that were identified and successfully optimised by ERP.

Table 6.4 A Number of Identified Critical Processes Successfully Optimised by ERP - ElectCo case

No	Critical Processes
1	Full automation of the purchasing process that included paper-less online approval
2	Ensure the system generates the time sheets online for the manufacturing technicians.
3	Ensure that basic attributes of the employee master file are captured and maintained through the system.
4	Ensure that finance can have efficient and timely manner monthly closing of financial books.

6.2.2.3 Preparation for ERP Implementation

ElectCo was in a good position in terms of its readiness for implementing ERP. The analysis of the case infers two main reasons for such readiness. First; the first version of the systems, policies and procedures of ElectCo was inherited from the Western founding partners of the company. This fact enabled ElectCo to adopt international business practices, which can be seen to confer a competitive advantage in comparison to local companies. This advantage positively expedites the development of the staff's interpersonal skills and business practices. Such Western influences can be seen as an advantage for ERP implementation as ERP was developed, and evolved, in Western countries. Second, there are several pieces of evidence that suggest that ElectCo invested a lot in ERP readiness and awareness. The first readiness investment element is demonstrated by the business process management activities (Table 6.3). There are several DiversCo members who attended international ERP conferences and exhibitions, which represent the second readiness investment element. The third readiness

investment element is demonstrated by the effective use of the demo sessions and the successful engagement of end users during the selection process. A member and focal point from every department was involved in the demonstration sessions of each and every ERP product demonstration, including the preparation of the show-me list. These sessions served not only to evaluate the functionalities and ERP capabilities but can also be seen as an effective awareness and educational tool. The only exception is HR; their absence from the above-mentioned opportunities created an adverse effect on HR implementation at the later implementation stages.

6.2.2.4 Effective Project Structure and Ownership

The case analysis indicates that ElectCo never delegated the ownership of the ERP project to any external party. This ownership started from IMIS until further empowerment was obtained from the COO; then IMIS and the project manager took more of an ownership role. ElectCo had made firm decisions connected to the roles and responsibilities that were of assistance in gaining, implementing and leveraging ERP benefits. The decision to replace the Vice President of HR as a direct result of poor ERP implementation performance is an excellent example of the ElectCo commitment to leveraging ERP benefits and ensuring its success. It can be seen that the design of the project organisational structure (Fig 5.3) assisted in strengthening ElectCo's ownership and accountability towards the ERP success.

6.2.2.5 HR Modules: Lessons Learned

From the HR history that has been summarised in Table 5.5 and the review of the stakeholders involved (Fig 5.7) a number of lessons can be learned. The first lesson was discussed through the analysis of the adverse effect of hiring a less competent consultant (Fig 5.8). The "HR recovery plan" project can suggest three steps to ensure smooth implementation. Firstly, to analyse and assess HR staffs capabilities; secondly, to assess HR readiness, in terms of the availability of data and the HR procedures; and, thirdly, to approve proper HR organisational changes including hiring staff that can understand and undertake ERP implementation. The lessons to be learned from both the implementer and the ERP vendor side are summarised in Table 6.5.

Table 6.5 Roles and responsibilities- learned lessons: HR modules - ElectCo

Check List – Implementer	
No	Check Point Description
1	Do we have a qualified implementation consultant?
2	Does the consultant possess adequate module knowledge?
3	Does he possess the necessary communication skills to assist in communicating clearly the implementation status along with the difficulties he might face during the implementation?
4	Do we have a backup support for the consultant in case he fails at any point in time?
Check List – Vendor	
1	While providing an offer to any client, did we make sure that no further software development (either as localisation or upgrade) is required before?
2	Have we checked or verified that our implementer partners have qualified consulting team who understands and can implement the system properly?
3	Do we have enough back-office support to our Implementation partners?
4	Do we have a service level agreement that govern the relation between the back-office support and our implementation partners that states clear timelines and escalation process?
5	Is there any escalation procedure in place so the client, who is the ultimate beneficiary of the ERP product, knows when and how to contact the ERP vendor directly if the implementor fails to deliver?

6.2.3 Further Analysis - (AgriCo)

6.2.3.1 The First & the Second Implementation Cycles

6.2.3.1.1 Preparation for ERP Implementation

The holistic analysis of the various management initiatives that started in parallel with implementing ERP indicates that the CEO aimed to transform the organisation in a swift manner. The transformation attempts to change the inherited governmental processes, practices and culture. Most of these initiatives, besides their massive cost, are connected with a very long payback period where the board could not agree in the continuous spending without short-term returns. What seemed to weaken the CEO position was that he failed to generate a number of quick wins where he could raise the confidence level within the board of directors and to preserve their support. These ambitious initiatives lacked proper settings that could have ensured their smooth implementation.

When ERP was first introduced, there were only twelve personal computers in the organisation. This not only reflects the shortages of necessary machines but also reflects the fact that the AgriCo taskforce lacked necessary computing or information systems practices and knowledge. The issues from the technical side, during the first implementation cycle, demonstrate a complete ignorance of the necessity of planning ahead for the infrastructure. A good example of this is that a snap decision had to be made at the heart of the implementation stage to change the operating system. Another example of the lack of readiness assessments and rectification plans was the fact that the link between the network link between the factory and head office failed after the announcement was made for the go live stage.

6.2.3.1.2 Implementation Methodology Findings

It can clearly be seen that the recommended implementation methodology was not followed during the first implementation cycle. The enthusiasm from the CEO to reach the go-live stage as part of the over-all fast track approach adversely affected the recommended implementation methodology. This includes inadequate effort in studying the existing situation, the training plan and the transition phase from the legacy to the new system.

Improper customisation management is another example of neither following the suggested methodology nor adopting a clear strategy regarding the handling of customisation requests from end users. As per the RCT report, there are two observations that are connected with customisation management. First, the customisation was requested by end users, directly to

the implementer, without any indication of a clear strategy regarding its priority. Second, there was no clarity of the customisation process.

The second implementation cycle, on the other hand, demonstrated full compliance with the recommended implementation methodology (Table 6.6), as advised by ERP vendor which, in turn, led to the success of the second implementation cycle.

Table 6.6 Health Check Recommendations- Implementation Methodology: AgriCo Case

The RCT report states "the recommended methodology should have been and must be followed for the success of the implementation that includes:"	
No	Description
1	All required tasks stated in the methodology should have been documented.
2	Implementer is to agree with AgriCo team on the execution steps.
3	To ensure all team members clearly understand the aim and benefits from its implementation.
4	To ensure all implementation phases are clear and integrated

6.2.3.2 ERP Stakeholders Review

A number of influencing stakeholders in the implementation journey will be reviewed in terms of their influence, roles and responsibilities and the lessons learned from their engagements and interactions in the implementation context.

The engagement of a new CEO before the first implementation cycle began converted the ERP from an idea or option to an action that was to be completed. The IT director was hired to complete this task in the first cycle. The CEO and the IT director were seen as the most influencing stakeholders at the very early beginning of ERP journey. The third stakeholder in AgriCo implementation was the implementer who had been assigned to implement the system. When the first implementation failed, a new CEO and IT director were hired to recover the implementation. This time, the ERP vendor was successfully involved to conduct a neutral health check to analyse why the implementation had failed and to draw a road map for a success path to turn failure into success.

Once he took over, the IT director recruited an application manager who had experience of implementing ERP to handle the implementation and he extended his role to coordinate, educate and communicate with business managers. The first health check assignment conducted declared that both the implementer and AgriCo management shared the responsibility for failure through improper planning from the implementer and poor project management and supervision from the AgriCo side.

The RCT report states:

"The primary reason of the failure is the poor project planning and the break-down of the project into non-integrated phases do not ensure integration. Additionally the implementation style used by the implementor was inappropriate.

AgriCo can be held responsible of the failure due to the poor control over the project including the inappropriate change of the project manager and the complete absence of conducting meetings periodically to discuss implementation issues and problems"

The process of defining business requirements was not properly managed in the first implementation cycle as end users were disengaged from this process. The manufacturing general manager describes phase one of the implementation:

"That implementation was as if it was cooked in the laboratory and brought to AgriCo to use. We were requested to feed the implementer with the requirements without any feedback then we were told a few months later to use the system"

The newly appointed IT director played a significant role in turning the implementation process into a success. The primary success factor was that he engaged executive managers and end users through better coordination and more effective communication. In effect, the process of capturing and identifying requirements became smooth and successful. The system administrator from AgriCo emphasised the role of communication in leading the second implementation to success by offering the following description:

"If I am to summarise how the IT director turned the implementation from failure to success in one word; this is effective communication with business owners"

In summary, the primary stakeholders of the first and the second implementation cycles were the CEO, the IT director and the implementer. The fourth stakeholder is the ERP vendor through their role in conducting the implementation health check process.

It can be inferred that the stakeholder who recently joined the organisation made a difference and turned failure in to success through slight changes in understanding and managing their roles and responsibilities.

The audit review, through the health check, redefined the roles and responsibilities among the implementer and the end users that covered the necessary details of the required documentation, business requirements, etc. It states clearly that end users should own the process and therefore it is their responsibility to identify their requirements, business

process, business practices and their future directions. The implementer, on the other hand, requested to assume the role to review end user's inputs and advise necessary feedback. This is very significant in case the mapping process of those requirements in the system can lead to any issues worth further reviews or problems to be resolved. The RCT report states:

"The Implementer is requested to prepare necessary documentation for each module that includes all AgriCo procedures, to hand over to the implementer key and special AgriCo business requirements and the proposed solutions. The implementer is also requested to submit necessary changes to AgriCo in timely manner. AgriCo is requested to review and approve all documents taking into consideration to view it as these systems are tightly connected and integrated and to consider solutions for AgriCo as a one unit; to ensure that all submitted documents meet AgriCo requirements and needs".

The ERP vendor also advised all stakeholders regarding the possible risks associated with the implementation, along with the actions necessary to mitigate the risk (Table 6.7). The end user's expectations towards the ERP benefits and results were also adjusted.

Table 6.7. Risk Analysis : 2nd Implementation AgriCo

Risk	Description	Probability
1	Project management: it's imperative that PM is dedicated to the project.	Medium
2	Resistance to change especially after the restudying of the requirements.	Medium
3	The only choice left is to redesign the chart of the account which leads to redoing the implementation.	Medium
4	Implementer may not agree to make agreed changes.	High
5	The absence of technical qualified team from AgriCo.	Low
6	Readiness of key data: (the possibility that opening balances not ready in the needed time especially inventory)	Medium
7	No approval from AgriCo on suggested solutions, especially that procedures need to be completed thereafter.	Low
8	The experience level of the team who handles procedures compliance and complete procedures with the new system.	Medium
9	Continuity of the task force (possibilities of resignations during the implementation)	Low

6.2.3.3 The "Future of AgriCo" Project Analysis

6.2.3.3.1 The Change of ERP Ownership Observations

Two different IT directors took the lead of the first and the second implementation cycles, and the manufacturing general manager was appointed to lead the third implementation cycle. This decision was made based on the second health check recommendations that this implementation cycle should be managed by the business side and not from the IT department.

Transferring ownership, along with project management, from the IT department to business owners can be seen as positive. The analysis, however, shows a lack of detailed

roles and responsibilities of the new project manager. More specifically, there is no clear mandate that governs the relationship between him as project manager from the business side and other business owners and functional managers. Neither the detailed roles and responsibilities provided nor his mandate empowered him to take necessary actions at the process level. This can be seen as a root cause of most of the “future of AgriCo project” issues.

One of the earliest challenges he faced was the absence of proper documentation of the existing practices. Although the ERP team had done this process on the business owner’s behalf, it was a challenge to convince business owners to agree on the existing practices. The PM expresses his frustration and states:

“Business owners do not have documented business process that explains what they do. So as part of the project we have did this documentation on their behalf but we failed to make them agree and sign for the existing practice.”

One of the findings is that when business owners are asked to implement best practices, they fail to choose or determine what they consider to be the best practices.

The project manager states:

“When it comes to make the business owner to sign he demands for getting best practices or alternatively request the team to sell the system to them where the project manager said with laugh ‘I am sorry I am not a salesman’”

6.2.3.3.2 Business Process Hidden Cost

Table 6.8 Examples of business process deficits - AgriCo

No	Description
1	The major focus from the time of ERP evolution within AgriCo was to implement the system ‘as is’, which explains AgriCo’s tendency to avoid being involved at the process level
2	During the second stage, after the failure of the first one, AgriCo chose to shorten the ‘as is’ scope rather than getting involved in business process management
3	The “future of AgriCo” stage which again focused on the process improvements, was addressed through the applications implementation alone, without any parallel effort to address the business process management issues; that shortfall resulted in the project failing to reach the full closeout and the Manufacturing Director suffering the consequences

The example of the issue of the integration between the sales transactions (see section 5.4.1.4.1) demonstrates how un-identified processes that need to be streamlined or improved can lead to hidden costs. The application and manufacturing manager states:

“Since we gave up in pursuing support from sales manager to implement a process that ensure aggregation of sales values to be posted to ERP without any further changes thereafter, we chosen to develop a process of getting sales data

from each sales outlet on daily bases and we handles the integration and all necessary administrative sales activities without the knowledge of the sales department”

This example demonstrates the hidden cost of not defining and optimising existing processes and business practices before ERP implementation reached an advanced stage. It may be observed that the RCT report of the first health-check states:

“We must indicate that AgriCo must change some business processes and cycles to leverage the system benefits”

However, the prime mission of the critical process of phase one was to migrate the data from the legacy systems to ERP successfully and discard the legacy systems. The “future of AgriCo” stage, which focuses on the process improvements, was addressed through the applications implementation only, without any parallel effort to address the business process management issues. The “future of AgriCo” phase consists of several mission critical processes, which include:

1. Monitoring company performance.
2. Shortening the financial closing times.
3. Reducing the cycle times.

Each main process should have been reviewed in detail, in order to ensure full understanding of the existing sub process and business practices. Had this been undertaken, this would have opened the door for various improvements to the process itself.

Since mission critical processes were not managed properly, end users hide their resistance to change the existing practices and processes using various excuses such ERP deficits, incompetent consultants, failure to recommend best practices from the system, etc.

If such a process-based review had been undertaken and an updated processes and business practice had been agreed, end users could then have been educated, at the process level, regarding what they would have been expected to do differently and how ERP could, thereafter, have been expected to assist them in managing the new processes and practices.

In the absence of proper management of the mission critical processes including conducting necessary training on process management, conflict is expected to emerge between end users, ERP project manager and consultants.

The “future of AgriCo” project manager states:

“When it comes to conflicts, I have seen conflicts evolve from the lack of ERP understanding that includes understanding ERP outcomes to be perused. This lack of understanding advocates basic educational sessions to be provided to executive managers from ERP team and it’s not easy for senior executive staff to accept being educated by ERP consulting team!! This is where more resistance to change increases which motivates conflict acts to evolve”

The PM Manager elaborates on what he states by giving an example of the required decision in choosing the appropriate costing method in order to configure finance module according to that method. The CFO justified the delay in making such decision that he expects from the ERP team to suggest best practices in choosing the appropriate method.

6.2.3.4 Project Management

Project management differs between the three implementation phases. The project management was explicitly considered a failure in the first implementation cycle. The success made in project management in the second implementation cycle, on the other hand, can be seen as a direct result of the compliance project management recommendation part of the health check. The audit process by the health check properly identified three main project management stakeholders, namely the implementer, AgriCo and the project manager. Table 6.9 shows specific project management roles and responsibilities for both the implementer and AgriCo. The primary role of the project manager was to go through the list, finalise it, conduct frequent meetings and resolve pending issues. This includes ensuring obtaining sign-offs for each task.

Table 6.9 RCT Recommendations for Project Management

No	Implementer is requested to:	AgriCo is requested to
1	Define a project protocol that includes all team members, advisory committee members, project managers, meeting dates, introduce demonstrating outputs for review and approval and all other necessary information that helps the project management	Implement the suggested project structure especially the project sponsor, advisory committee and project manager.
2	Assign a qualified project manager to review the project status and ensure the quality of the implementer’s work.	Work with the implementer to conduct regular meetings at the taskforce and the advisory committee level.
3	Amend project plan as needed and review such amendments with AgriCo management	Ensure proper documentation of the minutes of meetings (MOM)

The third implementation cycle can be considered as a moderate success in terms of project management. The primary deficit of the project management resulted from the unnecessary dragging out of several action items and the inability to develop a formal closure for the project. The difference between the second and the third implementation cycles, from a

project management perspective, can be seen with regards to two issues. First, the scope of the “future of AgriCo” stage is concerned with the business process management aspects. The scope of second cycle, on the other hand, is limited to implementing the “As Is” modules. Second, the third implementation was dealt with as an internal project, so there was less pressure from external stakeholders to bring this project to a formal closure stage.

Table 6.10 explains the project management ranking and differences between the three implementation phases.

Table 6.10 Overall Ranking of Project Management Use – AgriCo Case

	1st Cycle	2nd Cycle	3 rd Cycle
Objective	Implement ERP ‘as is’	Implement ERP ‘as is’	Align business process
Results	Failure	Success	Survival
Project Management Description	A number of PM techniques and tools used, but in a typical task list format assuming total ignorance of the change process and the end user engagement. The result was that the potentially good aspects of project management practice did not lead to ERP success	PM management tools and practices used in a more realistic and rational view of the nature of ERP project. The project management process places a lot of emphasis on the coordination of activities that ensures in high quality results	This stage provides more insights into the underlying business processes and the real ERP implications on business activities. It shows, however, the minimum use of project management practices, formalities and tools

6.2.3.5 Leadership

The leadership spirits and practices can be explained using different examples from the three ERP implementation phases.

The first leadership finding can be seen from the capacity of the new CEO leadership to turn the failure of the first implementation cycle into a success. The challenge that faced the first cycle coexisted with major changes in the organisation, as most of the line managers were changed. There was, as a result, a complete de-motivation towards the ERP implementation. The new CEO led the process by admitting the failure and taking proper actions and decisions that are summarised in Table 6.11.

Table 6.11 The Actions Taken by the CEO between the 1st & 2nd implementation phase - AgriCo case

No	Description
1	Meeting with concerned members to admit the failures and to suggest a new way to move forward.
2	The hiring decision of a qualified information systems director to lead the ERP process.
3	The support of allocating budget to hire a qualified ERP applications consultant.
4	The empowerment of the IS director including the first health-check process and the hiring of the new implementation consulting team.

The second leadership observation can be extracted from the behaviour of the project manager during the second phase. Although he was empowered and supported by the CEO, the PM tends to use his influence and communication skills with key users and he avoids using the CEO's power to enable key users to cope with the project requirements. The project manager tends to obtain the buy-in from the business owners to the system by convincing them of the systems benefits rather than using enforcement.

The CEO demonstrated another leadership model upon starting the third implementation cycle. Before the evolution of the "AgriCo future" project, several complaints were noted by the vast majority of executive staff on the ERP product, where explicit pressure was exerted to influence the CEO to replace the existing ERP vendor. The CEO took the lead and listened to all the different opinions, and he decided to invite the existing ERP vendor to conduct a second health check to find out whether the ERP vendor need to be replaced by a new alternative or not. At the same time, he took a courageous decision and appointed the manufacturing director to lead the project that was named, at a later stage, as "the future of AgriCo", which implicitly meant that ERP ownership was transferred from IT to the business side.

Table 6.12 Leadership Examples : AgriCo

The CEO Role and the First Failure
The first failure coexisted with major organisational changes The new CEO led the process by accepting the failure, taking important decisions and nurturing several initiatives that included: 1. Meeting with the ERP team members concerned, in order to admit the failure and suggest a new way forward 2. The decision to recruit a qualified Information Systems Director to lead the ERP process 3. Allocating budget to recruit a qualified ERP Applications Consultant 4. Empowerment of the IS Director, including during the first health-check process and recruiting a new Implementation Consulting Team
PM Leadership of the Second Project
The Project Manager's leadership behaviour during the second phase was demonstrated by his tendency to use his influence and communication skills with key users and to avoid employing the power delegated to him by CEO power, in order to ensure that key users to coped with the project requirements.
The CEO's Leadership in Initiating "Future of AgriCo"
Before the evolution of the "AgriCo future" project, several complaints had arisen about the ERP product, these coming from the majority of executive staff engaged in the project; there was explicit pressure on the CEO for the existing ERP vendor to be replaced. The CEO listened to all the different opinions and decided to invite the existing ERP vendor to conduct a second health check and to formally capture all the deficiencies and to examine all the complaints made by the executive managers. At the same time, he appointed the Manufacturing Director to lead the project that was known, at a later stage, as "the future of AgriCo".
The Manufacturing Manager Leadership vs. "The Costing Method"
The PM of the third implementation stage demonstrated excellent influencing skills to get tasks done. Most of the accomplishments achieved through the influence role he played with business owners and end users and through management power he has granted from the CEO. Despite resistance to change from the business owners; he extended his efforts towards developing their skills and knowledge and motivated them to implement the system successfully.

6.2.3.6 Integrated Training Plan

The analysis of the case reveals that the training process in the first implementation cycle was inadequate and was confined to the form of instructor-led sessions. Poor training, as per the health-check, combined with disengagement of the IT department in the first implementation cycle, represented a prime reason for the failure. On the other hand, the effective training process turned the second implementation to success. Moreover, it ensured sustainable knowledge transfer after the go-live stage, as the IT department took the lead in facilitating and implementing the required ERP future enhancements and maintenance.

The RCT report states:

"The ignorance of engaging IS team in the beginning of the project to be actively involved in the implementation activities lost the knowledge transfer process to be completed that include system and database maintenance, training for new end users, modifications and development of new reports, possibility of implementing new modules and application support for end-users"

Table 6.13 describes how the proper definition of roles and responsibilities between AgriCo and the implementer led to the training success.

Table 6.13. Roles and Responsibilities - ERP Training: 1st health check-AgriCo

No	Implementer is requested to:	AgriCo is requested to
1	Evaluate the training process, end user requirements and prepare the integrated plans to retrain end users.	Evaluate trainees after each training course and identify their strengths and weaknesses in order to 1) achieve better results and 2) to recognise the adherence of applying the system as per AgriCo policies and procedures.
2	The training is to be designed as per the approved implementation methodology.	
3	To link training between system capabilities and business practices of AgriCo Assign qualified project manager to review the project status and ensure the quality of the implementor work.	

The review of the difficulties and challenges that emerged in the ‘‘future of AgriCo’’ project revealed training deficits. The training shortages were found in the business process management as they represent a prime reason for not achieving higher ROI value. The second implementation stage did not suffer from the absence of the business process management training as the scope of this was confined to the ‘As Is’.

The holistic analyses of the case, including all phases, demonstrate the absence of an integrated training plan. Dominant training efforts primarily covered the application and technical aspects of the system. The painful experience the ‘future of AgriCo’ project

manager had gone through can be seen to be connected to the lack of ERP knowledge by business owners. This knowledge gap could have been filled through extended and integrated training plans that should cover applications and process management. The PM indicated that he had noted such a knowledge gap but that he found it very difficult for business owners to admit their need for ERP training, especially if it was received from the PM directly. The “future of AgriCo” project manager stated:

“I have realised the significant ERP understanding gap. If such gap was addressed properly and filled through adequate integrated training plans most of the critical implementation issues would have been resolved easily and much more benefits achieved from ERP. Moreover, the project would have been completed successfully on time. I tried personally to fill this knowledge gap but I failed as I found it was not easy for senior executive staff to accept being educated by ERP consulting team!!”

6.2.3.7 Go-Live Vs. Audit Process Analysis

The first and second implementation cycles indicate that go-live outcomes can act as an accurate measure of success or failure. It can assess whether the implementation is properly planned and the implementation steps were followed. The detailed go-live plans during the second implementation cycle represent valuable lessons. The health check suggested detailed procedures that should be followed by the implementor and reviewed by end users. The process starts with evaluating each module in terms of the go-live readiness (Table 6.14).

Table 6.14. The Audit Assessment Categories of ERP Modules – AgriCo case

No	Category	Description
1	In-adequate	The status is unacceptable as there are still serious problems that affect the project.
2	More development required	The completed task, either by AgriCo or the implementer, represent a minimum acceptance standard but it's subject to improvement.
3	Adequate	The completed task either by AgriCo or implementer is acceptable.

There are two supporting lessons that can be learned from the first and the second implementation cycles related to the data migration and to the procedures for the final move to the production. Before any module is approved for the go-live, it is necessary to review the procedures and work instructions. Necessary amendments can be made as needed before an official change request to install the new change in the production. Once system staff receive this formal change request, another review from the system perspective will be received, to allow an assessment of how these changes are to be incorporated.

Part of the reason for the failure of the first implementation cycle related to data migration, as per the RCT report, which stated:

“there was no clear strategy on data that need to be migrated to the new system”

This go-live point, therefore, is an excellent time point at which to review the data migration process, including a review of what data needs to be migrated, when the data might need to be migrated, and who will verify or will be accountable for the testing and verification of the data after it has been migrated. Fig 6.4 summarises the necessary steps, work instructions and procedures for the go-live stage.

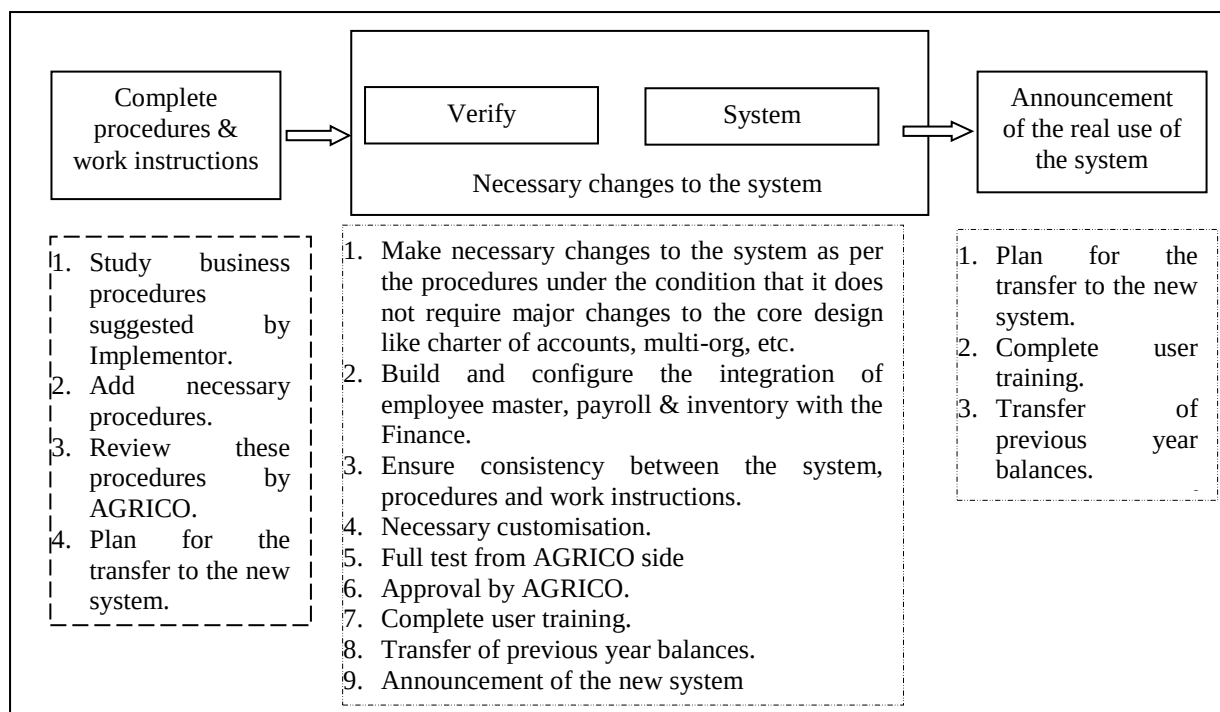


Fig 6.4. Final completion procedures – AgriCo

The analysis of the ‘future of AgriCo’ did not reveal technical problems during the go-live transition, and AgriCo didn’t need a third party consultant to assist the IT department. This is proof that the organisation, at that stage, had reached a confident level that the local staff were capable of managing this process. In summary, it can be argued that the preparation of the go-live represents an excellent opportunity in the reviewing of the roles and responsibilities among stakeholders and to evaluate the implementation. Furthermore, this review requires necessary corrective actions to be taken that ensure the implementation is back on the track of achieving a higher ROI.

6.2.4 Further Analysis – ServCo

6.2.4.1 Roles and Responsibilities lessons

This case clearly demonstrates roles and responsibilities lessons that can be discussed in line with the implementation phases.

6.2.4.1.1 Transition from the First to the Second Implementation Cycle

The description of this case demonstrates that, at the time of launching the project, fundamental issues emerged from the O&M partner that required enormous changes to the implementation. ServCo, however, took the lead in revisiting the existing implementation in order to make the necessary amendments to comply with the O&M requirements. It can be concluded from the analysis of the ServCo efforts that proper management of roles and responsibilities played a significant role in this recovery process. Once the ERP team realised the significance of the issue, a proper definition of stakeholders, roles and responsibilities was developed and converted into an action plan.

The roles and responsibilities started with the end users who formally requested that they actively use the system and report in writing all observations on the systems behaviour, starting from three days of the announcement. The IT support team also formally requested to register all observations in a newly created enhancement log; the project manager assumed the responsibility of strictly managing this process until the existing modules reached a stabilised state and a clear view of the extra enhancements was required. Despite the difficulties faced in the first implementation cycle, it can be argued that the revolutionary roles and responsibilities management review among the stakeholders facilitated development of a strong base for the second implementation cycle to successfully renovate significant parts of the first implementation cycle deficits.

6.2.4.1.2 Roles and Responsibilities Lessons from the Second Cycle

While analysing the project plan start-up activities of the second implementation phase, an interesting finding can be perceived. The implementer had suggested a very clear, realistic and fair roles and responsibilities definition. The ServCo project manager demonstrated excellent leadership in assuring a full commitment of the definition of these roles and responsibilities.

The second implementation cycle project manager offered the following description:

“The second implementer has successfully absorbed the legacy implementation issues, rectified all pending problems, implemented needed additions and produced excellent support services. The roles and responsibilities definition provided by the implementer has proven to be a prime success factor that paved the rout for the third implementation phase success“

Table 6.15 demonstrates examples of the proper identification of roles and responsibilities.

Table 6.15 Roles and responsibilities- Project management: 2nd implementation – ServCo

Responsibilities	Activities for the Role
Implementor is requested to	1. Define a project protocol that includes all team members, members of the advisory committee, project managers, meeting dates, introduce demonstrating outputs for review and approval and all other necessary information that helps the project management 2. Assign qualified project manager to review the project status and ensures quality of Implementor work. 3. Amend project plan as needed and review such amendments with ServCo management.
ServCo is requested to	1. Implement the suggested project structure especially project sponsor, advisory committee and project manager. 2. Work with Implementor to conduct regular meetings at the taskforce and the advisory committee level. 3. Ensure proper documentation of the minutes of meetings (MOM)
ServCo Project Sponsor	1. Provide management sponsorship and direction to the project 2. Provide limited time for executive interview and review project progress 3. Chair the steering committee meeting
ServCo Project Manager	1. Conduct reviews and weekly status meeting 2. Engage with Infosys support manager in decision making process around – support processes 3. Facilitate management decision and approvals 4. Facilitate project infrastructure availability and activities scheduling 5. Single point of contact for Infosys team from communication perspective

6.2.4.1.3 Roles and Responsibilities Lessons from the Third Cycle

The analysis of the third implementation phase demonstrates the effective management of roles and responsibilities. Table 6.16 demonstrates precise roles and responsibilities for the stakeholders from the implementor side. The definitions include project manager, functional analyst, change consultant, functional subject matter expert, technical developer and quality assurance.

Table 6.16 Stakeholders roles and responsibilities – Implementor Part

No	Stakeholder	Roles & Responsibilities
1	Project Manager	1. Lead the finalization of the project work and resource plan 2. Create the Deliverable Responsibility Matrix 3. Lead the creation of required project planning and status documentation 4. Monitoring Risks, Issues and Quality 5. Support the measurement and monitoring of progress 6. Help manage scope, schedule, budget, quality and risks 7. Provide risk mitigation strategies and execution
2	Functional Analyst	1. Create Business Process requirements documentation 2. Create Custom Functional Design 3. Support the development team for technical design 4. Configuration of the System 5. Build and Execution of Test Scripts 6. Execute the Training to Trainers 7. Execute the conversion activity
	Change consultant	1. Lead the creation of Communication Strategy 2. Lead the creation of the Training and Performance support Blueprint and Strategy
3	Functional Subject Matter Expert	1. Provide overall product Knowledge or extensive Industry Knowledge 2. Assist in the final decision of the product fit gap analysis
4	Technical developer	1. Create Technical Design for Customizations 2. Build custom and interface program 3. Create Conversion Script 4. Execute product Test 5. Participate in the Integration Test 6. Fix issues with RICEW items uncovered in testing
5	Quality Assurance	Interact (on-site or remotely) with the project team to ensure that the work performed meets our high standards of quality

Table 6.17, on the other hand, demonstrates precise roles and responsibilities for the stakeholders from the ServCo. It further includes the required timings from each stakeholder in the implementation. The stakeholders are categorised in teams where every team member assumes similar roles and responsibilities in his specific area.

It can be argued that such clarity and detailed roles and responsibilities assisted ServCo in developing a mature understanding of how they can be effectively involved in the implementation. It enabled ServCo to positively respond to the implementation requirements in a timely manner, which led to the avoidance of unnecessary delays and allowed optimal ROI from the ERP investment.

Table 6.17 Project team roles – ServCo Part

No	Team	Stakeholder	Time	Roles and Responsibilities
1	PMO	Project Director	20%	The Project Director will be involved also in planning and mobilizing Finalization (leverage Compass resource)
2	PMO	Project Manager	60%	ServCo PM in Plan phase is assumed high level of involvement based on the nature of the phase
3	PMO	PMO Analyst	40%	Support of PMO (leverage Compass resource)
4	Functional Team	Business Leads	30%	Usually he is a selected and trusted representative of the Business Users Functions, with corporate visibility and authority. He will act as a gateway with BU for Planning of Workshop to be held in Analyse phase. He will act as the gateway for the user's community, facilitating communication and decision making, one for each functional area related to HQ (Fixed Asset, Sourcing, and Self Service).
5	Technology Team	IT focal points	30%	Specific skills in current IT capabilities supporting such processes. Able to discuss/ report/ communicate on current practices, and act as a catalyst/ change agent on to-be practices. In this phase, there is just one at the HQ level
6	Technology Team	Support DBA *per each area	30%*	The role will bring the required knowledge in the areas of DBA, System Administration and NW (LAN, etc.) – Among these 3 roles it is expected that one resource will act as prime and will support the documentation finalization.
7	Change Team	Change Manager	20%	Representative of HR department - To cover also the Change Management part – He will be assumed to be the gateway with Business Users for Training needs and schedule finalization and for the Communication Plan (leverage Compass resource)
8	Change Team	Business Analyst Change	40%	Assist the Change Manager in his daily work

6.2.4.2 The Adverse Effects of Neglecting Stakeholders

This holistic review of the implementation process including the analysis of the difficulties and issues that emerge indicates a neglecting of the requirements of prime ERP implementation stakeholders. This mistake is a direct result of improper engagement and roles and responsibilities definitions among the prime stakeholders involved at the initiation stage of the ERP. The ERP plans were developed by government staff using government practices. The transition process of ServCo from government to the private sector was ignored whilst preparing the RFP and ERP Contract. The transition period required dual processes of private sector and government practices. The purchasing system for the government practices, for example, is governed by the Ministry of Finance rules and regulations. On the other hand, the private sector, which is the legal entity of ServCo, ought

not to follow the government purchasing system. This is because of the bureaucratic nature of the government purchasing systems that lacks the adequate flexibility to deal with ERP complexity and uniqueness.

From the labour perspective, the labour law to be followed by the private sector is governed by the General Organisation for Social Insurance (GOSI), while government employees whom worked physically in ServCo under the secondment agreement were still governed by the government labour practices, policies and procedures. The stakeholder's identification and roles and responsibilities management are poorly defined and badly managed. The first implementation, as a result, lacks the proper base where the ERP team can make the implementation successful. The weak base of the implementation, due the previous problems described, led the ERP team to be in a confused state regarding addressing the requirements of end users. More precisely, they could not configure the ERP to cope with the real day-to-day business operations. Further details on the effect of neglecting stakeholders for functional managers and O&M partner is explained in the sections below.

6.2.4.2.1 Neglecting Functional Managers

The ERP implementation was designed based on the policies and procedures that were not considered in the involvement of the operating and maintenance partner. In effect, it assumes that operation level staff received all their instructions from their line managers as per the organisational structure of ServCo. The O&M partner, however, was responsible and accountable for the knowledge transfer process including the hands-on aspects and on-job training. DiversCo operation teams reported technically to supervisors from the O&M party, which is different from the official reporting, as per the DiverSco structure.

At the time of launching the ERP end users in several areas suffered from the fact that they were reporting to the two different line managers, one from ServCo and the other from the O&M partner. From the technical and knowledge side, they should report to the O&M appointed manager and for other issues they report to ServCo managers. However, in reality it is not easy for the staff to differentiate on when to report to either manager. In HR areas, the ERP could not serve most of the employees who have not yet transferred their contract from the government to the company. Their legal reporting is neither governed by the policies and procedures nor by the current ERP configuration.

6.2.4.2.2 Neglecting Operations & Maintenance Partners

The neglect of O&M as a prime stakeholder has not only affected the ERP implementation investment but it has also adversely affected the business profitability. The reason is the contract with O&M states that a success fee is to be paid to the O&M partner based on the saving from water consumption; which is conditioned by tracking the consumption by ERP. As ServCo could not include consumption tracking in the first ERP project, the full success fee has to be implemented regardless of whether an equivalent saving is made or not. The effect of such neglect in ERP implementation context is best described by the O&M internal report to ServCo, which was written after it realised that the ERP would not be ready.

The O&M partner states:

‘Amongst other things, ServCo is required to submit its Initial Service Delivery Plan for ICT by the completion of eighteen months of the contract signing. The ICT strategy is conditioned by the current situation, which is dominated by the absence of ERP and associated business systems, which we had expected to be in existence at the Commencement Date’.

The report further explained how difficult the situation became as a result of this mistake.

The O&M report further states:

‘This places ServCo in an extremely difficult position as it means the development of information systems to support all of the separate business divisions (Water Supply O&M, Wastewater O&M, Asset and Investment Management, Customer Services, Financial Management, Human Resources and Support Services) will be delayed compared to our expectations contained in our Preliminary ICT Plan, thereby making it impossible to improve services to customers as quickly as we intended. The absence of the expected information systems is a recurring theme in all of the separate reports on these business functions, either submitted already or being submitted for approval at the same time as this document.’

This problem of not completing software applications that tracks the consumption led ServCo to obtain huge extra unplanned funds for a new ERP project in order to rectify the situation. This unplanned cost adversely affected the ROI from the ERP investment.

The O&M describes the sense of urgency by stating:

‘We strongly urge ServCo top management to review its ICT Strategy as a matter of urgency as it will affect all water services to the whole of the country in the future. As the saying goes, the future will last a long time.’

6.2.4.3 People Servants to Policies, Procedures & Technology

The basis for the requirements definition for the ERP implementation of the first implementation cycle was the policies and procedures of the organisation. The remarkable observation here was that those policies and procedures were developed in isolation from the management team of the organisation that were hired at later stage. Most of the functional manager's feedback remarks after testing the system indicate deficits in the policies and procedures, meaning that, in effect, the implementer regretted accommodating those changes as it would call for huge reworking efforts. Hiring the consultants to develop policies and procedures before the organisation officially formed might be looked at positively as a head start. However, ignoring the significance role of the functional managers and business owners in reviewing those policies and procedures is seen as unwise approach. As a result, although business owners recognised the deficits in those policies and procedures they were requested by the ERP sponsor to strictly adhere to it. This has led to a situation where people (stakeholders) became in a position to serve those policies and procedures. The treatment of the policies and procedures led to an adverse effect upon the ROI as the role of the policies, procedures and technology is to serve the people to achieve business efficiencies.

6.2.4.4 Proper Incentive Settings for ERP Stakeholders

A positive observation from the case can be drawn from the alignment of the staff's incentives with their contribution and involvement in the ERP implementation. The pay schemes for ServCo are more attractive than the traditional government pay systems of the Ministry. Most of the staff who worked for the Ministry were eager to transfer to ServCo. The process followed that each candidate started to work physically for ServCo under a temporary secondment contract before his performance was evaluated. If the candidate achieved a good evaluation, then he could be recommended for the transfer. The CEO took advantage of the employee's motives to include ERP performance and contribution in the evaluation.

6.2.4.5 A Smooth Knowledge Transfer Process

One of the remarkable findings that distinguish this implementation process is the dedicated investment to the knowledge transfer. This process is managed through the use of the ServCo College, which is dedicated to the training management. The analysis of the success achieved in transferring the knowledge can be referred to a number of reasons. Firstly, the dedicated

team in managing the transactions and the activities of training has taken a lot of burden from the ERP project manager. This return allows the knowledge transfer team to focus not only on the training activities, but rather they managed to focus on the quality of the supporting knowledge transfer activities. This is including primarily the assurance of the quality of the training contents, outcomes and the trainees' abilities to leverage the knowledge they gained in achieving ERP goals. Secondly, the effective use of the 'train the trainer concept' assisted in developing a culture of the training continuity where the new trainer become responsible to look after end users training needs permanently. Thirdly, a detailed breakdown of the roles and responsibilities in managing the training process led to the achievement of training aims and objectives. The ERP implementation team become the main customer of the ServCo college as they specified in detail what training objectives that need to be achieved by the end of each training process. ServCo college specialist's role is to design training contents that are in line with the ERP implementation aim and objectives. The role of the trainer becomes more clear by understanding in adequate detail what is the precise knowledge that needs to be acquired and why this knowledge is necessary for ERP success. The task, therefore, is to capture this knowledge before they can transfer this knowledge to end users through training courses and hands on sessions. The critical success factors of the ServCo College are presented in Fig 6.5.

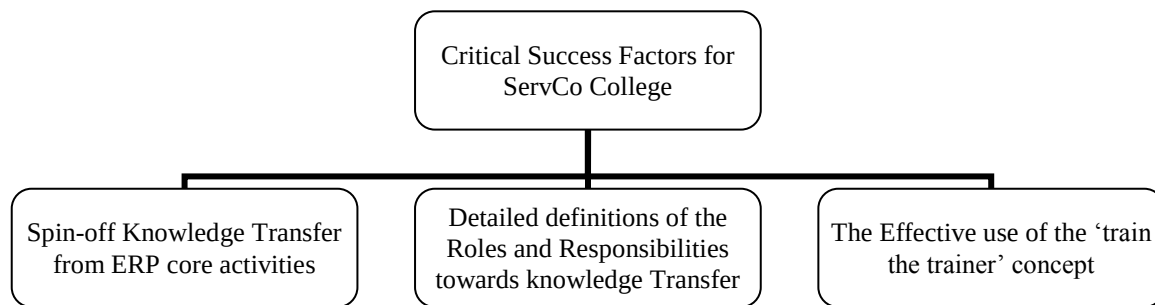


Fig 6.5 CSF of ServCo College

6.3 Comparative Analysis of the Four Cases

6.3.1 Evaluation of the Implementation Projects

The DiversCo and ElectCo cases had only one implementation project. The AgriCo and ServCo sides, however, have experience of three implementation projects. It is therefore, more useful to evaluate each implementation project to draw more lessons that can enrich the study analysis and findings. Based on this approach, the four cases consist of eight implementation projects that are evaluated based on the analysis of the each case (See previous sections) in Fig 6.6.

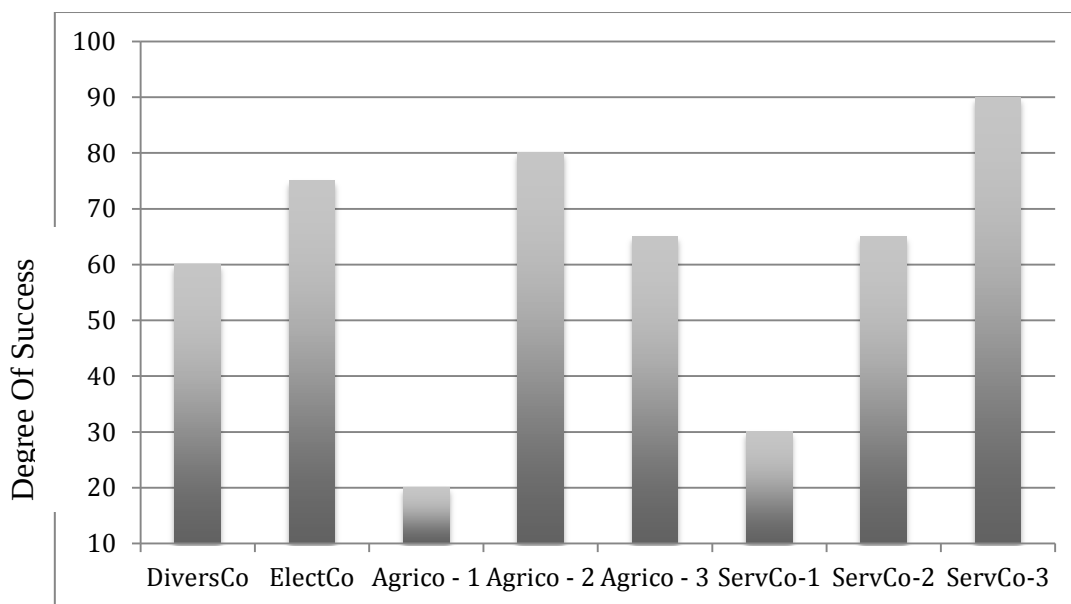


Fig 6.6 Evaluation Summary of the eight ERP Projects

6.3.2 The Early ERP Activities Comparative Analysis

This section considers the findings from the comparative analysis of the first implementation phases, which begin with initiating ERP in the organisation until the contract is signed with the ERP vendor and the implementer.

6.3.2.1 The Underlying Reasons for Adopting ERP

Every organisation shows a different reasoning for considering the adoption of ERP implementation. In the case of ElectCo, the first reason for adopting ERP (Fig 5.5) was to meet the business expansion requirements. The second reason was the dissatisfaction with the legacy systems. For the DiversCo situation, the potential of an ERP solution was initially raised by the external management consultant, who had suggested it to the Company, as part of his remit to develop policies and procedures. The Y2K preparation prompted AgriCo to

consider ERP as a solution to that issue, in combination with the requirement to upgrade its legacy systems. The ERP also supported the holistic new management developmental plans that covered all business areas, including IT, as well as responding to the pressure from competitors, which had already implemented ERP systems. The main driver for ServCo adopting ERP was the privatisation process, in which ERP was considered as a fundamental part of the facilitating elements required for transformation from public sector to private sector practices.

The comparative analysis of the early ERP activities indicates a number of reasons for organisations to pursue ERP implementation. Fig 6.7 attempts to demonstrate the reasons for organisations to pursue ERP implementation.

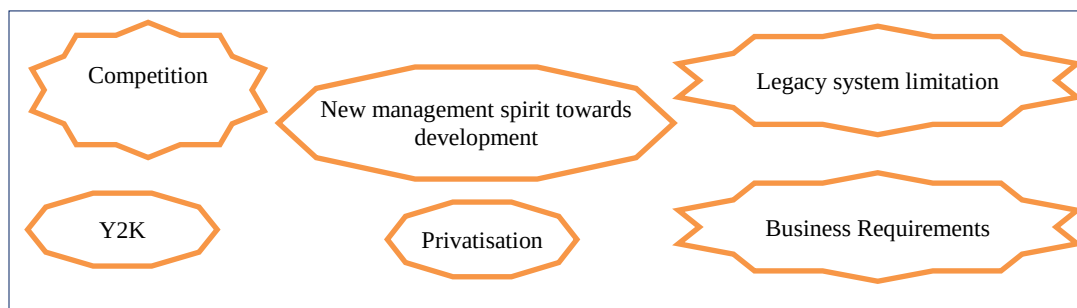


Figure 6.7: Reasons for organisations to pursue ERP

6.3.2.2 The Selection Process Management

At this stage, ERP becomes part of the executive board agenda, in all cases; it was evident that product selection was the first step in the pre-selection preparation tasks and activities. The four cases show different stakeholders engaged in the selection process (Table 6.18). For ElectCo and AgriCo, the selection process was assigned to the IT department while a freelance IT consultant was engaged by DiversCo to conduct this task. For ServCo, the selection process was preliminary made as a direct influence from their sister company. Apart from the ServCo case, the level of involvement also differed across the cases (Table 6.18).

Table 6.18: Selection Process Management - Comparative Analysis

No	Selection Process Management		Extent of Involvement
	Org.	Key Stakeholder	Major Criteria
1	DiversCo	IT Free Lancer Consultant	Only 50% functionality Focus
2	ElectCo	IT Executive Manager	>80% functionality focus
3	AgriCo	IT Executive Manager	60-80% functionality focus
4	ServCo	Sister Company	Influence by sister organisation

It may be noticed (in Table 6.18) that functionality comparisons dominated the selection process criteria at the expense of assessing organisational readiness. Minimal efforts were

made in terms of assessing whether the organisation is ready for the change associated with ERP; or whether it was necessary to develop plans to prepare the organisation for accommodating such a massive change. Preparing the organisation for ERP implementation also differs across the four cases (Table 6.19). Each case has its own strengths and weaknesses in their efforts to develop its readiness for the ERP implementation.

Table 6. 19 Strength-weakness comparative Analysis : Readiness Perspective

Org	No	Strength	Weakness
DiversCo	1	Hiring a GM with a solid ERP background.	Difficulties in understanding the issue of including sales invoice of non-stock items.
	2	Optimal usage of the selection process to increase awareness	Failure to define and communicate existing business processes
ElectCo	1	Attending ERP events.	Assign low qualified ERP coordinator for HR.
	2	Conduct internal process management review before ERP implementation.	No effort made to prepare HR for the upcoming change.
	3	Arrange process management course attended by various departments & business units.	Improper understanding of the nature of the business which adversely affect the change process.
AgriCo	1	Health check successfully determined the necessary actions that increase the readiness level.	No readiness preparation made for the first cycle of the implementation.
	2	Hiring qualified leaders for the second and the third implementation cycles.	Late consideration of the business process management until the 3 rd Implementation cycle.
ServCo	1	Developing motives within end users by linking the level of gained ERP knowledge and skills within their employment and career benefits.	Poor readiness preparation for the line managers in the 1 st implementation cycle through an exclusive focus on the policies and procedures.
	2	Comprehensive change management program embedded within the 3 rd implementation cycle.	No process readiness considerations that align ServCo processes with O&M partner's changes.

Training and awareness management at this stage also represents an interesting comparative element. The understanding of the significance of ERP readiness is different in the four cases being investigated (Table 6.20). DiversCo and ElectCo demonstrate a higher awareness level compared to AgriCo and ServCo who demonstrate a lower awareness. The volume of the preparation activities to fill the readiness gap also differs across the four cases. ElectCo shows large investment in preparation activities; only a small investment in the preparation activities by DiversCo and the first project of AgriCo. For ServCo, the investment gradually increased through the three implementation phases.

Lastly, there are four forms of training provided at this stage of the implementation that includes technical training, training from ERP vendors, business process and the attendance at ERP forums.

Table 6.20 Training Investment – 1st implementation phase

No	Org.	Awareness ¹	FR ²	Forms of training			
				Technical	ERP vendor ³	Business Process	ERP events ³
1	DiverSco	High	Few	No	Yes	No	No
2	ElectCo	High	Many	Yes	Yes	Yes	Yes
3	AgriCo	Low	Null	No	No	No	No
4	ServCo	Low ⁴	Few	No	Few	No	No

¹ The awareness of the importance of training at the early beginning of the implementation ² Refers to the Frequency and number of training activities ³ Refers to forums and conferences that address various ERP aspects organised by ERP vendors ⁴ The awareness improved gradually and became optimal in phase three

6.3.2.3 Defining Roles and Responsibilities

The performance of defining the roles and responsibilities among stakeholders is differing between the four cases during the preparation stage of the implementation. The differences between the cases are demonstrated in Table 6.21.

Table 6.21 :Roles and responsibilities definitions – 1st Implementation phase

Case		Rank	Strength	Weakness
DiversCo		Good	1. The GM has adequate clarity and experience in managing the roles and responsibilities. 2. The supervisory consultant is assigned to manage the roles and responsibilities	1. No role is defined to who should review the business processes. 2. The roles and responsibilities are not documented. 3. The definitions of the roles and responsibilities is not well-communicated
ElectCo		Good	1. 70% of the business owners are aware with their roles and responsibilities. 2. The implementation methodology document include a formal documentation of the roles and responsibilities	1. Very poor management of roles and responsibilities in HR modules. 2. Lack of defining roles and responsibilities
AgriCo	1 st Project	Poor	NULL	1. Roles and Responsibilities not defined. 2. Misleading communication
	2 nd Project	Excellent	Roles and responsibilities are: 1. Well-defined. 2. Well- documented. 1. Well- communication	The scope is limited to implement 'As IS' so defining roles and responsibilities was not challenged by implementing process-based parts
	3 rd Project	Fair	Transfer the ownership role including the overall responsibilities from IT department to the business side	1. In-adequate clarity in defining roles and responsibilities 2. The definition of roles and responsibilities lack necessary details for what is required from other business owners
ServCo	1 st Project	Poor	Developing policies and procedures by specialised consultants	1. Roles and Responsibilities not defined. 2. Misleading communication
	2 nd Project	Very Good	Roles and responsibilities are well-defined., well- documented and well- communication	The scope was limited to renovation of the previous project
	3 rd Project	Excellent	1. Roles and responsibilities are well-defined, well- documented. and well- communication 2. The creation and effective use of SevCo College	Null

6.3.3 Implementation Comparative Analysis

6.3.3.1 Requirements Definition

The requirements definition process is the first step after the implementer started his assignment. The management of this process among the four cases demonstrates different performance results (Table 6.21). ElectCo and DiversCo achieved good ranks compared to ServCo and AgriCo. The prime difference was that the two organisations did not need to repeat the implementation as they managed to identify, to a great extent, what they targeted to achieve. AgriCo and ServCo achieved better results in capturing their requirements at the second and third implementation phases. Although DiversCo and ElectCo achieved better results in capturing the requirements, both cases consist of a number of failed experiences (Table 6.22). The third implementation project in ServCo case can be seen as an ideal practice of defining ERP requirements which led to higher ROI. Apart from this good example, the comparative analysis demonstrates (Table 6.22) 1) a lack of the process of defining ERP requirements, and 2) the adverse effect of the poor management of defining ERP requirements to the ROI.

Table 6.22 Requirements Definition – Various Comparative Analysis

The rank of the overall structure and systematic requirements (poor, fair, Good, Very good, Excellent)			
DiversCo	ElectCo	AgriCo	ServCo
Good	Good	Poor ¹ /Good ²	Poor ¹ /Excellent ²
Examples of negative impact resulted from bad management of requirements definition process			
DiversCo	ElectCo	AgriCo	ServCo
Automatic invoice generation for the fashion SBU.	HR modules configuration.	For the first cycle, end users were completely disengaged and the requirements definition doesn't reflect practical business requirements.	The complete reliance on policies and procedures for requirements definition of the 1st cycle.
1.The issues of including sales invoice items that do not exist in the inventory.	1. Planning module	The second and the third implementation cycles showed incidents of configuring the system based on assumptions without relying on solid approved requirements definition.	1.The ignorance of the O&M contract in the requirements definition of the 1st cycle.
The availability of holistic requirements definition and approvals			
DiversCo	ElectCo	AgriCo	ServCo
No	No	No	Yes ⁴
Examples of the requirements definition gaps that ERP could not handle			
DiversCo	ElectCo	AgriCo	ServCo
The chosen ERP lacks the point of sales features and facilities and its integration with back-office information systems	The chosen ERP product lacks the ability to provide online links between end user ERP screens and the policies, procedures and work instructions.	The chosen ERP lacks the abilities to capture remote transactions using PDA devices that are needed by the mobile sales and distribution activities such as shipping, handling and loading products from/to sales and distribution outlets.	The chosen ERP could not handle the O&M requirements fully; where a new system is purchased and integrated with ERP at later stage
¹ Poor rank for 1 st implementation cycles , ² Good rank refers to 2 nd and 3 rd implementation cycles ³ Poor for 1 st cycle; Excellent for the 3 rd cycle ⁴ For 3 rd cycle only			

6.3.3.2 Conflict Management

The four cases demonstrated several aspects of conflict resolution and management. In the company DiversCo, conflict management and GM leadership were seen as complementary to each other in regards to ERP success, as shown in several observations. The unwritten strategy set by the GM was that, for ERP to succeed, the consulting organisation and DiversCo team should act like a unified team. There were incidents where key DiversCo users complained to the GM regarding the performance of the ERP consultants; the resulting technique, used by the GM, was always to focus on resolving the issue rather than taking action against the consulting company. In fact, the GM always motivated the ERP team to consider the knowledge deficits of ERP consultants as opportunities to advance their ERP knowledge through the ownership of resolution for various ERP support issues.

The implementation process in the ElectCo case consists of several examples that highlight the occurrence of conflict and its consequent management.

The main four areas where conflicts were developed (table 6.23) are 1) the temporary conflict between the PM and the finance team leader, 2) the conflict between the costing manager and the finance consultant, 3) the conflict between the acting material team leader and the consultants and 4) the various conflicts in HR implementation.

Apart from the HR conflict incidents, the previously extracted approach in managing the implementation has successfully resolved these conflicts without unnecessary escalation.

The ElectCo Company's Human Resource (HR) team was a source of conflict incidents, at different levels that included the internal conflict between the HR and the IMIS departments; examples include the conflict between IMIS and implementer, between the implementer and the vendor, and various incidents between the implementer and the HR department.

Learning about managing conflict in HR implementation is summarised in the following points:

1. The most important learning resulted from the IMIS department and the implementer, demonstrating a true cooperative partnership. The internal IMIS department took the lead by criticising the inefficiency in the HR area, which had stalled the ERP implementation; this action assisted in exposing the weaknesses in HR operations relevant to successful ERP implementation

2. The ElectCo and implementer Project Managers jointly took a wise decision that the issues with the HR implementation should not adversely affect the implementation of the other modules. The timing of escalating knowledge of HR deficiencies to the CEO was skilful because the success made in other implementation areas provided definite evidence that the source of the HR implementation failure came directly from the HR department.
3. The interventions of the COO and the CEO were professional and effective, since they both insisted on resolving existing problems rather than apportioning blame or diverting attention towards contract disputes.

For AgriCo, the conflict between different ERP stakeholders in the case varies in the different stages of the implementation. However, since the “future of AgriCo” stage reflects a more mature implementation process, the conflict was critically reviewed and the analysis inferred that the root cause of the conflict was the lack of understanding of the ERP and the results that could be achieved. The “future of AgriCo” Project Manager states:

“I have seen conflicts evolve from the lack of ERP understanding, in terms of expected outcomes to be perused. This lack of understanding can be resolved through training sessions provided to executive managers. However, it is not easy for senior executive staff to accept being trained by the ERP consulting team! This incites greater resistance to change, which generates the evolution of conflict”

The PM cited his experience with the Chief Finance Officer (CFO) when he delayed approval of the costing method that was critical for the ERP configuration. The CFO denied causing delay and stated that he expected the ERP team to suggest the best practices for him to choose from, and that they did not do so, which proves their incompetence. Such statements from the CFO further confirmed that such conflict resulted from a poor understanding of ERP concepts and his roles and responsibilities as the business owner to define precisely the business roles and requirements.

Table 6.23. Conflict management - comparative analysis summary

The rank of the overall structure and systematic requirements (poor, fair, good, very good, excellent)			
DiversCo	ElectCo	AgriCo	ServCo
Excellent	Very Good	Good ¹ /Fair	Fair ² /Good/Excellent
Conflict management summary			
DiversCo	ElectCo	AgriCo	ServCo
The GM used his authority to place pressure on the consulting and vendor company by deducting from invoices and delaying some payments for the underperforming pieces of work, however, he protects the implementation plans by his rational use of these acts.	The proper conflict management resolution by the PM with the finance team leader, has not only resolved the conflict, but also transformed the attitude of the financial team leader to assist the ERP team to manage conflict incidents effectively throughout the implementation.	For the second and the third implementation cycles, no conflict found between AgriCo staff and consultants. Most of the conflict cases emerge between AgriCo staffs.	The foundation of the 1 st implementation cycle is full of a lack of clarity of roles and responsibilities, which created an environment that can nurture conflict; however, the proper interference and decisiveness of the CEO reduced the conflict effects.
In case DiversCo staffs complain on the lack of knowledge by the consultants, the GM encourages DiversCo staff to take the lead to resolve the issues that the consultants failed handle. The GM approach that the gain from developing the knowledge outweighs the effect of the knowledge deficit by the consultants.	This conflict between the costing manager and consultant, which escalated to the CFO, was resolved in no more than half an hour by wise interference of both project managers (ElectCo & Implementor).	The CEO and the IT director for the 2 nd cycle and PM of the third cycles played different roles in managing conflicts.	The 2 nd and the 3 rd implementation cycles clarified in adequate details the roles and responsibilities which left no room for conflict to evolve and grow.
The consulting organization was never dealt with as an external body.	The COO and CEO interferences were wise and practical. They insist on fixing problems rather than fixing blame.		
A couple of decisions were made to replace the key users who demonstrated a continuous confrontation stand against the consulting company.			
¹ Poor rank for 1 st implementation cycles, Good rank refers to 2 nd and 3 rd implementation cycles ² The conflict management improved gradually among the cycles			

6.3.3.3 Leadership

Diversity in the leadership style was indicated in all four cases by the acts and practices observed. The General Manager of DiversCo demonstrated positive leadership qualities in the various implementation stages.

Examples of leadership observed from DiversCo general manager are shown in Table 6.24.

Table 6.24 Leadership examples - DiversCo general manager

No	Example description
1	The General Manager engaged the entire team including branch managers, key users and end users for a joint meeting to announce the ERP project initiative.
2	The General Manager participates in attending the demonstration sessions provided by the three ERP competitors. His presence to those sessions demonstrate his motivates business owners and end users to play positive role in the success of ERP implementation.
3	The GM was accessible to all the teams, individuals and groups who were trying to resolve issues or seeking solutions. Such practices convey a clear message that the ERP implementation has priority; therefore the fast track channel can be employed to accomplish it.

The ElectCo ERP Manager demonstrated an excellent leadership model as is evident from several examples. The first leadership indicator was his effort to recover the ERP initiative, after the project was cancelled with the previous ERP vendor. His prompt attitude in suggesting, developing and executing an alternative plan and leading the effort until ElectCo signed a contract with the alternative vendor took six months, compared with the two and a half years for this to occur with the previous vendor. The second indicator is the ability to motivate, support and empower IMIS members to lead all ERP modules. The third indicator is the capability to motivate, support and empower team leaders from the business side so that they facilitated and executed ERP activities; this demonstrated his skill in influencing key business users without having been given explicit organisational reporting power as a key success factor. The fourth indicator was a positive, strong intervention to defend the implementer and the independent consultant on a number of occasions. He emphasised that ElectCo was always expected to own the implementation. The fifth indicator was a caring approach that was demonstrated to all the team, including members who do not belong to his department or section.

The ElectCo case was rich in other examples of good leadership practices by the stakeholders that included, but were not limited to:

- The ElectCo CEO, COO, CFO, Purchasing Manager and IMIS Director
- The ElectCo ERP Project Manager
- The Implementor Project Manager
- The Implementor General Manager

Examples of leadership observed from ElectCo stakeholders are shown in Table 6.25.

Table 6.25 Leadership Examples - ElectCo Case

ElectCo ERP Project Manager
The first failure coexisted with major organisational changes; most of the line managers changed along with complete a demotivation owing to the ERP failure. The new CEO led the process by accepting the failure, taking important decisions and nurturing several initiatives that included: 1. Meeting with the ERP team members concerned, in order to admit the failure and suggest a new way forward 2. The decision to recruit a qualified Information Systems Director to lead the ERP process 3. Allocating budget to recruit a qualified ERP Applications Consultant 4. Empowerment of the IS Director, including for the first health-check process and recruiting a new Implementation Consulting Team
Project Manager from Implementer Side
The implementer's Project Manager's leadership style is evident from several examples. First is the immediate attention to, and a prompt response to, any issues raised by any stakeholder. Second, although maintaining a calm leadership approach, he adopted more aggressive behaviour especially if he sensed actions/attitudes that would have a significant adverse effect on meeting the deadlines.
General Manager from the Implementer's side
Although his involvement in the implementation was limited, it was noticed that whenever he intervened, his influence was remarkable. He maintained a calm, confident and professional approach in all encounters with ElectCo executives. Whilst never accepting explicit blame directed at the implementor side, he took neither a defensive nor an attack position against ElectCo, at any time; take, for instance, his remarkable intervention in the ITEM master data migration and the conflict in the HR area.
CEO
demonstrated management commitment at the beginning of the implementation and took the lead in major changes, such as ownership of the planning module, rectifying implementation in the HR area and engaging and encouraging executives to own, learn and participate in the ERP implementation
COO
was the true sponsor of the ERP; always approachable and visible supporter to ensure all the necessary encouragement and empowerment for the ERP and the ERP team, in order to make it successful
CFO
Leadership observed primarily as: • demonstrating his commitment to successful ERP implementation to the Finance Team by insisting and ensuring that all the financial and audit requirements were met flawlessly within the ERP implementation stage • providing support and influence in other areas of the implementation that did not fall under his direct supervision
IMIS Director
Although he delegated power to the Computer Systems Manager for the majority of ERP activities, he mediated remarkably as follows: • Led in supporting and strengthening the Project Manager's position during the peak of the HR conflict • Supported, motivated and empowered the Project Manager, including nominating and supporting the ERP Project Manager to receive the highest presidential award.

For AgriCo, the examples of leadership spirit and practices described are derived from the three ERP sub-projects (Table 6.26).

Table 6.26 Leadership Examples - AgriCo Case

The CEO Role and the First Failure
The first failure coexisted with major organisational changes; most of the line managers changed along with complete a demotivation owing to the ERP failure. The new CEO led the process by accepting the failure, taking important decisions and nurturing several initiatives that included: 5. Meeting with the ERP team members concerned, in order to admit the failure and suggest a new way forward 6. The decision to recruit a qualified Information Systems Director to lead the ERP process 7. Allocating budget to recruit a qualified ERP Applications Consultant 8. Empowerment of the IS Director, including for the first health-check process and recruiting a new Implementation Consulting Team
PM Leadership of the Second Project
The Project Manager's leadership behaviour during the second phase was demonstrated by his tendency to use his influential and communication skills with key users and to avoid employing the power delegated to him by CEO power, in order to ensure that the key users to cope with the project requirements.
The CEO's Leadership in Initiating "Future of AgriCo"
Before the evolution of the "AgriCo future" project, several complaints had arisen about the ERP product, and these came from the majority of executive staff engaged in the project; explicit pressure to influence the CEO that the existing ERP vendor should be replaced. The CEO listened to all the different opinions and decided to invite the existing ERP vendor to conduct a second health check and to formally capture all the deficiencies and to examine all the complaints made by the executive managers. At the same time, he appointed the Manufacturing Director to lead the project that was known, at a later stage, as "the future of AgriCo".
The Manufacturing Manager Leadership Vs. "The Costing Method"
The Manufacturing Manager, who acted as the PM of the third implementation stage demonstrated excellent influencing skills to get tasks done. Most of the accomplishments were not achieved as a consequence of the power he received from the CEO and, despite resistance to change from the business owners, he extended his efforts towards developing their skills and knowledge and motivated them to implement the system successfully.

6.3.3.4 Business Process Management

The four cases exhibit the diverse understanding and management of business processes within the companies. There were no formal considerations of business process management for DiversCo; discussions concerning the business processes took place after the realisation that some failures were a consequence of the lack of understanding and management of the business processes. A good example that generated awareness of this factor was when salesmen in the retail electrical business unit show rooms reported that they could not create sales invoices from the system. An investigation of the failure to produce these documents revealed that some items were included in the sales invoice but there was no inventory record, since other, non-standard items, were bought and sold as needed to complete customer orders. There would have been significant savings in the implementation cost, if the business process concerned had been reviewed at an early stage of the implementation, including suggesting various options to manage this process effectively. As a temporary solution, the decision was made to suspend the link between the warehouse and the sales module, in order to allow inclusion of non-stock items in the sales invoice; this represented a temporary solution but under-utilised the integration functionality of the system.

Another example was the HR management of the contracted labour, who were not assigned employee numbers since they were not working under the sponsorship of DiversCo. As a consequence, they were unable to complete the online timesheet, their remuneration was not recorded in the project costing, and as a result the costing was inaccurate. These types of issues were finally resolved after all unnecessary extra costs had been incurred, in terms of time, money and the adverse attitude that developed as a result of the problems. There were several process management efforts within the ElectCo case; which led to the success of identifying and optimising various critical processes, as shown in Table 6.4.

On the negative side, the case of the planning module and the failure to run MRP from the system revealed that there was inadequate consideration given to the process change requirements in this area. Additionally, the very limited benefits from the project module revealed that no-one led the integration of scattered administrative and non-administrative transactions necessary for there to be a project-driven basis. The project module failed to capture all the data, which can be explained by the project manager relying on the project module to master all project attributes. For AgriCo, one of the main findings discovered after the first and major failure was that AgriCo must analyse and change parts of its business processes. The health check report stated:

"We must indicate that AgriCo must change some business processes and cycles to leverage the system benefits"

The analysis of the case shows that AgriCo failed to consider the importance of business process management, as is inferred by the examples summarised and discussed in Table 6.8. For the ServCo case, the analysis shows that the ROI was significantly affected by the failure of managing business processes within the roles and responsibility context. These main processes were namely: 1) Optimising warehouse and inventory management; 2) Defining the HR processes to accommodate government employees and newly hired; and 3) O&M processes requirements.

6.3.3.5 Project Management

All four cases show common project management concepts and practices, however, each case had its own style of adopting them; the diversity of project management adoption allows a comparative analysis to indicate interesting findings. Since AgriCo had been through several implementation cycles, its findings are discussed separately. DiversCo adopted only simple,

basic project management tools and practices, with minimum use of formal style of communication and documentation; face-to-face communication was predominantly used. In comparison to DiversCo, ElectCo employed more formal project management practices, although analysis of the findings still suggested excessive use of informal tools and practices. The style of project management employed in ElectCo played a significant role in the implementation success. From a stakeholder's project management perspective, DiversCo and ElectCo, indicated two aspects worth focusing on:

A milestone focus rather than a typical project time line follow-up

In the DiversCo case, the project reviews from the supervisory consultant and the GM were in the form of verbal discussions. The primary issue was to always monitor, review and update milestones and deadlines, as well as problems and suggested solutions that hindered progress in meeting deadlines and achieving milestones. Similarly, the analysis of the ElectCo project management attributes showed that both PMs placed most of their focus on goals, deadlines update and review; only limited consideration was given to the detailed project plan and the task list review. It can be inferred that both organisations focused on identifying selected goals as milestones, and to drive the whole team to meet those milestones. Each milestone was treated as if it is an independent project and sufficient flexibility was provided to each module team so that it could manage the project schedule of its part. This contrasts with the traditional timeline view often employed in project management.

Quick Wins

Analysis of the behaviour of both DiversCo's GM and the supervisory consultants revealed that their focus was on how to develop quick, multiple and repetitive wins. This became evident from the tremendous pressure to expedite the parallel run and to stress the need to discard the legacy systems to rely only on the ERP, at least for financial modules. The new section created for the two members who assumed several developmental initiatives show how keen the management was to recognise members who contributed positively to the success of the implementation. The early launch of the purchasing module, on the other hand, demonstrate this, since the ElectCo managers, department heads, COO and CEO all started to use the new system to record their approval online. The impact of that action placed more pressure on the remaining implementation areas in order to complete their implementation contributions. The key learning that resulted was that the project manager must ensure that

the project plan includes some ‘quick wins’ as early milestones, which must be achieved. ERP implementation is a lengthy and resource consuming project so it is not uncommon for the ERP team to become bored easily. ERP success is not easily sensed at the departmental or individual level, therefore ‘quick wins’ are crucial to maintaining momentum and positive spirit until the project accomplishes its targets.

AgriCo Project Management Review

For AgriCo, the lack of project management skills and practices represented a core reason for the failure of the first implementation cycle; the absence of real project sponsorship, especially after the previous project manager left, represented a major finding concerning that project failure. The health check described this:

“Only few key decision makers from AgriCo participated and their minimal presence made the effort less connected and lacking integration and there was inadequate documentation of the agreed actions and solutions between AgriCo and Implementor”

At the same time, the adherence to project management roles and practices created success in the second implementation cycle, since the health check reports fully explain the project management roles of the organisation and the implemented. Table 6.27 provides the suggested roles and responsibilities related to project management for the implementor and the AgriCo.

Table 6.27 Proposed roles and responsibilities – Project Management : AgriCo

No	Roles and Responsibilities for the Second Implementation Cycle	
	Implementor	AgriCo
1	Define a project protocol that includes all team members, members of the advisory committee, project managers, meeting dates, introduce representative outputs for review and approval and all other necessary information that helps the project management	Implement the suggested project structure especially the project sponsor, the advisory committee and the project manager.
2	Assign qualified project manager to review the project status and ensure the quality of the Implementor work.	Work with Implementor to conduct regular meetings at the taskforce and the advisory committee level.
3	Amend project plan as needed and review such amendments with the AgriCo management.	Ensure appropriate documentation of the minutes of meetings (MOM)

Table 6.28: Project management review : AgriCo

	1st Cycle	2nd Cycle	3 ^r Cycle
Objective	implement ERP 'as is'	Implement ERP 'as is'	Align business process
Results	Failure	Success	Survival
Project Management Description	A number of PM techniques and tools used, but in a typical task list format assuming total ignorance of the change process and the end user engagement. The result was that the good aspects of project management practice did not lead to ERP success	PM tools and practices used in a more realistic and rational view of the nature of the ERP project. The project management process places a lot of emphasis on the coordination of activities that ensures quality results.	This stage touches more insights into the underlying business processes and real ERP implications on business activities. However, it shows minimum use of project management practices, formalities and tools

The overall project management process for the three implementation phases is explained in Table 6.29.

Table 6.29. Project Management – Comparative evaluation (from 1 to 10)

DiversCo	ElectCo	AgriCo	ServCo
6	7.5	5	8
The use of project management tools			
DiversCo	ElectCo	AgriCo	ServCo
Basic – limited	More advance	Basic – not limited	Advance – not limited

6.3.3.6 Training

In the cases studied, the findings regarding the role of training were significant to both the ERP success and failure. The training awareness is discussed (see section 6.3.2.2) and the results of analysing the four cases towards training are demonstrated in Table 6.19. For DiversCo, the formal training was limited to product training which was provided in different forms:

- Formal classroom training, as per the master ERP schedule.
- *Ad hoc* training as needed in workshop form, in which participants were allowed to suggest different scenarios and ask the consultant to demonstrate the effect of each scenario

In the case of ElectCo, the training that took place represented a remarkable attribute of the organisation. This holistic view confirmed that ElectCo considered training to be a priority (Table 6.20), as is inferred from the non-stop commitment to all the ERP training types and the appreciation of the taskforce who demonstrated the ERP skills received as a consequence of the training. In addition, ElectCo's commitment to the ERP training was not limited to the product training, but also covered the technical and process management training. ElectCo

also encouraged the team to attend the ERP user groups, as another source of training from peers in different organisations. In fact, another remarkable advantage was that the ERP training started as a process at a very early stage of ERP history, and the learning and development culture of ElectCo evolved; it was not confined to implementing the ERP project. The exception to this was the HR department, which failed to demonstrate any consideration of training as a priority; in fact, it can be argued that most of the HR failures and problems came from underestimating the importance of the ERP preparation and training.

For AgriCo, the holistic approach it took to the three ERP implementation cycles undoubtedly shows the correlation between the training and ERP outcomes. For example, the health check conducted between the first and second implementation cycles is evidence of this. The research findings were:

“There was no training plan in place and the training material that had been handed over to end users was:

- Limited to demonstrating how to navigate and access the system
- The indirect training process was not conducted, since AgriCo users were completely disengaged from the process of building and configuring the system
- All end users explained that the training was in-adequate, un-planned and very limited to specific parts”

In fact there was no training plan that linked the ERP training with business practices, for which a comprehensive plan was required. The health-check report states:

"Implementor is requested to:

- Ensure the members of AgriCo IS Department and key users of the modules that are not yet implemented are adequately trained; this is necessary to make sure that the modules, which have already been built and configured can be maintained before Implementor complete their assignment
- Evaluate the training process, end user requirements and prepare integrated plans to retrain end users
- Design training as documented in the approved implementation methodology
- Link the training between system capabilities and the AgriCo business practices”

In regards to the role of the organisation assuming the responsibility for evaluating the training outcome, the health-check report states:

"AgriCo is requested to evaluate trainees after each training course and to identify strengths and weaknesses, in order to achieve better results and to recognise that

adherence to applying the system as per AgriCo policies and procedures is critical”

The analysis of the case, covering all phases, demonstrated the absence of an integrated plan. The various debates, discussions and end user reactions indicated the knowledge and awareness gap that should have been closed; training, at all stages, was limited to the application and technical aspects of the system. The training process was limited to instructor-led applications training complemented by self-learning and hands on support as the only other part of the training process. If more training efforts had occurred and there had been a focus on training and appropriate tools had been employed, the implementation process could have been faster and more successful. There were few team members that possessed the integrated knowledge, experience and educational background necessary, during all implementation phases. Closing the knowledge gaps is essential to ensuring that all ERP stakeholders have consistent understanding, which enables efficient implementation and effective use of the applications.

The lack of training effort was complemented by recruiting qualified IT staff during the second and the third phase of the implementation and by using the ERP vendor for consultations, which addressed the training deficiencies. There should be a balance between recruiting sufficient consultants and relying on internal staff by training them.

The consequence of prioritising cost savings above adequate training is that the learning curve normally exceeds the allocated period that was indicated in the implementation time plan.

6.3.3.7 Technical Administration

This section addresses a number of technical issues that include the ERP configuration, infrastructure development and ‘add-on’ SW applications. The semi-standard ERP configuration process is that Application Consultants from the implementer side configure each module according to the details given in the requirements gathering document. This is followed by a test process, using the system in demo mode to avoid the risk of using the system directly in production and it being faulty. In the four cases, it was evident from the findings that limited quality assurance efforts took place throughout the whole process.

The following examples from the cases inferred the testing inadequacies:

1. For DiversCo, there was no evidence for any comprehensive test being made during the transition process from test to production platform

2. The failure in using ERP in DiversCo's remote factory, in ElectCo's repair facilities and data transmission from the field to AgriCo's headquarters, demonstrate the fact that the ERP plans lacked rigour and underestimated the technical and networking specifications considerations.

The reasonable common practice in the four cases was that the organisations did have a technical team responsible for the technical infrastructure; their scope covered the network administrator and system administration. The implementer provided the necessary assistance to enable those teams to complete the technical structure required. Three cases demonstrate that the vast majority of testing and specification efforts were conducted on the basis of head-office requirements and that remote sites, such as sales outlets, warehouses and factory plants were considered least. The ElectCo case shows more effort in preparing the in-house systems and database administration for the ERP master database administration and technical infrastructure, as well as the support activities, in terms of training the staff and purchasing the advanced servers. Despite these preparatory efforts, however, the team could not anticipate the technical issues that arose at the time of launching the ERP in the repair facilities; this unexpected problem caused an extra two months of delay. Assessing and upgrading the link should have taken place at an earlier stage, in which both the implementer and the ElectCo Project Team should have considered the potential issues.

The first implementation of the DiversCo case also indicates a number of issues that ensued from poor technical considerations of the remote site requirements. Implementing the ERP in the warehouse was significantly delayed as a direct result of this mistake. In the overall case of AgriCo, this aspect was very similar and almost the same conclusions could be drawn, for instance, the first phase failure demonstrates complete ignorance of the necessity for planning ahead regarding the infrastructure arrangements. This was followed by improper selection of the operating system, which was discovered during the system launch of the second phase. Another symptom of that deficiency was that the network link between the factory and head office failed, after the announcement had been made for the second phase go live stage. The health check process did not specifically include investigation of the infrastructure development and arrangement, which indicates a grey area, in terms of defining the roles and responsibilities as to who should have raised this issue, at what time, and who should have taken the necessary actions to avoid the failure.

Add-on Software Applications

The two examples found in the DiversCo case were the point-of-sale and the HR software packages. The implementer's efforts to customise the new software, in order to integrate the HR localisation requirements with core ERP modules, failed before DiversCo decided to purchase a stand-alone software application and to discard the customised part developed by the implementer. ElectCo initiated a project to build a product database management (PDM) module for manufacturing and R&D requirements; the decision was made to address the integration between PDM and the ERP. During the ERP implementation, the end users realised that the PDM was a very advanced application that provided much more than ElectCo required and that there were no well-defined guidelines as to how or when product data management could be met, whether from PDM, ERP or from integration of the two.

In both the first and second stages of the AgriCo implementation, no evidence was found about how the add-on applications would be integrated with the core ERP functions. The "future of AgriCo" phases reported an enormous delay owing to the underestimation of the time and effort required for integrating the stand-alone application that captured daily sales transactions and that were needed in order to post them to the finance modules. The significant delay did not, however, result from the add-on software development cost but from integration, which was tasked with deploying the application to thirty-two remote sites, requiring massive technical support and coordination efforts.

6.3.4 'Go Live' and Post Implementation Comparative Analysis

This section explores the implementation process before and after the 'go live' stage; a comparative analysis of these dimensions for the cases studied will be conducted from a stakeholder and a roles and responsibilities viewpoint. The purpose is to infer the key learning points and common findings that, ultimately, enrich and complement the analysis of the two implementation phases. It will investigate how and when organisations decide to bring ERP implementation to a close, acknowledge its completion and how they maintain continuous improvements in the ERP.

The four cases followed different routes to the project close-out. In the case of DiversCo, the GM intervened and met with the implementer, the ERP vendor and the supervisory consultant, in order to shortlist the pending issues. The GM conducted a thorough

investigation so that he could distinguish between the tasks that were likely to be completed and other more difficult ones; a final plan was devised to tackle those items that fell under the 'what can be done' category and complex issues were discarded. For ElectCo, all team leaders were requested to formally provide a list of all uncompleted tasks and then take the initiative to prepare a conditional sign-off sheet, which excluded the uncompleted tasks.

Another clever initiative was to introduce a post implementation plan and explain, before the project close was announced, where those snag-listed items were included in the post implementation plan. In a similar manner to the positive effect of the post implementation plan in the ElectCo case, the two health checks from the AgriCo case assisted in the formal considerations of the project completion status. There was, however, no clarity in the project closeout for the third implementation cycle, probably because it was dealt with as an internal project, so there was less pressure from the external stakeholders to bring the project to a formal close-out stage. For DiversCo, the GM requested the supervisory consultant to list pending issues for the ERP project completion that included the areas that had been identified as having barriers to implementing ERP in some areas. The short list was included in the sign-off sheet that the ElectCo PM prepared for the five ERP modules. For AgriCo, the first implementation phase was admitted as closed, as an official failure, by the CEO intervention and the assignment of a health-check activity. For ServCo, the first implementation phase was closed by the termination of the contract with the first implementor as described in the case description. The second implementation was governed by a fixed contract, where the project is closed at the end of the agreed project period automatically. The third implementation phase was well planned and there were no issues in delaying the close-out. The primary reason was that the implementation had successfully executed a change management program. Through the effective management of the ServCo College concept, end users became ready ahead of schedule and there was no need to request the consultants to extend their service.

It can be concluded from the cases that the ERP sponsors needed to pay attention to the fact that the ROI might be significantly impacted if the ERP project had not reached an official close-out stage. This is including the possibility to pay extra fees to the consultants and engaging internal resources for extra timings without realising ERP benefits. It is, therefore, essential for ERP sponsors to intervene in order to bring the project to a closing stage. On the other hand, it has been observed that there is a correlation between open-ended ERP projects

and the bad management of roles and responsibilities among relevant stakeholders. This can be demonstrated because once an audit or review is conducted, it is expected to lead in finding improvement opportunities in enhancing the roles and responsibilities management. Table 6.30 summarises the symptoms for the necessity to close-out the ERP projects by its sponsors.

Table 6.30 Symptoms for the necessity of ERP Project close-out

No	Symptom	Description
1	ERP Project Manager alerts	When ERP Project Manager communicating alerts that the ERP project is dragging
2	Implementer pressure – Payments	In case Implementer places pressure on releasing outstanding payments.
3	Implementer Pressure – Cost	In case implementer complain that the project cost is increased without compensation
4	End user pressure for continuing the parallel run process.	End user pressure for continuing the parallel run process.
5	Top management frustration	Top management frustration owing the project length.
6	Irrational business owners complain	In case business owners complain on ERP outcomes without providing convincing reasoning that support their complains.
7	Tension & Blame cultural acts	When tension and exchanging blames among ERP stakeholders on ERP outcomes

6.3.4.1 Post ‘Go Live’ / Post Implementation

During this stage, DiversCo were found to have taken tangible roles and responsibilities actions that included:

- The application consultant recruited to provide the first line support was asked to resign and his roles and responsibilities were transferred to the system administrator and one accountant
- The recently created department for corporate finance and DiversCo audit, assumes the role of driving the continuous improvements, in leveraging existing features and implementing more, including new modules or supporting ERP applications
- The supervisory consultant role was limited to settling pending payments with the ERP supplier and implementer

DiversCo managed to implement three continuous improvements successfully without seeking assistance from the implementer or from the supervisory consultant; invoice generation from electrical show rooms, the online timesheet from the project side and the add-on software in the HR area.

The ElectCo case revealed that the ElectCo Project Manager had excellent timing to train and develop the top executives by introducing the post implementation stage and its on-going activities. The PM succeeded in appropriately meeting his expectations by drawing their attention to the common factor that organisations suffer from a temporary performance dip after reaching the 'go live' stage and, since this message was successfully communicated to the CEO, the following actions were taken:

- A package of reward and incentive schemes was approved for the ERP core team to recognise their achievement and to retain them for the post implementation phase
- The CEO successfully convinced internal teams that the uncompleted tasks remain within ElectCo departments for completion; department heads who owned certain modules aggressively took the lead in completing their parts.
- A subcommittee headed by the CEO was formed to redress the HR implementation failure. After close monitoring of the HR implementation activities, the HR Vice President resigned and a newly appointed executive was announced as the Acting HR Vice President.

ElectCo did an exemplary job in preparing and training the organisation for the post implementation; the Project Manager and the IMIS Director chose the correct time to introduce the post implementation plan and to train the ElectCo executives to appreciate that the 'go live' stage was just the end of the beginning and not the beginning of the end. The key messages the CEO received at the end of the 'go live' presentation were that:

- The 'go live' stage is neither the end nor the only measure of ERP success.
- The 'go live' stage is the end of the beginning.
- It is justified for the business to experience a performance dip at the 'go live' stage
- It places more pressure on the areas in which ElectCo had not reached the 'go live' stage, primarily in the HR and the Projects area

ElectCo managed to assume full responsibility in executing the incomplete ERP tasks mentioned in the conditional sign-off sheets, accommodate new changes and master the ERP upgrades. It is inferred from the holistic analysis of ElectCo's actions after the 'go live' stage that ERP users respected the need for continuous changes and updates to the roles and responsibilities. The Director had ensured perfectly that any changes that needed to be implemented in the test server were conducted before they were transferred to the production version.

For AgriCo the post implementation differed, based on each implementation cycle as follows:

- The failure of the 'as is' stage meant that implementation did not reach post implementation owing to the complete malfunction of literally all predecessor tasks.
- For the successful 'as is' stage, it can be argued that AgriCo did not close the project properly and therefore that there was no suitable preparation for the post implementation activities, which created an unnecessary gap between the second phase and "AgriCo future project" achievement.
- AgriCo failed again during that project when it struggled to close the project by developing a smooth transition to the continuous improvement loop

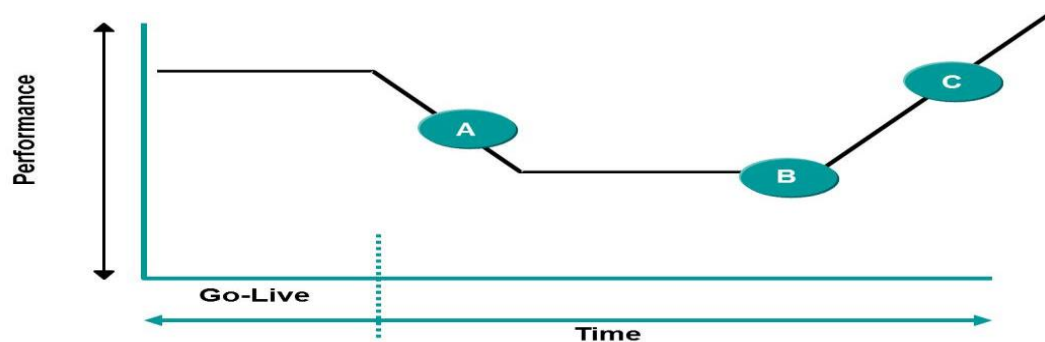


Figure 6.8. Performance Dip - ElectCo Internal Presentation

6.3.4.2 Project Completion Review

When DiversCo's GM realised that the ERP project would not be accomplished as planned, he devised a new plan with the supervisory consultants, who explicitly stated who should do what, in order to bring ERP project to its close. During the preparation of the plan, the GM suggested that the team should exclude certain areas/modules and admit failures to implement them, and that they should include only the successful parts in the final 'go live' handover and sign-off process. ElectCo, in contrast, used two initiatives to motivate its management to approve the project completion. Firstly, the Project Manager initiated the process of training and developing executive staff about the post implementation plans, emphasising that the ERP project sign-off and 'go live' were the end of the beginning rather than representing the end of the process. Secondly, the formal request addressed to all module team leaders to shortlist pending ERP actions was included in the conditional sign-off sheet for each module. The Project close-off was conducted based on the progress made in completing those actions that comprised the sign-off sheet. HR was an exception, as a new plan was developed to complete HR at the time where all other modules reach the go-live. The new HR plan is managed in parallel with the process of closing the contract for the rest of the modules. Eventually, minimal outcomes were achieved from the HR modules during the first implementation cycle.

The use of the health-check process between the implementation cycles helped AgriCo to expedite the project close-out of the first implementation cycle and also to set specific goals for the second implementation cycle. One health check helped the organisation to expedite the project completion process for two implementation cycles. It can, however, be seen that the case lacked the focus to address future ERP improvements adequately, since it took the company more than two years before it announced the third implementation cycle. During the third implementation cycle, executive management still showed limited understanding of what the company has achieved and what it still expected to gain from ERP implementation. For ServCo, the second project has not experienced any close-out difficulties due to 1) clarity of the scope and the detailed roles and responsibilities that had been defined early and 2) the project operates within specific time constraints. Since the implementor 'I-b' completed what he has committed for and the project time line is completed the close-out was smooth. For the third implementation project, the primary influence that smoothed the close-out can be seen from the ServCo College. This is because by the time that the project reaches the close out stage ServCo members are the ones who lead both the implementation and the support. The presence of the consultants, therefore, is seen as unnecessary. ServCo members, were clear on their role and they understand what is required from them and from the consultants as this was part of the intensive training received. The first project in ServCo, on the other hand, faced difficulties in the close-out stage as most end users and the management were confused by the poor ERP results. Further complexity in closing the project found from the ignorance of the requirements of the O&M partner.

The suggested ranking of the close-out performance of the eight projects of the four cases is summarised in Fig 6.9.

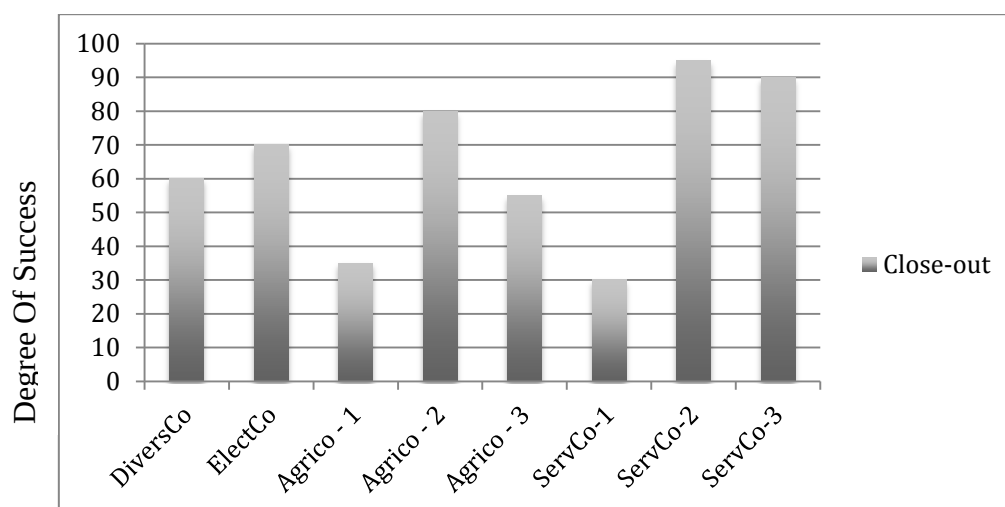


Fig 6.9: Close-out ranking between the 8 Projects

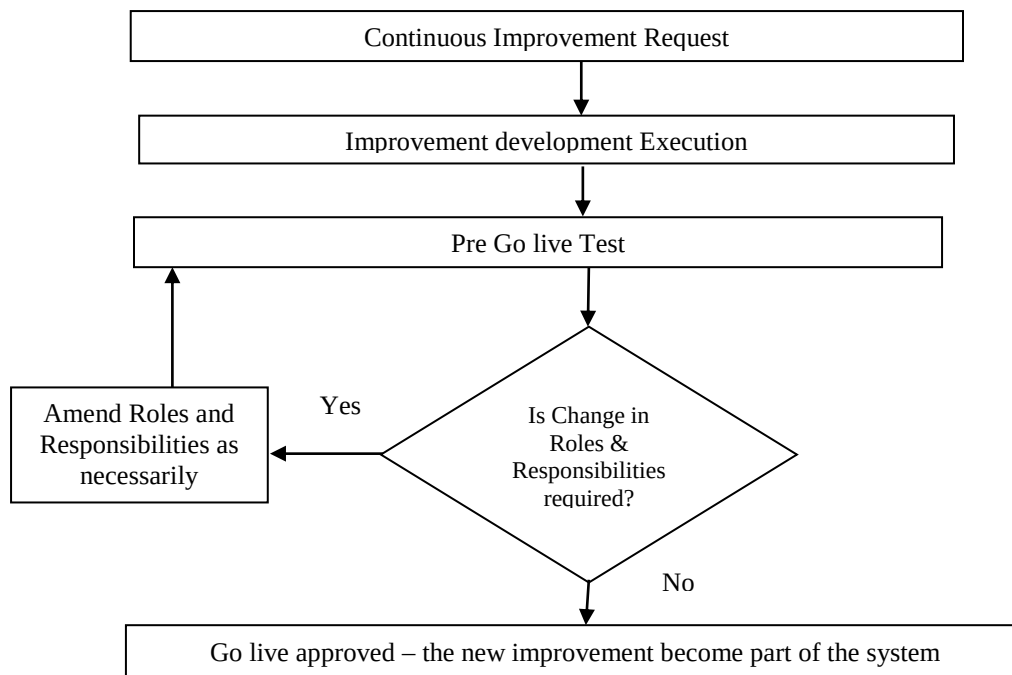


Fig 6.10: Roles & Responsibilities after Go-Live – ElectCo Case

6.3.5 Holistic Perspective - Comparative Analysis

This section addresses a number of elements that have been extracted from a holistic review of the comparative analysis of the four cases. It is divided into the below sections and subtitles.

6.3.5.1 Presence & Clarity of Business Strategy

The four cases demonstrate different practices in terms of the existence of the business strategy at the time of deciding to adopt ERP as a strategic IS business enabling tool (Table 6.31). Moreover, communicating business strategies to ERP planners at the time of deciding to adopt ERP and during the implementation process is another element across which the four cases show different behaviour and practices.

Table 6.31 Comparative Analysis – ERP Strategy perspective

Org	No	Strength	Weakness
DiversCo	1	Clarity of vision with GM.	Failure to obtain shareholder's commitment on implementing business strategy.
	2	Effective communication of business strategy to ERP team.	Lateness in identifying core vs. secondary business.
ElecCo	1	The company does prepare a three years business plan.	The business plan does not include any reference to corporate strategy.
	2	The approved ERP guidelines act as an ERP strategy.	The pressure to obtain IT strategy without developing corporate strategy.
	3	Effective communication of business changes to ERP team.	
AgriCo	1	The two health-check documents and the third cycle of ERP implementation plan cover several ERP strategies aspects.	The 1 st implementation cycle started without proper strategy.
	2	The second and the third implementation cycle have and implicit strategy.	Business strategy of the 1 st cycle is not communicated & IT strategies.
ServCo	1	The early consideration of ERP reflects the awareness of IS role to execute business strategy.	The absence of coordination between O&M contract and ERP implementation is an implicit sign of miss alignment between business strategy and ERP plans; and it reflects poor coordination between the two elements.
	2	A typical application of aligning ERP plans according to well-defined business strategy.	
	3	The 3 rd implementation cycle is: Excellent communication process between strategic directions and ERP implementation.	

6.3.5.2 Priority Management of Mission Critical Processes

A number of processes in every case were in more critical need of being reviewed, streamlined, optimised or reengineered through the implementation process (Table 6.32).

Table 6.32 Priority management of critical processes – Comparative Analysis

Org	No	Mission critical	Description	Special effect
DiversCo	1	Defining the core business.	Initially DiversCo did not distinguish any business unit as a primary business. At a later stage, contracting becomes the primary business.	1. Sanitary Implementation cost would have been saved. 2. Project modules would have been implemented. 3. Specialised S/W for fashion. 4. A middle tier ERP solution would have been chosen.
	2	For electro-mechanic SBU, to define the issue of selling non stock items.	The dominant practice that sales invoices include items that not in stock. Those items are purchased and included in the same invoice as the stock items.	The three ways matching between orders, receiving and shipping don't match in the system. Eventually the integration between sales and inventory disabled
	3	Real time invoicing and stock inquiry in the fashion business	The necessity to facilitate automatic invoice generation from the outlets. In addition to facilitating the view of the availability of the size and the color among other shops and warehouses.	All attempts made to satisfy those basic critical requirements failed and led to an inflation of the implementation cost, delaying the project and killing the morale towards using a system
ElectCo	1	Aerospace and defense A/E compliance.	Enforcements made until pre go-live to impose A/E compliance in all processes	A tremendous effort, time and consulting fee would have been saved throughout selection and implementation.
	2	MRP automation process	The insight analysis shows that ElectCo follows build-to-order manner. Most orders differ from each other which makes the full automation of MRP inappropriate	
AgriCo	1	New management initiated mega initiatives simultaneously	Those parallel initiatives lack priority settings and realistic implementation plans. At very advanced stages of the first implementation cycle, most of those initiatives either suspended or cancelled	The absence of priority settings, a distinction between missions critical vs. non-mission critical and failure to provide quick wins caused to turn the implementation effort into failure.
	2	Executives are not clear whether profitability is a priority.	Government is the prime shareholder and one of the founders of AgriCo. This is to ensure quality and continuity of supply of food and dairy.	The lack of defining strategic motives between profitability and continuity of services and products caused business managers to be reluctant to decide on business processes.
ServCo		Optimising warehouse and inventory management.	The inherited warehouses were huge and have never been organised or managed using any computer system.	The underestimation of the effort to organise the warehouses caused significant delay and hindered the implementation.
		Define the HR processes to accommodate government employees and newly hired.	The policies and procedures (P&P) includes only non-government employees.	HR manager could not use ERP to handle government employees. A number of work-around solution outside the system become a normal practice.
		O&M processes	No changes made to the existing processes as in effect of engaging O&M partner	The implementation collapse and admits its inability to accommodate the O&M practices and requirements.

6.3.5.3 Various Roles & Responsibilities Comparative Analysis

A comparative analysis of the overall management process of the roles and responsibilities among the four cases is summarised in Table 6.33. It includes the overall ranking of the roles and responsibilities management, the ranks of the use of third party consultants and a number of examples on the roles of the management of the roles and responsibilities to the success of the implementation.

Table 6.33 Roles and Responsibilities - Various Comparative Analysis			
Roles and Responsibilities Documentation (poor, fair, , Good, Very good, Excellent)			
DiversCo	ElectCo	AgriCo	ServCo
Poor	Very good	Good ¹	Excellent
The rank of the use/proper use of a 3 rd party to supervise the implementation (poor, fair, Very good, Good, Excellent)			
DiversCo	ElectCo	AgriCo	ServCo
<u>Excellent</u> A supervisory consultant was hired to do this task completely from selection until a few months after the go-live. The respect for his role was excellent, as the GM hardly accepted blame from the DiversCo team towards the vendor/implementor performance; the focus always shifted to fix the problem	<u>Fair</u> ElectCo did not hire a third party to assume this role apart of the limited involvement of the manufacturing consultant in a very few areas.	<u>Good</u> No independent or 3 rd party to cover the full implementation but the proper use of the health check partially filled this gap.	<u>Fair</u> No independent or 3 rd party hired to interfere. However, the proper use of the assessment process improved the implementation process.
The rank of the management of the roles and responsibilities in practice (poor, fair, Very good, Good, Excellent)			
DiversCo	ElectCo	AgriCo	ServCo
<u>Very Good</u> Despite the poor documentation of the R&Rs DiversCo ranked the best in terms of the distinction between R&Rs of the ERP vendor vs. the customer	<u>Very Good</u> Despite the poor documentation of the R&Rs, SiversCo ranked the best in terms of the distinction between R&Rs of the ERP vendor vs. the customer	<u>Good</u> ² There were only fair consideration of the R&Rs identifications and definitions however the effective use of the health check helped a lot to recover the R&Rs identification and application	<u>Poor/Excellent</u> ³ Despite the poor documentation of the R&Rs DiversCo ranked the best in terms of the distinction between R&Rs of the ERP vendor vs. the customer.
Examples of the effect of the management of the roles and responsibilities to ERP success (P: Positive ;N: Negative)			
DiversCo	ElectCo	AgriCo	ServCo
1. (P) The overall implementation survives despite massive strategic changes occur during the implementation. 2. (P) Huge cost would have been incurred if improper applications of R&Rs between vendor-customer and within customer stakeholders themselves. 3. (N) ITEM master migration plan resulted from the poor definition of the roles and responsibilities.	1. (P) Finance modules implementation successfully implemented. 2. (P) The overall implementation completed successfully (A plan vs. actual difference is good as per the literature). 3. (P) The organization became self-dependent and managed to support the system and initiate further improvements initiatives. 4. (N) ITEM master migration plan resulted from the week and disrespect of R&Rs. 5. (N) HR implementation had been , in reality, started after the contractual go-live date as a direct result of the ignorance of proper identification and application of R&Rs.	1. (P) The success of the 2 nd implementation cycle can be seen as a direct impact of the proper consideration of the identification and application of the R&Rs. 2. (N) The total failure of the 1 st implementation cycle can be seen as a direct impact of the absence of R&Rs identification and applications.	1. (P) Second implementor success is connected with proper R&Rs definitions and practice. 2. (P) R&Rs of the 3 rd implementation cycle are properly defined and strictly followed. 3. (N) The failure of the 1 st cycle resulted from poor R&Rs definition. 4. (N) O&M issues is a pure adverse effect of poor R&Rs management.
¹ This rank for 2 nd and 3 rd implementation cycles as the 1 st cycle was poor ² 1 st cycle Poor; 3 rd in Excellent			

6.3.5.4 The Role & Use of Supervisory Consultants

The four cases indicate the role and the significance of the supervising and advisory party in setting ERP plans. Different forms of engaging the advisory and supervisory party in the four cases are self-explained by Table 6.34. DiversCo case demonstrated the most effective use of the supervisory consultant, despite the limited budget assigned for his service in the implementation. For ElectCo, the engagement of the independent consultant advocates necessary decisions to be made, however, his roles and responsibilities were not clearly defined. Moreover, nobody was assigned for the role of supervising the entire implementation process. The CFO attempted to assume this role partially by requesting that the finance team participate in each implementation area to explore any implementation gaps that might eventually affect financials. For AgriCo, the use of the supervisory role is primarily focused on assessing the implementation outcomes for the first and the second projects. The role was extended to set up the second and the third project plans only without any involvement during the implementation process. The third implementation project in ServCo case represents a full involvement of the supervisory consultant that covers the three implementation stages. This is because of the parallel change program that supports the ERP plan which ensures the sustaining and the transfer of the knowledge. The first implementation project shows no involvement of the supervisory role, which as a result led the relationship between ServCo and the implementor to reach a dead-end state.

Table 6.34 The use of the supervisory consultant

Org	Supervisory Form	Involvement nature and Timing	Effect to the implementation	Roles and Responsibilities
DiversCo	Part time consultant	From ERP product initiation until several months after the go-live stage	Very positive Very effective	The scope was not well defined; however the execution shows clarity of the roles and responsibilities.
ElectCo	Consulting firm	Very limited to suggest starting document for the RFQ document preparation	Very minimal	Clear and documented
	Independent consultant	Five weeks divided into two visits (one week in the beginning and three weeks at later stage)	Limited however, his presence advocate ElectCo to take necessary actions to move forward	Not clear
AgriCo	Consulting team from ERP vendor site	Two health check assignments between the first and the second and between the second and the third implementation cycles	1. Their involvement after implementation. 2. Their contribution limited to the setup preparation, don't cover the continuous supervision of the execution	Clear and documented
ServCo	Consulting firms hired specifically to assess the implementation position	Comprehensive Assessment conducted after the 1 st implementation cycle; the second one after the expiry of the second implementor	1. The 1 st assessment restricted to the application only. 2. The 2 nd assessment included process and overall business issues.	Clear, comprehensive and documented

6.4 Summary

This chapter has presented the detailed findings of the case studies under discussion and analysed in detail the successes and failures of the eight ERP implementations over the course of four case studies.

This chapter has also sought to 1) provide an in-depth analysis of the case studies that have been described in details in chapter five and 2) engage in a comparative analysis that takes account of successes and failures across all the four organisations.

The complexities of each case make it difficult to categorise each implementation as an outright success or failure, with each company demonstrating mixed experiences at different stages of implementation.

However, this plurality of experiences, even within one company, presents extremely interesting findings. Correlation may be clearly drawn between factors such as effective management, communication and planning, and successful outcomes leading to higher ROI.

The results of the case studies indicate the critical importance of effective roles and responsibilities management, leadership and conflict resolution and staff training and education in bringing about successful outcomes for implementation. Furthermore, the role of key stakeholders should not be underestimated and a key theme emerging from the research is the need for a clear requirements definition and an evident business strategy. These themes will be addressed further in Chapter Seven in the discussion of overall findings.

The following chapter will build on this analysis, exploring the critical nature of roles and responsibilities management and providing a comparative analysis of all four case studies.

CHAPTER SEVEN

Discussion of Findings & Model Development

7.1 Introduction

This chapter is divided into two parts. The first part discusses the findings of the comparative analysis of the four cases using the literature review and the published case studies and surveys. The discussion is presented in line with three implementation phases 1) pre implementation, 2) implementation and post implementation including the go-live stage and continuous improvements. The second part attempts to derive the targeted framework based on the discussion of the findings of the first part of the chapter.

7.2 Discussion of findings

7.2.1 Discussion of Findings – Holistic View

7.2.1.1 Communicating Corporate Strategy to ERP Project Team: A Priority

The relationship between ERP success and strategic plan has been discussed in Chapter five section (5.4.2.3). It is a common mistake that organisations make strategic decisions during ERP implementation without considering how such decisions may affect the implementation outcomes. Such lack of communicating strategic changes to ERP stakeholders in a timely manner can adversely affect the ROI. DiversCo and ServCo are good examples of how fundamental changes in business strategy that evolved in the middle of ERP implementation can adversely affect ERP ROI. The sanitary division of DiversCo was sold after the completion of its related ERP implementation. Furthermore, the sudden strategic diversion towards contracting conflicted with the chosen ERP product that was selected to satisfy trade and manufacturing.

The contract with the O&M business partner, in the ServCo case, was not communicated in a timely manner to the ERP team. As a result, both business and ERP incurred considerable cost effects in terms of time and money to integrate O&M contracts with other business requirements, through the ERP implementation. The

ElectCo case shows how the implementation of planning modules failed due to an improper understanding of the business. The lack of clarity by AgriCo regarding the strategic priority settings between profitability and the continuity of supplying products meant that line managers were unable to decide on business processes.

The importance of aligning business needs and business strategy with ERP implementation and project plans are well-documented in the literature and is considered a significant parameter in determining success or failure of ERP implementation (for e.g. Davenport, 1998; Holland and Light, 1999; Kang et al, 2008; Millet, 2013; Oana, 2010). Davenport (1998), citing examples of Dell, Dow Chemicals and others where ERP implementations failed, attributes the main reason for failure in each case to the lack of the alignment of ERP systems with business needs. He opined that “the companies deriving the greatest benefits from their (ERP) systems are those that, from the start, viewed them primarily in strategic and organizational terms” (Davenport, 1998, p. 10). He even suggested that a firm should not invest in ERP at all until a thorough study of its business implications is done (Davenport 1998, cited in HsiuJu Rebecca and Chwen, 2004, p.208). Markus and Tanis (2000) emphasised the importance of building a “business case for investing in an enterprise system” in the chartering phase to decide on the go-ahead for the ERP system.

HsiuJu Rebecca and Chwen (2004), using case-studies of five large Taiwanese and US manufacturing firms, reiterated the importance of aligning competitive strategy and ERP plans and assert that “... many firms failed to recognize the benefits of ERP because of the lack of planning at the strategic level” (p. 218). Kang et al (2008), who conducted a study of 341 Korean firms who had implemented ERP systems between 1998 and 2001, conclude that clarity of ERP implementation objectives and ERP alignment to business needs produce better business performance. Oana (2010) stressing the same principle, investigated the relation between ERP’s “strategic alignment” and its successful implementation using data collected from 87 of the largest companies in the Nordic countries region through surveys. She found that the “results showed that the more the ERP system strategy was aligned with the business

strategy, the more likely that the ERP project was completed on budget and on time” (Oana, 2010: p. 164).

Ghosh and Skibniewski (2010) rate “ineffective strategic thinking and planning” as a key risk factor (RF) with maximum complexity. Their study was based on all likely risk factors mentioned in Moon’s (who compiled the same) review of the ERP literature (313 articles from 79 journals) from 2000 to 2006 (Moon, 2007). The alignment problem caused by lack of fit between existing business process and off-the-shelf standard vendor processes can decide the success or failure of an ERP implementation (Pnina et al, 2005). Thus, we can conclude with what Ike and Mogens (2005) state in their study: “Implementing an ERP system requires a thorough strategic thinking that allows companies to gain better understanding of their business processes” (p. 547)

7.2.1.2 People should not be considered as subservient to technology

It has been found from the cases studied that ERP can only generate its targeted benefits if stakeholders use it properly, something that can only be attained if the complete implementation process is properly managed. This is only achieved if process management and technology are considered to occupy a subservient role to stakeholders and not the reverse.

The analysis of the first implementation cycles in the Agrico and ServCo (section 6.2.4.3) cases demonstrate that people become servants to policies, procedures and technology. When people became subservient to policies and procedures, such as in the ServCo case, the implementation failed. This finding is supported by the literature; Deloitte (1999) makes it very clear that ERP, at its core, is a people project. In their study on justifying enterprise resource planning adoption, Oliver and Romm (2002) explore the justification for ERP through locating the debates surrounding the adoption of the system in the context of communication, rationality and domination. The types of domination of stakeholders which ERP is related to are technology, process and organisation. The paper contends that, in spite of the claims of ERP advocates to empower stakeholders to undertake their roles and responsibilities more efficiently, and with greater freedom, ‘there is some evidence to suggest people are

considered to occupy a subservient role to technology, process and organisation' (Oliver and Romm, 2002: p. 199).

7.2.1.3 The IT role versus IT department role

It has been found, in all the cases that have been investigated, that it is a common practice for ERP sponsors to rely heavily on the IT department for, and during, the ERP implementation. Examples from the four cases can be seen from the significant IT role in the ERP selection process (Table 6.18) where the process was led by IT departments and consultants. It was found that the IT department role facilitates and enables ERP implementation to succeed. However, this role is not and should not be stretched in order to perform activities that should be handled by business departments. Despite this, confusion remains with end users who tend to believe that the IT department is fully responsible for the ERP implementation and success.

Standish Group (1999), by conducting a survey of all IT projects in America in 1998, stated that project management must understand the different roles and responsibilities of stakeholders, and commented that "IT must clarify roles and responsibilities early on by defining the rules of engagement" (Standish Group, 1999). Alsalem (2009), in his study of a finance company in China, demonstrated how ERP implementation failed when it was perceived as a purely technical issue, to be dealt with solely by the IT department. The study also demonstrated, however, that when senior managers began to convey their enthusiasm for the new system to the whole company through newsletters, and through extolling the virtues of the new system verbally to employees, retailers and suppliers, the failing implementation is turned to success.

The lesson that can be learned from the AgriCo case is that they assigned a project manager for the third implementation cycle from the business side of the company (See section 6.2.3.3.1), which conveyed a clear message that ERP is a business (non IT) initiative. ERP sponsors, however, needed to ensure that the role of IT and the technical aspects was clearly understood. This is essential for end users to distinguish between pure technical tasks where the IT department is to be involved and the non-technical issues, where business stakeholders are to be involved. Pabedinskaite (2010)

argues that ERP managers need to ensure that the teams responsible for ERP implementation do not become polarised between ‘technical’ and ‘non-technical’ issues. There needs to be effective communication between technical and non-technical staff, so that everyone understands the common vision and purpose for which the implementation is designed to serve. Effective bridging between the technical and non-technical issues should also, according to Pabedinskaite (2010), contribute to a holistic sense of ownership of the project. Opening up channels of communication in this way signals a welcome shift away from traditional, linear, conceptions of IT project management.

The comparative analysis of the go-live findings (see section 6.3.4) demonstrates why ServCo successfully passed the go-live stage. The ServCo College, by adopting ‘train-the-trainer’ concept, played a significant role in bridging a gap between technical and non-technical issues. Through the proper selection of various candidates from the business side, supported by a well-developed syllabus that combined necessary ERP knowledge with business knowledge, qualified in-house trainers became effective in bridging such a knowledge gap among a wide range of end users.

Arlbjorn & Haug (2010) emphasise the importance of senior managers impressing upon all stakeholders the way in which ERP implementation relates to the company’s overall goals and mission statement. This also links with the sense that the change should be sold as a wholesale ‘institutional’ change, and not just a change related to the technical side of the organisation.

7.2.1.4 The impact of the Post Implementation Management on ROI

The holistic review of the cases investigated (See section 6.3.5) advocates the need for ERP sponsors within the organisation to strengthen their long term outlook of ERP, especially their understanding of the importance and nature of the post implementation plans before the implementation process was begun. The understanding of the expected performance dip (Figure 6.8) is significant. It can lead ERP sponsors to plan for a number of actions. First, they may prepare necessary plans to improve the ERP learning curve, thus gaining performance efficiency. Second, they can plan to maintain the attitude of the taskforce by communicating to them that a

performance dip is normal in the implementation process. Third, it enables them to assess and mitigate business risk that might result from such a performance dip. Four, they are able to develop a contingency plan that includes suspending the implementation of some modules in case the exposed risk is found to be difficult to deal with. Fifth, they can ensure a smooth transition from the go-live to the continuous improvements stage.

As Esteves and Pastor (2002) note, it can be difficult to define the roles and responsibilities of stakeholders in the ERP implementation process. The definition of what each stakeholder should do, can be difficult as some roles and responsibilities can overlap, meaning that it is not clear which roles and responsibilities should be assigned to which stakeholder. What is clear, however, is that the roles and responsibilities should be assigned with a view to ensuring that the overall aim of the organisation, with regards to the ERP acquisition and implementation, are met and that there is no conflict between the roles and responsibilities and the achievement of this in the short and long term (Esteves and Pastor, 2002).

As Nah et al. (2001) note, of the eleven factors they identified as being important in the success of ERP implementation, one of the main factors is the assignation of clear roles and responsibilities across the stakeholders and the appointing of a project champion who is responsible for overseeing that all assigned responsibilities are met with a view to ensuring the overall success of the project. As Liu (2009) discusses, it is important for all staff and people involved in the ERP implementation process to be aware of what is expected of them, and what the organisations' motivations are for choosing to implement the ERP, as only when all staff are following the organisations approach to this process will the process be successful in the long term. Failing to ensure that the organisational culture is supportive of the ERP implementation will fail the organisation in the long term, in terms of reducing the likely ROI of the ERP (Liu, 2009).

Therefore, for higher ROI to be achieved ERP sponsors need to advance their understanding of the characteristics of the post implementation nature and process; going live with ERP is, after all, the end of the beginning of a more rewarding, long-

term journey (Deloitte, 1999). The importance of the post go-live phase has led some researchers to suggest that ERP implementation should be viewed as two phases separated by the go-live. Willis and Willis-Brown (2002), for instance, identify two key stages of ERP implementation that businesses must accommodate in order to ensure a successful and smooth transition. Phase one refers to the period in which the old legacy system is phased out and the ERP system 'goes live'. The second phase refers to measures which the company must take following the 'go live' stage. The authors again emphasise the importance of both stages to the success of the implementation, warning against an exclusive focus on the pre-implementation phase.

The common mistake by ERP sponsors is to view the 'go live' stage as an end goal. This represents a high risk as most of the ROI gains can be realised after the proper management of the post 'go live' stage. As Zafeiropoulos et al. (2005) discuss, by ensuring that all potential risks pertaining to the successful implementation of the ERP are identified, and possible solutions for mitigating these risks addressed, the organisation can help to maximise their long-term ROI for the ERP. By using risk management techniques in this manner, the organisation can mitigate the potentially negative effects of failing to plan, thus decreasing the risk that the ERP implementation will fail.

Such a common mistake, to fail to plan for risk management, is unfortunately confirmed by recent studies, such as that presented by Bharat (2012), who noted that a widely prevalent failing amongst senior managers is to focus almost exclusively on the initial stages of ERP implementation, and to view the 'going live' stage as the end goal. A consequence of this is that the ERP systems that are introduced tend to be generic in nature and not tailored to the specific needs of the company. Although there may be short-term advantages to this emphasis on the pre-going live stage, in that it tends to ensure that deadlines are kept, and that budgets are adhered to, the long-term consequences are negative.

7.2.1.5 The dilemma between in-house training vs. consultants hiring

The four cases show different forms of training management 1) investing in training local staffs and 2) hiring and using consultants (Tables 6.18 and 6.2). The

comparative analysis did not specifically advise on the budget distribution between the two elements. At one extreme, the DiversCo case demonstrates more reliance on the in-house training with very minimal hiring of consultants. ServCo, in the other extreme, demonstrated in the first and the second projects an excess use of consultants. ServCo invested heavily in both directions by creating the ServCo College that uses both hiring consultants and investing in training. In the ElectCo case and the second project of AgriCo a balance was demonstrated between hiring consultants and in-house training.

Kraemergaard & Moller (2000) highlight the problems inherent in employing external ERP consultants to assist with ERP implementation. They point to problems of consultant shortages in general, and also problems involved in managing them effectively once they have been appointed. Although the price of hiring external ERP consultants can be low compared to in-house training, the total cost for ERP implementation can still be '3 to 5 times the purchase price of the software'. The training of in-house employees can be very costly, since a huge investment is needed to send the employees on training programs, and to employ extra temporary help to cover these staff in their absence. Once trained, such staff may also find they are in demand from other companies, and so there is the risk that they will leave the company to work for a competitor.

The analysis of the four cases (Section 6.3.2.2) presented this dilemma, between the cost and benefits of hiring external consultants and in-house training. It shows how the investment in people can generate future ERP benefits. These benefits include reducing consultancy fees and generating the ability for the organisation to handle ERP continuous improvements after the go-live stage. This is achieved through a focus on training the trainer and developing trainers within the organisation. In other words, if the organisation provided early ERP training investment it can expect higher ROI.

The finding presented by Figure 7.1 that is adopted from the eight projects of the four cases can suggest a general relationship between early training and the ERP ROI (Figure 7.2).

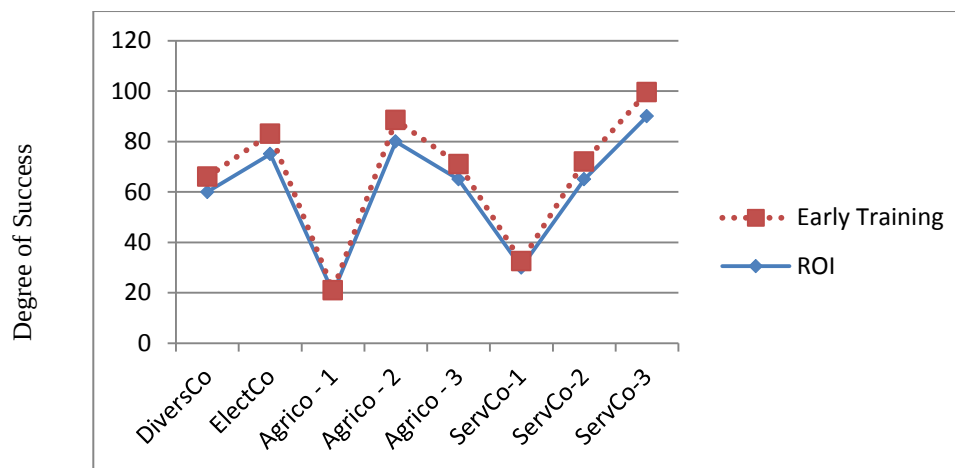


Figure 7.1: Relationship between early Training and ROI based on Implemented Projects

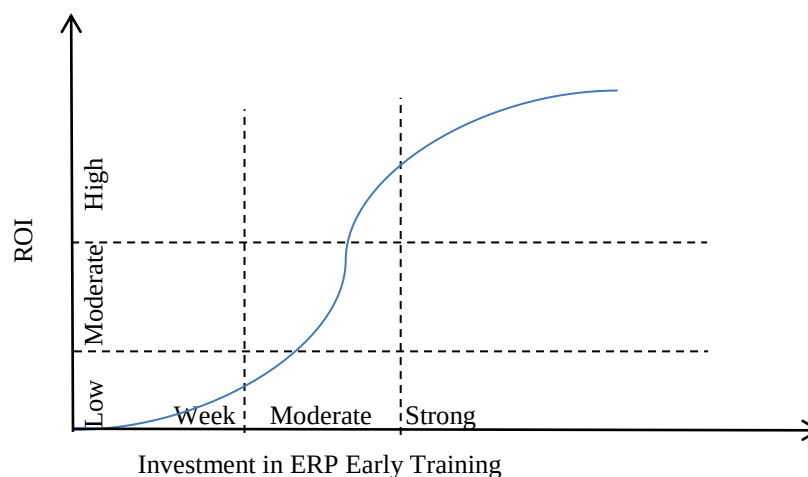


Figure 7.2: Generic relationship between early training and ROI In ERP Implementation

It can be seen, from the comparative findings that qualified members who demonstrated ERP knowledge have not relied on the standard ERP training provided by ERP vendors and implementor. This has been confirmed by researchers such as Alrashid and Al Mashari (2005) who analysed two successful cases. The researchers found that the concept of ‘train the trainer’ is very effective to the success of the implementation. However, the researchers also found that for ‘train the trainer’ to produce optimal results it should be supported by other initiatives. This includes placing more emphasis on self-learning, availability of training infrastructure, adequate support from consultants and incentive schemes for both trainers and trainees.

Barker et al. (2003), through the use of a case study, highlight a number of opportunities and pitfalls associated with the hiring of both internal and external individuals for the purposes of implementing ERP. One of the pitfalls outlined was the hiring of internal people with insufficient experience. Hiring candidates with only a few months experience on the job, who were new to the industry, or in some cases only recently graduated from college, was not a sound strategy in the case study they describe. Familiarity with the current business processes is deemed by Barker et al. (2003) to be essential, and senior managers must sacrifice the time of these experienced individuals normally devoted to routine day-to-day duties for the long-term benefit of successful ERP implementation. In recognition of their achievements, senior management should provide rewards/incentives at particular milestone points in the implementation process.

As Smith et al. (2011) note, project managers can become very stressed when managing a project such as the implementation of an ERP system. This can, in turn, affect their attitude towards the ERP system, which can, in turn, affect the approach they have towards the training of staff and the opinions they give to other staff about the ERP system. Having project managers who are stressed, and pessimistic about the ERP system will, essentially, mean that the ERP system comes to be seen, by the organisation as a whole, as something that is negative (Smith et al., 2011). This can mean that the ERP system is viewed negatively across the organisation, this meaning that its implementation is not as optimal as it could be and that attitudes towards the ERP are not conducive to the ERP functioning at its optimum capability. This, ultimately, means that the ROI for the ERP will not be as high as it could be, thus having an overall negative effect on the company's performance. Research by Smith et al. (2011) suggests that it is important, therefore, that the organisation does all it can to ensure that the project manager, or the person responsible for overseeing the implementation of the ERP system, is kept as stress free as possible. This means having clear and open communication channels and providing opportunities for the project manager to vent any frustrations they might have. Managing the implementation of an ERP is dependent, after all, on the staff chosen to plan and manage the implementation process.

7.2.2 Discussion of Findings - First Implementation Phase

This section will consider the findings from the comparative analysis of the first implementation phase that begin with initiating ERP in the organisation until the contract is signed with the ERP vendor and the implementer.

7.2.2.1 ERP Initiation Forces in Organisations

The forces that initiated the decision to implement ERP in the four organisations (Figure 6.7) indicate the internal and external stakeholders involved in this process.

The drivers for adopting ERP are consistent with the findings of Buonanno et al. (2005) whose literature review explored the internal and external factors that drive organisations to consider ERP; sixteen drivers were discovered (Table 7.1).

Saatcioglu (2009) looked at the important drivers for organisations to consider during ERP implementation, finding that organisations see ERP as a holistic solution for many of the problems facing their organisation.

Table 7.1 Drivers for ERP Initiation (Buonanno et al., 2005)

No	Driver	No	Driver
1	HW/SW obsolescence	9	Dissimilarity of procedures
2	Euro issue	10	Logistics issues
3	Y2K issue	11	High cost of data distribution
4	Unsatisfactory process integration	12	Forced decision (by a controlling company)
5	Unsatisfactory order management	13	Data redundancy and/or inconsistency
6	CRM issues	14	Stock control issues
7	Limited decision support	15	Unsatisfactory time-to-market
8	Lack of flexibility	16	Other reasons

Other researchers, like Ike and Mogansc (2005) found that improving internal business processes represents the primary force for implementing ERP. The other forces that relate to the customer, competitor or market are secondary forces. As a result, the researchers emphasised to the importance of identifying these forces at early stage of the implementation. Ike and Mogens (2005) reached these conclusions after they conducted a survey of 36 companies who had implemented ERP in the US Midwest, and attempted to discover the drivers for ERP implementation. They state that “the key driver for ERP was the internal business process with 67% of the respondents affirming the need to streamline” the same (p. 550). The other important drivers, they found were competitors, customers and market climate. It thus becomes

important to identify these drivers early and correctly to set clear objectives and goals for the ERP project.

7.2.2.2 Lack of ERP understanding by its Sponsors

The holistic review of the comparative analysis indicates strategic strengths and weakness for each case investigated (Table 6.19). This comparative analysis and the analysis of the early ERP activities of each case (see section 6.3.2) lead to several findings. Firstly, all organisations except ElectCo, tended to follow a rapid approach to fully implementing ERP. Secondly, the ERP sponsors of the four organisations demonstrated a lack of understanding of the precise meaning of the ‘as-is’ implementation approach. Their implicit understanding proved to be limited to the configuration requirements of the system that would be conducted by the ERP consultants. In other words, their perception is that ‘as-is’ is similar to the installation and deployment of the stand-alone software packages.

Most of the efforts at the planning and preparation stage is dedicated to the evaluation of the product functionalities of the different ERP products. It is observed, among the cases being investigated, that ERP is a project that primarily needs budget allocation in order to purchase software licence and consultants fees. There has often been an inadequate effort towards merging ERP implementation with other supporting initiatives such as business process management, learning or change management.

The most senior managers represented by the GM, the CEO and board of directors were, for example, largely unaware that ERP is a long-term initiative with a widespread impact on operations. There was no evidence from most of the different ERP projects by the four cases that can demonstrate that the ERP sponsors, who were empowered to take ERP investment decisions, understood the true benefits of ERP to the organisation. It seems that the ERP sponsors do not view ERP as a powerful vehicle to promote, facilitate and sustain organisational change that has the power to transform the organisation and lead the company to achieve competitive advantage.

The lack of understanding, by ERP sponsors, of the nature of ERP and how it can transform the organisation generates negative consequences. Firstly, inappropriate decisions are made regarding the scope of ERP implementation. Secondly, the ERP

objectives are not set properly. Thirdly, the organisation is unable to properly define stakeholders and establish the definition of the roles and responsibilities that govern their relationships and their involvement in the implementation. Fourthly, since both the scope and detailed objectives were poorly defined, the organisation ignored identifying the ‘mission critical’ processes (Table 6.31) that needed to be streamlined, improved or re-engineered, in order to achieve the performance targets; the ERP sponsors often have the perception that the ERP would automatically handle this issue.

This lack of understanding by the ERP sponsors, which led to the poor definition of the scope and objectives of the ERP implementation and usage had, overall, a significant adverse effect on the ROI, owing to the delay in implementation of the ERP, inefficient process management, additional costs and failure to achieve significant ERP functionality. This, as a result, led to declining performance, to increasing the implementation costs and to failing to achieve significant ERP benefits. Figure 7.1 shows the correlation between the lack of understanding of the nature of ERP by its sponsors and ERP failure.

From this finding we can draw the following two conclusions: the lack of understanding of ERP by its sponsors leads to 1) inappropriate identification of stakeholders and 2) poor definition of roles and responsibilities (Figure 7.3).

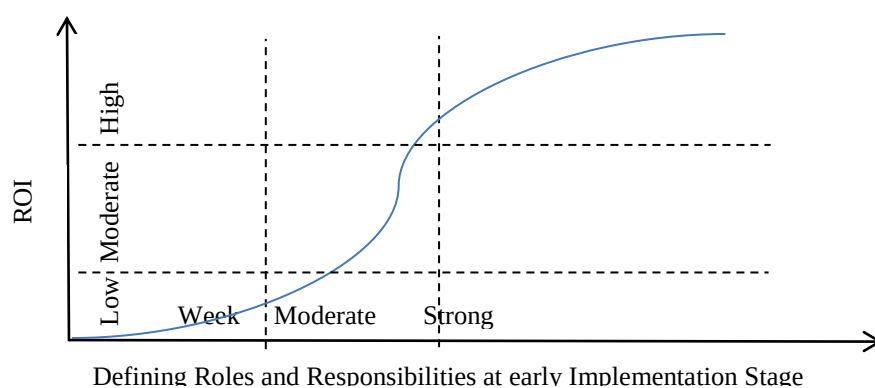


Figure 7.3: Relationship between early definition of roles and responsibilities and ROI

Other researchers support these findings. Murphy et al. (2012), for example, emphasised the problems that can arise from senior managers having a narrow view of the ERP system implementation, in particular one that fails to appreciate the inter-

relationship between the ERP software and all the other departments that comprise the business. Senior managers must resist the temptation to view ERP as a process disconnected from other business processes and must, instead, assume a holistic approach to facilitating business operations.

Furthermore, the literature supports the view that the success of ERP is greatly influenced by the morale of the sponsor. The role of the sponsor should be clear and consistent from the first day to the completion of the project. The project sponsor must provide strategic ownership of the project and ensure that senior management are made aware of the goals and expected outcome of the project. The sponsor of the project is instrumental in ensuring that the top level management is committed to the implementation of the ERP system. The sponsor has the ability to set timelines and goals to be achieved during the implementation of the project and compel the senior executive to work towards realising these goals. The sponsor should also be a member of the steering committee that is mandated with the duty of ensuring that the project is successfully completed.

Various authors have documented the roles and definition of the project sponsor or champion. Roure (1999 p.4) defines a project champion as “any individual who made a decisive contribution to the innovation by actively and enthusiastically promoting its progress through critical stages in order to obtain resources and/or active support from top management”. Based on this definition, a project sponsor should evaluate the information, choose to install the system, motivate the top level managers to support the system and provide a guarantee that all materials and resources will be availed during the implementation of the project. According to Kale (2000), a project sponsor is a member of the steering committee who is actively involved in the process of maintaining the project credibility and is committed to supporting the implementation of the ERP system through all the phases.

The role of the project sponsor differs from that of a manager in that his role is mainly that of the steering committee chairman, while the manager oversees the implementation of the day to day activity during the implementation phase. The main functions of the sponsor are, therefore, that of ownership of the project and leadership

of the steering committees to ensure that the implementation process is successful. The project sponsor is also the final budget authority and is responsible for ensuring that the ERP project is funded as per the requirements. Lack of sponsor commitment may result in underfunding, lack of resources and delayed payments, which affects the success of ERP systems. The change management process that results in business disruptions must be authorised by the project sponsor and hence, he plays a critical role in the development of the project.

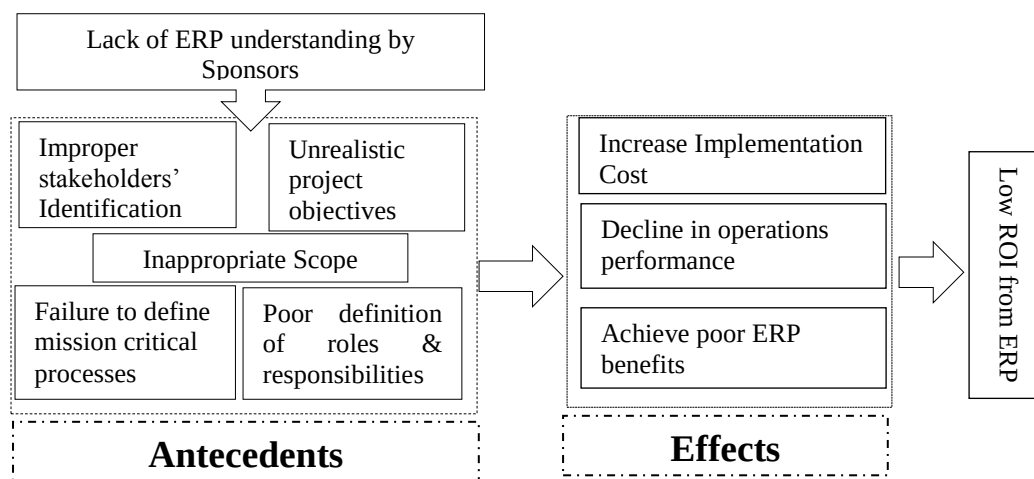


Figure 7.4 'Impact on ROI of a lack of understanding of ERP'

Murphy et al. (2012) highlight the fact that in the cases in which a narrow perspective is taken, there tends to be a failure to comprehend the impact that the ERP will have on organisational culture. In order to prevent such adverse consequences to the implementation outcomes, Murphy et al. (2012) recommend that senior managers adopt a more holistic attitude to ERP.

Senior managers were cited by Grabski et al. (2011) as visualising the ERP process as linear, characterised by a start, middle and a clearly defined endpoint. This is, essentially, a mechanistic attitude, which relegates responsibility for the project to a few individuals in the IT department. The consequence is that the overall success of the implementation is endangered. In order to avoid this error, Grabski et al. (2011) emphasised the necessity for ERP sponsors to take a holistic view of implementation and to engage the whole company in the ERP implementation process. Grabski et al. (2011) emphasised that all stakeholders need to understand the institutional nature of

the change. The conceptualisation of the change via a wholly traditional project management model is to be avoided, rather, senior managers should be acutely aware of the impact ERP has on organisational change and the employees who will use it.

Boyer (2001), in his case-study detailing the Go-Live and Final preparation stages of a ERP system MERLIN (Boyer was the project sponsor as well) set up to replace legacy systems for a US County, comments that

“a well-defined organization chart and clear roles and responsibilities are particularly critical. The project sponsor should communicate project organization, roles and responsibilities to the project team from the beginning of the project. Obtaining agreement on individual roles and responsibilities helps to set expectations up-front so as to avoid confusion later in the process.” (p. 41).

7.2.2.2.1 Lack of Definition of Roles and Responsibilities

As demonstrated in Figure 7.3, organisations are expected to lose a lot of the ERP capabilities and benefits if they proceed from the selection to the execution stage without clearly defining roles and responsibilities among stakeholders. The four cases show (section 6.3.2.2 and Table 6.18) that the dominant practice that both the pre-selection and the selection processes focus on is the functionality comparison between ERP products. Inadequate considerations were made, by the ERP sponsors, to prepare the organisation for the change derived by ERP (Table 6.19). Similarly, the comparative analysis demonstrates (See section 6.3.2.2) inadequate efforts in defining the roles and responsibilities among the various ERP stakeholders before the implementation started (Table 6.21). More precisely, this deficit is observed while the organisation moves from the preparation to the implementation stage.

It can be noticed that the implementation projects where roles and responsibilities are defined early (Table 6.21), achieved highest ROI. Similarly, the most failed implementation projects are the ones where the definition of the roles and responsibilities at the preparation stage is poor. For instance, the second implementation of AgriCo and the third one of ServCo achieved the highest ROI among the eight studied projects, leading to correlation of ERP success with the proper definition and communications of the roles and responsibilities before the beginning of the implementation (Figure 6.6).

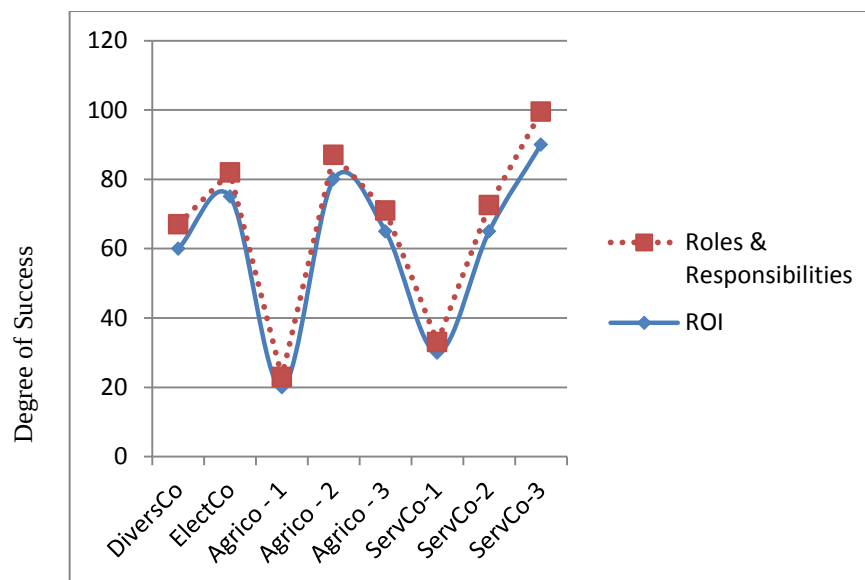


Figure 7.5: Relationship between definition of Roles and Responsibilities and ROI

The relationship strong between the definition of the roles and responsibilities at early stages of the implementation and the higher ROI suggest that this relationship may be generalised as presented in Figure 7.3.

This lack of attention to the stakeholder roles and responsibilities led to the second finding, that organisations neither engaged with nor empowered any party to develop and manage these roles and responsibilities. Finally, the comparative analysis found a lack of understanding of the relationship between the ERP vendor, implementer and customer. Despite the fact that the ERP sponsors describe the relationship with ERP vendor and implementor as a partnership, it is widely found that this concept was inadequately communicated to the taskforce.

The comparative analysis also demonstrated that implementation success cannot be obtained by a one-time definition of roles and responsibilities. Defining roles and responsibilities should be treated as a dynamic process with flexibility to amend these as the business and implementation require. The ElectCo case, for example, demonstrates the discussion between material and production on the issue of who should lead the planning process. This example indicates that roles and responsibilities definitions are expected to change during the implementation process.

Similar to the planning discussion, AgriCo, decides to transfer ERP project ownership from IT to the business side. The primary reason, as per the report prepared by

consultants, is to make business people responsible for ERP results. For ServCo, the key user was replaced due to persistent conflict with the consultants, and the in-house applications consultant was dismissed due to poor performance. Furthermore, a new department was created and assigned high ERP performers to manage the process of completing pending ERP tasks and continuous improvements.

Finally, the comparative analysis indicates that arriving at well-defined roles and responsibilities between ERP vendors, implementor and client is a challenging process. The greatest challenge was found to be in the management of internal stakeholders who tend to shift the responsibilities to the implementor. The HR in the ElectCo case is a good example of how difficult it can be to manage internal stakeholders. It took the project manager two years to put HR implementation on track. Most of the struggle in the third ERP project of AgriCo centred on the resistance to change from the internal stakeholders. This is clear from the issues of the costing method and the integration of the sales transactions. The automatic invoice generations for both electro-mechanic and fashion in DiversCo case represent a good example in this manner. All stakeholders involved in this process were unaware in adequate detail how the new system was affecting these two important processes and what was required from each individual stakeholder. This leads to the conclusion that the ERP sponsor and the project manager need to be aware that it is crucial to communicate to stakeholders how the new system is going to affect them.

This finding is precisely supported by Tiwana and Keil (2009) who argued that, in order for ERP implementation to be successful, senior managers must have a thorough understanding of the way the new ERP system will impact upon all stakeholders in the organisation. Roles and responsibilities must be clearly defined as this ensures that there are no serious project management, communication problems or conflicts and confusion later. This is even more crucial as any ERP project team is a cross-functional one and companies often cannot find the resources to let all ERP project team members work solely on the ERP implementation alone; many individuals work on multiple projects at the same time (Ike and Mogens, 2005).

Hossain et al (2011) in their case study of six Saudi organizations found some interesting evidence pointing to the dangers of unclear role definition in ERP projects.

For instance, they found that during the chartering phase in one organisation, top management interfered with the selection of ERP system vendors. They also found cases of reluctance by top management to change business processes and refusal by owners and top management to delegate authority to low-level employees in the shakedown phase. Clear definition of authority and early delegation and proper stakeholder agreements could have prevented these severe problems in EPR implementation.

7.2.2.2.2 The Role of the Requirements Definitions

The comparative analysis of the findings (Tables 6.21 and 6.22) shows the relationship between the definition of ERP organisational requirements and the ROI. If the organisation defines its requirements in a clear manner, ERP ROI is expected to improve. As per the examples mentioned from the cases (Table 6.21), the adverse effect of the poor definition of requirements to the ROI definition was found to be underestimated.

The base for defining requirements is seen to be limited to the input received from end users who explained only their departmental needs. This was evident from the narrow, departmental focus of requirement definition gathering in the companies studied, in which departmental interest is served at the expense of efficiency targets at the level of the whole organisation. No adequate effort is seen to capture the business requirements from a holistic manner. If this is done, then defining requirements to be assessed against the business processes that involves cross-departmental requirements definition. It has been found that end users and consultants are aware of this requirements definition gap. However, there is no stakeholder found to be responsible to fill the gap of the holistic and cross-departmental requirements definition.

Researchers like Pnina et al (2005) emphasize that proper “gap analysis” is necessary to prevent future implementation difficulties. Those difficulties are expected from the mismatch between the standard ERP processes and the existing business practices. To resolve this problem by determining the extent of configuration/customisation required is “critical to the success of an ERP implementation project, since it determines the future processes of the enterprise” (p. 640).

7.2.2.3 Organisational Readiness vs. Roles and Responsibilities Management

Organisational readiness, which involves several aspects, including conducting initial assessments and development plans in order to prepare the organisation for the change associated with ERP implementation, was found to vary considerably in the four organisations (Table 6.19). The relationship between readiness for ERP and ERP success can clearly be seen in the results of the comparative analysis. DiverSco and ElectCo achieved better results in readiness and building ERP awareness, having succeeded in reaching the go-live. On the other hand, AgriCo and ServCo, which demonstrated minimal readiness, failed to reach the go-live and they ended up starting a new implementation project.

Efforts to improve readiness (as shown in Table 6.20) can be described as informal, poorly organised and not considered as a priority. In other words, the comparative analysis indicates that there is an underinvestment in the effort of analysing the organisational readiness for implementing ERP. This is because the lack of readiness is followed by inadequate efforts to improve awareness of the magnitude of change required to derive optimal ROI of ERP. Consequently, no effort is expected to define the roles and responsibilities among the stakeholders towards leading the change that is derived from ERP. The readiness deficit, therefore, acts as an obstacle to understand the significance of identifying stakeholders and the roles and responsibilities to govern their relationship.

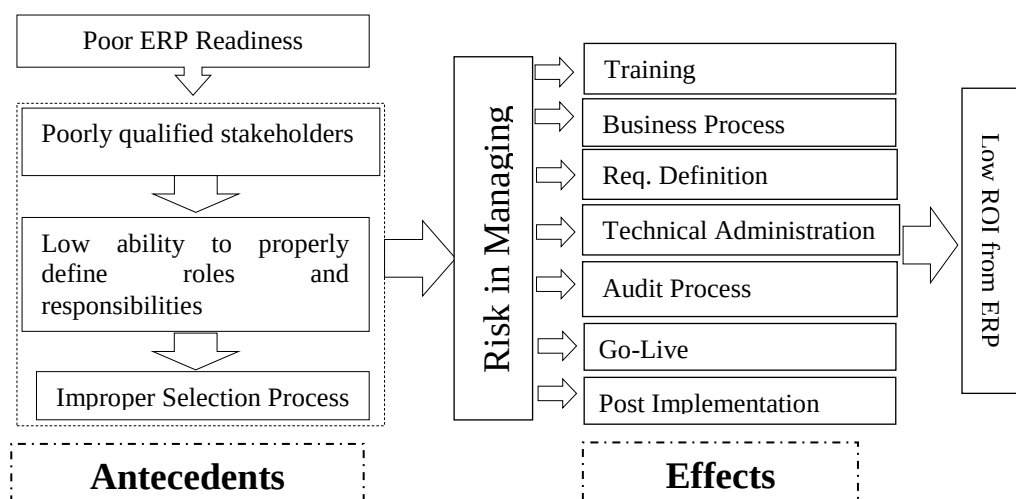


Fig 7.6 Impact of poor ERP readiness on ROI

As indicated in Table 6.33, DiversCo and ElectCo achieved a ‘very good’ rank in defining their roles and responsibilities before the implementation process started. On the other hand, AgriCo and ServCo achieved a ‘poor’ rank in defining their roles and responsibilities in the first implementation. Given the success that DiversCo and ElectCo experienced, it indicates that proper and adequate investment in ERP readiness leads to ERP success through effective definitions of roles and responsibilities among stakeholders. This finding is demonstrated in Figure 7.6.

A review of the literature in this area demonstrates that ERP is not just a standard business initiative but represents a revolutionary, massive change management exercise. As Beheshti (2006: p. 184) states:

“ERP are designed to improve competitiveness by upgrading an organisation’s ability to generate timely and accurate information throughout the enterprise and its supply chain”.

Researchers argue that such a complex initiative requires a company to be ready and prepared prior to tackle the implementation of such a project; for instance, Al-Shawi (2007: 189) confirmed the importance of conducting a readiness assessment before tackling a large IS investment:

“It is important that organisations identify their level of readiness to integrate new IS into their current operations prior to committing large investment into the development and implementation of these systems”

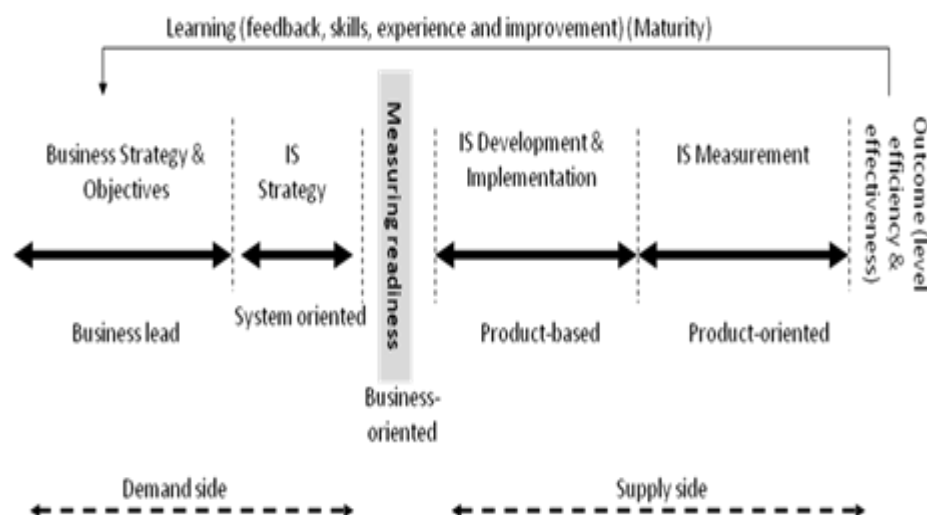


Figure 7.7 Introducing “measuring readiness” Phase (Alshawi, 2007)

Al-Shawi (2007; pp. 191-192) justifies his opinion and recommends that the assessment should take the form of guidelines, which functional managers can use to assess the organisational gap, prior to the commencement of any new IS investment.

Al-Shawi (2007) describes the readiness assessment phase as:

“The new phase will provide an organisation with an early warning of the risk level that they might face during the implementation of a new IS and therefore will act as a risk measurement (to) buffer”

As shown in Figure 7.7, the timing of the readiness assessment phase is suggested to hold a pivotal position in a continuous circular process of IS development within the organisation. Shafaei and Dabiri (2008) developed an EFQM-based model mapped to common ERP CSFs to assess enterprise readiness for ERP implementation and applied the model on an Iranian CNC machine manufacturer, intending to implement an ERP system. They concluded that the organisation was not ready for ERP.

Baki et al. (2004) conducted a retrospective investigation on the readiness of 47 Turkish companies from different sectors who had already implemented ERP systems of major vendors using a simple and practical organizational assessment checklist (OAC). The data was collected from surveys (questionnaires) sent to the target companies using ERP systems. They concluded that only seven of 47 companies (14.9 per cent) scored above 90 points, the cut-off for them to be considered full ready for ERP implementation.

7.2.2.4 Training vs. Roles and Responsibilities Management

The analysis of the research findings shows that training has a positive impact in mitigating the risk presented by the lack of readiness. Table 6.21 shows that, due to their early training preparations, ElectCo achieved good implementation results and had a smooth go-live process. Based on the previous discussion (see section 6.2.3.6) the holistic view demonstrates that, apart from HR area, ElectCo considered training to be a priority, and this can be evidenced from the company's non-stop commitment to all types of training.

The AgriCo case clearly demonstrates how the inadequately integrated training plan that was intended to cover the period beyond the application training, resulted in the

first failure. As described in Table 6.13, ineffective roles and responsibility training management led to the first implementation failure.

The health check conducted between the first and second implementation cycles is evidences this, stating that:

“There was no training plan in place and the training material that had been handed over to end users was:

- Limited to demonstrating how to navigate and access the system
- No indirect training process was conducted, since AgriCo users were completely disengaged from the process of building and configuring the system
- All end users explained that the training was inadequate, unplanned and limited to specific parts”

There was, in fact, no training plan that linked ERP training with business practices, for which a comprehensive plan was required. The health-check report states:

"The implementer is requested to:

- Ensure the members of AgriCo IS Department and key users of the modules that are not yet implemented are adequately trained; this is necessary to make sure that the modules, which have already been built and configured can be maintained before implementor complete their assignment
- Evaluate the training process, end user requirements and prepare integrated plans to retrain end users
- Design training as documented in the approved implementation methodology
- Link the training between system capabilities and the AgriCo business practices”

On the other hand, the second implementation was successful due to the proper definition of training roles and responsibilities (Table 6.13).

In DiversCo, the ERP sponsor was conscious of the wisdom of commencing training at an early stage in the implementation process. He demonstrated a high awareness of the significance of training (Table 6.20). Owing to budget and resources constraints, this early-stage training was limited to basic ERP training and the demo sessions that were offered by the ERP vendor. However, different forms of training methods were used that fit with the small training budget.

The investment in staff development enabled DiversCo to successfully reach the go-live stage. This can be demonstrated by the fact that, through the use of local resources, DiversCo succeeded in maintaining technical support and continuous improvements that relates to ERP. The influence and motivation of the ERP sponsor succeeded in promoting a self-learning culture in DiversCo case. The best example of this is that one of the accountants succeeded in resolving ERP application support issues that the implementer was unable to handle. The same accountant made several other improvements, including leveraging ERP features by introducing innovative scenarios and new ERP features. Eventually, those innovative initiatives led to business process improvements.

The ServCo College led to the success of the third implementation cycle (see section 6.2.4.5). The knowledge transfer that resulted is a direct result of the detailed definition of the roles and responsibilities (Figure 6.5). The comparative analysis undertaken arrived at the conclusion that ROI is strongly related to appropriate investment in training before implementation commences. Early training has been seen to enhance the decision-making processes surrounding ERP. It led to a more effective management of roles and responsibilities amongst the diverse range of end users. It can assist in defining a comprehensive responsibility matrix, which clearly defines the relationship between the implementer, the IT department and end users, according to their responsibilities. If key users do not receive adequate training before the ERP implementation begins, potential issues such as improper definition of requirements and resistant to change can emerge. Such issues are likely to increase and hinder the progress of the implementation process. Consequently, it led to the ineffective management of the relationship between the implementer and end users. Through the discussion of the comparative analysis (section 6.3.3.6), the positive and negative experiences extracted from the cases can be summarised in Figure 7.8.

The correspondence between training management and ERP success is supported in the literature. Deloitte (1999) found that inadequate training was one of the major barriers to the successful implementation of ERP. Other researchers attempted to consider the inadequate training as one of the most important critical factors for ERP implementation success. Hawking et al. (2004), for instance, ranked inadequate

training efforts third out of ten of the barriers they had identified to realising the full benefits of ERP. A literature review study by Ngai et al. (2008) looked at the critical success factors (CSFs) for ERP implementation, across ten different countries/regions, finding eighteen CSFs, with training and education being the second most frequently cited reason for the success of ERP implementations.

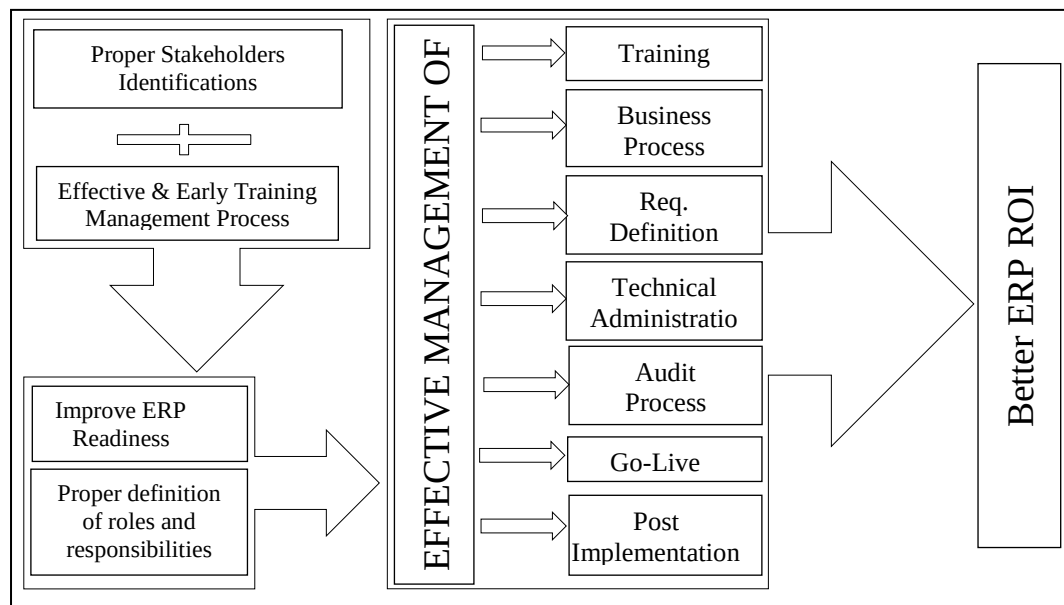


Figure 7.8 Relationship between Training, roles and responsibilities and ERP ROI

For training to realise these benefits, it must have two important characteristics; broadening scope and training continuity.

7.2.2.4.1 Broadening Training Scope

The overall analysis can draw a result that there is a significant impact of the effective use of different forms of training (Table 6.20) and the overall ERP project success (Fig 6.6).

For DiversCo, formal training was limited to product training, which was provided in different forms including formal classroom training and *ad hoc* training in the format of a workshop in which participants were allowed to suggest different scenarios and to ask the consultant to demonstrate the effect of each of the alternative scenarios presented. ElectCo's commitment to ERP training was not limited to the product training but also covered technical and process management training. ElectCo also

encouraged the team to attend ERP user groups, as this provided another source of training from peers in different organisations. The early consideration of ERP training and the variety of training forms assisted ElectCo in developing an ERP learning culture across the organisation. For the AgriCo Case, the lack of training efforts, especially during the second phase, was complemented by recruiting qualified IT staff and leveraging ERP vendor resources. An analysis of this case, covering all phases, shows the absence of an integrated plan. The only exception of considering a comprehensive and integrated training plan is the third implementation in the ServCo case. Since ServCo realised how expensive developing comprehensive training would be, ServCo College was introduced and implemented. As the case analysis shows, the establishment of this College represents a prime success factor for the third implementation phase.

In all failed projects of the four cases, training process is seen to be limited to the technical side of ERP and to the very basic application training. The comparative analysis indicates that, in order to reduce the ERP implementation cost and produce more beneficial outcomes, training should consist of three main features. First, the training should have a broad cover encompassing multiple dimensions. Second, the training should be designed in an integrated manner, considering other implementation issues. Third, it is important to ensure synergies between the technical, application and process training activities.

7.2.2.4.2 Training Continuity

While analysing the four cases, it can be clearly demonstrated that there are few team members that possessed integrated knowledge elements. Those elements include experience and educational background necessary to contribute to the processes required for a successful implementation during all implementation phases. Filling such knowledge gaps is essential to ensuring that all ERP stakeholders have adequate understanding, which enables efficient implementation of ERP and effective use of its applications. Training should not, therefore, be considered as a one-time activity, limited to a few people; retraining should be normal practice, not the exception.

Prior studies, such as that of McCredie and Updegrave (1999) support the suggestion that training should not be regarded as a one-off activity. Their findings suggest that training should be on-going and should cover as many people in the organisation as required, including newcomers, and that advanced training should be arranged for staff as and when necessary. The re-training of senior employees was advocated as a good investment, since they are strongly committed to the organisation and training is a part of the rewards program that also supports the enhancement of organisational learning (McCredie and Updegrave, 1999).

Mashari et al.,(2003) suggests that user training and involvement should be pursued throughout from the design, initiation and implementation of the system. It is also critical that pre-implementation and post-implementation training takes place in order to facilitate the assimilation of an ERP system (Umble, et al., 2003). This view is further supported by Davenport, et al., (2004) who suggests that post-implementation training has a positive effect on all aspects within the organisation. This training might include regular meetings, the exchange of views and regular discussion of problems and issues that may arise (Umble, et al, 2003).

Knowledge transfer is also a key factor in the overall success of the implementation (Wang, et al., 2007). It has been demonstrated that poor user performances with regard to ERP systems is commonly caused by knowledge gaps between the ERP functionalities and those required by the firm implementing the system (Everdingen, Hillegersberg, & Waarts, 2000). Markus & Tanis (2000) also argue that successful implementation of ERP depends on identification of knowledge gaps and subsequent transfer and utilisation of this knowledge. Volkoff & Sawyer, (2001) and Willcocks & Sykes (2000), argue that critical ERP success factors are influenced by a firm's ability to acquire knowledge and use it during the exploitation of the new system. Firms should aim at tapping knowledge from the system developers, technicians, project managers and other consulting firms. According to Wang *et al.* (2007), successful knowledge transfer results to the development of an ERP system that meets the client's expectation and enables the user benefit from all the functions provided by the system. According to Wang *et al.* (2007), inadequate knowledge transfer leads to common problems experienced during the ERP system implementation such as: "the

system takes too long”, “system is too costly”, “the system will interrupt business activities” and “benefits will never be realized”. Most ERP system incorporates the best practices within a given field and the transfer of this knowledge to the organisation will improve its overall performance.

7.2.2.4.3 Summary of Training Management Findings Discussions

A number of findings related to training and development can be extracted from the analysis of the four case studies. Firstly, perceiving training as a priority and promoting a culture that encourages capturing ERP knowledge through self-development has a major impact on the ERP ROI. Successful ERP training enables organisations to expedite the knowledge transfer from consultants to the in-house staff. This generates several strategic benefits, including a reduction in consulting costs and an increase in user confidence levels with ERP. This also assists in completing the project on time and the in-house resources can still manage ERP continuous improvements after the go-live.

Secondly, significant training gains can be expected if the organisation develops a learning culture. This culture is developed through an encouragement to the staff to apply as many self-learning principles as possible. This can be supported by investing in implementing the train-the-trainer programs. Significant training budgets can be saved and enormous training gains can be achieved if the management recognise and appreciate self-learning efforts. The management appreciation of the training efforts and outcomes is to include monetary and non-monetary incentives. Examples of the training gains include a reduction in the budget of consultants and the number of process improvements that the new trainees can implement.

Thirdly, evaluating ERP training outcomes should always be the responsibility of the client and should not be delegated to either the implementer or to the ERP vendor.

Fourthly, there should be a balance between training in-house staff members and the use of external consultants. In general, more use of external consultants is expected at early stages of the implementation. Their involvement then needs to be gradually decreased as the knowledge transfer to the local staff members is increased.

Fifthly, ERP sponsors need to broaden the scope of the ERP training to cover 1) technical, 2) business process and 3) the application training.

7.2.2.5 Summary of the First Implementation Phase

The holistic review of this first implementation phase demonstrates that it is imperative to identify the internal and external forces that motivate the organisation to adopt ERP. A thorough understanding of these forces supports the decision-making process and the implementation approach that is to be adopted. Those decisions include, but are not limited to, the identification of the implementation scope, its objectives, the overall implementation strategy, mission critical processes, roles and responsibilities, and the integrated training plan. If this is achieved, it can be argued that the organisation has successfully developed a strong base for achieving higher ROI across the next implementation phases.

The summary of the findings from the first phase are summarised in Figure 7.9.

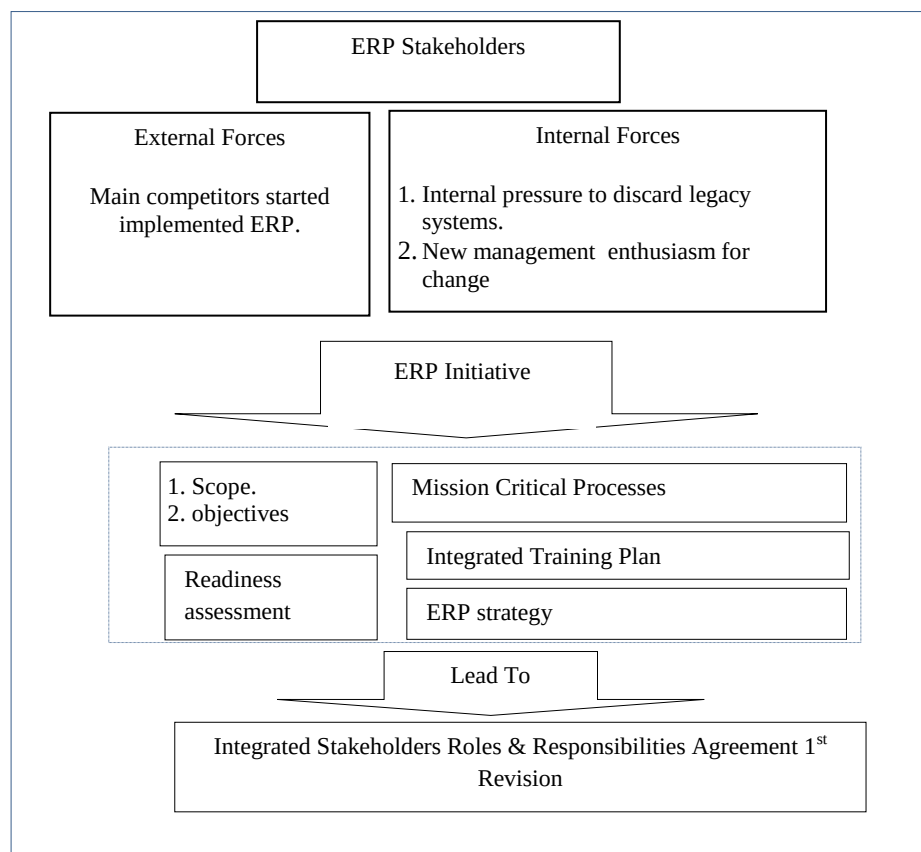


Figure 7.9: Defining roles and responsibilities at pre-implementation phase

Davenport (1998), citing the case of Compaq Computer, gave another important reason for identifying critical processes pre-implementation – the loss of a company's unique source(s) of competitive advantage by adopting standard processes indistinguishable from competitors and which replace the organization's own unique processes (p. 8).

Ghosh and Skibniewski (2010), in their exploratory study of all critical success factors (CSFs) mentioned in literature from 2000 to 2006, compiled by Moon (2007) comment that having an adequate business plan and clear goals and objectives from the beginning is an important CSF for ERP implementation success. Hasibuan and Dantes (2012), in their survey of 74 companies based in Indonesia rated 'clear goals and objectives' as the third important key success factor (KSF) in the project preparation stage (pre-implementation phase) of an ERP project. Mabert et al. (2006) stated that a chief success criterion for ERP implementations is the completion of the project on time and within the budgeted resources (p. 18). A regression model developed by them with empirical data from a survey of ERP implementations in the US manufacturing sector show that the planning variables: 1. Top management involvement and 2. Clearly-defined objectives contribute positively to on-time, within-budget implementation (Mabert et al, 2006).

7.2.3 Discussion of Findings – Second Implementation Phase

7.2.3.1 Conflict Management and Leadership

7.2.3.1.1 Conflict Management

The comparative analysis summarised the conflicts that evolved in the cases and how the company managed the conflict (Table 6.23). The comparative analysis of the eight projects implemented by the four cases shows the impact of the process of defining roles and responsibilities among stakeholders on the emergence and management of conflicts.

Conflict can be expected to emerge if the implementation process has not identified all relevant stakeholders and if their roles and responsibilities are poorly defined. This can be drawn from Figure 7.6 that details how the improper definition of stakeholders, roles and responsibilities can mislead the implementation which creates an environment for conflict to emerge, grow and to become difficult to resolve.

In such a case, it is expected that conflict management would become ineffective. On the other hand, if stakeholders are clearly identified and their roles and responsibilities are clearly defined, conflict is not expected. Furthermore, in cases where conflicts arise, the proper definition of roles and responsibilities can mitigate negative effects of this conflict.

As Aubert et al. (2013: p. 64) state, "...communication quality is repeatedly listed among the top success factors to be considered when implementing an ERP system". The research conducted by Aubert et al. (2013) suggests that different aspects of communication quality impact different aspects of project success, with the form of communication assumed to be having the ability to avoid conflict from being generated and to ensure conflict management processes in place are effective at mitigating conflict where and when it arises.

This conclusion is best described by the project manager of the third implementation cycle of AgriCo case, who states:

“When it comes to conflicts, I have seen it evolve from the lack of ERP understanding. More precisely, the lack of understanding the different

roles of different stakeholders and responsibilities of the business owners in providing needful input that can lead implementation to succeed”

The following figure (Figure 7.10) shows the impact of the clarity in defining roles and responsibilities and the proper identification of stakeholders on the possibilities of the emergence of conflicts and the effectiveness of its management.

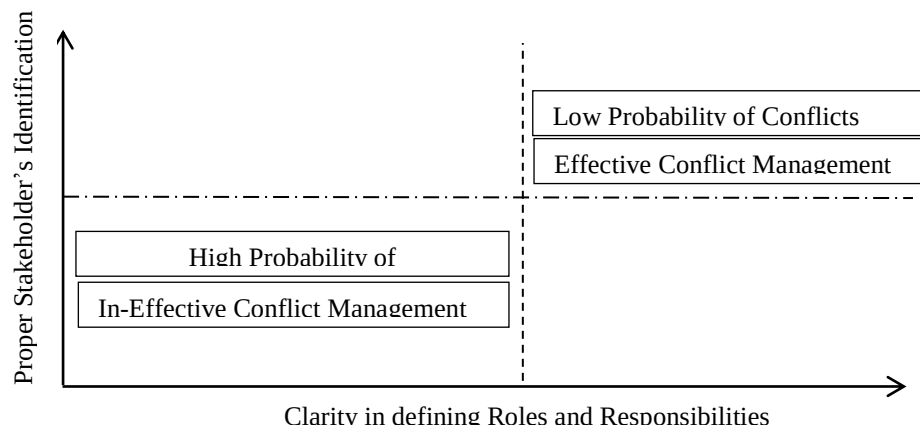


Figure 7.10: Relationship between roles and responsibilities and conflict management

Top management has a crucial role in ensuring this as it can set up conflict resolution, change management and communication structures directly or indirectly, by allocating or delegating resources. Its visible support for the ERP project can reduce user resistance, minimizing conflicts from end-users and lead to more effective communication and conflict resolution in the consulting process (Wang and Chen, 2006: p. 1033). They also stated that visible top management support should be critical for inter-unit conflict resolution during the ERP implementation process (p. 1036).

Jaaskelainen and Pau (2009), studying internal ERP stakeholder conflicts through an experimental research project focused on three large company-wide ERP projects at companies headquartered in Finland, all of which have already implemented ERP systems, show how role conflicts impact negatively on business commitment to ERP. They advise one of the firms with scope conflicts to “state project organizations’ roles and responsibilities clearly improve communication procedures to avoid escalation” (p. 22).

7.2.3.1.2 Leadership

A diversity of leadership styles was found across all four cases as witnessed by the acts and practices observed in the people leading the ERP implementation. Those leadership examples that have been discussed (See section 6.2.3.5) have found a relationship between leadership and effective conflict management. The analysis of the examples discussed in section (6.2.3.5) is summarised in Fig 7.11 which indicates that effective leadership leads to better mitigation of conflict if it arises.

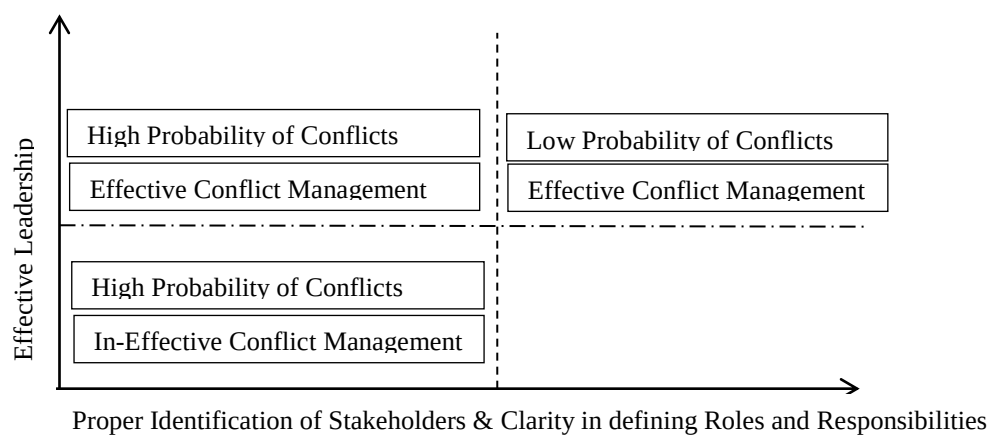


Figure 7.11: Relationship between Leadership and conflict management

This relationship from the comparative analysis shown in Figure 7.12 suggests a relationship between the strength of leadership and mitigation of the negative effects of conflict if it arises.

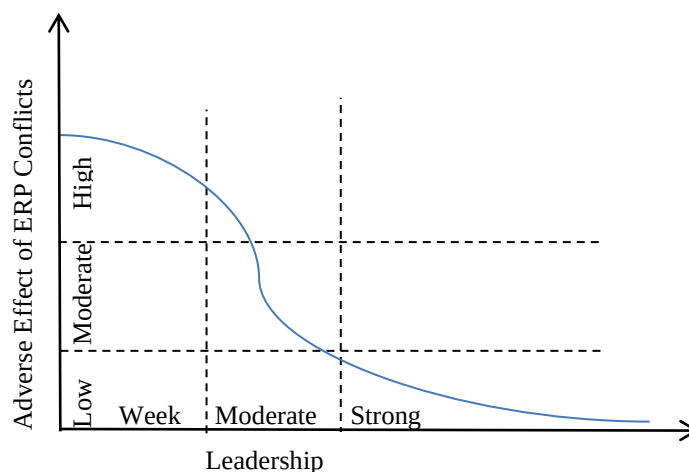


Figure 7.12: Relationship between ERP Conflict and Leadership

The literature supports the findings of this study, demonstrating that leadership is a critical to the success of an ERP implementation. It has been argued that senior management must be convinced of the benefits of ERP and committed to the notion of

the implementation in order to prevent deficiencies in commitments result in a poor implementation (Somers and Nelson, 2001). Senior and low level management must, therefore, be committed to the process of implementing ERP and ensure that the necessary resources are available (Nah and Delgado, 2006).

Weiling & Kwok (2008) indicate that the senior leaders have a significant impact on ERP implementations by fostering a required organisational culture that ensures the success of the system. Positive organisation culture leads to participative decision-making process, power sharing, collaborations, employee empowerment, learning and development. All these aspects are important in the successful implementation of the ERP as they result in the creation of an enabling environment for the implementation of the system.

Recent studies have shown that the implementation of ERP is affected by many impediments and this affects the overall performance of the systems. Kim, Lee and Gosian (2005) documented the main impediments to ERP implementations as: conflict of interest, lack of human resource involvement, failure to redesign the business process as per the ERP requirements, lack of change management strategy and resistance by the system users. All these problems can be significantly solved through effective leadership and development of a good corporate culture. Senior management must develop strategies of resolving conflicts that arise during the change process. Hong & Kim, (2002: p. 25) state that “even the very best system in the world will fail if end users do not believe in it”, thus emphasising the critical factor of effective leadership. ERP implementations result in different resource allocations and power distribution and this has often resulted in conflict. This results in the formation of groups within the organization that oppose each other. Senior leaders must prevent this by effective role allocation, ensuring that the users work as a team and solving any arising issues promptly.

7.2.3.2 Business Process Management

The influence of business process management on the ERP ROI has been addressed in previous chapters (section 6.3.3.4). The comparative analysis (Table 6.32) exemplified the significance of the mission critical processes to the ROI. The impact

of inadequate management of business processes to the implementation ROI varies among the four cases. For the AgriCo case, the inappropriate management of the mission critical process hindered the third implementation cycle from achieving significant benefits. A good example of the adverse effects of the inadequate consideration to the business process is the delay in deciding the costing method. Such a decision would normally take a few days which delays the implementation for two months. This is because the process of pricing and costing the product and services has neither been studied nor planned to be improved. For DiversCo, it led the first implementation cycle to collapse and to initiate another new implementation project.

The results and discussion of the preparation steps (Figure 7.9) suggested including the definition of mission critical processes. In each example mentioned in Table 6.32, the individual case analysis shows that the recommended process by (Figure 7.9) was not followed. In the first project of ServCo case, for example, a primary stakeholder was not identified like the O&M partner. Sometimes, important processes were not treated as mission critical like the MRP process in the ElectCo case, managing the warehouse in the DiversCo case, aggregating sales data in the AgriCo case and real-time invoice printing of the fashion outlets in the DiversCo case (Table 6.32). From the comparative analysis, such deficits in managing business processes are either related to the poor readiness assessment or to the ineffective training management.

The struggles faced by ERP project managers as a result of improper business process management are best described by the project manager of the third implementation cycle of AgriCo case, who states:

“This lack of ERP understanding advocates the resistance from business owners to share or define their current business processes and practices. This is, in effect, hinders defining the to-be processes that represent the base for ERP configuration. This is where more resistance to change increases which motivates conflict acts to evolve”

Previous discussion leads to the conclusion that, in the context of the roles and responsibilities of the stakeholders, business process management is a significant ROI factor. The summary of the relationship between business process management, stakeholder's identification, definition of roles and responsibilities and ROI is shown

in Figure 7.8. The figure (7.8) demonstrates that proper definition and management of the roles and responsibilities minimises the risk of the ineffective management of the business processes. The figure shows that there is a correlation between the definition and the awareness of the roles and responsibilities and the mitigation of a number of key implementation elements including the business process management. This can lead to a direct relation between the proper definition of the roles and responsibilities and the business process management in the ERP implementation context figure (7.13).

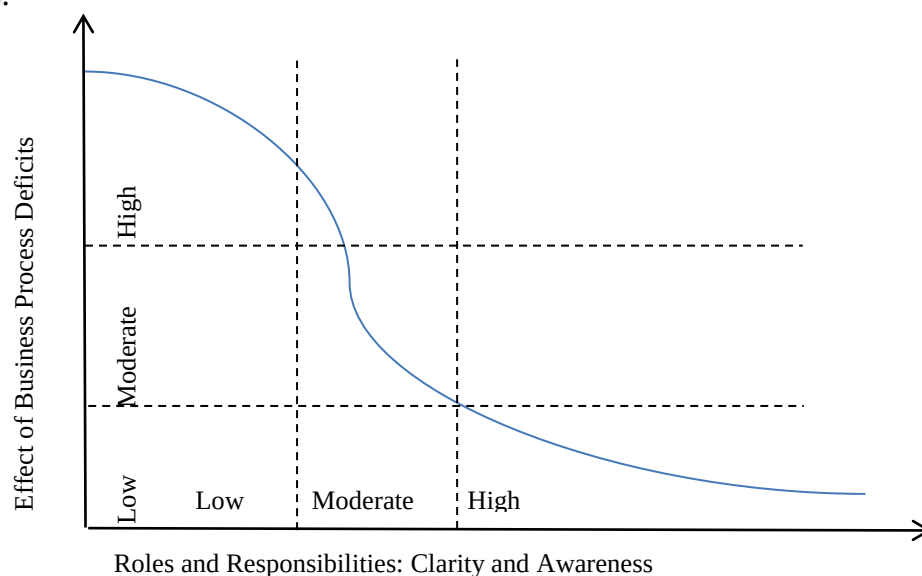


Figure 7.13: Relationship between roles, responsibilities and poor business process management

As the figure (Figure 7.13) shows, if the organisation developed adequate awareness and definitions of roles and responsibilities in the planning stage, it is likely to minimise adverse effects of the business process deficits. This result is presented in Fig 7.14 where it shows that for instance ElectCo and DiversCo achieved lower rank in managing business process due to a number of deficits (Table 6.32). However, since the both cases achieved higher rank in defining roles and responsibilities, the deficits in managing business processes have less impact on the ROI (Figure 7.14).

It is usual for company's business processes to be subject to re-engineering (BPR) in an ERP implementation, where they will be replaced by standard processes (which are configured or customised later as per requirements) from the ERP vendor, as they need to fit the framework of the target ERP system (Davenport, 1998; Pnina et al, 2005). This gives rise to dangers of widespread disruption during and after the project

for all stakeholders – the new processes may be less robust, very unlike older ones or not perform as per expectations.

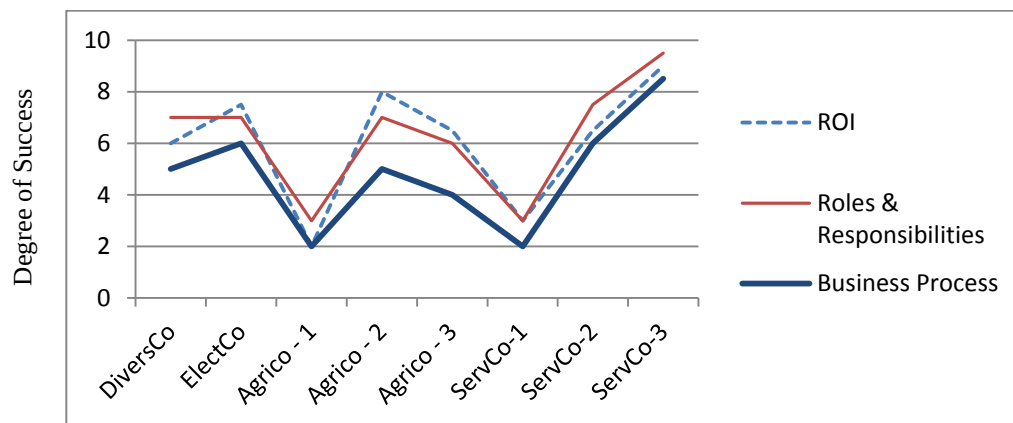


Figure 7.14 Impact of defining roles and responsibilities on minimising business process risk

7.2.3.3 Project Management

The findings of the comparative analysis show different success made in the project management tools and practices (Table 6.29). As Boersma and Kingma (2005) discuss, the project manager plays a pivotal role in the successful implementation of ERP in organisations.

In the context of roles and responsibilities, three findings can be drawn from the comparative analysis of the eight projects implemented in the four cases. Firstly, the selection of the project manager is very important for the success of the implementation. In all implementation phases that the four organisations went through, a project manager was closely involved in both the success and failure of the projects. Secondly, it is necessary to denote appropriate tasks as milestones. Thirdly, those milestones should include as many quick wins as possible. This is found to be important as completing these milestones and achieving quick wins develops more trust among end users and motivates the organisation to pursue more implementation gains.

When implementing the ERP project it is necessary that managers focus on goals and objectives that can be achieved within a short period and budget. Kremzar and Wallace (2001) studied the process of ERP implementations and they state that quick

wins are important in ensuring that the end users are motivated by the outcomes in the short run. They state that the implementation of the system should be done rapidly so that the organisation can reap benefits more quickly and sustain their competitive position. They argue that such implementations should be done on high impact production lines and services first so that the changes can be recognised at an early stage. The authors state that managers should carefully evaluate aspects such as improved cash flows, reduced floor space, increased productivity, reduced operation costs and inventories as they are directly affected by the implemented software. ERP system ability to improve the transaction time, reduce inventories and enable faster processing of consumer transaction should be used as incentives for the end users to accept the system.

Kimberling (2012), a consultant with an ERP company details ways through which an organisations can benefit from ERP. He states that, even though an ERP system can be implemented quickly, it is impossible for the company to reap all the benefits within a short time. It is therefore necessary for the managers to identify short term achievements and use them as motivating factors for long term achievements. He argues that managers should encourage quick utilisations of the system such as using emails/ websites to communicate with clients and other employees, streamlining operations after go-live stage, reducing the number of employee/ in active employees and enabling faster processing of orders and other issues within the organisation.

Harmom (2009) states that quick wins are important when managers want to promote the utilisation of given ERP software. Such quick wins may come in form of motivating employees who successfully use the software so as to encourage the others to do so or in form of improving customer service (this can be done easily and it has direct impact on service improvement such as a reduction of the order processing time), reducing customers, improving the working conditions of employee (this can be done by ensuring that employees use less effort in their day to day activities), using websites to communicate and organisation meetings where employees can discuss on the success and experiences with the new system. The management also needs to show other stakeholders that the implemented software has the capacity to save on costs, time and improve the business processes within the organisation. In addition to

ensuing that quick wins are achieved, managers should ensure that long term goals of ERP are monitored and achieved within the stipulated time. Harmom (2009) cautions that managers may focus on short term goals which may not be viable in the short run, it is therefore necessary that leaders study the benefits of ERP before engaging in tasks such as reducing the number of employees.

Ike and Mogens (2005) in their survey study of 36 companies with ERP systems found that two-thirds of ERP projects were initiated by top management and that project management principles and top management support explained nearly 30% of the variances that impact ERP implementation success.

7.2.3.4 Technical Administration

The comparative analysis noted negative impact on ROI as a direct result of the ineffective management of the technical aspects of ERP implementation (see section 6.3.3.7). Examples of the technical issues are network connection setups, system performance, compatibility between the database and the operating systems.

All cases showed unplanned stoppages that resulted from poor readiness, either from the network, from the operations systems or at the application level. A number of conclusions can be drawn from the review of the technical issues that arises in the implementation.

Firstly, the importance of planning for the technical parts of the implementation should not be underestimated. Failures in the technical settings or installation of the ERP can create costly mistakes. Secondly, project managers need to include in the master plan the tasks that are related to installing additional software applications which need to be integrated with ERP. These add-on software applications are chosen to fill the functionality deficits that ERP modules cannot handle. Therefore, they should be including in the implementation plan. Otherwise, if ERP implementation is completed, optimal ROI might still not be realised due to the adverse effect of the incomplete state of the adds-on applications parts. Thirdly, the process of using data in production instead of the TEST version need to be governs by strict procedures. This procedure is to ensure full data security and accuracy during the data transfer

process. As Ram et al. (2013) note, the ERP implementation is only as successful as its weakest link and the weakest link in many organisations is the system quality. By improving the system quality, the chance of improvements in ROI on ERP increases (Ram et al., 2013).

The ERP system has many potential technical issues arising during its implementation. It is important that the management identify and resolve these technical issues. Somers and Nelson (2001) indicate that for successful implementation of the ERP system, it is important to involve both business managers as well as the technical team leaders. This will ensure that the key technical issues affecting the implementation of the system are addressed in a timely manner when they occur. They suggest that managers within the organization should work with experienced people within the organization to ensure the successful implementation of the proposed system. During the initial implementation, technical issues may affect the operation of the system and it is important that managers, consultants and employees with technical knowledge are involved during the design and implementation phase of the system. This would be necessary in ensuring that technical issues do not affect the functionality of the ERP system at go-live stage.

Research carried out on the major technological risks that are likely to occur during the implementation of ERP document lack of ERP expertise among the professionals working within an organization as one of the key risks. This increases the implementation risk as none of the employees are aware of how the system operates. This presents a lot of difficulty for the existing firm members who are not able to align themselves in solving the complex technical issues that emerge during the implementation of the ERP.

It is necessary that the managers assess the knowledge level among the employees and ensure that consultants are hired so as to assist during design and implantation phase. The managers can seek solutions from independent experts and consultant so as to ensure that there are no system integration problems. Kay (1999) indicates that most ERP software is based on new programming languages that the existing technical

professional don't have. This requires that the organization collaborate with experts and consultants to ensure the successful implementation of the system.

7.2.3.5 Summary of the Second Implementation Phase

The holistic review of this second implementation phase demonstrates that it is imperative to undertake many basic planning requirements prior to starting to think about implementing an ERP. One of the most basic aspects of such preparation is to ensure that the planning of the ERP is comprehensive; failing to plan for this will mean that the implementation could be doomed to failure. Aside from this, as this review of the second implementation phase has shown, it is important to ensure the quality of the software systems in place. By failing to do this, the organisation runs the risk of failing in their efforts to implement the ERP system. By preparing as well as possible as far in advance, and by recruiting an efficient and effective project manager, problems that could damage the success of the implementation could be avoided. The summary of the findings drawn from the second implementation phase is presented in Fig 7.15.

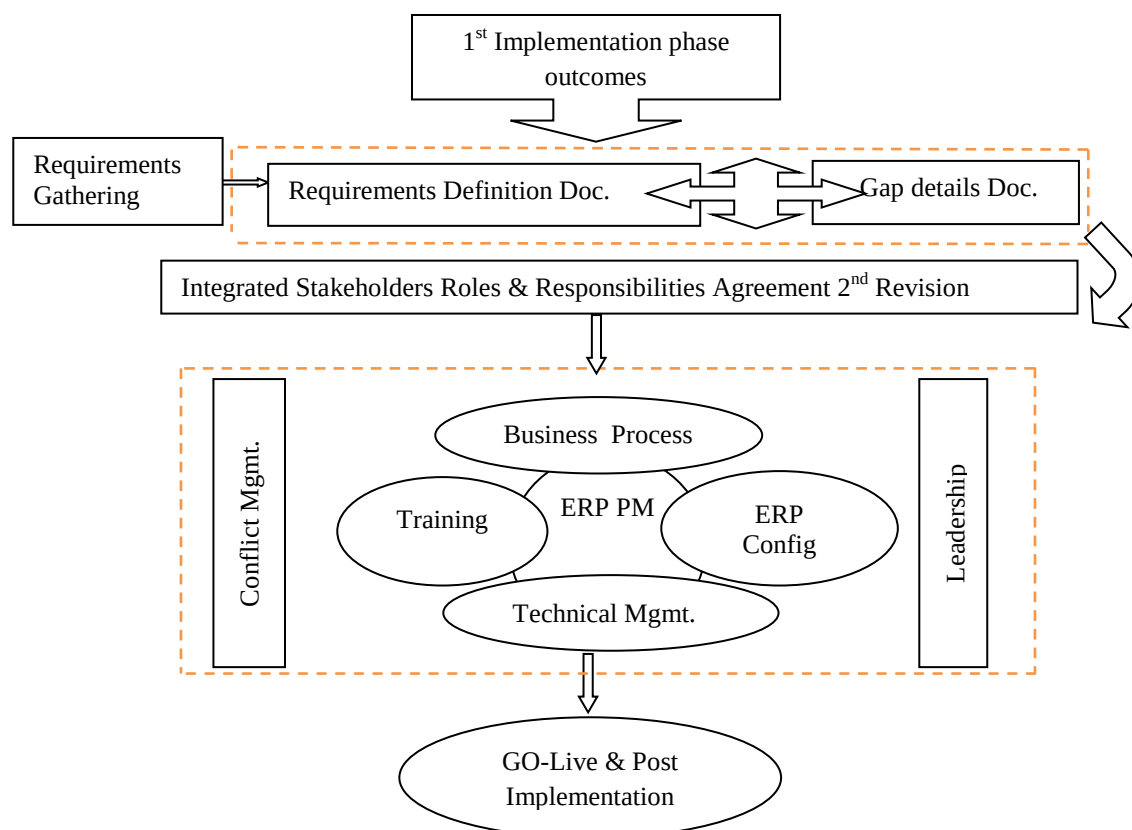


Figure 7.15 2nd Implementation Phase Findings from a Roles and Responsibilities Perspective

7.2.4 Discussion of Findings – Third Implementation Phase

This section discusses the findings of the third implementation phase that covers the go-live and the management of the post-implementation activities.

7.2.4.1 The Roles and Responsibilities vs. Close-out Stage

After the go-live stage, the implementer is requested to provide his support to the client until end users become familiar with the new system. Once the system reaches certain level of stability consultants can leave the site and the project close-out can be announced.

Evidences from the comparative analyses found that the ERP sponsors struggled to bring the ERP implementation projects to a close out (see section 6.3.4.2). The results of the eight implemented projects by the four cases, in terms of the degree of success, are presented in Figure 6.9. It can be noticed that the projects which properly defined the roles and responsibilities at the preparation stage are the ones who experienced less difficulties in the close-out stage. This finding can be drawn by comparing the results of the evaluation of the close-out (Figure 6.9) and the clarity in defining roles and responsibilities of those eight projects (Table 6.21). This can lead to the suggestion that defining roles and responsibilities correlates with the ability of the ERP implementation to close-out the project successfully

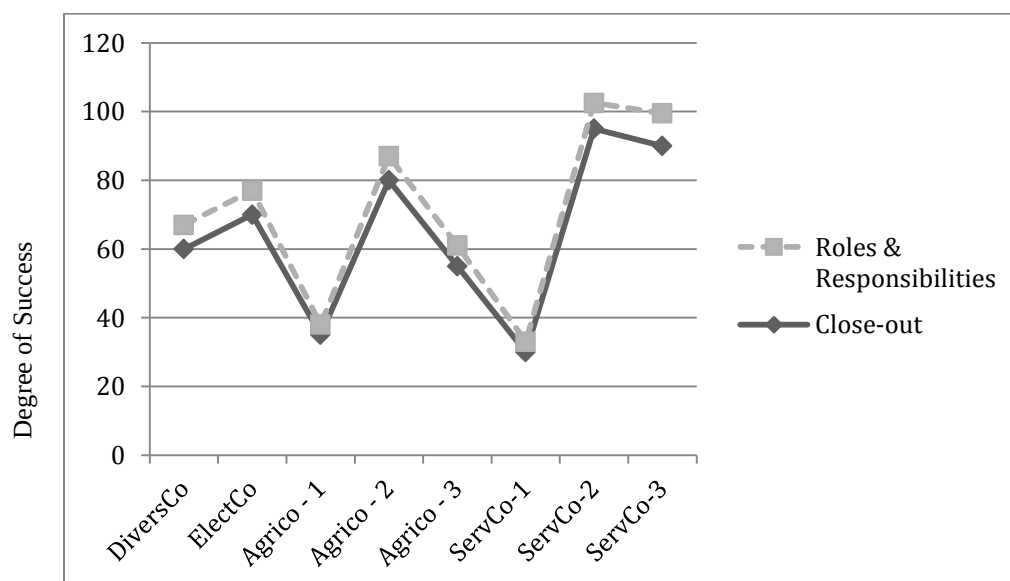


Figure 7.16: Relationship between defining of the roles and closing-out ERP projects

This is important finding for ERP sponsors to understand and to act upon accordingly: the close-out stage is a very reliable test to assess the success of the implementation. This result is inferred from the link between the two relationships 1) between the early definition of the roles and responsibilities, the early training and the ROI (Figure 7.2 and Figure 7.3); 2) between the early definition of roles and responsibilities and the smoothness of the close-out stage (Fig 7.16).

Hasibuan and Dantes (2012) note that the post-implementation stage of ERP is concerned with deployment and includes stabilising operations, optimisation, eliminating “bugs”, systems maintenance, user support, system upgrades and getting to normal operations. It includes operational, support, maintenance and monitoring procedures. While Gartner (2011) states that governance processes be defined and finalised before the implementation phase of the project (i.e. starting with Design) begins, the post-implementations audits and reviews to gain feedback and insights into the ERP implementation are just as vital. Grabski et al (2001) developed a model to identify risk and controls for ERP implementation and placed internal auditor’s involvement as a critical control. They further show a case study of an organisation to show how internal auditor involvement was very relevant and crucial to its ERP implementation success even after “Go Live”.

Boyer (2001) in his case-study detailing the Go-Live and Final preparation stages of a ERP system MERLIN (Boyer was project sponsor as well) set up to replace legacy systems for a US County noted that change management and communication needs did not end once the project was implemented, but were part of the ongoing support needed to ensure that MERLIN would be an efficient and effective tool. He noted how a post-implementation critique session conducted by the county showed the need for early planning for communication and change management governance aspects. (Boyer, 2001, p. 43). Oana (2010) summarised this aspect of ERP or any Information System project thus: “After the go-live stage, ERP implementations require a continuous improvement effort that involves alignment between the latest requirements of the business model and the update/change to the ERP software.” (p. 158-159)

The first recommendation for the ERP sponsors in this regard is to pay attention to the signs that indicate the need to intervene to close the project (Table 6.30). The second recommendation to the ERP sponsor at this point that he is expected to stress to the entire task force that ERP is not the beginning of the end but it rather to be the end of the beginning. This point can be further linked to communicate that a temporary performance dip is expected (Figure 6.8) before the second wave of ERP starts (Figure 7.17).

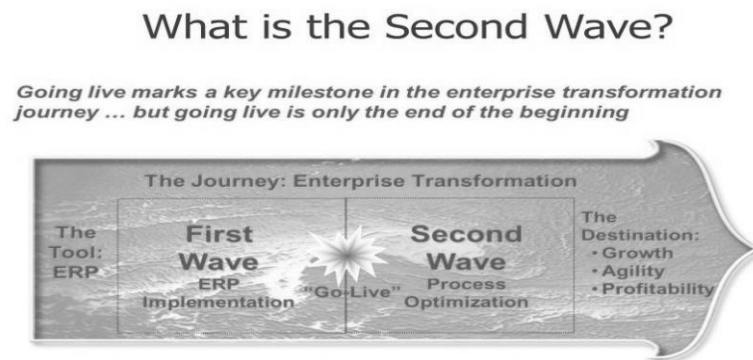


Fig 7.17 Post Implementation ‘‘Second wave’’ – (Deloitte ,1999)

7.2.4.2 The Role of the Audit Process

The relationship between 1) the early definition the roles and responsibilities, 2) the success of the close-out stage, and 3) the ROI is discussed. ERP sponsors, therefore, need to verify that the roles and responsibilities amongst stakeholders are still clearly defined before the go-live stage. If the audit process indicates that more effort is required to redefine the roles and responsibilities, then corrective implementation actions have to be made. The corrective action role is to ensure that the roles and responsibilities are well defined before the organisation can move to the post go-live and continuous improvements stage.

The audit process is illustrated in Figure 7.18.

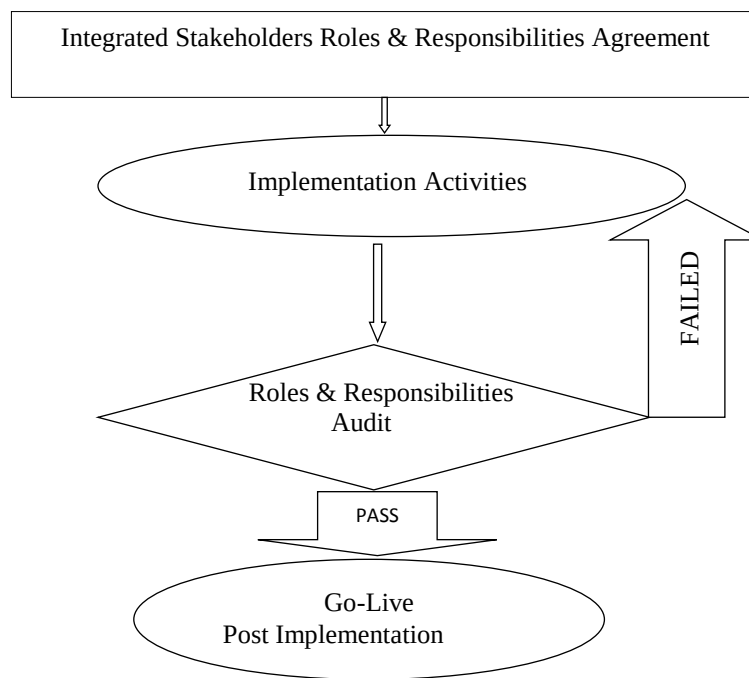


Figure 7.18: Findings Summary of the third implementation phase

Once the organisation passes the go-live, then any improvements made through ERP falls under the continuous improvements.

ERP implementation can be successful if the organisation demonstrates its abilities in using, leveraging and improving ERP applications using its own resources. This can only be achieved by conducting roles and responsibilities audit review and making any necessary amendments at each ERP continuous improvement stage (Figure 7.19)

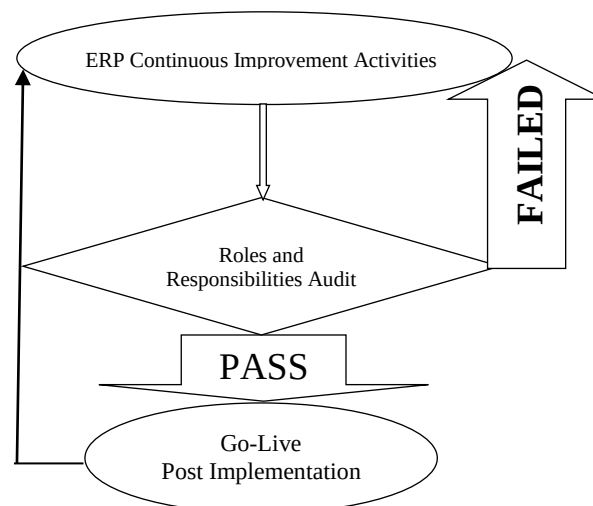


Figure 7.19 Roles and Responsibilities Process after the Go-Live

The audit of the governance aspects of ERP implementations is necessary to ensure that IT helps the enterprise in the achievement of its business goals (Anantha Sayana, 2004). Anantha Sayana (2004) mentions that it is “very important for an IS auditor to carry out an audit of the governance aspects of an ERP project” and points out this as a neglected area. He also recommends the governance audit to be done best in the ERP initiation stages though it should be done at different stages throughout the life of the project, beginning with the initiation, then mid-term stage, post-go live and finally post-system stabilization. Glover et al. (1999) argued that internal audit should be involved in an ERP system implementation early rather than later. Streamlining a governance and management structure that satisfies all stakeholders is a difficult task. (Ghosh and Skibniewski, 2010: p. 541).

In their research, which benchmarked the outcomes for companies that had implemented ERP, Deloitte (1999) found that a substantial body of knowledge was missing about what companies could do in order to realise a return on their ERP investment. Figure 7.17 shows that the ‘go live’ stage is just one milestone in the ERP implementation journey. At least three additional stages lie ahead for organisations to reach the ‘synergise’ stage, as described by (Deloitte, 1999; 38):

“This is really another level of change: new competencies, redefined business processes... In this stage the organisation is able to achieve new, sweeping changes that fundamentally benefit the company”.

Other authors, for instance Hawking *et al.* (2004), suggest that ROI is gradually maximised as the implementation undergoes, and passes through, five phases:

1. Implement core ERP.
2. Maximise value of core ERP.
3. Extend enterprise application within company.
4. Extend enterprise applications to partners.
5. Adaptive application environment.

It has been found that at this stage of the implementation, in which few steps remain before the ERP ‘go live’ milestone is achieved, all stakeholders should be kept informed about their roles and responsibilities and how the imminent changes to the ERP will impact them. This can be achieved by ensuring that an adequate

communication process takes place between the senior managers and the stakeholders. This finding is supported by Tiwana and Keil (2009) who argue that, in order for ERP implementation to be successful, senior managers must have a thorough understanding of the way the new ERP system impacts all stakeholders in the organisation. In their study, Singh & Bhattacharya (1995) argue that successful ERP system implementation is contingent upon adequate communication between senior management and all of the company's stakeholders, with a view to fully briefing them on the implications of the new ERP system and the role the new system will play in enhancing the performance of the company. Where appropriate, this appraisal should permit stakeholders to grasp the relationship between ERP and the overall process of change management.

Hasibuan and Dantes (2012) notes that the post-implementation stage of ERP is concerned about deployment and includes stabilising operations, optimisation, eliminating "bugs", systems maintenance, user support, system upgrades and getting to normal operations. It includes operational, support, maintenance and monitoring procedures. While Gartner (2011) states that governance processes be defined and finalised before the implementation phase of the project (i.e. starting with design) begins, the post-implementations audits and reviews to gain feedback and insights into the ERP implementation are just as vital. Grabski et al. (2001) developed a model to identify risk and controls for ERP implementation and placed internal auditor's involvement as a critical control. They further show a case study of an organisation to show how internal auditor involvement was very relevant and crucial to its ERP implementation success even after "go live".

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System project thus: “After the go-live stage, ERP implementations require a continuous improvement effort that involves alignment between the latest requirements of the business model and the update/change to the ERP software.” (p. 158-159).

7.2.5 Conclusion of the Discussions

The holistic review of this first implementation phase demonstrates that it is imperative to identify the internal training requirements of the staff in place at the company with a view to understanding what the current state of knowledge is and what, therefore, the training needs are amongst the staff. By ensuring that the roles and responsibilities of all stakeholders are identified and understood, prior to the implementation, the implementation process can be ensured of a higher probability of success, as all stakeholders will be aware of what they need to do and why, thus allowing them to act responsibly and appropriately with regards to the ERP implementation process. It is important to recognise that communication is vital, across the organisation as a whole, before, during and after the ERP implementation, as clear communication is vital to ensuring that any and all problems are identified in a timely manner and, as such, solved before they become major problems that threaten the implementation process, in the short term, and the ROI, in the long term.

This holistic finding is supported by Verville and Halington (2003) who used a case-study approach to study the team composition and effect of role definition on the ERP acquisition process of 4 large organisations. They concluded that team composition and role definition are critical factors affecting the acquisition process. The 4 organisations were found to exercise better control (through clear definition of authority), minimise conflicts (especially from end-users) and thus conclude the projects smoothly.

7.3 Deriving a Model for Holistic ERP Implementation

Previous sections and chapters demonstrate the significance of identifying stakeholders, defining their roles and responsibilities and how it can relate to the return on ERP investment. This conclusion includes a number of key elements that are drawn from the holistic review of the ERP implementation process. Given that these elements are emphasised throughout the discussion, it is appropriate to consolidate them into a model. The model is holistic in nature and centered on the identification of stakeholders and the management of the roles and responsibilities that govern their relationships. This section will provide a description of the role of the model elements in the implementation process, as well as their inter-relationships. The model is discussed in the following sections.

7.3.1 Deriving the Model

The discussion of the findings produced four summaries for the three implementation phases and the continuous improvements stage (see Figure 7.9, Figure 7.15, Figure 7.18 and Figure 7.19). The discussion of the findings from the three implementation phases indicates that the management of roles and responsibilities consists of three implementation milestones. These three milestones require ERP sponsors to intervene in order to ensure that roles and responsibilities are defined, audited, reviewed and properly maintained.

The first milestone is the emergence of the first revision of the roles and responsibilities agreement (Figure 7.9). At this point, ERP sponsors can make sure that all stakeholders have clarity regarding their roles and responsibilities, something that is important, as discussed, before the implementation process is begun. The second milestone is suggested as occurring after the completion of the requirements definition process.

It is not expected that ERP fulfill 100% of the business requirements. Therefore, it is required to revise the ERP implementation to include the necessary tasks to close the deficits of the ERP functionalities, i.e. the functionalities that ERP cannot fulfill. Revising ERP plan leads to the emergence of the second revision of the roles and responsibilities definitions (Figure 7.15).

The third milestone is associated with the audit review process that has been suggested, and is required before the go-live stage (Figure 7.18). At this point, the ERP sponsor can verify whether the current state of the implementation reflects the preset scope and objectives. ERP sponsors can verify before approving the move to the go-live stage that all stakeholders have adequate clarity on their roles and responsibilities. This review is expected to produce the third revision of defining roles and responsibilities among stakeholders. Once the organisation passes the go-live stage successfully ERP sponsors need to ensure that the roles and responsibilities audit is embedded within each and every ERP continuous improvement (Figure 7.19).

The three milestones that require the involvement of the ERP sponsor to define and review the roles and responsibilities are aggregated and presented in Figure 7.20.

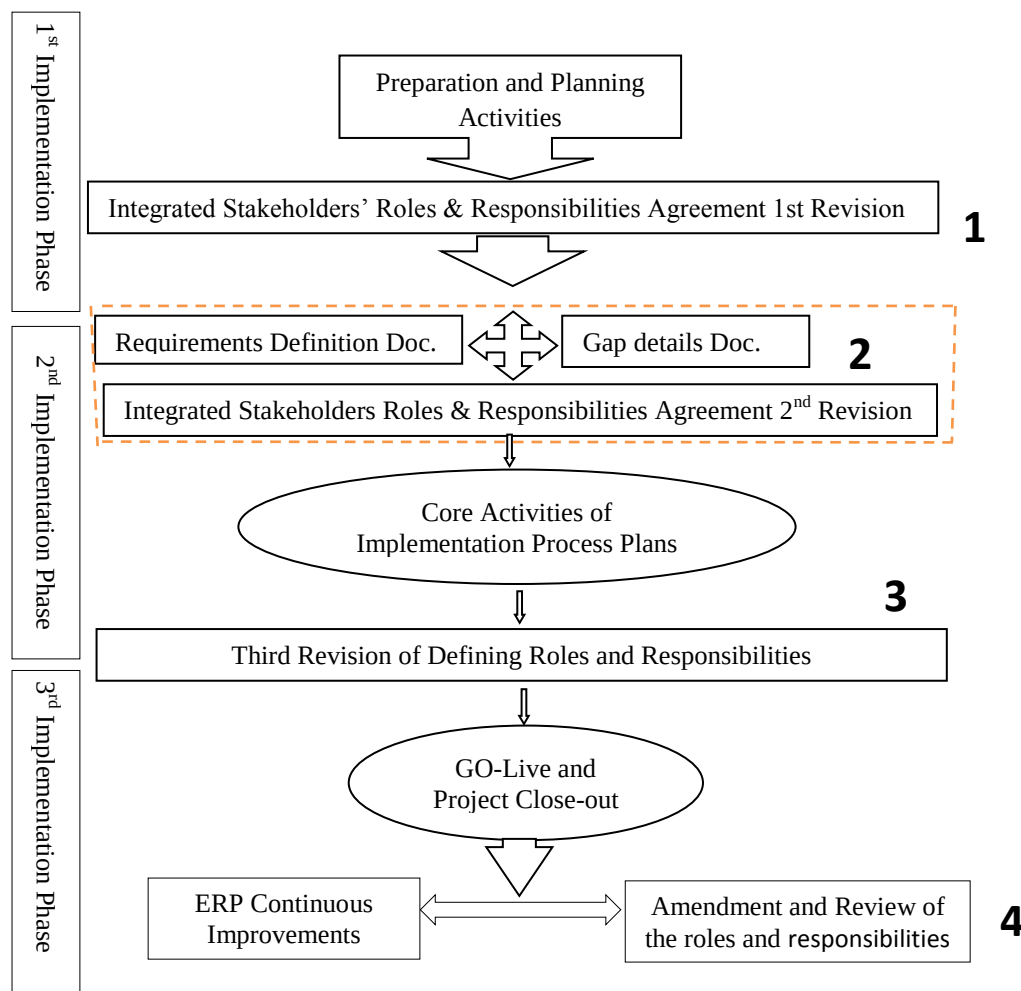


Figure 7.20: Milestones of defining roles responsibilities in ERP Implementation

The findings from the discussion of the three implementation phases are summarised in the four figures (Figure 7.9, Figure 7.15, Figure 7.18 and Figure 7.19). Each figure can be seen as a subset of the target model that will be developed and presented later in this Chapter. Figure 7.20, on the other hand, summarises the three milestones that ERP sponsor is requested to ensure proper definition, review and amendments of the roles and responsibilities. The combination and integration of those four sub-models can be used to derive a holistic model for ERP implementation from the perspective of managing the roles and responsibilities among stakeholders (Figure 7.21).

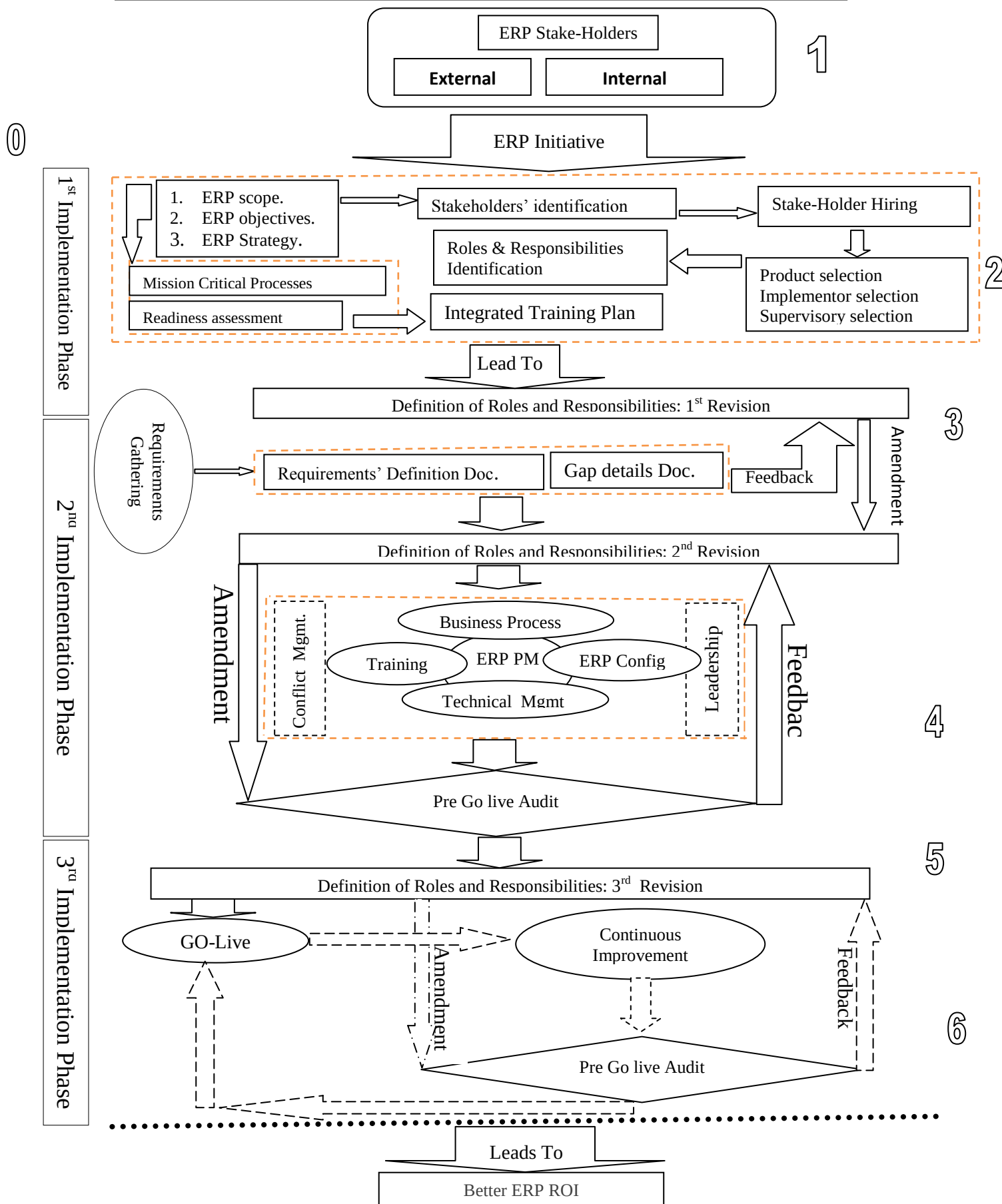


Figure 7.21 Roles and responsibilities management-based holistic model of ERP implementation

7.3.2 Overview of the Model

The elements of the holistic model (Figure 7.21) are briefly described in Table 7.2. The Chapters containing the case analysis have highlighted a number of elements that were found to be critical to the implementation of ERP. A comprehensive understanding of these key elements, which follows a holistic approach and attempts to understand their inter-connectedness, is the base of the model.

Table 7.2 Description of ERP implementation holistic Model Key attributes

No	Model Attribute	Purpose in increasing ROI
0	Implementation phases	It enables ERP sponsors to visualise Implementation as a three-stage process. Each stage represents a milestone for defining and amending roles and responsibilities among stakeholders.
1	Change drivers	Describing stakeholders involved in the initiation stage that trigger the change through adopting ERP implementation. This includes proper understanding of the underlying reasons for initiating and adopting ERP.
2	Preparation steps	Describes necessary planning steps that include: 1 Scope, objectives 2 Strategy 3 stakeholders identification & hiring 4 vendor & implementor selection 5 preliminary roles & Responsibilities identification 6 integrated training plans 7 Defining mission critical processes along with necessary plan 8 readiness assessment
3	Requirements gathering process Vs. Roles & Responsibilities amendments	The detailed outcomes of the requirements gathering process is expected to identify ERP functionality gaps. This can trigger plans for managing those gaps through initiating parallel tasks/sub-projects along with ERP implementation. Necessary amendments to the first revision of Roles & Responsibilities agreement are required.
4	Core implementation processes and activities	This refers to the core implementation processes that include 1 business process management 2 conflict management 3 leadership 4 project management 5 training 6 Technical management
5	Roles & Responsibilities Audit	This refers to the need for an audit process to review roles and responsibilities before the GO-live. This is will lead to the emergence of a new revision of the roles and responsibilities agreement.
6	Post Implementation process	The experiences that the organisations lived before the go-live need to be embedded within its practices and culture. Roles and responsibilities management need to always be an essential part of any ERP continuous improvement process.

7.3.3 The Model Elements

The key attributes of the model illustrated in Figure 7.21 & Table 7.2 are explained further in the following sections.

7.3.3.1 Implementation phases

The study suggested using the approach of dividing ERP implementation into three phases. ERP sponsors need to thoroughly understand these implementation phases. The three phases are differentiated by two key milestones: the first milestone is the starting date of the implementation process, as specified in the signed contract with the implementor. This milestone separates the planning and preparation from the implementation and execution phases.

The second milestone is the go-live stage, which separates the implementation and execution from the go-live, the post implementation phase and the process of ensuring continuous improvements in the ERP. ERP sponsors need not limit their understanding only to the three phases and the two milestones only. They should develop, at least at a high level, the key elements of the model.

7.3.3.2 Change Drivers

The sources of ERP drivers can be classified into external and internal stakeholders. Examples of external stakeholders include external consultants, competitors and government agencies. Examples of internal stakeholders include CEO, executive managers and IT directors. The proper identification of the external and internal stakeholders who suggested implementing ERP in the organisation is essential. In particular, it is important to understand and analyse their driving forces to adopt ERP as this can assist in 1) defining the three essential elements; scope, objectives and to define mission critical processes that ERP is expected to improve 2) to use the three essential elements to measure the success of the implementation.

7.3.3.3 Preparation Steps

The preparation steps are related to the change drivers (as discussed previously) that suggested the need for the ERP in the first place. This is followed by proper alignment between the ERP plans and corporate strategy at all implementation stages. This should be followed by an identification of the required stakeholders and the outlining of a realistic scope and objectives for the ERP implementation. Consistency between the analysis of drivers of the change, scope and objectives is fundamental for obtaining optimal ROI.

Defining the precise scope and objectives offers benefits to the organisation throughout the remaining implementation steps. Firstly, it acts as a checkpoint in measuring the ERP results. Secondly, the proper definition of the scope and the clarity of defining objectives facilitate decision-making process throughout the implementation phases. Thirdly, it paves the way for ERP sponsors to define roles and responsibilities, authority and to define the responsibility matrix amongst the stakeholders.

On the other hand, failure to define proper scope and objectives can lead to several risks. Firstly, inadequate empowerment to the ERP project manager is expected which in effect hinders decision-making. Alternatively, the unnecessary escalation in obtaining decisions from higher management level leads to extensions of the time line and reduces the ROI due to the excess cost of the implementation delay. Secondly, in the case of fundamental changes that evolved in the business during the implementation process, it would be difficult to align the ERP plans to cope with those changes. Thirdly, evaluating ERP implementation could become difficult and there would be no clear reference for obtaining an accurate ROI value.

Defining the scope and objectives should be in line with corporate strategy and such consistency alignment needs to be maintained throughout the implementation phases. Failure to maintain consistency between the corporate strategy and the ERP plan settings can lead to a number of consequences that adversely affect the implementation. As a result, the original scope and objectives that were defined at an earlier stage of ERP implementation might be no longer appropriate for achieving the desired strategic changes. The management of roles and responsibilities among ERP stakeholders might become ineffective. Eventually, ROI value would be decreased through the possibilities of 1) ignoring significant requirements, 2) automating unrequired processes, 3) unnecessary implementation delay and 4) poor management of resources. Once the scope, objectives and strategies become clear and identified two parallel directions started as per Figure 7.21.

7.3.3.3.1 Stakeholder's Hiring

Organisations need to select the right resources to drive the preparation steps from the ERP implementation. Those resources must have adequate qualities and past experience to ensure proper management of the first implementation processes.

Hiring the skilful stakeholders at this early stage is very significant in achieving an optimal ROI. Engaging the right stakeholders, who possess adequate experience, will assist ERP sponsors in reviewing, aligning and amending the ERP scope, objectives and strategies. Their effective involvement at an early stage can always ensure that the detailed plans fit precisely with the predefined scope, objectives and strategy. The required skills and experience of stakeholders who will be leading the first implementation process should not be limited to technical or ERP functionality knowledge. ERP sponsors need to be supported by stakeholders who possess adequate change management experience in particular in regards to the best modes of adopting ERP and the best ways of implementing ERP. It is a great advantage if the stakeholders have a balance of both successful and failure implementation experience. The success experience enables them to implement successful practice while failure experience taught them not use techniques that may lead to failure.

The more experience those stakeholders have, the greater the chance that they can guide the implementation team to pursue success and to avoid failures. Stakeholders with such robust knowledge and experience cannot easily be found and they are normally highly paid. The cost of hiring those stakeholders at an early stage can lead to a higher return on investment at the end of the implementation and so it can be argued that the cost of employing them for a short period is justified.

ERP sponsors must be warned that the value of hiring such skilful resources can be achieved if they are involved at the planning and preparation stage. The results from engaging the skilful resources will be totally different if they are engaged to recover a failure implementation. For example, if the planning and preparation processes led by incompetent resources and the skilful resources are engaged thereafter,, the cost of engaging skilful resources to recover the implementation will be higher and the value from their engagement will be very much less.

Once those skilful resources are hired, their experience should be leveraged by ERP sponsors, especially in the process of developing and shaping plans for the implementation of the ERP. It is not necessary that such a highly qualified consultant should be hired in a full time capacity throughout the implementation phases. They can be hired in a form of part time or through the hourly rate arrangements. Highly qualified consultants who possess a wider range of skill sets and experience are required, however, for shaping and reviewing the plans for the ERP. Their second involvement in the ERP implementation is at the point where the implementation requires a comprehensive audit that aims to assess the outcomes against the original scope and objectives.

It is not necessary that the rest of implementation resources possess prior experience with ERP. The deficits in their ERP knowledge can be fulfilled through well-designed training and through the development of a well-defined implementation plan.

7.3.3.3.2 Product, Vendor & Supervisory Selection

As the ERP scope, objectives and strategy are developed, this leads to the selection of the specific ERP product and the external implementation partner. Some organisations have adequate budget and in-house expertise to be able to manage the selection process. Others might need a third party to fill this experience gap. The selection process milestones always need to be assessed against the predefined scope, objectives and strategy. There is no harm in doing this; it is, in fact, healthy to amend the scope, objectives and ERP strategy based on the findings from the selection process. It is always essential that the scope, objectives and ERP strategy remain consistent with the selection process decisions. Smooth implementation calls for consistency between the two.

There is no standard form of engaging external consultants to assist in managing the selection and supervision of the implementation process. The supervisory party can be a consulting house, a freelancer or a permanent specialist hired on a full-time basis. What really matters is that the ERP sponsors need a third party who should have a neutral perspective between the implementer and the organisation. To accomplish his mission, the supervisory consultant needs to intervene in a timely manner once he

sees any inconsistency between the selection process and the predefined scope and objectives of the process.

For a supervisory party to succeed, a communication channel with the ERP sponsor must be opened and must remain active. In the case of any misalignment between the selection, scope and objectives, either the ERP sponsor needs to get involved, or to empower the supervisory party to take proper action. In either case, the ERP implementation should be brought back on track in terms of maintaining full consistency of the ERP plans and the three predefined elements (i.e. scope, objectives and ERP strategies). The supervisory consultant is responsible for assuring that the first revision of the roles and responsibilities agreement among stakeholders at this point is complete.

7.3.3.3 Mission Critical Processes, Readiness & Training Plans

It is imperative to include in the plan and objective settings processes that are to be considered as mission critical. If these processes are identified then streamlined or optimised through the implementation process this will lead to the achievement of maximum ROI.

In the absence of defining mission critical processes, the ERP implementation can easily be dragged out and, potentially, the implementation delay might spiral out of control. This is because there are an enormous number of processes that ERP is capable of optimising. In effect, it is very difficult to achieve optimisation for all processes. Once mission critical processes are defined, it is imperative thereafter to assess the readiness level of the organisation for implementing ERP. The readiness assessment results can suggest necessary training and development plans to close the deficits readiness gaps. The process required to fulfil the deficit gap can either be conducted before or during implementation. The outcome of the readiness assessment can lead to the recommendation of critical decisions such as organisational restructuring, staff rotation or hiring new skilful resources to occupy existing or new positions.

The assessment might guide to revisit the scope, objectives and mission critical processes, owing the fact of the current readiness state of the organisation. If the readiness results indicate that those predefined element are very ambitious, it is highly recommended to replace them with more realistic ones. It is the role of the supervisory consultant to lead the process of review of 1) the proper setting of the scope, objectives and mission critical processes, 2) to conduct the readiness assessment and 3) to develop adequate alternatives for ERP sponsors before he can approve the final version of scope, objective and mission critical processes.

If this process is not followed in the suggested order, the implementation is expected to experience difficulties that might adversely affect the ROI. These adverse effects can be seen in the form of delay, for example, or repetitive rework, trial and error solutions, incurring unnecessary costs and negative morale towards ERP implementation.

The outcome of the readiness assessment can lead to a number of initiatives. Firstly, it can suggest training or education requirements for stakeholders at different implementation phases. This can ensure that the training plan is effective and can lead to higher ROI. Secondly, it might suggest the need to replace some of the stakeholders. It is possible to suggest hiring new stakeholders either from external sources or through internal hiring from within the organisation. Thirdly, it can suggest reengineering some processes before the implementation started. A significant adverse effect on ROI is expected if the ERP sponsors fail to conduct a readiness assessment.

A common mistake in most ERP implementation projects is to limit training scope to teach end users how to navigate between ERP screens. It is the responsibility of the supervisory party to ensure that the training process covers all the necessary skills, knowledge, and competences that are required to achieve the target objectives. ERP sponsors should keep in mind that continuous training is always required to assure the sustainability of the benefits that can be achieved from ERP. Training requires not only a budget to be allocated but, also, that necessary actions are taken towards building a training culture that motivates stakeholders to acquire the knowledge and

skills that are required to achieve optimal organisational results through ERP. Once the ERP sponsors have succeeded in developing such motives for the stakeholders to learn, stakeholders can achieve optimal ERP training results. It is expected that they will leverage available training and knowledge tools and resources. In short, they can demonstrate higher training returns using a much smaller budget, which in return improves the ROI of the ERP.

It is recommended that if employees have contributed positively to the ERP enhancements during the post implementation stage, either in terms of quality of enhancements or quantity of enhancements, they should be entitled to receive incentive payments, provided through HR systems.

7.3.3.4 Requirements Gathering Process Vs. Roles and Responsibilities

The management of requirements definition correlates with the management of stakeholders. It is the role of the supervisory consultant to conduct a holistic and integrated requirements definition review. This review is to ensure not to miss necessary requirements that the user driven process of capturing requirements is unable to address.

Once these requirements gaps are identified then it is strongly recommended that parallel plans be developed in order to ensure these requirements gap are fulfilled. These plans need to clearly show the roles and responsibilities of the stakeholders who are to be involved. This leads to the emergence of the second revision of the roles and responsibilities agreement among stakeholders.

Roles and responsibilities must be clearly defined as this ensures that there are no serious project management, communication problems or conflicts and confusion later. This is even more crucial as any ERP project team is a cross-functional one and companies often cannot find the resources to let all ERP project team members work solely on the ERP implementation alone; many individuals work on multiple projects at the same time (Ike and Mogens, 2005). This will make it more difficult to clearly allocate duties.

Top management has a crucial role in ensuring this as it can set up conflict resolution, change management and communication structures directly or indirectly, by allocating or delegating resources. Its visible support for the ERP project can reduce user resistance, minimizing conflicts from end-users and lead to more effective communication and conflict resolution in the consulting process (Wang and Chen, 2006, p. 1033). Wang and Chen also stated that visible top management support should be critical for inter-unit conflict resolution during the ERP implementation process (p. 1036). Clear delineation of responsibilities of the two top management groups (Board of Directors and CEOs/Executives) will ensure a cohesive “top management” team to provide fully integrated support to the ERP system implementation project. (Fitz-Gerard and Carroll, 2003)

Maditinos et al (2011) stated that insufficient communication of users’ needs, goals and aspirations to external consultants may undermine the implementation of the ERP system. Esteves and Pastor (2002), through a literature review and web survey identified project sponsor (in a project champion role) as a critical success factor in ERP projects. Verville and Halington (2003) used a case-study approach to study the team composition and effect of role definition on the ERP acquisition process of 4 large organisations. They concluded that team composition and role definition are critical factors affecting the acquisition process. The 4 organisations were found to exercise better control (through clear definition of authority), minimise conflicts (especially from end-users) and thus conclude the projects smoothly. Albert (2006), using a case study of a large organisation with 3 major divisions showed how changing role definitions (esp. of the Board - project sponsor) and lack of stakeholder responsibility agreements led to deviation from initial project goals with major conflicts by three stakeholder groups with their own interests, leading to 3 separate ERP projects in various stages of implementations.

Skok and Legge (2002), also using evidence from 5 case-studies of organisations emphasize the importance of involving key team members from the top management early, right from project beginning to resolve or mitigate conflicts of interest.

7.3.3.5 Core Implementation Processes and Activities

The previous section addresses the planning activities, while this section addresses core execution activities. After the requirements have been defined, consultants start the configuration of the system in the test server. End users take necessary actions toward preparing the data that need migration from legacy to the ERP system. The core implementation process phase is centred on project management and, primarily, on the qualities and competencies of the project manager. A qualified project manager with a proper attitude and empowerments is expected to increase the ROI.

The project manager is responsible for the execution of the agreed training plans that include technical and functionality training. The configuration process of both the hardware and the application, along with the detailed plans of when and how end users should use the system either in the TEST or Production servers are also part of the project management responsibilities. The project manager is also responsible for ensuring smooth flow between the implementation of the core ERP modules and the add-on software applications that have been included in the larger ERP master plans.

The management team are expected to experience difficulties and face challenges with some stakeholders who might resist the change caused by the implementation. These challenges are not confined to the ERP applications that are related to stakeholders, such as the ERP vendor, the consultant or the ERP team. Difficult challenges come from the inefficient processes and business practices, as he might lack adequate empowerment to fix or resolve them. The ERP sponsor should, therefore, be accessible in order to intervene immediately once the project manager reports any business process issue. Due to the various implementation pressures in completing tasks, meeting deadlines, competition in acquiring resources, etc. conflict among stakeholders is expected to emerge.

A qualified ERP project manager is expected to resolve most of the conflicts, however higher level management are expected to solve a few conflict cases.

Leadership from the ERP project manager and the ERP sponsors is essential, not only to resolve conflicts but also to ensure that the entire organisation is working as a team

to achieve a unified corporate ROI from the investment made in the ERP. Training management is a critical success factor for the model. This is because most of the decline in ERP implementation results from poor readiness. Training is always a facilitating tool that allows such obstacles to be overcome. Where financially viable, the flexibility to conduct as many training sessions as necessary should be provided. Last but not least, the project manager is requested always to ensure timely manner solutions for technical administration issues that include but are not limited to networking, database issues, systems performance, hardware, and software errors.

7.3.3.6 Roles and Responsibilities Audit

One of the unique advantages of the model is the structured process for conducting an audit process of the roles and responsibilities of related stakeholders. The audit process aims to ensure that the three key elements of scope, objectives and ERP strategies are fulfilled before the organisation moves from the implementation to the go-live phase. This involves a review of the second revision of the roles and responsibilities agreement. It is always expected that through the heat, speed and the complexity of core implementation activities, that the roles and responsibilities agreement should be significantly changed. It is the responsibility of the person responsible for the audit process to identify any differences between the second revision and the reality.

It is highly recommended that an independent stakeholder conduct the audit review for three reasons. First, to ensure that the current state of the implementation meets the predefined scope. Second, to make sure that mission critical processes are improved. Third, to review the current version of the document that defines roles and responsibilities. The review might lead to suggest necessary changes to roles and responsibilities before the go-live stage. It is also preferable to hire the same supervisory body who reviewed the scope, objectives and who helped with the identification of the mission critical process. The previous supervisory consultant has the advantage of understanding deeply the mission critical processes and underlying reasons behind nominating them. In addition, he has developed relationships between various implementation stakeholders which can assist in facilitating the audit review.

If this task is assigned to another consultant, it is expected that 1) he needs extra time and effort to understand the basis for defining those mission critical processes, 2) the investment advantage of understanding the culture and knowing various stakeholders made in the first implementation phase will be lost. The outcome of the audit review will lead to the emergence of a third revision of the roles and responsibilities agreement.

Another advantage of conducting the audit process is to assess the expected ROI from ERP implementation. This can be conducted through proper assessment of: 1) the achieved gains from optimising the mission critical processes, 2) the analysis of the actual versus budgeted implementation cost and 3) the analysis of the actual versus budgeted implementation time.

7.3.3.7 Post Implementation Process

The post implementation, go-live and the audit processes are tightly connected. ERP sponsors need to realise the temporary performance dip (Figure 6.8) upon reaching the go-live point. More than at any other time, the involvement of ERP sponsors is needed at this stage in order to lead the organisation until the organisation passes that performance dip. Their support and leadership is required until the organisation has developed trust in its ability to sustain the ERP stability and until they have ensured the effective management of the ERP continuous improvements. ERP sponsors are requested to remain responsible for leading ERP continuous improvements. This includes consistency and synchronisation between the roles, responsibilities and the ERP continuous improvements.

Full adherence to the roles and responsibilities management leads after the go-live stage encourages adopting ERP continuous improvements. This in return increases the learning curve in the organisation to revise, as needed, the roles and responsibilities along with the ERP improvements made. As the learning curve shows a sharp increase, the ERP sponsors will see a fundamental change in the relationship between the ERP and the organisation. The perception of ERP will change from an outer tool to an embedded organisation engine or as an inside organ of the organisation body. This organ or the embedded engine can always play the assistance organisational role

in adopting further business improvements, no matter how difficult or complex these improvements are. The organisation will then act as a player who boosted his fitness competency and has the power to accomplish hard tasks in a short period of time without burning up his energy.

7.4 Summary

This chapter has two parts, discussions and deriving the proposed model. For the first part, it provides discussion and external validation of the qualitative data analysis presented in Chapters Five and Six. Besides the comparative analysis of the four primary cases, an attempt was made to see how these cases compare with other organisational experiences reported in secondary case studies. Other empirical surveys were used for comparisons to support the findings.

The discussion in this chapter is divided into three parts as per the three implementation phases that have been chosen for this research, as discussed in Chapter Four. These three parts are 1) pre-implementation, 2) implementation and 3) the post implementation, go-live and continuous improvements.

The second part of the chapter was concerned with deriving the model this study aims to produce. The elements validated through primary and secondary data were consolidated in holistic model for implementing ERP that is centred on the management of the roles and responsibilities among stakeholders.

The model elements are divided into seven parts that start with the three implementation phases. The second part describing stakeholders involved in the initiation stage that trigger the change through adopting ERP implementation. This includes proper understanding of the underlying reasons for initiating and adopting ERP. The third part describes necessary planning steps that include 1) scope and objectives, 2) strategy, 3) stakeholders identification and hiring, 4) vendor and implementer selection, 5) preliminary roles and responsibilities identification, 6) integrated training plan, 7) defining mission critical processes and 8) readiness assessment.

The fourth part describes the necessity to redefine the roles and responsibilities if necessary after completing the requirements definition process. The fifth part refers to the core implementation processes that include 1) business process management, 2) conflict management, 3) leadership, 4) project management, 5) training and 6) technical management.

The sixth part refers to the need for an audit process to review roles and responsibilities before the GO-live. This will lead to the emergence of a new revision of the roles and responsibilities agreement.

The last part is concerned with the post implementation process which aims to turn the experiences that the organisations had before the go-live need to be embedded within its practices and culture. Roles and responsibilities management needs to always be an essential part of any ERP continuous improvement process.

CHAPTER EIGHT

Conclusion and Recommendations

8.1. Introduction

This chapter aims to summarise key findings of the research. The main results will be presented in a brief descriptive form, in addition to its proposed contribution to the research field. It also highlights, through various discussions, what may be considered as limitations of this research. Finally, it will suggest further avenues for research that may be conducted based on the findings of this investigation.

8.2. Summary of Research

As the management of stakeholders in an ERP context is a relatively new concept, both research and practice in this field are still immature. At the concept level, confusion remains in the literature around how stakeholders can be best managed to derive maximum return from ERP investment. From a research point of view, many writings about ERP appear to lack empirical evidence of how better ROI can be achieved from the implementation. Much of the existing literature focuses on singular success factors perspective of the implementation. Most of the other empirical studies on ERP have focused on the adoption and implementation issues of ERP systems (Markus *et al.*, 2000, Kumar *et al.*, 2003, Law and Nagi, 2007; Maheshwari, 2007). At the practice level, it has been repeatedly cited that as many as 75% of the organisations fail in implementing ERP (Rasmy *et al.*, 2005; Wang *et al.*, 2007). This means that ROI from the ERP investment is not achieved as a direct result of overrunning costs, overrunning time or from discrepancies between the expected and the realised benefits.

The existing critical success factors models insist that effective senior management is fundamentally required to support ERP implementation in order to achieve its success. ERP sponsors such as the board of directors or executive staff are, therefore, critical to successful implementation. However, existing literature lacks both the clarity and the necessary detail regarding the way in which management support can

be best delivered and managed. It also lacks the empirical evidence on how ERP sponsors can supervise ERP investment and ensure that such investments produce the targeted ROI. It is not practically expected that ERP sponsors develop a strong understanding of each singular perspective of the various existing ERP models.

Besides its narrow focus, existing ERP models are presented in a form that is seen as too detailed for ERP sponsors to understand and implement.

Despite the fact that ERP sponsor's support is essential; it is not practically expected that they will be available for the implementation most of the time. Therefore, they need a delegation mechanism for the vast majority of ERP activities while they still remain responsible for the overall ERP success. To achieve this objective, ERP sponsors need an effective roles and responsibilities tool that is easy to understand and implement. This tool can allow ERP sponsors to supervise the implementation ROI in a holistic manner.

From this perspective, there has been a call for a holistic model of ERP implementation centred on the management of roles and responsibilities. This model aims to enable ERP sponsors, primarily in Saudi Arabia, managing the relationship between stakeholders towards maximising ROI. Yet studies that have attempted to investigate maximising return from ERP investment from stakeholder's perspective are significantly few. Such studies, that address the management of roles and responsibilities among ERP stakeholders, are scattered among different theories. It also lacks the holistic approach and need comprehensive integration so it can assess ERP sponsors to manage ROI effectively.

ERP is a complex phenomenon since it affects nearly all business units (Boonstra, 2006). Each employee inside the organisation is involved in the ERP implementation process at different levels. The effect of ERP implementation is extended to include external parties such as the organisation's customers, suppliers, and government agencies. A holistic understanding involves a review of the process, people, technology, structure and different management systems.

The holistic approach, when studying implementation, therefore entails unifying schools of thought and research. This includes a review of existing critical success factors for ERP implementation from various perspectives. A strong base has been

created for more informed research and successful practices in the management of the roles and responsibilities in ERP context. This study has sought to contribute to this area of research and practice.

Adopting a holistic view, it reviewed a large body of literature relevant to ERP implementation models concerning many issues involved in its implementation.

From the literature, the categorisation of the ERP implementation into three implementation phases was chosen as a base for structuring the investigation.

A comprehensive analysis of the success factors among different models was undertaken in order to nominate the most influencing factors to the implementation success. These filtered factors were used to develop the basis for preparing interview questions. Relevant elements to the stakeholders roles and responsibilities management were then explored in the field using case studies. This was aimed at investigating how various elements that interact with stakeholder management are being operationalised in implementing ERP in real organisational settings. Furthermore, the investigation focused on how ROI is affected by the interaction between those nominated elements and the roles and responsibilities management. The review covered all implementation phases, preparation and planning, implementation and post implementation and continuous improvements.

Through this type of investigation, the study proposed a holistic model for ERP implementation centred on the roles and responsibilities management among ERP stakeholders. The model of ERP implementation has finally emerged as a result of this investigation effort.

Despite the limitations of this study, it provides significant findings. First, this study demonstrates that organisations possessing adequate knowledge of the most important ERP concepts can lead to the implementation success. However, it is evident that such knowledge often remains theoretical when there is a lack of effective guidelines to assist in leveraging this knowledge to produce a higher ROI. In other words, this knowledge remains theoretical while organisations struggle how to use them in practice. The proposed model attempts to fill this theory-to-practice gap in the real ERP implementation settings.

Second, the study findings demonstrate that organisations who implemented ERP are still confused whether they have achieved the targeted benefits or not. Typically, the IT department is the only stakeholder who is proud of the successes achieved in the implementation. The IT department indicates success through the discarding of legacy systems, unifying software and hardware platform, configuring ERP modules and the effective use by end users. However, the stakeholders from the business side often still have a number of doubts whether or not they have really achieved efficiency and cost saving benefits or not. The model has suggested a clear mechanism in setting specific performance targets that can be audited during the implementation and measured after the go-live stage.

Third, the overall findings have indicated that the organisational experience in integrating business strategy and on-going ERP implementation process is still immature. This study has found that ROI is adversely affected by the inconsistency between corporate strategy and implementation plans. The necessity to align implementation plan settings and the corporate strategy as per the findings should not be limited to the start-up implementation phase. Such alignment needs to remain consistent throughout the implementation life cycle that includes the stage of post implementation and continuous improvements. It is not expected that organisation ought to change its strategy because of ERP. However, changes in the corporate strategy need to be coordinated in a timely manner with the existing ERP plan settings as ERP can be an effective source for strategic decisions.

Fourth, the findings have shown that there are three milestones where the roles and responsibilities can be defined and reviewed. The first milestone is before the beginning of the implementation project when both ERP team and consultants are ready to start. The second milestone is before completing the requirements definition and finding the ERP requirements gap. The third milestone is before the go-live stage where a comprehensive review of the roles and responsibilities audit needs to be conducted. The roles and responsibilities review should be embedded within each and every ERP improvement after the go-live and during the post implementation.

Fifth, this study has demonstrated the significance of the post implementation stage which requires comprehensive understanding and advance planning. In fact, the

results have shown that the success made in the post implementation is the best certificate that the implementation is successful. The success in the post implementation is connected with the proper definition of the roles and responsibilities. This is clearly understood from the previous findings that state; 1) the significance of conducting comprehensive roles and responsibilities audit process before the go-live stage, 2) the importance of inculcating the roles and responsibilities review in each and every ERP continuous improvement. Success in the post implementation phase is therefore essential for achieving higher ROI. Furthermore, post implementation plans cannot succeed without; 1) ERP sponsors to develop strong understanding to its significance and nature, 2) the inclusion of post implementation in the ERP master plan itself.

Sixth, the study has found a number of elements that correlate with the stakeholders' roles and responsibilities in the implementation context. Those elements both interact with and contribute to, and are involved with and affected by the management of the roles and responsibilities perspective. Those elements are 1) strategy, 2) readiness, 3) training, 4) business process management, 5) project management, 6) conflict management and 7) technical management. The research has demonstrated how proper definition, review and audit of the roles and responsibilities interrelate with the effective management of those mentioned elements. The proper management of the roles and responsibilities can lead to higher ROI through the optimal management of the aforementioned elements.

Seventh, the study shows the significant role of the ERP vendor and Implementer to obtain higher ROI. However, the study found that most implementation difficulties relate to the stakeholders of the organisation such as the end user and functional managers. Issues connected with the ERP vendor and consultants can be dealt with easier and faster than the issues of the end users and functional managers.

Eighth, this study has reinforced the need to develop clear ERP implementation targets. This can be presented to end users and consultants in a form of mission critical processes that are required from the system to achieve performance gains. This is found to be important as it will 1) sharpen the focus and unify the effort to achieve those targets, 2) ensure that implementation produce tangible benefits, 3) allow the

achievement of quick wins which is important to preserve positive attitude and trust in ERP and 4) to provide a measurement criteria for the project success. Without this, the implementation may be vulnerable to 1) uncertainty of achieving benefits, 2) lack of measuring the ERP success, 3) adverse effects on staff morale towards ERP and 4) ultimately, adverse effects on the ROI.

Finally, based on the overall findings of this study, a proposed model for holistic ERP implementation was developed. It is centred on the management of the roles and responsibilities among stakeholders. Detailed descriptions and illustrations for the workings of the model elements were given, based on empirical investigation of four primary case studies, representing diverse organisational experiences with ERP implementation. Further descriptions were also given through a review of secondary data and literature review. The secondary data includes published case studies and surveys. The primary themes around which descriptions were given are the implementation phases, selection process and start up activities, implementation process that include project management and the management of training, business process and conflicts, post implementation and ERP continuous improvements.

8.3. Contribution of Study

This study aimed to contribute to research and practice. The theory of stakeholder management in the ERP context field is still immature and inadequate; this study aimed to act as an opening for mature theory building. It represents scattered aspects of ERP literature in a new form that integrates and unified different models of ERP implementation. Prior research places an emphasis on the significance of senior management support in ensuring implementation success. However, no detailed guidelines are provided that explain how senior management support can be best provided and how it can lead to better ROI.

This model closes this gap and reduces the ambiguity of the way in which ERP sponsors can lead the implementation process to achieve better ROI. The uniqueness of this model is exemplified by its holistic characteristics, and the fact that it is easy to understand and implement and consists of clear milestones. Owing these features, the model is specifically tailored for the needs of ERP sponsors as they can supervise the ROI with minimal follow-up effort. This can be assured as the model is equipped with

a clear mechanism of defining and maintaining the roles and responsibilities throughout the implementation lifecycle. The model will continue to serve ERP sponsors in the long-term until ERP becomes an embedded part of the organisation competencies. It serves the implementation until ERP acts as organ of the organisation body or as an inside engine to facilitate changes and continuous improvements.

The overall findings of this study can guide future work to various areas. As has been demonstrated from the findings of this study, successful ERP implementation does not accord with the narrowly-focused perspective, and research in this field has to take a broad approach.

From a practical point of view, this research has provided several major contributions. As many organisations suffer from the low rate of return from the ERP investment, this study provided useful tool to improve the ROI. Executive management teams who assume the ERP sponsor role can use the suggested model to derive the promised implementation benefits. It can assist them from the early beginning of the decision to adopt ERP until the implementation reaches the post implementation stage and continuous improvements. This study provides a fine example of how process, people and technological factors can be managed together with a clear people focus.

From this investigation, practitioners can derive a better understanding of the management of roles and responsibilities in real ERP implementation settings. The current practices of ERP implementation which follow narrowly-focused approaches is enhanced by the model proposed by this study. These enhancements resulted from the balanced perspective of this model which permits the unification and integration of the capabilities and strengths of the existing models. While the primary uniqueness of the model is the roles and responsibilities focus, other models can still be used alongside the proposed model. For example, the proposed model consists of management of training and business process management. The existing models of training and business management can still be followed to satisfy these two elements while the entire implementation is governed by the proposed model.

8.4. Limitations of Study

Despite considerable effort made to enrich the study it still has a number of limitations. The stakeholders and the roles and responsibilities management ERP context can be described as a green research field. This broadens its research scope, challenges faced by the different organisation experience. The number of cases reviewed is also still inadequate to generalise the research findings.

From the literature, the stakeholder's management in an ERP context is a relatively new research topic, rendering the available theory inadequate. This leads to the adoption of an exploratory approach that dictates, by its nature, a widespread review of relevant literature and need to collect an extensive amount of data. This may lead to the development of a more holistic and integrative understanding of the management of stakeholders and the roles and responsibilities. This is, in effect, demands a broadening of the scope of the study.

Due to the holistic approach taken it is not possible to claim that the study has exposed all issues related to the management of stakeholders and the roles and responsibilities in ERP implementation context. This is due to various constraints including, but not limited to, time frame, limited access to organisational information and the size of the PHD final thesis. As quoted by Al-Mashari, (1999) Given the limited time frame, a complete investigation of the phenomenon under consideration, particularly with case studies, could not be undertaken (Eisenhardt, 1989; Al-Mashari, 1999).

For the chosen cases, necessary efforts were made to interview as many stakeholders as possible but this inevitably faced constraints. For example, some stakeholders involved could not been interviewed due to the fact that they have changed their employers and they could not be reached. However, a balance of replacement list also acted as a backup plans to fill such information gathering gaps. The nature of the study requires a wider span of review to cover as many implementation phases as possible. In effect, it was difficult to find adequate candidate for each and every implementation phase especially for organisations that implemented more than one ERP project.

Time frame for interviews was a constraint at least for some candidate stakeholders. To complement interview findings documents related to the history of the implementation were provided. This represents a helpful tool to complement and enhance interview findings, however, a few documents were either no longer available or could not be accessed. The researcher undertook significant efforts towards assuring candidate stakeholders to be as open to share necessary details and opinions as possible. However some candidates were more open to share detailed information while a very few provided only what they thought to be adequate. The researcher, for those limited cases, sought secondment from different peers or counterpart stakeholders to ensure not to miss necessary details. However it cannot be denied that lack of ultimate openness from some interviewees represent a constraint.

Time constraints had a significant impact on the nature of the case study evaluation. Studying ERP stakeholders demands a longitudinal approach that permits the observation of the implementation phases over a long period of time. This is essential in order to observe the necessary details of all the implementation phases throughout the organisation as they progress. A longer time period would have afforded the capture of further details, which could enhance the recommendations and conclusions presented here.

Organisations normally start claiming credit by taking the initiative of adopting ERP systems. This, in contrast, creates pressure for implementation team to admit implementation mistakes as this will adversely affect the overall image of the organisation. This pressure results in some interviewees considering underlying ERP implementation details as private information.

In addition, the nature of this study involves critical investigation of senior management involvement and contributions. This required capturing as many details as possible that can expose mistakes or poor decisions made by executive management. It is understandable that participants such as functional managers, end users or IT staff members may be reluctant to share this type of detail. However, all efforts were made to ensure quality of data captured by providing adequate assurance in terms of the privacy and confidentiality of the captured information. Despite this,

concerns remain that some information may have been obscured or withheld, meaning that the data should not be regarded as complete, or without bias.

This study, for the reasons outlined above, primarily relied upon qualitative data drawn from interviews, and as a result, the extent to which the conclusions may be generalised is limited. A potential improvement to the study, or an area of further research, would involve the addition of closed questions within the interview questions that would permit greater scope for generalisation of the results.

8.5. Recommendations for Future Research

Previous discussions confirmed that this study can not cover the full scope of the research theme. However, it may act as a catalyst for further research. This investigation has found a lack of understanding of how stakeholders, roles and responsibilities can be best managed to achieve higher return from ERP investment. This conclusion is reached through the qualitative data collection process and through the review of the literature.

This study provides ample opportunities for further research work in this area. The holistic model proposed in managing roles and responsibilities among ERP stakeholders may be considered as starting point for further refinement and testing. For example, the research methodology chapter justifies the use of qualitative approach for building this holistic model. As a result of the model proposed by this study, an opportunity for a quantitative approach to the research has emerged. This could test several hypotheses derived from the findings using a number of variables to investigate both model components and their inter-relationships.

The proposed model covers three implementation phases in a holistic manner. There is still room for further examination through exploratory studies for the elements that fall specifically in particular implementation phases under investigation. It may be observed that research findings could be extended to cover specific areas such as industry, region, or an examination of the way in which these findings differ between large corporate environments versus small and medium organisations. Most of the secondary data used to support the model are extracted from studies conducted in developed countries like United States and Europe. Further studies can be conducted

to assess whether the results found are applicable in the context of a developing economy.

Finally, the management of ERP stakeholders under investigation in this study touches on components that relate to other emerging and existing management approaches. This includes process management, change management, strategic management, e-government and CRM. It also relates to various human resources theories and practices such as talent management and leadership. It would, therefore, be interesting for researchers to explore how the concepts of stakeholders, roles and responsibilities in ERP context integrated with such management approaches and practices.

REFERENCES

- Ahmed, Z., Zbib, I., Arokiasamy, S., Ramayah, T. and Chiun, L., 2006. Resistance to Change and ERP Implementation Success: The Moderating Role of Change Management Initiatives. *Asian Academy of Management Journal* 11(2), pp.1–17.
- Albert, B., 2006. Interpreting an ERP-implementation Project From a Stakeholder Perspective. *International Journal Of Project Management* 24, pp.38-52.
- Aldwani, A., 2001. Change Management Strategies for Successful ERP Implementation. *Business Process Management Journal* 7(3), pp.266-275.
- Al-Mashari, M., 1999. Implementing ERP Through SAP R/3: A Process Change Management (PCM) Perspective. *Journal of King Saud University: Computer and Information Sciences* 14, pp.25-38.
- Al-Mashari, M., 2003. Enterprise Resource Planning (ERP) Systems. A Research Agenda. *Industrial Management and Data Systems* 103, pp.22-27.
- Al-Mashari, M., Al-Mudimigh, A. and Zairi, M., 2003. Enterprise Resource Planning: A Taxonomy of Critical Factors. *European Journal of Operational Research*, 146, pp.352-364.
- Al-Rashid, W., Alshawhi, M. and Al-Mashari, M., 2009. Exploring Enterprise Resource Planning (ERP) Implementation From Stakeholders Perspective: Analysis of Case Study. *Proceedings of The 4th European Conference On Intelligent Management System In Operations (IMSIO4)*. Greater Manchester: UK. 7-8 July 2009, pp.140 -147.
- Al-Rashid, W., Alshawhi, M. and Al-Mashari, M., 2012. Exploring Enterprise Resource Planning (ERP) Implementation From Stakeholder Perspective: A Case Study. *5th International Conference on Communications, Computers and Applications (MIC-CCA2012)*. Istanbul: Turkey. 12-14 October 2012, pp.65-70.
- Alsalem, A., 2009. Benefits and Limitations of Implementing ERP Systems in Saudi Organisations. [online] Available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1706030> [Accessed 19 September 2012].
- Al-Turki. U. M., Andijani, A. A., Siddiqui, A. W., (2003), “ERP Implementation Trends and Practices in Saudi Arabia”, *King Fahd University of Petroleum & Minerals*. [online] Available at <https://www.google.com.sa/search?site=&source=hp&q=ERP+Implementation+Trends+and+Practices+in+Saudi+Arabia&oq=ERP+Implementation+Trends+and+Practices+in+Saudi+Arabia&gs_l=hp.3..0i22i30.3001.3001.0.4386.1.1.0.0.0.184.184.0j1.1.0...0...1c.1.27.hp..0.1.182.WPmJZgpQv_o> [Accessed 25 September 2013]
- Al-Turki. U. M., 2011. An exploratory study of ERP implementation in Saudi Arabia. *Production Planning & Control: The Management of Operations* Volume 22, Issue 4, 2011pp. 403-413
- Arlbjorn, J. S., and Haug, A., 2010. *Business Process Optimisation*, New York: John Wiley & Sons.

Anantha Sayana, S., 2004. Auditing Governance in ERP Projects. *Information Systems Control Journal* 2. [online] Available at <http://www.isaca.org/Journal/Past-Issues/2004/Volume-2/Documents/jpdf042-AuditingGovernanceinERP.pdf> [Accessed 10 September 2013].

Aubert, B., Hooper, V. and Schnepel, A., 2013. Revisiting the Role of Communication Quality in ERP Project Success. *American Journal of Business* 28(1), pp.64-85.

Baki, B., Dereli, T. and Baykasoglu, A., 2004. An Investigation on the Readiness of Turkish Companies for Enterprise Resource Management. *Journal Of Manufacturing Technology Management*, 15(1), pp.50-56.

Barker, T. and Frolick, M. N., 2003. ERP Implementation Failure: A Case Study. *Information Systems Management* 20, pp.43-49.

Beheshti, H.M., 2006. What Managers Should Know About ERP. *Management Research News* 29, pp.184-193.

Beheshti, H.M., and Beheshti, C.M., 2010. Improving Productivity and Firm Performance with ERP. *Enterprise Information Systems* 4, pp.445-472.

Bernard, H. and Ryan, G., 2009. *Analyzing Qualitative Data: Systematic Approaches*. London: Sage.

Bezawada, R., 2012. Enterprise Resource Planning. [online] Available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2142293> Accessed 19 September 2012.

Bharat Institute of Management, 2012. Impact of Enterprise Resource Planning Tools and Techniques in Management Education. [online]. Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1980601> Accessed 19 September 2012.

Bingi, P., Sharma, M. and Godla, J., 1999. Critical Issues Affecting an ERP Implementation. *Information Systems Management* 16, pp.7-14.

Boonstra, A., 2006. Interpreting an ERP-Implementation Project From a Stakeholder Perspective. *International Journal of Project Management* 24(1), pp.38-52.

Boyer, D., 2001. ERP Implementation: Managing the Final Preparation and Go-Live Stages. *Government Finance Review*, 17(6), p. 41.

Buonanno, G., Faverio, P., Pigni, F., Ravarini, A., Sciuto, D. and Tagliavini, M., 2005. Factors Affecting ERP System Adoption: A Comparative Analysis Between SMEs and Large Companies. *Journal of Enterprise Information Management* 18, pp.384-426.

Burns, M., 2008. Implementation is all about people. *CA Magazine*, October 2008, p. 16.

Burns, M., 2011. What does an ERP system cost? *CA Magazine*, August 2011, pp.15- 16.

Chang, M.K., Cheung, W., Cheng, C.H. and Yeung, J.H.Y., 2008. Understanding ERP System Adoption From the User's Perspective. *International Journal of Production Economics* 113, pp.928-942.

Chou, S-W. and Chang, S., 2008. The Implementation Factors that Influence the ERP Benefits. *Decision Support Systems* 46, pp.149-157.

CommsMea, 2012. Middle East: market overview. [online] Available at <http://www.commsmea.com/11898-middle-east-market-overview/#.UkJh2obIbSI> [Accessed 25 September 2013].

Cresswell, J.W., 2008. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. 3rd ed. London: Sage.

Davenport, T. H., 1998. Putting the Enterprise into the Enterprise System. *Harvard Business Review* 76(4), pp.121-131.

De Soysa, S. and Nanayakkara, J., 2006. Readiness for ERP Implementation in an Organization: Development of an Assessment Model. *International Conference on Information and Automation*. Shandong: China. 15-17 December 2006, pp.27-32.

De Villiers, R., 2005. Interpretative Research Models for Informatics: Action Research, Grounded Theory, and the Family of Design and Development Research. *Alternation* 12(2), pp.12-52.

Dezdar, S., and Ainin, S., 2011. 'The Influence of Organisational Factors on Successful ERP Implementation. *Management Decision* 49(6), pp.911-926.

Dorobat, I., 2009. Applying Blended Learning in ERP Training. *International Conference in Berlin 'E-Learning and the Knowledge Society'*. Berlin: Germany. 31 August 2009.

Dorobat, I., and Nastase, F., 2012. Training Issues In ERP Implementations. *Accounting and Management Information Systems* 11(4), pp.621–636.

Esteves, J., and Pastor, J.A., 2002. Understanding the ERP Project Champion Role and its Criticality. *Proceedings of the European Conference on Information Systems*. Gdansk: Poland. 6-8 June 2002, pp.1077-1086.

Finney, S., and Corbett, M., 2007. ERP Implementation: A Compilation and Analysis of Critical Success Factors. *Business Process Management Journal* 13(3), pp.329-347.

Fui-Hoon Nah, F., Lee-Shang, J. and Kuang, J., 2001. Critical Factors for Successful Implementation of Enterprise Systems. *Business Process Management* 7, pp.285-296.

Fui-Hoon Nah, F., Zuckweiler, K.M. and Lau, S., 2003. ERP Implementation Chief Information Officers' Perceptions of Critical Success Factors. *International Journal of Human-Computer Interactions* 16, pp.5-22.

Fitz-Gerald, L. and Carroll, J., 2003. The Role of Governance in ERP System Implementation. *Proceedings of the 14th Australasian Conference on Information Systems*, 2003.

Francoise, O., Bourgault, M., Pellerin, R., 2009. ERP Implementation Through Critical Success Factors' Management. *Business Process Management Journal* 15(3), pp.371-394.

Ganesh, L., and Mehta, A., 2010. Critical Success Factors for Successful Enterprise Resource Planning Implementation. *International Journal of Business, Management and Social Sciences* 1(1), pp.65-78.

Garg, P. and Garg, A., 2013. An empirical study on critical failure factors for enterprise resource planning implementation in the Indian retail sector. *Business Process Management Journal* 19, pp.496-514.

Gargeya, V.B., and Brady, C., 2005. Success and failure factors of adopting SAP in ERP system implementation. *Business Process Management Journal* 11, pp.501-516.

Gartner Consulting, 2011. WCTC ERP Project: Governance Recommendations. Presentation for Engagement: 224071510. [online] Available at http://sbctc.edu/college/it/ctcLink_Governance_Recommendations.pdf Accessed 10 September 2013.

Gattiker, T. and Goodhue, D., 2005. What Happens after ERP Implementation: Understanding the Impact of Inter-Dependence and Differentiation on Plant-Level Outcomes. *MIS Quarterly*, 29(3), pp. 559-584.

Ghazanfari, M., Rouhani, S., Jafari, M. & Taghavifard, M. T., 2009. ERP requirements for supporting management decisions and business intelligence. *The IUP Journal of Information Technology* 5(3), pp.65-84.

Ghosh, S., and Skibniewski, M., 2010. Enterprise Resource Planning Systems Implementation as a Complex Project: A Conceptual Framework. *Journal Of Business Economics And Management* 11(4), pp.533-549.

Glover, S.M., 1999. Implementing ERP. *Internal Auditor* 56(1), pp.40-47.

Grabot, B., Mayere, A., and Bazet, I., 2008. *ERP Systems and Organisational Change: A Socio-Technical Insight*. Springer.

Grabski, S.V., Leech, S.A. and Lu, B., 2001. Risks and Controls in the Implementation of ERP Systems. *International Journal Of Digital Accounting Research* 1(1), pp.47-68.

Grabski, S.V., Leech, S.V. and Schmidt, P.J., 2011. A Review of ERP Research: A Future Agenda for Accounting Information Systems. *Journal of Information Systems* 25, pp.37-78.

Grabot, B., Mayere, A. and Bazet, I., 2008. *ERP Systems and Organisational Change: A Socio-Technical Insight*, Cambridge: Cambridge University Press.

Grover, V., 1999. From Business Reengineering to Business Process Change Management: A Longitudinal Study of Trends and Practices. *IEEE Transactions on Engineering Management* 46(1), pp.36-46.

Hwang, W., 2011. *The Drivers of ERP Implementation and Its Impact on Organizational Capabilities and Performance and Customer Value*. PhD, University of Toledo.

Hasibuan, Z. and Dantes, G., 2012. Priority of Key Success Factors (KSFS) on Enterprise Resource Planning (ERP) System Implementation Life Cycle. *Journal Of Enterprise Resource Planning Studies* pp.1-15.

Hawari, A. and Heeks, R., 2009. Explaining ERP Failure in a Developing Country: A Jordanian Case Study. *Journal of Enterprise Information Management* 23(2), pp.135-160.

Hawking, D., Crimmins, F., Craswell, N. and Upstill, T., 2004. How Valuable is External Link Evidence When Searching Enterprise Webs? *Proceedings of the Australasian Databases Conference* Dunedin: New Zealand.

Hawking, P., Stein, A. and Foster, S., 2004. Revisiting ERP Systems: Benefit Realisation. *Proceedings of the 37th Hawaii International Conference on System Sciences*. Big Island: Hawaii. 5-8 January, 2004.

Hofstede, G., Hofstede, G.J. and Minkov, M., 2010. *Cultures and Organizations: Software of the Mind*. 3rd ed. New York: McGraw-Hill.

Holland, C. and Light, B., 1999. A Critical Success Factors Model For ERP Implementation', *IEEE Software*, 16(3), pp.30-36.

Hooshang, M.B. and Beheman, C.M., 2010. Improving productivity and form performance with ERP. *Enterprise Information Systems* 4, pp.445-472.

Hossain, M., Bala, H. and Bhagwatwar, A.B., 2011. Untold Stories of ERP Systems Implementation: Role of Ownership and Governance, Scope Management, and Employee Empowerment. *22nd Australasian Conference on Information Systems*. ACIS 2011 Proceedings, Paper 12. Australia: Sydney. [online] Available at <http://aisel.aisnet.org/acis2011/12> [Accessed 10 September 2013].

Hsiuju, R.Y. and Chwen, S., 2004. Aligning ERP Implementation with Competitive Priorities of Manufacturing Firms: An Exploratory Study. *International Journal of Production Economics* 92, pp.207-220.

Ifinedo, P. and Nahar, N., 2009. Interactions Between Contingency, Organizational IT Factors, and ERP Success. *Industrial Management & Data Systems* 109(1), pp.118-137.

Ike, C.E., and Mogens, M., 2005. Identifying Critical Issues in Enterprise Resource Planning (ERP) Implementation. *Computers in Industry*, 56, pp.545-557.

Jaaskelainen, K. and Pau, L.F., 2009. ERP project's internal stakeholder network and how it influences the project's outcome. MPRA Paper No. 31016. [online] Available at http://mpra.ub.uni-muenchen.de/31016/1/MPRA_paper_31016.pdf [Accessed 10 September 2013].

- Johnson, G., Scholes, K., Whittington, R., 2009. *Exploring Corporate Strategy with MyStrategyLab*. London: Prentice Hall.
- Jonàs Montilva C. and Judith Barrios A. 2004. BMM: A Business Modeling Method For Information Systems Development CLEI ELECTRONIC JOURNAL 7(2), PAPER 3
- Jonker, J. and Pennink, B., 2010. *The Essence of Research Methodology: A Concise Guide for Master and PhD Students in Management Science*. New York: Springer.
- Kanellou, A. and Spathis, C., 2013. Accounting Benefits and Satisfaction in an ERP Environment. *International Journal of Accounting Information Systems* 14, pp.209-234.
- Kang, S., Park, J. and Yang, H., 2008. ERP Alignment For Positive Business Performance: Evidence From Korea's ERP Market. *Journal Of Computer Information Systems*, 48(4), pp.25-38.
- Kapp, K.M., Latham, W.F., and Latham, H.N.F., 2001. *Integrated Learning for ERP success: a Learning Requirements Planning Approach*. New York: CRC Press.
- Kee-Young, K. and Jae-Nam, L., 2008. The role of readiness for change in ERP implementation: Theoretical bases and empirical validation. *Information & Management* 45, pp.474-481.
- Kemp, M. and Low, G., 2008. ERP Innovation Implementation Model Incorporating Change Management. *Business Process Management Journal* 14(2), pp.228-242.
- Kim, Y., Lee, K. and Gossain, S., 2005. Impediments to successful ERP implementation process. *Business Process Management Journal* 11, pp.158-170.
- Kirk, J. and Miller, M., 1986. *Reliability and Validity in Qualitative Research*. London: Sage.
- Klein, H. and Myers, M., 1999. A Set of Principles for Conducting and Evaluating Interpretive Field Studies In Information Systems. *MIS Quarterly* 23(1), pp.67-94.
- Koh, S.C.L., Gunasekaran, A. and Cooper, J.R., 2009. The Demand for Training and Consultancy Investment in SME-Specific ERP Systems Implementation and Operation. *International Journal of Production Economics* 122(1), pp.241-254.
- Kotter, J., 2012. *Leading Change*. Boston: Harvard Business Review Press.
- Kraemmergaard, P. and Moller, C., 2000. A Research Framework for Studying the Implementation of Enterprise Resource Planning (ERP) Systems. [online] Available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.25.8971&rep=rep1&type=pdf> Accessed 10 September 2013.
- Kraemmerand, P., Moller, C. and Boer, M., 2003. ERP implementation. An integrated process of radical change and continuous learning. *Production Planning and Control. The Management Operations* 14, pp.338-348.

Kuhn, R. and Sutton, S. G., 2009. Continuous auditing in ERP system environments: the current state and future directions. [online] Available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1511990> Accessed 19 September 2012.

LaPiedra, R., Alegre, J. and Chiva, R., 2011. The importance of management innovation and consultant services on ERP implementation success. *The Service Industries Journal* 31, pp.1907-1911.

Legare, T., 2002. The role of organizational factors in realizing ERP benefits. *Information Systems Management* 19, pp.21-42.

Lin, H-F., 2010. An investigation into the effects of IS quality and top management support on ERP system usage. *Total Quality Management and Business Excellence* 21, pp.335-349.

Liu, L., 2009. How does strategic uncertainty and project sponsorship relate to project performance? *Management Research News* 32, pp.239-253.

Li, D., Xu, A., Tjoa, M. and Chaudhry, S.S., 2007. *Research and Practical Issues of Enterprise Information Systems*, New York: John Wiley & Sons.

Loh, T.C. and Loh, C.L., 2004. Critical elements for a successful ERP implementation in small- and medium-sized enterprises. *International Journal of Production Research* 42, pp.3433-3455.

Longinidis, P. and Gotzamani, K., 2009. ERP user satisfaction issues: insights from a Greek industrial giant. *Industrial Management & Data Systems* 109(5), pp.628-645.

Lytras, M.D. and Ordonez de Pablos, P., 2009. *Emerging Topics and Technologies in Information Systems*. London: Pearson Publishers.

Mabert, V.A., 2006. Model based interpretation of survey data: A case study of enterprise resource planning implementations. *Mathematical And Computer Modelling* 44, pp.16-29.

Madhani, P. M., 2008. *Enterprise Resource Planning (ERP): Enhancing and Sustaining Value*. Hyderabad: ICFAI University Press.

Maditinos, D., Chatzoudes, D. and Tsairidis, C., 2011. Factors affecting ERP system implementation effectiveness. *Journal Of Enterprise Information Management*, 25(1), pp.60-78.

March, S. T., & Smith, G. F. (1995). Design and natural science research on information technology. *Decision Support Systems*, 15(4), 251-266.

Marija Bjekovic and Handerik A., 2013. Challenges of Modelling Landscapes pragmatic Swept Under the Carpet?. In *Proceedings of the Third International Symposium on Business Modelling and Software Design*. Noordwijkerhout, The Netherlands, 8-10 July 2013, pp.11-22.

Markus, M.L. and Tanis, C., 2000. The Enterprise Systems Experience: From Adoption to Success. In R.W. Zmud, (ed.) *Framing the domains of IT research: Glimpsing the future through the past*. Cincinnati, OH: Pinnaflex Educational Resources, pp.173-207.

McCredie J., and Updegrave, D., (1999). Enterprise System Implementation: Lessons from the Trenches. *Cause/Effect Journal* 22(4), pp.1-10.

Miles, M. and Huberman, M., 1994. *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd ed. California: Sage

Millet, P., 2013. Toward a model-driven, alignment-oriented ERP methodology. *Computers In Industry*, 64(4), pp.402-411.

Momoh, A., Roy, R. and Shelab, E., 2010. Challenges in enterprise resource planning implementation: state-of-the-art. *Business Process Management Journal* 16(4), pp.537-565.

Moon, Y.B., 2007. Enterprise Resource Planning (ERP): a review of the literature. *International Journal Of Management & Enterprise Development* 4(3), p.4.

Morris, J. J. and Lakshmana, I., 2010. Measuring the impact of enterprise resource planning (ERP) systems on earnings management. *Journal of Emerging Technologies in Accounting*, 7. [online] Available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1894839> [Accessed 19 September 2012].

Mouton, J. and Marais, H., 1993. *Basic Concepts in the Methodology of the Social Sciences*. Pretoria: Human Sciences Research Council.

Murphy, G.D., Chang, A. and Unsworth, K., 2012. Differential effects of ERP systems on user outcomes: a longitudinal investigation. *New Technology, Work and Employment* 27, pp.147-162.

Muscattello, J.R. and Parente, D.H., 2006. Enterprise resource planning (ERP): a postimplementation cross-case analysis. *Information Resources Management Journal* 19(3), pp.61-80.

Naden, C. and Lewins, R., 2010. *Induction and Deduction: A Historical and Critical Sketch of Successive Philosophical Conceptions*. Kessinger Publishing

Nah, F., Lau, J. and Kuang, J., 2001. Critical factors for successful implementation of enterprise systems. *Business Process Management Journal* 7(3), pp.285-296.

Nair, J., Reddy, D.B.S. and Samuel, A.A., 2011. A framework for ERP system implementation: socio-technical change management perspective. *International Journal of Business Derivatives*, 1(1).

Newman, M. and Westrup, C., 2005. Making ERPs work: accountants and the introduction of ERP systems. *European Journal of Information Systems* 14, pp.258-272.

Ngai, E.W.T., Law, C.C.H. and Wat, F.K.T., 2008. Examining the Critical Success Factors in the Adoption of Enterprise Resource Planning. *Computers in Industry* 59(6), pp.548-564.

Oana, V., 2010. Strategic alignment of ERP implementation stages: An empirical investigation'. *Information & Management* 47, pp. 158-166.

Oliver, D. and Romm, C., 2002. Justifying enterprise resource planning adoption. *Journal of Information Technology* 17, pp.199-213.

Olson, D.L. and Kesharwani, S., 2009. *Enterprise Information Systems: Contemporary Trends and Issues*. New York: World Scientific Publishers.

Pabedinskaite, A., 2010. Factors of successful implementation of ERP systems. *Economics & Management* 15, pp.691-697.

Par, A. and Shanks, G., 2000. A taxonomy of ERP implementation approaches. *Proceedings of the 33rd Annual Hawaii International Conference 2000*. IEEE, pp.1-10.

Parr, A. and Shanks, G., 2000. A model for ERP project implementation. *Journal of Information Technology* 15, pp.289-303.

Pan, K., Nunes, M.P. and Peng, G.C., 2011. Risks Affecting ERP Post-Implementation: Insights From a Large Chinese Manufacturing Group. *Journal of Manufacturing Technology Management* 22(1), pp.107-130.

Panorama Consulting Group, (2013). "2013 ERP REPORT" [online] Available at <http://Panorama-Consulting.com/resource-center/2013-erp-report/>. [Accessed April 11th, 2013].

Parry, G. and Graves, A., 2008. The importance of knowledge management for ERP systems. *International Journal of Logistics Research and Applications* 11, pp.427-441.

Parthasarathy, S., 2010. *Enterprise Information Systems and Implementing IT Infrastructures: Challenges and Issues*. New York: John Wiley & Sons.

Peng, G.C. and Nunes, M.B., 2008. A discussion of barriers to successful exploitation of ERP systems in China. *Proceedings of the IADIS International Conference in Information Systems*. Algarve: Portugal. 15-17 April 2008, pp.73-80.

Peslak, A., Subramanian, G. and Clayton, G., 2008. The phases of ERP software implementation and maintenance: A model for predicting preferred ERP use. *Journal of Computer Information Systems* 48(2), pp.25-33.

Petre, M. and Rugg, G., 2012. *The Unwritten Rules of Ph.D Research*. 2nd ed. Maidenhead: McGraw Hill.

Phillips, E. and Pugh, D., 2010. *How to get a Ph.D*. 5th ed. Maidenhead: OUP.

Ptak, C.A. and Schragenheim, E., 2004. *ERP: Tools, Techniques, and Applications for Integrating the Supply Chain*. 2nd ed. New York: St. Lucie Press.

Soffer, P., Golany, B. and Dori, D., 2005. Aligning an ERP System with Enterprise Requirements: An Object-based Approach. *Computers in Industry* 56, pp.639-662.

Razmi, J., Sangari, M.A. and Ghodsi, R., 2009. Developing a practical framework for ERP readiness assessment using fuzzy analytic network process. *Advances In Engineering Software* 40, pp.1168-1178.

Ramanathan, T., 2009. *The Role of Organisational Change Management in Offshore Outsourcing*. Universal Publishers.

Richey, R. and Klein, J., 2007. *Design and Development Research: Methods, Strategies and Issues*. Mahwah: Lawrence Erlbaum Associates Publishers.

Ritchie, J. and Lewis, J., 2010. *Qualitative Research Practice*. London: Sage.

Robson, C., 2002. *Real World Research*. 2nd ed. Oxford: Blackwell.

Saunders M., Lewis P. and Thornhill, A., 2009. *Research Methods for Business Students*. 5th ed. Harlow: Pearson Education.

Saatcioglu, O.Y., 2009. What determines user satisfaction in ERP projects? *Journal of Enterprise Information Management* 22, pp.690-706.

Schein, E., 1985. *Organizational Culture and Leadership*. San Francisco: Jossey Bass.

Shahin, A., Dadri, A. and Gazor, R., 2010. Evaluating the Application of Learning Requirements Planning Model in the ERP Project of Esfahan Steel Company. *International Journal of Business and Management*, 5(2) pp.33-43.

Saudi Gazette, 2013. Saudi IT market's value to rise to \$5.7b by 2016. [online] Available from <<http://www.saudigazette.com.sa/index.cfm?method=home.regcon&contentID=20120219117860>> [Accessed 23 September 2013].

Shafaei, R. and Dabiri, N., 2008. An EFQM Based Model to Assess an Enterprise Readiness for ERP Implementation. *Journal of Industrial and Systems Engineering* 2(1), pp.51-74.

Silva, N., De Silva, B. M. and de Gunawardana, K., 2011. 'The impact of enterprise resource planning systems on management accounting in private companies in Sri Lanka'. [online] Available from < http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1742377> [Accessed 19 September 2012].

Singh, K. and Bhattacharya, S., 1995. *Management Information System*. New Dehli: Discovery Publishing House.

Singh, A., 2009. ERP trend towards SMEs. *The IUP Journal of Systems Management* 7(3), pp.224-31.

Skok, W. and Legge, M., 2002. Evaluating enterprise resource planning (ERP) systems using an interpretive approach. *Knowledge & Process Management* 9(2) pp.72-82.

Spitzley, L. and Kumar, A., 2012. Enterprise resource planning systems in public organisations: an examination of benefits, challenges and critical success factors. [online] Available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2025775> Accessed 19 September 2012.

Stake, R., 1995. *The Art of Case Study Research*. Thousand Oaks, CA: Sage Publications.

Standish Group, 1999. Chaos: A Recipe for Success. The Standish Group International. [online] Available at http://www4.informatik.tu-muenchen.de/lehre/vorlesungen/vse/WS2004/1999_Standish_Chaos.pdf [Accessed 10 September 2013].

Stewart, T., 2013. Factors affecting the performance of enterprise resource planning systems in the post-implementation stage. *Behaviour and Information Technology*. [online] Available at <http://www.tandfonline.com/doi/abs/10.1080/0144929X.2013.799229#.Ui8VSWTXgsk> [Accessed 10 September 2013].

Sumner, M., 2000. Risk factors in enterprise wide and ERP projects. *Journal of Information Technology* 15, pp.317-327.

Sumner, M., 2009. How alignment factors influence ERP project success. *Enterprise Information Systems* 3, pp.425-448.

Stair, R. and Reynolds, G., 2011. *Principles of Information Systems*. New York: John Wiley & Sons.

Štemberger, M., Vukšić, V. and Kovačič, A., 2009. Business Process Modelling as a Critical Success Factor in Implementing an ERP System. *South East European Journal of Economics and Business* 4(2), pp.89-96.

Swanson, E. and Beath, C., 1989. *Information Systems Maintenance: Comparative Cases*. London: Wiley and Sons.

Taylor, B., Sinha, G. and Ghoshal, T., 2006. *Research Methodology: A Guide For Researchers In Management And Social Sciences*. New Delhi: Prentice-Hall.

Teittinen, H., Pellinen, J. and Jarvenpaa, C., 2013. ERP in action: challenges and benefits for management control in SME context. *International Journal of Accounting Information Systems*. [online] Available at <http://www.sciencedirect.com/science/article/pii/S146708951200019X> [Accessed 10 September 2013].

Tiwana, A. and Keil, M., 2009. Control in Internal and Outsourced Software Projects. *Journal of Management Information Systems* 26(3), pp.9-44.

Tsai, W.H., Chien, S.W., Hsu, P.Y. and Leu, J.D., 2005. Identification of critical failure factors in the implementation of enterprise resource planning (ERP) system in Taiwan's industries. *International Journal of Management and Enterprise Development* 2, pp.219-239.

Tsai, W.H., Chena, S.P., Chena, H.C., Hsub, J.L., Yang, C.C. and Yuanlin, C., 2010. The Relationship between Critical Success Factors (CSFs) and Performance of ERP Systems Implementation: View of Implementation Phases. *Journal of e-Business* 12, pp.297-316.

Tsai, W.H., Hwang, E.T.Y., Chang, J.C., Lai, C.W., Lin, S.J. and Yang, C.H., 2012. Taxonomy of cost of quality (COQ) across the enterprise resource planning (ERP) implementation phases. *African Journal of Business Management*, 6, pp.854-864.

- Tsai, W-H., Lee, K., Liu, K. and Chou, Y-W., 2012. The Influence of ERP Systems Performance on Earnings Management. *Enterprise Information Systems* 6, pp.491-517.
- Tsai, W. and Hung, S., 2009. E-commerce implementation: an empirical study of the performance of ERP using the organisational learning model. *International Journal of Management* 25(2), pp.348-352.
- Umble, E.J., Haft, R.R. and Umble, M.M., 2003. Enterprise Resource Planning: Implementation Procedures and Critical Success Factors. *European Journal of Operational Research* 146, pp.241-257.
- Verville, J., Bernadas, C. and Halington, A., 2005. So You're Thinking of Buying an ERP? Ten Critical Factors for Successful Implementation. *Journal of Enterprise Information Management* 18, pp.665-668.
- Verville, J. and Halington, A., 2003. The effect of team composition and group role definition on ERP acquisition decisions. *Team Performance Management* 9(5), pp.115-130.
- Wagner, B., 2012. *Concepts in Enterprise Resource Planning*. Mason, OH: Course Technology.
- Wagner, W. and Antonucci, Y., 2009. The ImaginPA Project: The first large scale, public sector ERP implementation. *Information Systems Management* 26(3), pp.275-284.
- Walsham, G., 1995. Interpretive Case Studies in IS Research: Nature and Method. *European Journal of Information Systems* 4, pp.74-81.
- Wang, E. and Chen, J., 2006. Effects of internal support and consultant quality on the consulting process and ERP system quality. *Decision Support Systems* 42, pp.1029-41.
- Wanger, B. and Monk, E., 2008. *Enterprise Resource Planning*. 3rd ed. Boston: MIT Course Technology Press.
- Weber, R. (2012). Evaluating and developing theories in the information systems discipline. *Journal of the Association for Information Systems*, 13(1), 2.
- Wei, C., 2008. Evaluating the performance of an ERP system based on the knowledge of ERP implementation objectives. *International Journal of Manufacturing Technology* 39, pp.168-18.
- Wenrich, K. and Ahmad, N., 2009. Lessons learned during a decade of ERP experience: A case study. *International Journal of Enterprise Information Systems (IJEIS)* 5, pp.55-73.
- Wickramasinghe, V., and Gunawardena, V., 2010. Effects of people-centred factors on enterprise resource planning implementation project success: empirical evidence from Sri Lanka. *Enterprise Information Systems* 4(3), pp.311-328.
- Willis, T.H. and Willis-Brown, A.H., 2002. Extending the value of ERP. *Industrial Management & Data Systems* 102, pp.35-38.

Williams, R. and Pollock, N., 2009. Beyond the ERP implementation study: a new approach to the study of packaged information systems. [online] Available from <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1424371> Accessed 19 September 2012.

Yin, R., 2009. *Case Study Research: Design and Methods*. 4th ed. Thousand Oaks, CA: Sage.

Zabjeck, D., Kovacic, A. and Stemberger, A., 2009. The influence of business practice management and some other CSFs on successful ERP implementation. *Business Process Management Journal* 15, pp.588-608.

Zafeiropoulos, I., Metaxiotis, K. and Askounis, D., 2005. Dynamic risk management system for the modelling, optimal adaptation and implementation of an ERP system. *Information Management and Computer Security* 13, pp.212-234.

Zhang, L., Lee, M., Zhang, Z and Banerjee, P., 2003. Critical Success Factors of Enterprise Resource Planning Systems Implementation Success in China. *Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS'03)*.

Zhu, Y., Li, Y. and Wang, W., 2010. What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry. *International Journal of Information Management* 30, pp.265-278.