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Understanding the Perception of Success in the Development of an ERP System: an Interpretive Case Study in a Saudi Arabian Private Organisation

Majed Abdulaziz Al-Braithen

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Dedication

I dedicate this thesis to my parents (my father, Abdulaziz H. Al-Braithen, and my mother, Sarah 1. Al-Braithen), to my wife, Kholoud, to my daughters, Sarah and Ghaida, to my son, Abdulaziz, and finally to my mother-in-law, Mrs Haleh M. Al-Sabti

Acknowledgment

Before anything else, I would like to thank God, ALLAH, for giving me the power that helped me to complete this work. Without his help, I am sure this work would never have seen the light of day. Secondly, I would like to express my gratitude and appreciation to a great lady who made me feel at home although I was thousands of miles away from my real home. Professor Alison Adam is a name that I will never forget. She deserves the greatest praise that words can convey, although I have never found any written word in any dictionary which can be used to express adequately my appreciation. She was not merely my supervisor but my big sister, social advisor, friend and colleague. I am deeply thankful to her, as without her support, advice, guidance and motivation, this work would not have reached its end. This is not mere flattery, but the plain truth.

I also wish to express my sincere gratitude to a great lady who worked behind the scenes. She really deserves my gratitude in a separate paragraph or even a chapter. I refer to my wife, Mrs Kholoud I Al-Abdulkarim (Um-Abdulaziz), without whose unconditional and continuous motivation, patience and love, it would not have been possible for me to complete this work. I must also thank my daughters, Sarah and Ghaida, and my little boy, Abdulaziz, for being so patient while I was away from them, although we lived in the same house.

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Declaration

I declare that

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is originally my work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Majed A. Al-Braithen

30th June 2010

Abbreviations and Glossary

BoB	Best of Breed
BPR	Business Process Reengineering
CAQDA	Computer Assisted Qualitative Data Analysis
CRM	Customer Relationship Management
CSF	Critical Success Factor
D&M Model	DeLone and McLean Model of Success
DBMS	Database Management System
Emdad	Project name of SABIC's supply chain, meaning 'supply' in Arabic
ERP	Enterprise Resource Planning
ERP-II	Extended Enterprise Resource Planning
ES	Enterprise System
Fanar	Arabic word meaning 'lighthouse'
FI/CO	Finance and Control Module
GDP	Gross Domestic Product
GTM	Grounded Theory Method
Hadeed	Arabic term meaning 'iron'
HR	Human Resources Module
ICT	Information, Communication and Technology
IS	Information Systems
IT	Information Technology
MM	Materials Management Module
MRP	Materials Resource Planning
MRP-II	Manufacturing Resource Planning
NVivo	Qualitative software developed by QSR
PM	Plant Maintenance Module
PP	Production Planning Module
PRIME	Hadeed's legacy mainframe system
PS	Project System Module
PWH	Price Waterhouse consultancy
QM	Quality Management Module
QSR	An international developer of qualitative research software
SABIC	Saudi Basic Industries Corporation
SAP Fanar	Hadeed's fourth SAP R/3 project (2004-present)
SAP Hadeed	Hadeed's second SAP R/3 project (1996-2004)
SAP R/3	An ERP system designed and developed by SAP AG
SAP SMO	Hadeed's third SAP R/3 project (1999-2001)
SAP-I	Hadeed's first SAP R/3 project (1992-1995)
SCM	Supply Chain Management
SD/LE	Sales and Distribution / Logistic Module
SMO	Supply Management Organization
SS	Shared Services: a BPR concept
SSL	SABIC Services Limited
SSO	Shared Services Organization
SSRS	Shared Services Request System (The Competency Centre)
TEI	Total Enterprise Integration
Y2K	Year 2000

Abstract

Information System (IS) success continues to be an important theme in IS research. However, the majority of IS success studies have adopted a very narrow and deterministic approach. A number have adopted a form of factoring approach such as model based on Critical Success Factors (CSFs) which is an instance of positivism paradigm research despite the fact that their findings fail, to some extent, to reflect the dynamic reality and complexity of the implementation and success of IS projects. The work reported here is a qualitative study of IS success and failure in the context of the implementation of a series of Enterprise Resources Planning (ERP) projects dating from 1992 to 2005 by a Saudi Arabian private organisation. It focuses on understanding the perceptions of IS success of two major groups of internal stakeholders: end users and project team members. Accordingly, 57 semi-structured interviews were conducted and most were audio recorded. Data were analysed using the Grounded Theory Method (GTM) underpinned by Pettigrew's ideas of contextualisim and the use of NVivo software.

This research makes a contribution to the interpretive literature on IS success, as it shows the competence of interpretive research in reflecting the reality of the implementation process. Therefore, it is an empirical confirmation of the findings of authors who criticise the deterministic positivist tradition of the factoring approach and its competency to reflect the reality. Additionally, it emphasises the importance of the work of Pettigrew that has been mainly developed based on contextualisim for investigating organisational change. Moreover, it contributes to the literature on ERP systems by demonstrating the dynamic and complex nature of their implementation activities and context. Therefore, it gives emphasis to the importance of continual inclusion of the implementation context in the exploration process. The importance of the inclusion of different stakeholders' views and time of evaluation in IS evaluation is also stressed. Finally, it contributes to the literature on IT in developing countries, particularly in wealthy ones as it highlights a lack of expertise in implementing ERP systems, despite the availability of the required financial resources. Accordingly, it exposes the role of the absence of strict management accountability during ERP projects, particularly in regard to continuous management support.

1 Introduction to the Research

1.1. Introduction

Information Systems (IS) success continues to be an important theme in IS research, a substantial body of which is concerned with the issue of IS implementation and success (Larsen and Myers, 1999). An Enterprise Resource Planning (ERP) system is a configurable software package which encompasses a set of best-practice business modules which link most business functions into one well integrated system using a central database. Accordingly, ERP affects most of an organisation's business units and stakeholders and has been classified as a complex form of IS. ERP systems are now very widely used in the business context and their adoption has been extended to other sectors.

The adoption of such technology is a lengthy, costly and complex process whose failure can be disastrous, leading in some cases to bankruptcy (Light et al., 1999, Oz and Jones, 2008). Therefore, ERP success has attracted IS researchers since the emergence of the concept, while the broader topic of IS success is an active research area within the IS community (Larsen and Myers, 1999, Markus et al., 2000). Thus, investigating the success of such systems is an important issue worthy of careful consideration.

However, the majority of IS success studies have adopted a very narrow and deterministic framework, taking some form of factoring approach such as the MacLean and DeLone IS success model or a model based on Critical Success Factors (CSFs) which are instances of positivism paradigm research. In such studies, researchers have tried to propose ultimate solutions in terms of a set of dependent and/or independent variables which guarantee IS success, notwithstanding that IS success cannot be fully guaranteed, due to its dynamic nature. Although this approach has to date dominated IS success research, its findings often do not reflect the dynamic reality and complexity of the implementation and success of IS projects. This is due to that fact that researchers have tended to overlook different social processes that take place during IS adoption.

Against this background, the PhD research reported here is a qualitative study of IS success and failure in the context of the implementation of a series of ERP projects dating from 1992 to 2005 in a Saudi Arabian private organisation. Its main focus is on understanding the perceptions of IS success of two major groups of internal stakeholders: end users and members of project teams. Accordingly, 57 semi-structured interviews were conducted and most were audio recorded. Data were collected and analysed using the Grounded Theory Method (GTM) and underpinned by Pettigrew's ideas of contextualisim and the use of NVivo software.

This research makes a contribution to the interpretive literature on IS success, as it shows the competence of interpretive research in exploring technical and social processes of IS implementation and helps to assess how different factors influence and are influenced by each other, forming a temporary context which in its turn influences the success perceptions of different internal stakeholder groups. Therefore, it provides empirical confirmation of the findings of Bussen and Myers (1997), Larsen and Myers (1997, 1999), Wilson and Howcroft (2002), Mitev (2003) and Adam and Spedding (2005), who criticise the obvious deterministic and positivist tradition of the factoring approach to IS success and failure research. Moreover, it supports Pettigrew's ideas of contextualisim research (Pettigrew, 1987, Pettigrew, 1989, Pettigrew, 1990) that have stressed the importance of the inclusion of the continual interlay among outer and inner contexts of the implementation of any organisational change initiative alongside the activities of that project. additionally, it contributes to the literature on ERP implementation by demonstrating how dynamic and complex that process is and by highlighting the dynamic nature of certain factors as well as the implementation contexts which are difficult to determine objectively and to measure in a unified and static way.

It also provides confirmation that IS success cannot be determined without considering the views of different stakeholders and the time of evaluation, since perceptions of IS success and failure will change with time. Finally, this research makes a contribution to the literature on information technology (IT) in developing countries, particularly wealthy ones. The context of Saudi Arabia is important because of the rapid development of different aspects of business, which implies the widespread adoption of IT, particularly when affording the required resources is not major problem.

Accordingly, it exposes the role that the absence of strict management accountability plays during ERP projects, particularly in regard to continuous management support. This thesis thus provides confirmation of the finding of Sauer (1993) that the provision of continuous management support and commitment to an IT project will tend to overcome perceptions of failure by any definition, as long as the support continues within the limits of available resources.

A major finding of this research is that although the factoring approach is appreciated and welcomed, there is empirical evidence that IS success and failure studies have tended to overlook social aspects of IS implementation and therefore lack comprehensiveness due to a deterministic and objective view of such phenomena. Thus, understanding the complexity of IS implementation requires a socio-technical approach to be taken. This will provide a deeper understanding of the social, cultural, political, economic and historical factors that are involved in the implementation process. Additionally, this research shows the importance of the role of contingent variables, such as previous ERP experience, which have a major role in shaping the implementation process and thus perceptions of its success. It also demonstrates that the inclusion of different stakeholders' views in such studies is important in order to be able to evaluate IS projects. A further finding concerns the dynamic nature of IS success and failure, which means that the associated perceptions change with time. Finally, this research stresses the importance of considering the differences between developing and developed countries, particularly in regard to IS success and failure studies.

1.2. Problem Domain and Sources of Inspiration

Despite the very considerable input of effort and resources required, ERP systems have become widely popular among different businesses and industries, due to the potential benefits for organisations of an appropriate and successful adoption of this technology. Implementing such a system will, by its nature, affect most or even all aspects of the organisation, including its different stakeholders. Thus, although achieving a successful implementation is ultimately the main goal of such efforts, that success remains an elusive and moving target. Notwithstanding the many studies that have been published in this domain of knowledge, the failure rate of ERP projects remains high (Davenport, 1998, Robey et al., 2002).

Indeed, in spite of the widespread availability of positivist IS success studies, particularly in the form of factoring based research, a review of the relevant literature shows a high rate of IS failure. In fact, it also shows a lack of interpretive research into IS success and failure, reflecting the dominance of positivist research not only in this particular domain of knowledge but in all others. Thus, investigating the perceptions of ERP system success of different stakeholder groups from an interpretive perspective is a worthwhile endeavour, given the urgent need to carefully explore ERP implementation and the social aspects and contexts of such technology projects. The process of exploring this phenomenon will be referred to as 'unpacking the black box' of ERP implementation. The main reason for unpacking that black box is to explore different aspects of implementation, social as well as technical.

My own rich experience in the field of IS over a number of years as a systems developer, systems analyst and finally database administrator has given me the ability to observe how vague perceptions of system success can be, particularly when more than one group of stakeholders is involved or when they are considered over time. This makes these perceptions very complex, difficult to understand in practice and resistant to objective generalisation to different cases in different contexts (Pettigrew, 1998). Empirically, when working in that field, I noted that perceptions of the success of the same IS project were changeable with time and according to changes in the surrounding conditions. In fact, it was evident that certain obscure factors, mainly social rather than technical, were playing a major role in influencing stakeholders' perceptions of success. Hence, the choice of topic for this research project was inspired by the researcher's own experience, in addition to some important interpretive publications which have played an essential role in shaping this research. These are the works of Pettigrew (1985b, 1987, 1998), Sauer (1993), Bussen and Myers (1997), Larsen and Myers (1997, 1999), Markus and Tanis (2000), Markus et al (2000), Wilson and Howcroft (2002), Wagner and Newell (2004) and finally Adam and Spedding (2005).

An important distinctive feature of the present research project is that the organisation selected for study was at the time of the fieldwork implementing its fourth successive SAP R/3 project since 1992. Of these, perceptions of only two are examined, as this selection was considered to provide a comprehensive coverage of the effect on different

business units and people. The nature of the ERP experience provides the required ability to investigate deeply the perceptions of relevant internal stakeholders of the success of more than one ERP project within the same organisation. Thus, it will contribute positively to enriching this research project by providing a historical and comparative element.

To sum up, this research project has been influenced by three main factors: the researcher's own IS experience, the literature on IS success and perceptions of it, and the nature of the chosen organisation. All of these have to some extent changed the trajectory of the research.

1.3. Aims and Objectives

While much has been published regarding the benefits of ERP systems, these cannot be attained as straightforwardly as sometimes suggested in the marketing of ERP products. There is thus a real need to move away from the simple notion of IT as a driver or enabler of changes (Boudreau and Robey, 1999). Instead, more attention should be paid to the context in which each ERP system is located and how it interacts with various players at different times during its implementation and use (Pettigrew, 1985b, Pettigrew, 1987, Howcroft et al., 2004).

Perceptions of success and failure are important in the field of IS, because of the different views pertaining to that subject matter. It is a topic that has been investigated for a long time, but unfortunately most researchers have presumed a unity of view within and among organisations in relation to IS success, despite differences of contexts and surrounding circumstances (Pettigrew, 1998). In other words, most of such studies have treated IS success as a static concept that can be easily isolated from its context and objectively identified with a set of variables whose presence will guarantee the success of any IS project (Pettigrew, 1998, Adam and Spedding, 2005). Prominent examples of the outcome of this approach are the DeLone and McLean success model; and CSF models, which are mainly based on variance theory and which stand in notable contrast to the adoption of such systems in practice, where their assumptions are found to be, to some extent, far from true. Although the suggestions of these researchers are valuable and worth considering during IS projects, it should not be taken for granted

that they represent the only vehicles for successful delivery. In other words, the variables identified by such models have been wrongly considered as panaceas for IS project success.

In response to this widespread misconception, the main aim of the present research is to develop a better and richer understanding of perceptions of success among internal stakeholders in ERP implementation, as an instance of IS projects. It also aims to show how such perceptions change over time. Achieving these aims would help in the movement away from viewing IS success as a static and objectively identified concept towards an analysis showing its dynamism and subjectivity taking into consideration the continues and dynamic influence of the implementation context and all surrounding circumstances.

In order to achieve these aims, this research must meet two main objectives: to provide an introduction to ERP systems and their implementation, then to undertake a critical revision of the related issues of success and failure as represented within the existing body of research into IS success and failure.

To meet these objectives, this research is grounded in the interpretive philosophical tradition, taking into consideration its ontological and epistemological principles in respect to the success and failure of ERP systems. The main strategy adopted to answer the research questions set out below is a case study of a suitable organisation, rich in resources and which has an ERP system that has been in use for some time. Semi-structured interviews are used as the main data collection instrument, triangulated by the examination of relevant documents. This data collection process is guided by the principles of GTM. Moreover, GTM is also adopted partially for data analysis and in line with a heavy use of NVivo software and is underpinned by Pettigrew's ideas of contextualisim (Pettigrew, 1987, Pettigrew, 1989, Pettigrew, 1990).

Accordingly, the present study defines different SAP projects' activities as the content of change, while the organizational (inner) context is represented as the structure, nature of business, previous experiences, technological factors, and intra-political factors within the organization in which SAP is implemented. The environmental (outer) context is identified as the social, economic, Y2K, political, and competitive

environments in which the organization operates. Additionally, in this research, the process of change also is defined as different actions, reactions, and interactions among context and content of change. The main purpose of collecting and analysing data in this way is to explore and develop empirically well informed major themes grounded in the data, which in their turn shape and influence either explicitly or tacitly the stakeholders' perceptions of ERP success.

1.4. Research Questions

This section sets out a number of questions developed so that if they were answered properly at the end of this research, its aims could be shown to have been achieved. In fact, as this is a qualitative research project, the formulation of these questions was reviewed and revisited continuously during its lifecycle. In this research, the researcher will attempt to answer the following main research's question:

How do changes in perceptions of success of internal stakeholders unfold over time in ERP project?

In fact, in order to be able to answer the abovementioned research question; another two interrelated sub-questions need, as well, to be investigated at the same time. They are as follow:

1) What cause internal stakeholders' success perception to change?

2) Why does success perception of internal stakeholders change as it does?

1.5. Scope and Limitations of the Research

A vital part of organising PhD research is to ensure at the outset that its boundaries and main scope are established and defined as precisely as possible. This is necessary in order to give the researcher the ability to focus his work, particularly if he intends to start without any predefined requirements. Indeed, while some organisations will fund and support PhD students to investigate only certain predetermined issues, usually for

the benefit of these organisations, the present researcher was given the freedom to choose his topic on condition that it should lie in the field of IS research. Therefore, this section sets out the scope and limitations of the project so that they are clear from the beginning.

This research, as indicated by its title, is limited to investigating the phenomenon of interest in the context of one Saudi Arabian private organisation. Furthermore, the researcher did not intend to examine different rationales behind the adoption of ERP systems over traditional custom IS applications. Instead, the investigation starts with the presumption of de facto ERP adoption and that the choice of system is not critical to the study. Thus, the decision to implement ERP rather than to develop a custom IS system is beyond its scope. Similarly, the choice of which particular ERP system to adopt is considered to lie outside the scope of this research, which means that the package selection process is addressed only to the extent that it may show a notable relation to the subject matter. In fact, the organisation chosen for the case study was engaged in its fourth implementation project involving the same ERP package, the SAP R/3 system. This provided the researcher an excellent opportunity to investigate success perceptions and changes to them at different points in time over more than one comparable project in the same organisation and involving the same groups of people in most cases.

1.6. Significance of the Research and its Boundaries

Although there are abundant publications in the field of IS success research, this particular study has its own threefold importance. First, it has significance in the context of private organisations in Saudi Arabia, which is an instance of a developing country. This gives the researcher the opportunity to introduce the principles of interpretive research to that particular context, as the majority of existing studies have been undertaken from a positivist perspective. Therefore, this research is an attempt to contribute to developing and underpinning a solid interpretive philosophy in that context. Second, it attempts to investigate IS phenomena by adopting a case study strategy in conjunction with the partial adoption of the GTM for the purposes of data collection and analysis taking into account Pettigrew's ideas o contextualisim research paradigm. This will allow a critical evaluation of the application of these ideas and the

proposed methodological synthesis to IS research and of its appropriateness for PhD research.

This study is also significant in being, to the researcher's knowledge, the first to explore the perceptions of different internal stakeholders within a single organisation of the success of more than one successive ERP implementation project. More precisely, the investigation covers two successive major ERP projects at specific points in time, determined according to the occurrence of major events during implementation. In the past, similar studies have explored perceptions of success either of only one ERP project within the same organisation, or of more than one project, but each in a different organisation. The current research thus combines these approaches.

This research is also limited to the investigation of internal stakeholders' perceptions of success, while the perception of external stakeholders such as customers, suppliers, vendors and consultants is beyond its scope. While a number of activities and decisions that pertain to the selection and implementation of the ERP system are considered, the decision to implement an ERP system rather than to develop a custom IS is not. Finally, this research does not consider any issues pertaining to personal characteristics which may, in some cases, influence participants' participation and then affect the quality of the data collected.

1.7. Structure of the Thesis

This introductory chapter is followed by a review of relevant literature, including that on ERP systems and on IS research. The philosophical and methodological choices are considered in the subsequent chapter, which sets out the research design. The fourth chapter explains the Saudi context and the selection of the organisation which is the subject of the central case study, including its different IT experiences, particularly those related to SAP R/3 projects. Chapter five offers a detailed description of how the empirical work was prepared in advance, covering aspects such as site communications and access negotiation. It ends with an explanation of the initial coding process, the subsequent development of major GTM categories, and finally the classification of these emerged categories to reflect Pettigrew's ideas in a form of outer context, inner context, and SAP project's activities.

Chapter six then shows how these categories acted, reacted, and interacted with each other at different points in time, causing changes in the perceptions of different internal stakeholders. The major findings of this research project are presented at the end of chapter six. However, the results of the actual data analysis, including evidence adduced from real data, are discussed in greater detail in chapter seven. Chapter eight concludes the study by stating explicitly the research evaluation, its contributions, examining opportunities for future research, and considering the implications of this work.

2 Previous Research

2.1. Introduction

This chapter will reflect some major results by reviewing previous related ERP studies. First, it is will be useful to provide an introduction to ERP systems and some related topics before discussing in more detail research into IS success and failure. Therefore, this chapter has two main parts, the first of which introduces the concept of ERP and some important related topics. The aim is to show the real nature of such systems and how they differ from traditional IS, particularly in implementation and use. The second part then presents a well elaborated critical revision of the relevant literature on IS success and failure. It is important to note here that the terms 'ERP system' and 'Enterprise System' (ES) are used interchangeably throughout this thesis, since they have the same meaning, as discussed by Klaus et al (2000).

Two major works on IS success studies will be critically reviewed, as both of them are commonly cited in this regard. These are the work of DeLone and McLean on IS success and the CSF model of IS success. The review will highlight some of their weaknesses and limitations in investigating IS success. The topic of IS failure and some major related issues are also examined. This chapter concludes by examining the current status of research into IS success and failure, considering the philosophical and methodological stances adopted. This conclusion will help to explain the shape of the current research and will accordingly provide the starting point for the next chapter. In other words, this chapter will contribute to formulating the subsequent phases of this research project.

2.2. ERP Systems: An Introduction

It is evident that since 1997 the IT industry has experienced substantial development and growth in its services (Motiwalla and Thompson, 2008). For modern organisations, IS, in general, has been mainly considered as an enabler of changes to these organisations or even within them, as it has been deemed an essential factor in

increasing the efficiency and effectiveness of managing and operating modern business (Irani and Love, 2008). Therefore, enhancing organisational performance and productivity has been perceived as a recent IT innovation, with ERP systems or ES as an example of that innovation (Ward and Daniel, 2005). A few years ago, it was evident that organisations had moved radically from developing their bespoke or custom applications to purchasing and implementing whole software packages such as ERP systems (Light et al., 1999, Hong and Kim, 2002, Ward and Daniel, 2005). This radical and noticeable shift has been mainly motivated by the change in organisations' IT strategies (Light et al., 1999).

Therefore, before reviewing the literature on IS success and failure, it is necessary to give some background information pertaining to the ERP concept such as what an ERP system is, its benefits and drawbacks, why it should be implement and other factors which are essential to explain why attention should be paid to ERP systems in particular. In other words, this section considers why organisations have to change their position in regard to IT adoption from bespoke applications to ready packaged software, with the implications this often brings concerning changes to the current way of doing business. It is hoped that this brief initial discussion of ERP systems and related issues will be useful and informative, helping readers to understand better and to evaluate appropriately subsequent sections and chapters.

2.2.1 Defining ERP

An ERP system is a customisable software package that has the ability to provide an organisation with a well integrated and comprehensive solution to its IS needs. Reviewing the relevant literature exposes two major views of these systems, either as business-technical (operational), or strategic-technical solutions. On one hand, Gable (1998), Rosemann (1999), Klaus et al (2000) and O'Leary (2000) focus on the integration capabilities of ERP systems to combine different business transactions into a single IT system in order to unify the view of the organisation. For instance, Gable (1998) defines ERP as:

> *Comprehensive packaged software solutions [that] seek to integrate the complete range of a business's processes and functions in order to present a*

> *holistic view of the business from a single information and IT architecture* **(Gable, 1998; p: 3)**

On the other hand, Skok and Legge (2002), while mentioning the above features of ERP systems, also stressed their strategic role in giving competitive advantages to organisations, referring to

> *Standard software modules for core business processes, usually combined with customization for competitive differentiation... to provide breadth of integration and depth of functionality across multi-functional and often multi-national organisations* ***(Skok and Legge, 2002; p: 72)***

Davenport explicitly considers the whole picture, emphasising the ability of such systems to integrate different business units and transactions into one central database which will improve the way in which strategically valuable information is produced, shared and managed across different functions and locations (Davenport, 1998). Hence, once it is implemented, the organisation will have the capability to leverage its competitiveness against competitors, the strength to grow and the flexibility required to adapt to future business changes (Davenport, 1998, Davenport, 2000).

2.2.2 History and Evolution of ERP

ERP systems did not emerge as fully formed off-the-shelf products available in the market, but as a development of previous IT concepts and applications (Kumar and Hillegersberg, 2000, Khan, 2002). There was an incremental evolution, starting with inventory control and passing through Materials Requirements Planning (MRP), Manufacturing Resource Planning (MRP-II), ERP to extended ERP (ERP-II) or Total Enterprise Integration (TEI) systems. Figure 2-1 illustrates the detailed growth of ERP systems (Langenwalter, 2000).

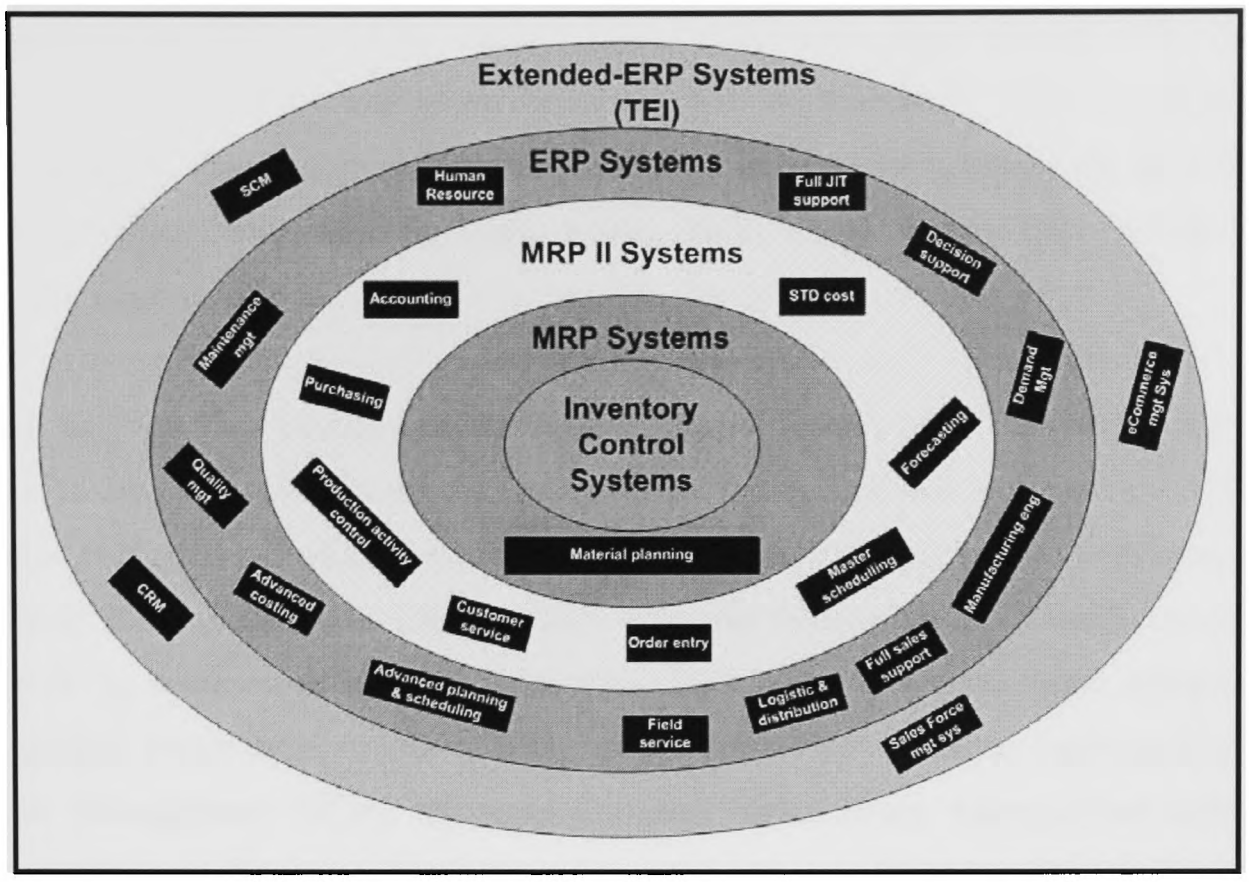


Figure 2-1: Evolution of ERP systems (Langenwalter, 2000)

In the early 1960s, the focus of manufacturing systems was mainly on inventory control applications, most of which were restricted to managing traditional inventory processes (Kumar and Hillegersberg, 2000, Al-Mashari et al., 2003, Pairat and Jungthirapanich, 2005). These applications suffered major shortcomings such as inventory shortages during manufacturing and poor quality of services and/or products (Ptak and Schragenheim, 2000). Accordingly, in the 1970s, the MRP concept was introduced, as the first production-oriented IS (Umble et al., 2003, Dodgson et al., 2008) able to overcome existing problems with inventory control applications (Ptak and Schragenheim, 2000, Shields, 2001, Pairat and Jungthirapanich, 2005). MRP encompassed additional functions, mainly concerned with the materials assembly process, in order to improve the manufacturing process (Kumar and Hillegersberg, 2000, Shields, 2001, Khan, 2002).

In the 1980s, there was a notable increase in competitive pressure on manufacturers as well as the emergence of significant needs that required the merging of some new business functions with the existing MRP functions to give manufacturers greater competitive advantages (Al-Mashari et al., 2003, Shehab et al., 2004). Accordingly, MRP-II systems were introduced as a development of existing MRP systems

(Langenwalter, 2000, Al-Mashari et al., 2003, Umble et al., 2003, Shehab et al., 2004, Dodgson et al., 2008). The main focus was now on integrating material planning, purchasing of materials for production purposes, accounting and running the shop floor (Langenwalter, 2000, Shields, 2001, Khan, 2002, Zhang et al., 2003, Pairat and Jungthirapanich, 2005).

Next, ERP systems emerged in the early 1990s to expand MRP-II functionalities in order to face new business needs (Langenwalter, 2000, Ptak and Schragenheim, 2000, Umble et al., 2003, Shehab et al., 2004, Pairat and Jungthirapanich, 2005, Williams and Pollock, 2008). Later, some ERP suppliers expanded the original ERP concept to create ERP-II, in some cases referred to as TEI. Thus, ERP-II systems were created by integrating standard ERP systems with more "front-office" functions such as Supply-chain Management (SCM) systems, Customer Relationship Management (CRM), advanced analytical applications and performance management applications (Langenwalter, 2000, Davenport et al., 2002, Stephens and Ramos, 2003, Botta-Genoulaz et al., 2005, Pairat and Jungthirapanich, 2005, Koha et al., 2008). In this regard, some authors have differentiated between standard ERP and ERP-II in that the former aims to integrate routine organisational transactions, while the latter goes beyond the original understanding of ERP by incorporating different external suppliers and customers (Turban et al., 2008, Baltzan and Phillips, 2009).

Figure 2-2 below shows the historical development from inventory control to ERP-II in a simple graphical form.

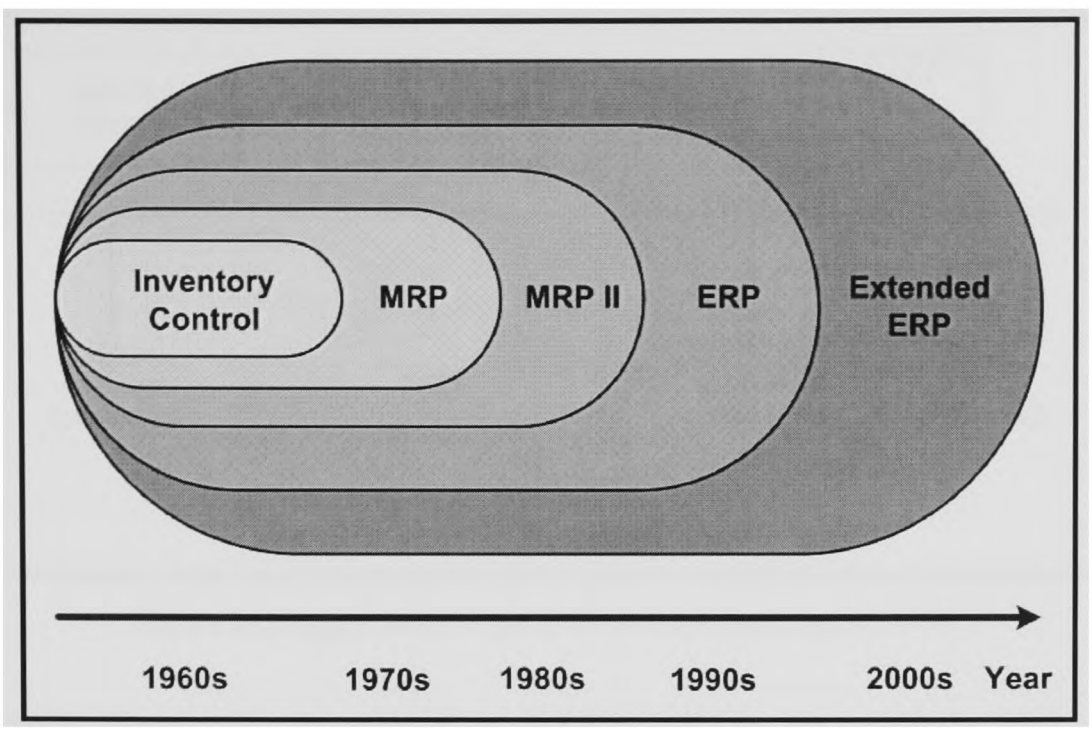


Figure 2-2: Historical development of ERP systems
Source: adapted from (Pairat and Jungthirapanich, 2005)

2.2.3 Academic Interest in ERP Systems

ERP systems have attracted the attention of both academics and practitioners for two decades, because of their value in running efficient businesses and in facing forthcoming challenges. The concept first appeared in the early 1990s when SAP AG, one of the leading vendors of business software in Germany, released its first comprehensive SAP R/3 system (Klaus et al., 2000, Williams and Pollock, 2008). In fact, details of this event were not immediately published in the academic literature, as the launch was directed to professional practitioners rather than academics. Thus, "*ERP is a concept that seemed to emerge from industry rather than academia*" (Williams and Pollock, 2008). Its first appearance in the academic literature occurred in 1996 when the proceedings of an IS conference included a paper on Mega Packages (Davenport, 1996). Figure 2-3 on page 18 depicts the emergence of the ERP concept in practice and in the academic field.

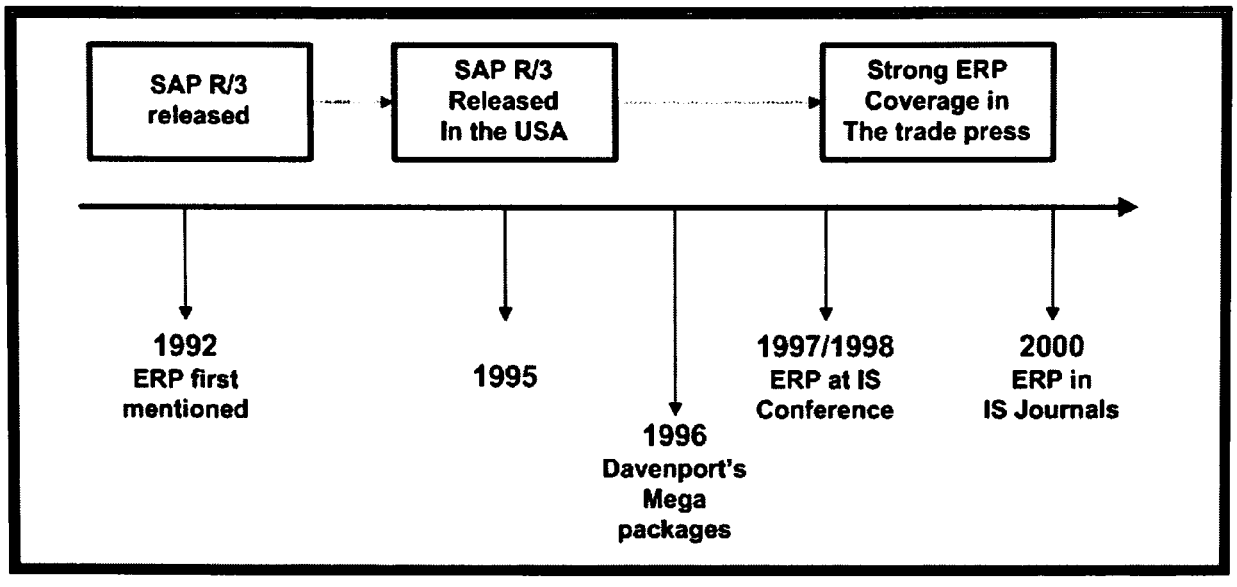


Figure 2-3: Appearance of the ERP concept (Klaus et al., 2000)

A few years after the first mention of the ERP concept in the academic field, a survey pertaining to different ERP activities showed significant development in ERP publications in selected journals and international conferences (Botta-Genoulaz et al., 2005). The result of this survey is summarized in Figure 2-4.

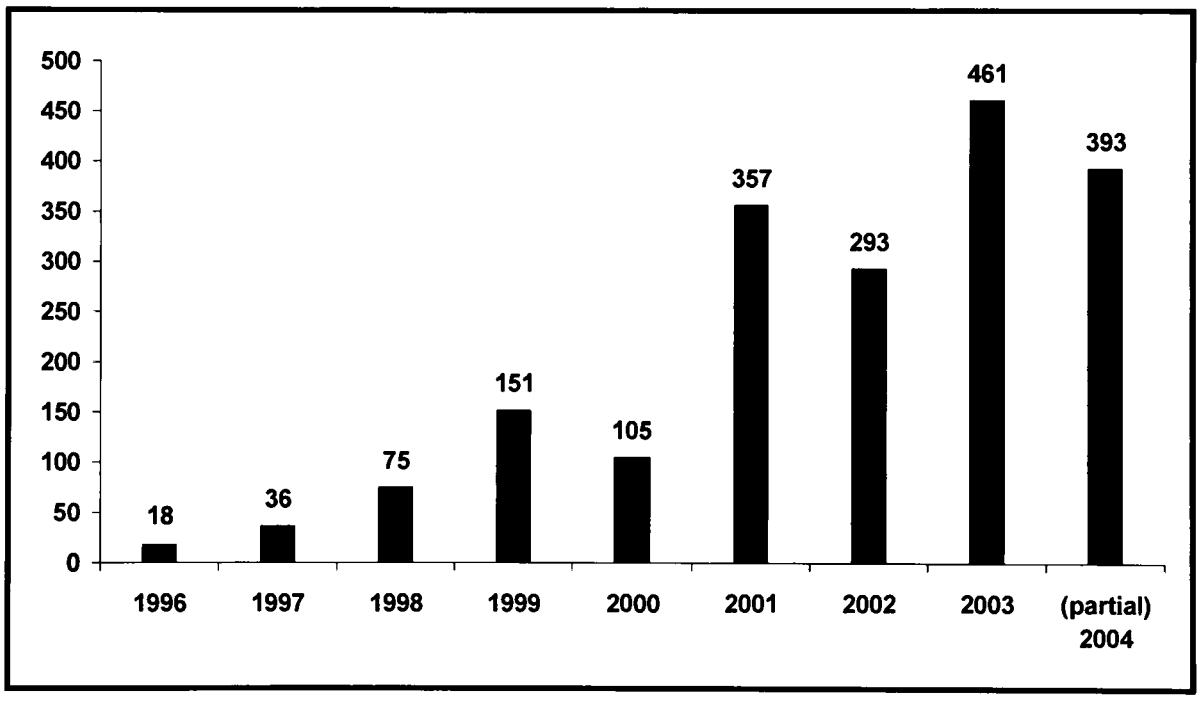


Figure 2-4: Number of articles in a given set of publications (Botta-Genoulaz et al., 2005)

Regardless of some variations in relevant publications between 1996 and 2004, Figure 2-4 shows a pattern of growth in the number of such publications over time. This observed evolution can be ascribed to the diffusion of the topic among both academics and practitioners, which indicates its popularity and importance.

2.2.4 Nature of ERP System

An ERP system, by its nature, has the ability to link most of an organisation's tasks and activities in order to provide a well-integrated system, whatever the organisation's core business and its size. Seeking such integration is very important for contemporary organisations, as it provides real-time information when needed (Davenport, 1998, Donovan, 2002), which then will improve decision making at all levels (Ward and Daniel, 2005, Laudon and Laudon, 2008). It is mainly designed and built by following a process-based IT approach, in contrast to traditional functional-based IT systems (O'Leary, 2000, Al-Mashari, 2003, Bocij et al., 2006). Thus, organisational tasks may be executed by using one or more ERP modules, which is called a cross-functional or cross-departmental approach, in order to increase business efficiency (Davenport, 2000, Klaus et al., 2000, Markus et al., 2000, Markus and Tanis, 2000). Figure 2-5 conceptually illustrates some common ERP modules and sub-modules, and how they are linked via a central database.

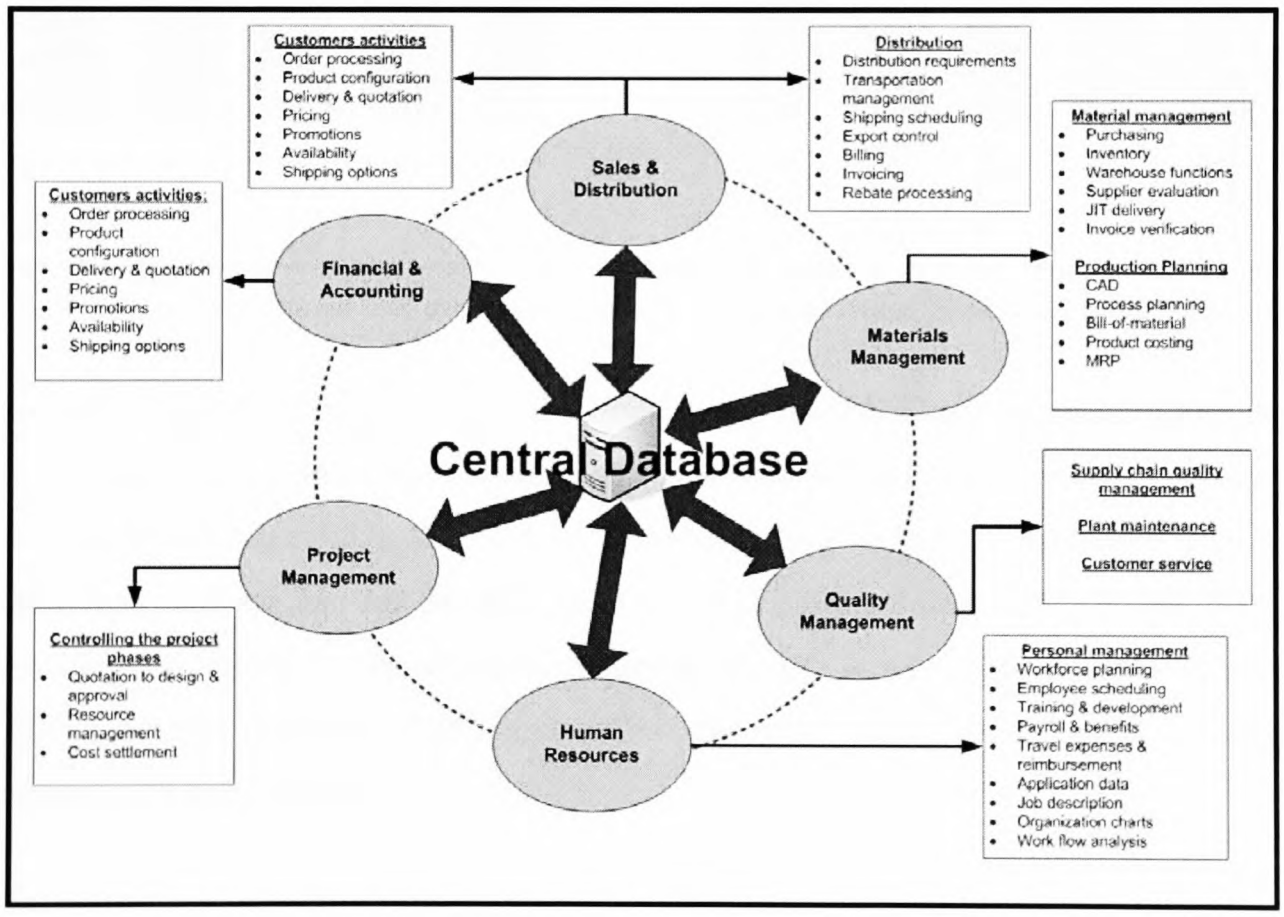


Figure 2-5: ERP structure and interactions among modules

In fact, building ERP systems by the process-based approach is the main aim of the concept of Business Process Reengineering (BPR) (Hammer and Champy, 1993).

Hence, once an ERP system is adopted, it will support the organisation with business process standardization based on a process-oriented view (Nah et al., 2001, Galoppin and Caems, 2007). Figure 2-6 shows graphically the overall differences between process-based and functional-based IT applications.

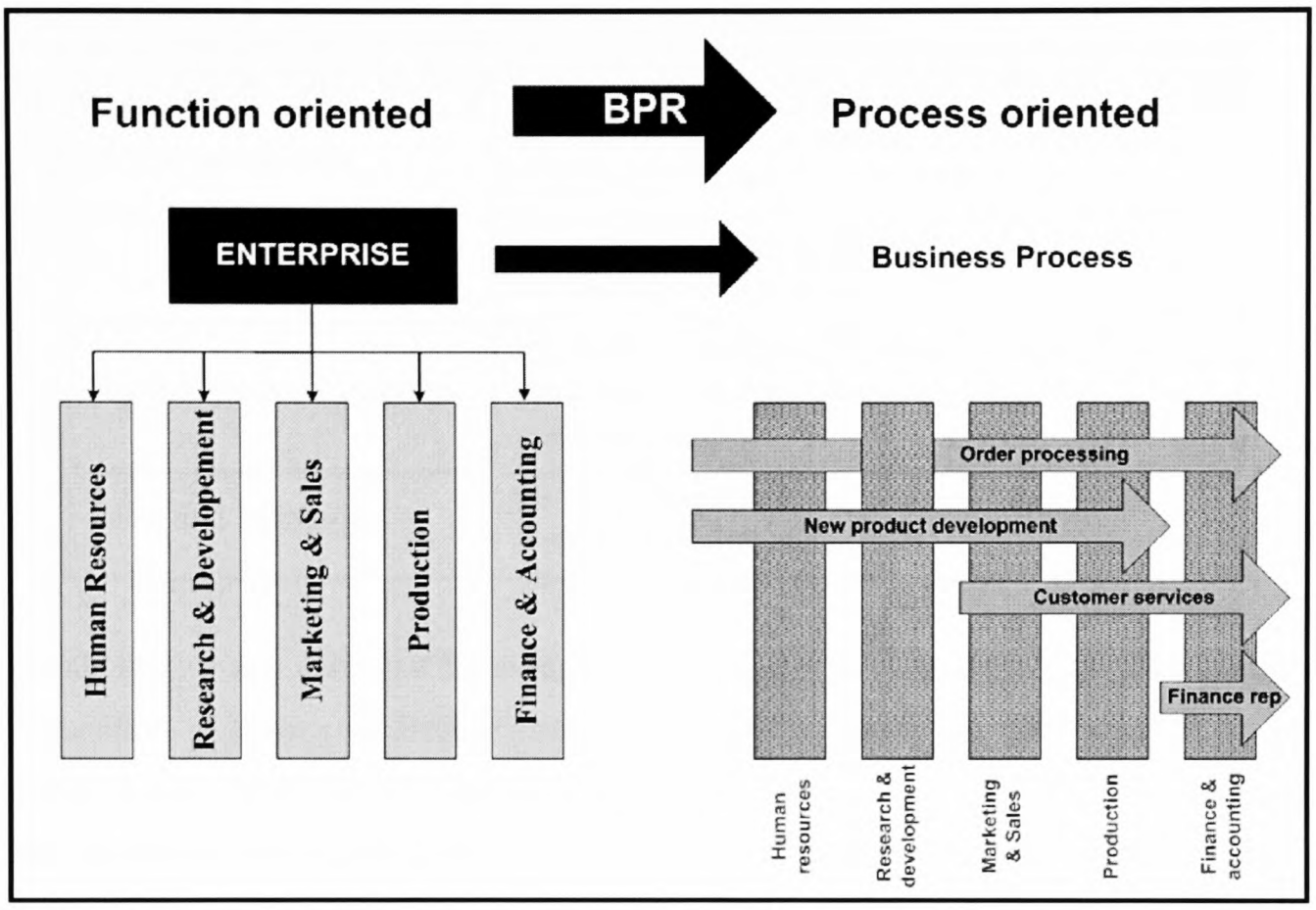


Figure 2-6: Functional-oriented vs. process-oriented organisation (Skok and Legge, 2002)

Generally, ERP systems are designed to encompass most business functions and units, rather than focusing on a single process, as in the case of MRP, or a few processes as in the case of MRP-II (Chian-Son, 2005). Thus, each ERP system is built upon a single centralized database, but can be replicated (Nah et al., 2001, Baltzan and Phillips, 2009), providing the different units within the organisation with more than 10,000 applications, 1,000 functions (Stevens, 1997) and a few thousand tables, all linked to a single database (O'Leary, 2000).

2.2.5 Common Components of ERP Systems

An ERP system, by its nature, comprises a set of major components called modules, each having a number of sub-modules. Despite differences among available ERP systems, there is a set of modules common to them all, as shown below in Table 2-1

(Davenport, 1998, Shields, 2001, Peslak, 2006, Boddy et al., 2008, Laudon and Laudon, 2008, Oz and Jones, 2008, Baltzan and Phillips, 2009, Valacich and Schneider, 2009). Nevertheless, implementing an ERP system does not imply the implementation of all of its modules at once (Khan, 2002).

Table 2-1: Common ERP modules

Major Function	Sub-functions
Human Resources	Payroll, personnel planning, travel expenses, human-resources time accounting, etc.
Financials	General ledger, asset accounting, profit-centre accounting, executive information system, etc.
Operations and Logistics	Inventory management, material requirements planning, plant maintenance, production planning, etc.
Sales and Marketing	Order management, sales management, sales planning, pricing, etc.

An alternative approach that some organisations prefer to consider in their ERP system acquisition is known as Best-of-Breed (BoB) and is based on integrating different modules from different ERP vendors (Light et al., 2000, Light et al., 2001). In adopting this approach, the organisation has to search the market for the best modules from diverse vendors, then integrate them (Shields, 2001). For instance, the Starbucks Café chain decided to customize its ERP system by integrating modules purchased from more than one vendor (Turban et al., 2008). Although this approach seems to be attractive in having the ability to provide organisations with considerable competitive power by its exclusivity, it is not easy to realize in practice, given the attendant risks, costs and integration issues. The BoB concept is discussed in detail by authors including Davenport (2000), Light et al. (2000), O'Leary (2000), Light et al (2001), Shields (2001) and Hyvonen (2003).

2.2.6 ERP System Development

ERP has been characterised as the most widespread IT strategy for all organisations (Light et al., 1999), providing them with enterprise-wide business processes (Light et al., 2001) and with a well integrated end-to-end connectivity (Klaus et al., 2000, Donovan, 2002). According to Davenport, ERP has been seen as the most important

development in the corporate use of IT (Davenport, 1998). Thus, in the last decade, ERP has been perceived as one of the most important developments in the IT industry and has been recognized as one of the fastest growing sectors of the software market (Somers and Nelson, 2001).

In 2005, AMR Research published a report predicting the continued growth of the ERP market over the next five years. The report shows that in 2005 the size of the market was 25 billion US dollars and that it was expected to increase by 10% annually, which reflects strong demand for this technology (AMR.Research, 2005). This demand is ascribed to the ability of such software to integrate most organisational activities and processes into a single system and to cope with most current and future contingencies arising from the dynamic nature of business conditions (Davenport, 2000).

In fact, as the ERP industry has developed, its products have become increasingly popular. This is due to the inclusion of new and improved functionalities, to the extension of the scope of ERP to industries beyond the manufacturing sector and to the covering of different sizes of organisation. ERP systems have been developed for mid-size organisations (Davenport et al., 2002, AMR.Research, 2005, Hernandez et al., 2006, Muir and Kimbell, 2008, Panorama.Consulting.Group, 2010) and some public sector bodies such as service departments (Williams and Pollock, 2008). For instance, Chung et al have highlighted the implementation by major construction firms of ERP systems in order to benefit from the integration capabilities of different business functions (Chung et al., 2009). These rapid developments have attracted ERP vendors and opened new opportunities for them to grow and compete (Davenport, 2000). Peslak has highlighted the recent status of ERP systems, which *"have become the de facto standard for large and mid-sized organisations to run all their major functional and process operations"* **(Peslak, 2006; p: 1288)**.

For instance, the new release 4.7 of SAP R/3, which is an obvious development and enhancement of the earlier SAP R/3 release 4.6C, has additional major functions such as CRM, corporate services, product lifecycle management, procurement and Supplier Relationship Management (SRM) (Muir and Kimbell, 2008, SAP.AG, 2008, Baltzan and Phillips, 2009). The new version, which is also called SAP R/3 Enterprise, release 4.7, has some additional technical developments in regard to its technical infrastructure,

such as a SAP web application server, new integration technology features and SAP R/3 Enterprise extensions (Hernandez et al., 2006, SAP.AG, 2008).

2.2.7 Benefits of ERP Systems

This section discusses some of the anticipated benefits of a successful ERP implementation, although the term "successful" denotes a questionable and elusive concept in IS adoption and it is important to draw readers' attention to the fact that not all benefits will be realized as soon as a system goes live, as some may take a long time to be realized. A study undertaken by Davenport et al identified the top ten benefits which organisation may attain from ERP implementation, listed below in Table 2-2 (Davenport et al., 2002, Hawking et al., 2004).

Table 2-2: Top ten benefits of ERP systems

ERP benefits	ERP benefits
Improved financial management	Ease of expansion/growth and increased flexibility
Improved customer service and retention	Cycle time reduction
Improved management decision making	Improved inventory/asset management
Faster, more accurate transactions	Increased revenue
Cost reduction	Fewer physical resources/better logistics

Some researchers have classified these benefits into at least two major benefits groups as business benefits and system/technical benefits (Umble et al., 2003, Motiwalla and Thompson, 2008). Notwithstanding this distinction, an ultimate benefit of implementing an ERP system that most or even all authors agree on is the integration of different functions into a single database which records all transactions and provides online information retrieval (Davenport, 2000, Kumar and Hillegersberg, 2000, O'Leary, 2000, Umble et al., 2003, McAdam and Galloway, 2005, Ward and Daniel, 2005, Bocij et al., 2006, Muir and Kimbell, 2008, Turban et al., 2008, Valacich and Schneider, 2009). Accordingly, the ability of ERP systems to provide well integrated solutions to organisations' needs is a major factor that increases their acceptance in the market (Davenport, 2000, AMR.Research, 2005). Additionally, as these systems are supplied with the implicit incorporation of so-called best practices (Kremers and Van.Dissel,

2000), capturing and acquiring these best practices is one of the major benefits of ERP implementation (Al-Mashari and Zairi, 1999, Al-Mashari et al., 2008).

Other authors, from a different perspective, have viewed the benefits of ERP according to its ability to differentiate one organisation from others as well as to respond quickly to any future change (Bingi et al., 1999, Laudon and Laudon, 2008, Muir and Kimbell, 2008). Al-Mashari et al (2003) have classified the anticipated benefits into two major types: tangible and intangible. In this regard, inventory reduction, personnel reduction and increased productivity are examples of tangible benefits (Al-Mashari et al., 2003), while improving responsiveness to customers, increasing corporate data visibility and making unanticipated reductions in cost are classified as intangible benefits (Gupta, 2000, Al-Mashari et al., 2003, Shehab et al., 2004).

On the other hand, Shang and Seddon (2000) propose a comprehensive framework, reproduced in Table 2-3, of the anticipated benefits of ERP systems, based on classifying them as operational, managerial, strategic, IT infrastructure and organisational benefits (Shang and Seddon, 2000).

Table 2-3: The five major dimensions of ERP benefits

Major dimensions	Sub-dimensions
Operational benefits	Cost reduction, productivity improvement, cycle time reduction, etc.
Strategic benefits	Business growth support, building business innovation, etc.
Managerial benefits	Decision making process improvement, better resource management, etc.
Organisational benefits	Empowerment, changed work patterns, etc.
IT infrastructure benefits	IT cost reduction, increased IT infrastructure capability, etc.

All in all, implementing a successful ERP system in an organisation can be expected to provide certain benefits. Nonetheless, acquiring all or even just some of these benefits would certainly not be possible without cost. The following section considers some major problems and disadvantages of ERP.

2.2.8 Problems Related to ERP Implementation

Notwithstanding the many benefits of implementing ERP systems, there are certain drawbacks and difficulties associated with their implementation. For example, Williams and Pollock (2008) offer an excellent critical view of ERP implementation. While they strive for fairness and balance in their arguments, their main aim is to evaluate critically the introduction of such systems to organisations and the consequences. Generally, whatever the promised benefits of these systems, implementing a successful ERP system is a complex, risky and costly endeavour, due to a range of associated changes (Markus and Tanis, 2000). Boonstra has highlighted this in the following excerpt.

> *Because these systems affect so many aspects of a company's internal and external operations, their successful deployment and use are critical to organisational performance and survival* ***(Boonstra, 2006; p: 2)***

Therefore, implementing an ERP system requires comprehensive effort and considerable resources in order to accomplish the related organisational objectives (Bancroft et al., 1998, Al-Mashari, 2003, Mandal and Gunasekaran, 2003). Even when such efforts and resources are deployed, a number of serious difficulties are often associated with such projects (Soh et al., 2000). Indeed, "... *the importance of and pervasiveness of ERP systems have not been without difficulties*" **(Peslak, 2006; p: 1289)**.

Therefore, adopting an ERP system is a debatable decision for any organisation and a problematic process, given these issues associated with its implementation (Soh et al., 2000). This does not imply, however, that organisations should avoid implementing ERP, but that they should give careful consideration to such difficulties, both before and during the implementation process, if they are to benefit from its features, avoid its pitfalls and so enhance the organisational infrastructure.

2.2.8.1 Cost

Accurate estimation of the budget for an ERP project is not easy, because beyond the software licence and hardware costs there will be additional so-called hidden costs which can not be precisely determined in advance. Accordingly, whatever the anticipated or realized benefits of ERP systems, they are very expensive, even under

ideal circumstances (Nah et al., 2001, Al-Mashari et al., 2003), and this is one major drawback of adopting such systems (Bocij et al., 2006, Wu and Wang, 2007, Boddy et al., 2008). Additional costs are commonly associated with new requirements, consultation, end-user training, change management programmes, integrating ERP with other systems, software customization, the human resources needed for the project, and ongoing support (O'Leary, 2000, Al-Mashari et al., 2003, Shehab et al., 2004, Powel and Barry, 2005).

When three main ERP vendors calculated the cost of ERP implementation and its associated services, they found it to be between three and seven times the cost of purchasing the system itself (Scheer and Habermann, 2000). For instance, consultation represents a substantial amount of the project costs (Nah et al., 2001). This confirms the conclusion of Gartner Group, an IT research organisation, that organisations may spend up to three times the cost of the system on consultancy alone (CTRC, 1999, Al-Mashari et al., 2003).

2.2.8.2 Risk of Failure

Risk of failure is another critical issue when implementing these systems: "*Despite the benefits that can be achieved from a successful ERP system implementation, there is already evidence of high failure risks in ERP implementation projects*" **(Esteves and Pastor, 2000; p: 1)**. Indeed, ERP project failure has been found to have a catastrophic outcome for some organisations (Davenport, 1998, Markus et al., 2000, Markus and Tanis, 2000). In the worst case, bankruptcy may ensue, as in the case of the FoxMeyer drugs company (Bicknell, 1998, Caldwell, 1998, Light and Papazafeiropoulou, 2008, Motiwalla and Thompson, 2008). There is also a strong risk of budget escalation and the failure rate has been reported to be as high as three quarters (Robey et al., 2002). Thus a number of authors have stressed the high risk of failure and its negative consequences for the organisation (Esteves and Pastor, 2000, Robey et al., 2002, Soh and Sia, 2004).

2.2.8.3 Lengthy Adoption Process

ERP implementation has been characterized as a lengthy and complex process which often requires more time than in the case of running a traditional business IS and which

does not finish once the system is installed or even as it approaches the time to go live (Gupta, 2000, Zhang et al., 2003). The issue of the length of the implementation process should be considered carefully during initial planning and the project management team should revisit its plans periodically. Consultants, implementers and project managers often consider time overrun as a failure of the project (Markus and Tanis, 2000). Thus, the length of the implementation process and the associated risks and difficulties should be considered carefully when organisations decide whether to adopt an ERP system or not (Kumar and Hillegersberg, 2000, Ward and Daniel, 2005).

2.2.8.4 Best Practice Adoption

As noted in section 2.2.7 page 23, implementing an ERP system to benefit from its standard embedded best practices is argued to increase the organisation's competitive power. Conversely, this can be taken as a serious critique of ERP systems, as they are unlikely to provide an enduring competitive advantage, given that competitors can easily implement the same system with the same set of reference models (best practices) (Cadle and Yeates, 2004, Boddy et al., 2008, Williams and Pollock, 2008). Indeed, acquiring the embedded best practices of the ERP system may cause the organisation to lack the required flexibility to accommodate quickly any future change (Light et al., 2001, Boddy et al., 2008). Davenport (2000) has highlighted this particular issue, arguing that adopting an ERP system as-is will impose rigid processes, so that the system will be too inflexible to accommodate quickly any changes to the marketplace or organisational structure. Hence, the implementation strategy decision, where such issue is discussed, should also be considered carefully before the commencement of such a project.

2.2.8.5 Technical and Social Issues

Due to the complexity, scale and expense of ERP projects, their implementation is almost bound to involve all aspects of the business in the change process (Boddy et al., 2008). This is likely to cause the emergence of technical problems such as data migration issues, user problems such as resistance to change (Gupta, 2000) and management problems, during the execution of the project or even after the launching of the system (Herb, 2000, Avison and Torkzadeh, 2009). In fact, the changes associated

with such projects are not limited to mere technological replacement (Ward and Daniel, 2005, Boonstra, 2006). According to a survey conducted by Deloitte & Touche, a financial services firm, users' issues represented 62 percent of total ERP implementation problems (Herb, 2000), which gives an indication of the importance of managing the social aspects of such projects.

This argument is supported by authors such as Al-Mudimigh et al (2001), Doherty and King (2005) Hwang (2005) Marchewka (2006) and Williams and Pollock (2008), who have sought to shift attention from considering IS development and implementation as merely a technical issue to address it as a socio-technical one, by paying more attention to various nontechnical issues. According to Cadle and Yeates (Cadle and Yeates, 2004), the socio-technical view of IS development and implementation is concerned with many sorts of change and their diverse impacts on people and organisations. In fact, little effort has been made to investigate these nontechnical issues, at least compared to the exclusively technical ones (Esteves and Pastor, 2000). Therefore, managing nontechnical issues during the ERP implementation process will greatly increase the success rate of these projects (Ward and Daniel, 2005, Galoppin and Caems, 2007). This does not mean neglecting technical issues by default, but simply emphasizes the importance of managing the social aspects of implementation as well (Kliem, 2008, Avison and Torkzadeh, 2009).

2.2.9 ERP Implementation Strategy

Once an organisation has decided to implement an ERP system, it should then consider which implementation strategy to adopt. There are two main choices: either to customize the system to suit current business processes, which is called system adaptation, or to change the organisation's current business processes to suit the embedded processes, best practices or reference models of the ERP system that is being purchased, which is called system adoption (Davenport, 1998, Light et al., 1999, Kumar and Hillegersberg, 2000, O'Leary, 2000, Al-Mudimigh et al., 2001, Light et al., 2001).

The latter choice is often called the technology-enabled strategy and has been advocated by many authors for the purposes of capturing the best practices embedded in ERP systems and achieving some of the competitive advantages associated with such

adoption (Davenport, 1998, Davis, 1998, LaMonica, 1998, Bingi et al., 1999, Light et al., 1999, Davenport, 2000, O'Leary, 2000, Siriginidi, 2000, Huang and Palvia, 2001, Nah et al., 2001, Al-Mashari and Al-Mudimigh, 2003, Yusuf et al., 2004, C. Wang et al., 2005, Ziau et al., 2006). Therefore, in this case, it is recommended to avoid heavy customization of the system, except in rare cases.

> *If, however, organisations implement an ERP system but change the implicit business model, by modifying source code, this recreates the legacy problems and disregards the advantages of a standard package-based IT strategy* ***(Light et al., 2001; p: 216)***

In the case of as-is system adoption, the next step is to decide when to change organisation's business processes (Al-Mudimigh et al., 2001): before, during or after system implementation. This critical question is the subject of some debate, especially in regard to the advantages of each option and their influences upon the ERP project (Markus and Tanis, 2000). All in all, in ERP implementation projects, there is no best or optimal strategy, as the choice is closely linked to the objectives of the implementation.

2.2.10 Implementation Lifecycle

The discussion in section 2.2 and its subsections shows ERP projects to be different from traditional IS projects in many ways, such as with respect to cost, time, complexity, the need for BPR, scale and risks (Davenport, 2000, Klaus et al., 2000, Somers and Nelson, 2001). The ERP project lifecycle has also been characterized as differing from that of a traditional IS project (Markus and Tanis, 2000). Chang (2004), has shown this variation in the following excerpt:

> *Unlike the traditional view of operational IS that describes a system life cycle in terms of development, implementation, and maintenance, examination of ERP implementations is revealing that their life cycle involves major iterations* ***(Chang, 2004; p:1)***

A study of the ERP literature reveals a range of different views of the implementation lifecycle. Somers and Nelson (Somers and Nelson, 2001), on one hand, adopt the Cooper and Zmud (1990) view of a lifecycle consisting of six phases, as follows: (1) initiation, (2) adoption, (3) adaptation, (4) acceptance, (5) routinization and (6) infusion.

This classification is based on a staged model of IT implementation activities originally proposed by Kwon and Zmud (Kwon and Zmud, 1987) and augmented with some post-implementation behaviours (Cooper and Zmud, 1990). Ross (Ross, 1999), for her part, characterizes the ERP lifecycle as a set of five successive stages: (1) design, (2) implementation, (3) stabilization, (4) continuous improvement and (5) transformation. A simpler classification recognizes only four successive phases: (1) planning, (2) implementing, (3) stabilizing and (4) improvement (Shanks et al., 2000).

SAP AG itself has proposed a different view of the project lifecycle in the form of a methodology that may be used to implement its SAP R/3 system, called ASAP (Khan, 2002, Anderson, 2003, Muir and Kimbell, 2008). For instance, Esteves and Pastor (Esteves and Pastor, 2001) have adopted an ASAP lifecycle that consists of five main phases: (1) project preparation, (2) business blueprint, (3) realization, (4) final preparation and (5) go-live and support (Khan, 2002, Muir and Kimbell, 2008). Finally, Markus and Tanis (2000) proposed another classification of the ERP project lifecycle comprising four major phases: charter, project, shakedown and finally the onward and upward phase.

It is evident from the above discussion that there is no agreed classification for the elements of the ERP lifecycle among different authors and that what is a valid and useful classification in one case could be inappropriate in another. Notwithstanding this variation among authors, it is evident that dealing with an ERP project is different from the case of a conventional IS development project, as explored in the next subsection.

2.2.11 Differences between ERP and Traditional Custom IS

From the discussion above, it is evident that there are some differences between implementing an ERP system and developing a traditional custom IS. First, ERP the design process takes a best-practice approach. Although the term 'best practice' has been commonly used in ERP studies, it is not uncontroversial. Wagner and Newell (Wagner and Newell, 2004) stress the elusiveness of the concept, particularly when implemented in the context of a multiple epistemic culture within the same organisation, such as a university. In contrast, many traditional IS are "tailor made" to fit a specific organisation's needs either to automate specific manual functions or/and to replace

existing computerized systems, with or without further modification (Avison and Torkzadeh, 2009).

Al-Mudimigh et al. (Al-Mudimigh et al., 2001) have asserted that the integrated nature of ERP is seen as a another major difference between such systems and traditional IS. Somers and Nelson (Somers and Nelson, 2001), in their turn, have advocated the existence of differences between these two sorts of system in regard to their scale, scope, project cost, associated change and the need for BPR. Accordingly, it is evident that ERP implementation requires careful consideration, because the relevant literature is not quantitatively comparable to its counterpart in the case of traditional IS research.

A further distinction lies in the dramatic changes that are caused by the adoption of ERP systems, in that this process entails a mix of software configuration and business process change (Light et al., 1999). Others see the need to configure an ERP system before using it as an essential dissimilarity from traditional IS (Davenport, 2000, O'Leary, 2000, Wagner et al., 2006). Finally, Howcroft and Light (Howcroft and Light, 2006) highlight differences in regard to the selection and implementation process of ERP, as an instance of packaged software. They explicitly mention the way that most ERP research reflects work on custom development applications, although the two are different:

> *Much of the existing research on package software selection and adoption mirrors the early custom development literature in the way that it conceptualizes the process as rooted in a linear, rationalistic process that is based on optimization* ***(Howcroft and light, 206; p: 215)***

Hence, the implementation of ERP systems is fundamentally different from that of bespoke or custom IS development. Given the high costs and the required changes to different aspects of the business in order to achieve integration, ERP acquisition decisions should be carefully evaluated and it must be remembered that the implementation of ERP is a problematic and difficult process (Kumar and Hillegersberg, 2000). Thus, the "plug and play" concept is not valid in implementing such systems, as it needs very considerable effort and resources before any of its benefits can be realized.

2.3. IS Success and Failure

One of the most enduring research topics in the field of IS is that of system success (Lyytinen and Hirschheim, 1987, DeLone and McLean, 1992, Markus and Tanis, 2000), which is unsurprising, since establishing a successful system must be a fundamental goal of any IS project. Among those who stress the importance of IS success research are Hee-Woong and Shan (2006), who argue that reducing the failure rate and supporting the success of information systems are the ultimate goals of IS researchers and practitioners (Hee-Woong and Shan, 2006). Hence, the importance of IS success research has been highlighted periodically within the IS community, among both professionals and academics.

Although there is agreement on the desirability of IS success as a target, there are divergent views on identifying it and how to measure it. Despite the large volume of empirical studies of IS success, what exactly is meant by the term has never been clear and has not yet achieved general agreement (Garrity and Sanders, 1998). Reviewing relevant literature shows that IS success has been characterized by its elusive nature (DeLone and McLean, 1992, Ballantine et al., 1996, Adam and Spedding, 2005). Zhang et al. (2003) attribute the nebulosity of the concept to its subjectivity and its nature as a moving target (Larsen and Myers, 1999, Heeks, 2002, Zhang et al., 2003). Others have argued that IS success is a concept that has never been clear; and different researchers in this domain have found little agreement in regard to its definition or indeed how it should be measured (Garrity and Sanders, 1998, Molla and Licker, 2001, Matthew Lee et al., 2005).

Markus et al (2000), for their part, have proposed a definition of ERP success, but one which is based on multiple perspectives. In other words, they argue that the success of ERP should be viewed from technical, economic and financial viewpoints, from the perspectives of those running the business operations, of internal customers and finally of the organisation's suppliers, investors and external customers. Therefore, what might be seen as success from one perspective might also be seen as failure from others (Lyytinen and Hirschheim, 1987, Sauer, 1993). This makes it difficult to agree on a general definition of ERP success or how it should be measured (Heeks, 2002); indeed, it may be impossible (Markus et al., 2000). Consequently, these two issues have become

problematic and remain unsolved (Seddon et al., 1999). Having reviewed the relevant literature, I found it very useful to classify research according to its relevance to IS success in order to simplify the reporting of the state of the art of IS success research and the obvious gaps. This endeavour concluded with the identification of two major IS success research classifications.

Studies in the first of these categories have tended to focus on investigating the success of IS projects at the final stage. In other words, the investigation is concerned essentially with the final product. According to Ifinedo and Nahar (Ifinedo and Nahar, 2007), the majority of IS success studies have focused their efforts on evaluating systems at the later stages of their lifecycles. In such cases, different technical or social factors that may affect the implementation process have not been considered, despite the major role which they may finally play in influencing stakeholders' perceptions of success. In other words, such studies often have not examined retrospectively the early stages of IS projects in order to explore how the final perception of success was developed. The DeLone and McLean (1992, 2003) success model has been considered an important instance of variance theory that has reflected and represented this approach to IS success classification.

By contrast, the second category of IS studies mainly seeks to identify sets of factors or variables, usually independent, that should be considered during the implementation of IS as affecting the final outcome, which is in this case achieving IS success. One of the best known examples of such an approach is the identification of CSFs, which is a clear reflection of the application of variance in epistemological interpretations of success. This is evident in the work of authors such as Bingi et al (1999), Light et al (1999), Nah et al (2001), Somers and Nelson (2001), Al-Mashari et al (2003), Umble et al (2003), and Al-Mashari et al (2006).

In fact, a common feature of studies in these two categories is their epistemological stance, as all of them adopt variance theories and some sort of factoring approach. However, the first type is concerned with identifying six major components that constitute IS success, called dependant variables (DeLone and McLean, 1992, DeLone and McLean, 2003), while the second is concerned with identifying a set of independent antecedent variables that will lead to certain outcomes in terms of IS success. Markus

and Robey (1988) describe variance theories as those in which *"the precursor (loosely that which might be referred to as the 'cause') is posited as a necessary and sufficient condition for the outcome"* ***(Markus and Robey, 1988; p: 589)***

Finally, it is important to highlight some barriers to IS success and how they have been tackled in the literature. Stakeholders, time and IS failure all are major negative factors that need careful consideration during any discussion of IS success and failure.

2.3.1 IS Success and Stakeholders

Evaluating IS project success is not an easy task, particularly when more than one group of stakeholders is involved. To date, to my knowledge, there has been no comprehensive study considering the perspectives of different stakeholder groups in the exploration of IS success or even some of the relevant issues. In fact, exploring IS success from different organisational stakeholders' perspectives has been discussed by academics for decades (Sedera et al., 2007). This underlines the importance of including this dimension in IS success studies. Indeed, it is impossible to investigate and determine properly the success and failure of certain IS projects, change projects, without considering the opinions of different stakeholder groups in regard to these projects (Sauer, 1993, Myers, 1995, Larsen and Myers, 1997, Larsen and Myers, 1999). Pettigrew, by his turn, has emphasised this issue when he conditioned change projects' success judgement with who is doing the assessment (Pettigrew, 1985a, 1990, 1998).

Unlike conventional IS, the ERP selection and implementation process entails the involvement of most or even all organisational stakeholders representing different business functions and structural positions, in addition to external stakeholders such as vendors, customers, suppliers and consultants (Skok and Legge, 2002, Chan et al., 2003, Gable et al., 2003, Sedera et al., 2004, Sedera et al., 2007). This is due to the direct and/or indirect effects of ERP systems upon most of the organisation's business units, because such systems are designed to operate across functions, departments and business processes in order to enhance their integration capability (Kumar and Hillegersberg, 2000, Laudon and Laudon, 2008).

Therefore, when adopting any model to assess a certain ERP implementation, it is important to take into account which stakeholder groups will be investigated, as different groups may view the same system differently. This has been one of the major criticisms of the DeLone and McLean IS success model, which will be discussed in section 2.3.3 page 41, as it does not take account of what types of stakeholder are concerned during the development process of the model (Sedera et al., 2004). Therefore, it is important to consider the organisation's stakeholders as a major dimension when evaluating ERP system success.

Accordingly, some authors have started to take this dimension into account explicitly in their work. This raises a critical question that should be addressed to make the argument clear to readers. While the importance of involving different stakeholder groups when evaluating an ERP project is clear, the criteria by which these groups of stakeholders are classified, is also important. In other words, how stakeholders should be categorised is a major question that should be addressed. A review of the relevant literature shows some variation among researchers in this matter; according to Sedera et al (2007), there is no clear consensus among researchers on how to classify organisational stakeholder groups for ES project evaluation.

2.3.1.1 Stakeholder Groups in ERP Studies

When discussing ERP success and failure, it is widely agreed that considering different stakeholders' perceptions of the evaluation process is a major dimension of that evaluation (Sauer, 1993, Myers, 1995, Bussen and Myers, 1997, Larsen and Myers, 1997, Larsen and Myers, 1999, Adam and Spedding, 2005). Indeed, some relevant research has taken into consideration, in advance, the importance of the views of different stakeholder groups in the assessment of ERP projects in particular. Such research has been mainly concerned with the investigation of one or more mechanisms for evaluating ERP success (Tai et al., 2002, Wu and Wang, 2006), such as users' satisfaction, system acceptance, system use or system quality. Nevertheless, there has evidently been a general failure by researchers in that domain of knowledge to agree on a classification of stakeholders. Table 2-4 below lists some ERP-related studies and the stakeholder categories adopted in them.

Lyytinen (Lyytinen, 1988) identifies IS stakeholders according to several classification criteria such as type of relation to IS, depth of impact, type of relationship to IS and internal or external status. In regard to internal stakeholders in particular, some other researchers have adopted the employee classification system of Anthony (1965), which has been considered fundamental in the field of management science (Sedera et al., 2004, Sedera et al., 2007). This classification places internal stakeholders at three levels: strategic, management and operational (Anthony, 1965). According to Anthony, the strategic level comprises top-level managers who are responsible for establishing the organisation's strategies, objectives and policies, while the second level is that of mid-level managers who are responsible for day-to-day activities. Finally, the lowest level comprises the ordinary workers who carry out clerical duties (Anthony, 1965). It is evident that this classification sees the organisation as a pyramidal structure, regardless of employees' relation to IS.

Therefore, it has been used in ERP success studies in particular. For instance, Sedera et al. have aimed to assess ERP projects according to multiple stakeholders' perspectives. Thus, they have adopted Anthony's (1965) classification in full and then investigated the success of ERP system from the perspectives of his three employment cohorts (Sedera et al., 2004, Sedera et al., 2007). As for Ifinedo and Nahar (2006), their main aim was to prioritize measures of ERP implementation success; therefore, they considered Anthony's top two cohorts, the strategic and management levels of organisational stakeholders.

The authors of other studies have viewed stakeholders differently from Anthony. For instance, Ifinedo and Nahar (2007) set out to explore ERP success from the perspectives of business managers (executives) and IT professionals, while Singletary et al (2003) considered the integration of applications from the viewpoint of managers, IT professionals and end users. Tai et al. (Tai et al., 2002) measured users' and key users' satisfaction with an ERP project, whereas Peslak (2006) decided to explore ERP success from the perspective of top management, particularly financial executives, concluding that the cost and time of implementation were correlated to the appraisal of success by financial executives and played major role in the overall view of success of that ERP implementation. Finally, Hakkinen and Hilmola (Hakkinen and Hilmola, 2008)

investigated the success perceptions of end users only, during the go-live period and then two years later, during the post-implementation phase.

Table 2-4 below lists these and other related studies, emphasizing the importance of stakeholders' involvement in ERP studies, regardless of the classification adopted or the particular groups consulted.

Table 2-4: ERP-related studies and the stakeholders' groups involved

	Strategic	Management	Operational	IT Professionals	Business Managers	Project Members	End Users	Key Users	External Consultants	Vendors Analysts	Vendors Consultants
(Tai et al., 2002)							●	●			
(Singletary et al., 2003)				●	●		●				
(Sedera et al., 2004)	●	●	●								
(Boonstra, 2006)	●	●	●	●		●	●		●		
(Ifinedo and Nahar, 2006)	●	●									
(Peslak, 2006)	●										
(Sedera and Dey, 2006)	●	●	●								
(Ifinedo, 2007)				●	●						
(Ifinedo and Nahar, 2007)				●	●						
(Wu and Wang, 2007)								●			
(Sedera et al., 2007)	●	●	●								
(Chetcuti, 2008)	●	●		●		●		●	●	●	●
(Hakkinen and Hilmola, 2008)							●				

2.3.1.2 A Gap in Existing Studies

A review of the possibly relevant studies, particularly those pertaining to evaluating ERP projects from different stakeholders' perspectives, indicates that there is a notable gap in terms of the classification of stakeholders. As mentioned above, due to the integrative nature of ERP systems and their process-oriented design, ERP projects in general affect most or all of an organisation's business units as well as different stakeholders, both internal and external. Accordingly, running such a project requires the involvement of many different groups of people, each tackling particular tasks.

Therefore, different project teams may have members representing a range of business functions from different organisational levels and positions. Moreover, due to the complexity, costs and risks of such projects, the formation of project teams must allow for the full-time involvement of their members. In other words, most people selected to join the project should be dedicated to working exclusively on it and should therefore leave their original positions in most cases.

Accordingly, the current study views organisational stakeholders as comprising two major groups: internal and external. External stakeholders can be defined as groups of people related to the organisation who are physically outside its structure but not outside its concern and interest, such as external customers, suppliers, vendors of the ERP system and consultants. As for internal stakeholders, the fact that project team members will normally have no other direct function during the project, as explained above, means that internal stakeholders can be classified according to their relation to the ERP project as either team members or end users, as shown in Table 2-5.

Table 2-5: Classification of internal stakeholders during ERP projects

	General internal stakeholders classification			
	Top management	Managers	End users	IT professionals
Classification of internal stakeholders according to ERP project structure	**ERP END USERS**			
	PROJECT TEAM MEMBERS			

The team members' group essentially encompasses all internal stakeholders who participate fully in the project, including some end users, line managers, general managers and IT professionals. Their roles during the project are mainly as key users, team leaders or project managers. On the other hand, the end users' group encompasses any organisational employee who does not participate in the project as a full-time member. Therefore, members of either group can occupy any position in the organisational structure.

2.3.2 The Timing of IS Success Evaluation

In ERP project evaluation, the time of evaluation is another important dimension that should be considered, because success immediately after implementation can turn to failure in the longer run and vice versa (Heeks, 2002, Adam and Spedding, 2005). For instance, the case of the London Ambulance Dispatch System clearly reflects the importance of considering time in the IS evaluation process (Beynon-Davies, 1999). In the London project, which has been described as one of the largest ambulance service projects in the world, a new IS system was implemented in October 1992 and remained in service only for only two weeks before ending in failure, having caused deaths (McGrath, 2002).

ERP projects as instance of organisational change programs tend to be more complicated than most traditional IS projects, due to the accompanying technical and business process changes, in addition to the involvement of diverse groups of stakeholders in the implementation process. Additionally, some benefits of ERP implementation cannot be realised in the short run but will need more time, as in the case of strategic benefits. Therefore, time of evaluation is a crucial factor affecting the result of that evaluation. According to Pettigrew (1985a, 1990, 1998), evaluating any change program's success is likely to be conditional on when the evaluation is made. This in fact shows the possibility of ERP success perception's change as the time move even on individuals' level which is compatibly with what Pettigrew stressed. The researcher does not claim here to have evaluated the system under study at particular points of time; rather, his main goal is to stress the importance of that silent factor, which plays a major role in ERP evaluation and its results, whatever they are.

The importance of time in IS success studies has been stressed by a number of authors who highlight the tendency for stakeholders' opinions of IS success and failure to change with time (Pettigrew, 1985a, Pettigrew, 1990, Sauer, 1993, Myers, 1995, Larsen and Myers, 1997, Pettigrew, 1998, Larsen and Myers, 1999). For instance, Larsen and Myers (1999) investigated ERP success in a financial services company and proved the importance of time, as their investigation revealed the failure of an ERP project after initial impressive success:

> *Although the project was deemed to be a success when the system was first delivered, this initial success soon turned to failure. While the short-term financial results were spectacular, the long-term implications of the changes were more worrying* ***(Larsen and Myers, 1999; p: 395)***

Sahay (1997) has emphasized the importance of time and space as two major factors in IS evaluation. He argues that over time, a set of conditions is likely to emerge in certain contexts which will modify the social interpretations of the changes which are a consequence of the adoption of new technology. Therefore, he supports the proposal of Giddens (1984) and Pettigrew (1985c, 1987) regarding the role that time plays in shaping social life and stresses the importance of explicitly integrating a temporal analysis into any IS implementation research when developing related theoretical models (Sahay, 1997). He explicitly states the importance of considering time in any attempt to understand technological change:

> *Time and space can significantly influence the social interpretations surrounding technology.... they are also fundamental for interpreting the meaning of technological change* ***(Sahay, 1997; p: 231-232)***

More recently, in regard to the role that time plays in IS success and failure evaluation, Adam and Spedding (2005) have come to the simple conclusion that:

> *...time is an extremely important facet of IS success and failure, which deserves much more attention that it has hitherto received. Some systems, quite literally, need time to fail* ***(Adam and Spedding, 2005; p: 11)***

2.3.3 The DeLone and McLean Success Model

A review of the IS success literature published during the last two decades reveals a large number of attempts to identify the variables by which IS success can be measured (Matthew Lee et al., 2005). It can be argued that identifying these dependant variables was a difficult task until 1992, when DeLone and McLean published their success model, henceforth referred to as the D&M model (DeLone and McLean, 1992). This well received work, which identifies six major dependant variables of IS success, did not emerge from a vacuum, but rather from an extensive review of the relevant literature. The importance of the D&M model has been stressed by many authors who see it as marking a substantial achievement in IS success research. For instance, Adam and Spedding (2005) note that a considerable number of IS success studies have been

undertaken around the work of DeLone and McLean, due to their achievement in classifying and summarizing IS success.

The D&M model of IS success was largely based on the work of Mason (1978) and of Weaver and Shannon (1949). DeLone and McLean (1992) reviewed approximately 180 published papers and articles in proceedings of one of the most important IS conferences and in six top IS journals. That intensive effort yielded a new classification of IS success dimensions into six major categories. Although this model and the updated one reflect an obvious influence of variance theory (see Figure 2-9, section 2.3.4 page 49), such as by adopting a factoring approach, the proponents of the model have argued that it is a mix of variance and process theories. Given the nature of the present research, I will not pursue this debate, as the model is not an essential component of this research. Figure 2-7 illustrates the final version of the D&M success model.

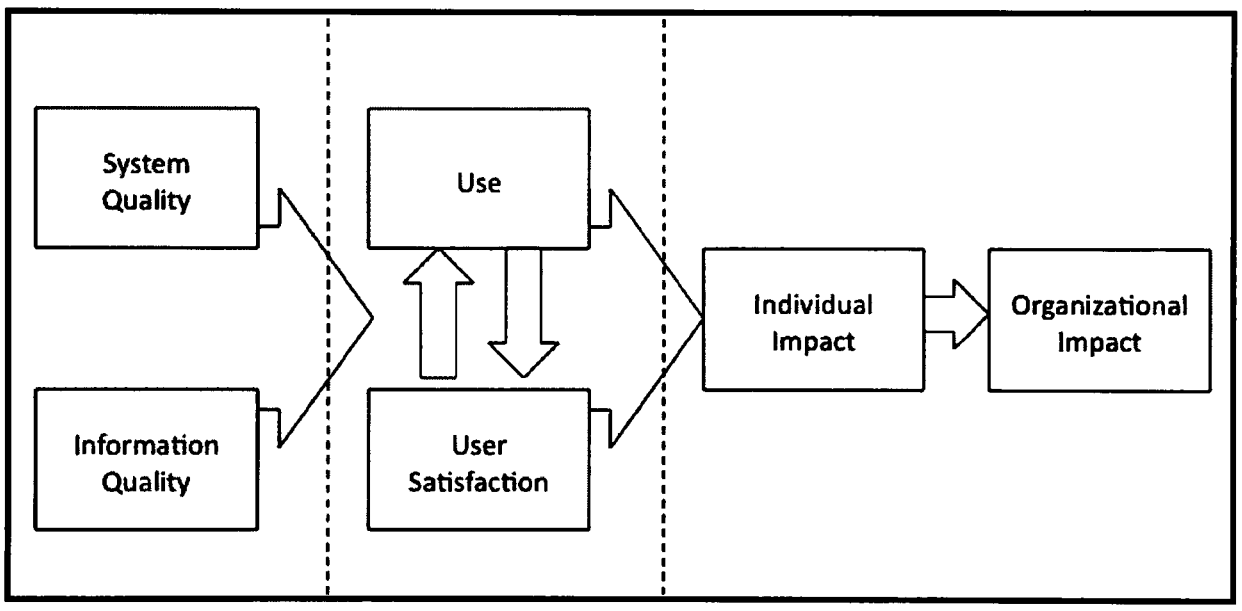


Figure 2-7: DeLone and McLean IS success model (DeLone and McLean, 1992)

As mentioned above, the D&M model has been viewed as representative of variance/ causal explanations of IS success, although its proponents have argued for the mixed nature of their model, combining process and variance interpretations of IS success (DeLone and McLean, 2002, DeLone and McLean, 2003). Seddon (1997) criticises this argument as a cause of confusion:

> *They attempted to combine both process and causal explanations of IS success in their model. After working with this model for some years, it has become apparent that the inclusion of both variance and process interpretations in*

> *their model leads to ... many potentially confusing meanings* ***(Seddon, 1997; p; 240)***

Indeed, D&M have since admitted that the combination of process and variance explanations of IS success in one model may lead to confusion (DeLone and McLean, 2002, DeLone and McLean, 2003). As for Seddon, he has built on the work of Newman and Robey (1992) by arguing that the arrows and boxes that appear in process and variance models have dissimilar meanings and hence represent different concepts. Thus, they cannot be combined in a meaningful manner into a single model (Seddon, 1997). For instance, he criticises the inclusion of a variable called "system use" in the D&M model, arguing that it would be appropriate for inclusion only in a process model, since use is in general a reflection of behaviour. He continues by arguing that "system use" does not necessarily *cause* impacts and benefits, although it must *precede* them. In my view, the sort of system use, whether mandatory or voluntary, should be considered carefully, as it is a vital factor in such discussions. Thus, it is a variable that it is appropriate to consider just in the case of the development of a process model (Seddon, 1997), although such models have historically been neglected in the IS field (Boudreau and Robey, 1999). I would argue that the D&M model may have been discussed by many authors simply because of the volume of prior references to it in the relevant literature, as no more than a representative of variance explanations of IS success, although the proponents of the model would argue against that point.

Notwithstanding the ontological and epistemological debate around this work, it is to be welcomed and appreciated as an important attempt to advance IS success research. In this regard, Seddon et al (1999) argue that the significance of the work lies in its originality and structure, as it was the first comprehensive study in the field of IS success that tried to impose some order on IS researchers' choices of success measures. This work has also been considered to have provided the foundation for further development and application in both theoretical and empirical research in the field (Garrity and Sanders, 1998).

The D&M model of success is based on six major interdependent constructs or categories, named "success parts" by DeLone and McLean (2002). Table 2-6 lists these six categories with a brief description of each of them.

Table 2-6: Categories in the D&M success model (DeLone and McLean, 1992)

Success Category	Description
System quality	Measures of IS processing itself
Information quality	Measures of IS output
System use	The consumption of IS output by receivers
User satisfaction	The response to the use of the output of IS
Individual impact	The effect of the information on receivers' behaviour
Organisational impact	The effect of the information on organisational performance

2.3.3.1 The Updated Success Model of D&M

In 2003, DeLone and McLean introduced an updated success model, which was criticised by some researchers as being no more than an amendment of their previous one. Thus, in building the new model, DeLone and McLean (2003) considered some criticisms and recommendations regarding the original model. While understanding the similarities and differences between the two models is not a major part of this research, it is important to highlight some of them, since it is the 2003 version of the D&M model which is referred to in particular in the discussion chapter. Figure 2-8 therefore shows the updated D&M success model.

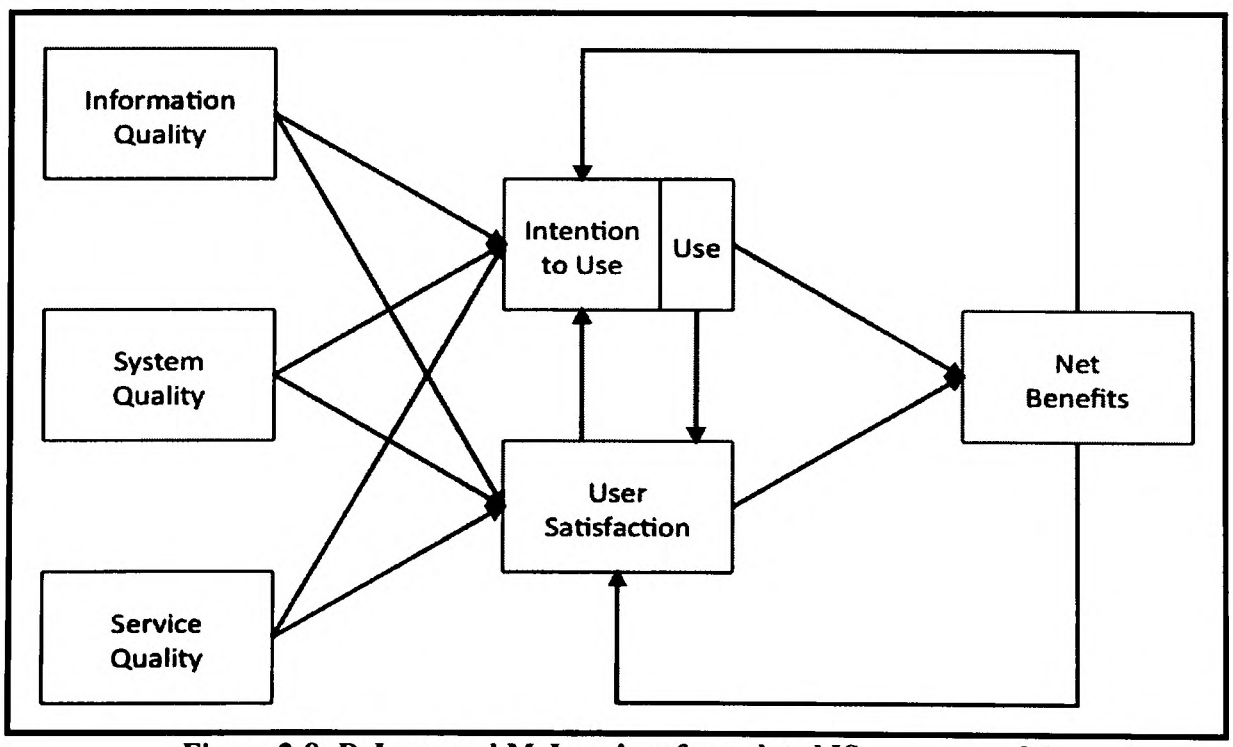


Figure 2-8: DeLone and McLean's reformulated IS success model

A comparison of Figure 2-8 with Figure 2-7 above makes it evident that DeLone and McLean have made some major modifications to their old model in response to criticism and suggestions. These are as follows:

- The new model has become bidirectional to some extent, while the first was unidirectional;
- There is a distinction between *use* as a reflection of behaviour and *intention to use* as an attitude (Seddon, 1997);
- The different impacts are merged into a more general category called *net benefits*, which encompasses individual, group and organisational benefits;
- *Service quality* is recognised as a major constituent of IS success, dealing in general with certain aspects of IS by using the dimensions of assurance, tangibility, reliability and so on to measure the quality of service (DeLone and McLean, 2003).

Despite its alleged weaknesses and a body of criticism, a review of the relevant literature indicates widespread adoption of the D&M model. Indeed, it has been popularly adopted in the IS community and is the most commonly cited model of IS adoption and use, particularly when IS success is the main concern (Kappelman et al., 1997, Gable et al., 2003, Matthew Lee et al., 2005, Agourram and Robson, 2006). As a consequence of this popularity and the frequency of citations within the IS community, the present researcher decided to take it seriously into account during the literature review and to build a set of arguments around the work of DeLone and McLean (1992, 2003). However, such considerations do not imply model testing by proving or refuting a set of identified hypotheses in regard to some or all of its constructs; the investigation of the D&M model is limited to establishing whether it will be informative in the investigation of ES success.

2.3.3.2 Criticisms of the D&M Success Model

In fact, reviewing relevant literature and the model itself resulted in the exposure of certain questions and weaknesses pertaining to the model. Some of these issues have been discussed in the literature, while others have not. Therefore, each of them is

discussed separately in the following subsections, where they are critically investigated and highlighted.

2.3.3.2.1 The Unidirectional Nature of the D&M Model

Seddon (1997) criticizes the unidirectional relationships in the original D&M model and it can be argued that the updated version continues to suffer weakness in this regard, due to the unavailability of feedback from system use to information quality, to system quality or to service quality, which limits the comprehensiveness of the model. Furthermore, it is evident that no relationships have been established among the information, system and service aspects of quality. For instance, if a user had not found the information quality that he was looking for as a consequence of the exclusion of some data field(s) from a certain report or form, he would report this shortcoming to the project management or IT people, who would either refuse or approve his request for the missing information to be supplied. If his request was approved, the project management or IT people would now be responsible for making modifications to the system itself and consequently to the information quality, thus fulfilling the users' need. Therefore, the feedback from the system use category should be established, as well as the relations between service, system and information quality.

2.3.3.2.2 The D&M Model and Stakeholders' Groups

The proponents of the D&M model have not considered distinctions among stakeholders who are affected by the adoption of the new system. It represents a single stakeholder perspective, although different stakeholders may perceive success differently (Wateridge, 1998). Stockdale and Standing (2006) have stressed the importance of considering different stakeholders in any IS evaluation process as central to other elements of evaluation, because the views of stakeholders will affect every aspect of IS evaluation. This criticism is linked to the next one, which concerns the volume of participation in traditional IS and ES as well as the nature of ES, as both call into question the competence of the D&M model to assess ES success (Gable et al., 2003, Sedera et al., 2004).

2.3.3.2.3 The D&M Model and Type of IS

DeLone and McLean (1992, 2003) have not shown in what types of system their models are adequate instruments to measure IS success (Seddon, 1997, Seddon et al., 1999), while some critics have claimed that a distinction should be made, for instance, between traditional IS and ES (Al-Mudimigh et al., 2001, Ifinedo, 2008), arguing that the D&M model may be used in evaluating IS but not ES. This is due to the differences between these two sorts of system, as implementing an ES in an organisation is likely to affect different aspects of that organisation, including most or even all of its stakeholders (Skok and Legge, 2002, Sedera et al., 2007). This, in turn, entails the participation of employees at different organisational levels and positions in addition to some external stakeholders such as customers, suppliers, vendors and consultants (Davenport, 2000, O'Leary, 2000, Skok and Legge, 2002, Chan et al., 2003, Peslak, 2006). Hence, evaluating success will be more difficult in the case of ES adoption than in conventional IS projects.

Gable et al. (Gable et al., 2003), in recognition of this distinction, direct their effort towards redefining the success dimensions of the D&M model to suit the evaluation of ERP systems, which they claim to distinguish from traditional IS in this regard. The present researcher supports these claims and therefore this study will take into consideration the alleged inadequacy of the model to assess ES, without excluding it from such evaluation. In other words, the use of the D&M model in evaluating ES remains questionable and thus needs more investigation.

2.3.3.2.4 The D&M Model and Actual System Use

Although the original D&M model only mentions the category of system use, the authors stress that the system quality, information quality and use categories become less useful when the use of the system is mandatory (DeLone and McLean, 1992, DeLone and McLean, 2003, Petter et al., 2008). Indeed, a question that needs to be addressed is whether the model will be informative in assessing the success of a system in an organisation where its use is mandatory for all users. In presenting the updated model, DeLone and McLean (DeLone and McLean, 2003) argue, in regard to this point, that no system use is totally mandatory; but this is also questionable.

Others have concluded that the productivity of satisfied users will be higher in the case of mandatory system use than when it is voluntary (Calisir and Calisir, 2004, Wu and Wang, 2007). Iivari (2005) tested the D&M model empirically in a context where system use was mandatory and concludes that the information quality and system quality were both significant predictors of users satisfaction but not of system use, while system quality was only a significant predictor of system use. Conversely, Ifinedo and Nahar (Ifinedo and Nahar, 2006) stress the importance of system use as a measure of IS success where it is not mandatory but voluntary.

On the other hand, regardless of whether its use is mandatory or voluntary, users will not be fully supportive of any system without first accepting it, after which it may satisfy their desires (Lim et al., 2005). Therefore, even in the case of mandatory use, users may use it, for instance, just to avoid any trouble with their managers, while being unwilling to participate in further system development and enhancement. Hence, this issue remains unresolved in the case of adopting the D&M model. In other words, it remains unclear whether the same results will arise if the D&M model is adopted to evaluate two otherwise similar systems, where the use of one is mandatory and the other voluntary.

2.3.3.2.5 The D&M Model and Time of Evaluation

While few researchers have critically examined the issue of when to evaluate IS, it is the contention of the present study that the recognition of evaluation time as an important aspect of success should be carefully considered. This issue is particularly complicated in the case of evaluating ERP systems, because of the range of associated changes that affect different aspects of organisations and their business processes. There are published cases where IS adoption was found to be successful but where success was transformed to failure or vice versa (Beynon-Davies, 1999, Larsen and Myers, 1999), demonstrating the need to consider the time of evaluation in any success investigation. Indeed, there is a need to rectify the comparative neglect of this factor and its relation to success measures.

When assessing ERP projects, a major issue is when to measure the organisational benefits or net benefits, as these may take a long time before they can be realized. This makes it particularly difficult to use the D&M model to measure their success, given that net benefit is a major constituent of success, according to its proponents, so that organisations might have to wait a long time before being able to measure the ultimate success of their ERP projects. In the case of traditional IS, despite some similarities to ERP systems, achieving net benefits or organisational benefits, in particular, is likely to take less time, because most IS projects are tailored to meet organisational requirements, in direct contrast to the case of ERP projects. These considerations do not favour the adoption of the D&M model in evaluating ERP projects.

2.3.4 The CSF Model

> *A typical approach used to define and measure ERP implementation success has been critical success factors approach* ***(Esteves and Pastor, 2000; p: 1)***

A second type of study commonly reported in the IS success literature consists of those measuring the CSFs of IS implementation projects. CSF studies are a clear instance of the so-called factoring approach, which is basically a practical application of variance theory. Although the factoring approach has been popularly used in IS success studies, some authors have criticised its failure to reflect reality and its overlooking of the social process of IS implementation. Some of the more important IS studies that critically discuss the factoring approach are those of Bussen and Myers (1997), Larsen and Myers (1997, 1999), Wilson and Howcroft (2002), Mitev (2003) and Adam and Spedding (2005).

CSF studies are also widespread in non-IS literature; indeed, CSFs have been extensively researched and explored (Francoise, 2009). A review of the IS success literature reveals many studies that pertain directly to those factors that should be considered during any IS project and which are likely to lead to success (Kim et al., 2005). In the IS community, accordingly, such studies have been taken to reflect the significance of CSFs in IS implementation (Light et al., 1999, Scheer and Habermann, 2000, Nah et al., 2001, Somers and Nelson, 2001, Nah et al., 2003, Zhang et al., 2003).

Indeed, the domain of ERP success research appears to be dominated by the CSF concept (Peslak, 2006).

Generally, the main aim of such studies is to identify a set of often independent variables called factors, in a certain classification and ranking order, which lead to certain outcome(s) (Markus and Robey, 1988, Newman and Robey, 1992). The work of Light et al (1999), Esteves and Pastor (2000), Somers and Nelson (2001), Milis and Mercken (2002), Al-Mashari et al (2003), Ramayah et al (2007), Ngai et al (2008) and Chung et al (2009) are some examples of the factoring approach to IS success research in terms of CSFs. However, some of the studies concerned have focused narrowly on ranking these factors and looking for the most important of them according to a set of priorities, examples being the work of Nah et al (2001), Milis and Mercken (2002), Garcia-Sanchez and Perez-Bernal (2007) and Ngai et al (2008).

Nonetheless, in the IS field, these factors are usually proposed as a list of non-interrelated variables for the purpose of achieving a successful outcome to IS implementation (Wagner et al., 2006). Table 2-7 lists of the top 10 factors as proposed by Somers and Nelson (2001) and also identified by others (Shanks et al., 1999, Skok and Legge, 2002, Umble et al., 2003, Eric Wang et al., 2008). Nevertheless, other authors have perceived these factors and ranked them differently (Sedera and Dey, 2006).

Table 2-7: Top 10 CSFs (Somers and Nelson, 2001)

No.	CSF	No.	CSF
1	Top management commitment	**6**	Communication
2	Change management	**7**	Project team competence
3	Training and education	**8**	Project management
4	Clear goals and objectives	**9**	Project champion
5	Careful package selection	**10**	Project team competence

According to Light et al. (Light et al., 1999), the application of CSF models has not been restricted to ERP projects but rather encompasses common project management issues, BPR projects and the implementation of manufacturing systems. For instance,

Remus (Remus, 2007) used CSFs to investigate the implementation of enterprise portals, while Milis and Mercken (Milis and Mercken, 2002) studied them in the context of an ICT project in the banking sector. Ravesteyn and Versendaal (Ravesteyn and Versendaal, 2007), in their turn, investigated the CSFs that were closely related to each implementation phase of business process management projects. Finally, Sedera and Dey (Sedera and Dey, 2006) considered the CSFs applicable to the context of rapid ES implementation and proposed three new ones specific to that context.

Figure 2-9 depicts the factoring approach as a type of variance theory. In such studies, researchers mainly seek to identify set of antecedent conditions in the form of independent (CSFs) or dependant (D&M model) variables that should be considered in order to achieve the required outcome(s) (Markus and Robey, 1988, Newman and Robey, 1992), usually IS success. In the figure, the black box explicitly represents the IS implementation process.

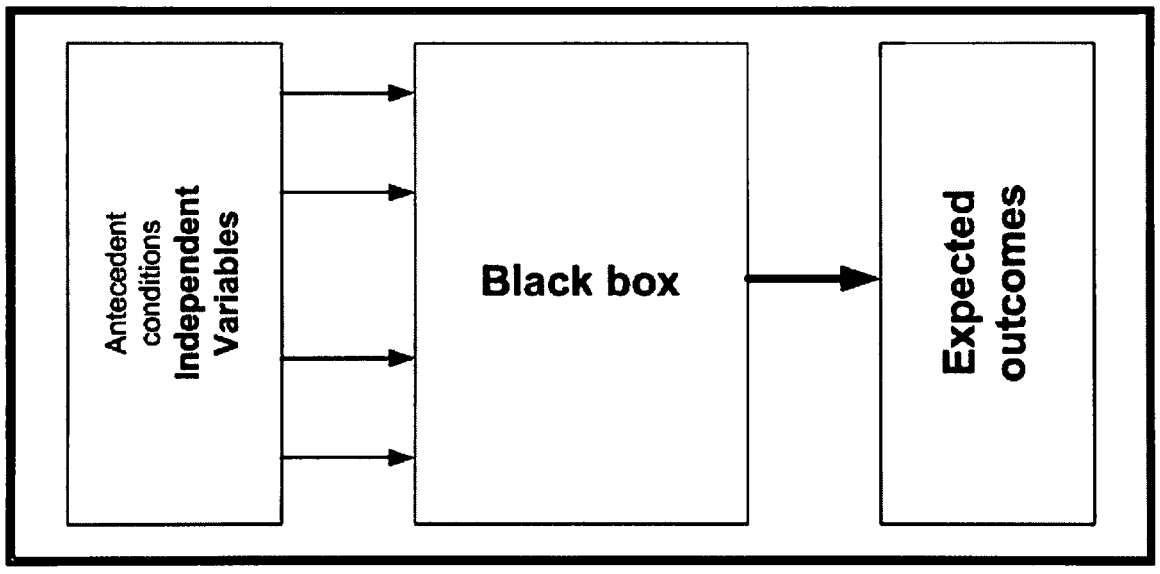


Figure 2-9: The nature of variance theory

2.3.4.1 Issues in CSF Implementation

Taking CSFs for granted as a guaranteed means to achieve IS success is proven to be a misleading notion, given the absence of any clear-cut explanation of how such factors, taken together, drive certain IS projects to success. According to Newman and Robey (1992), "*Ideally, factor research should establish strong empirical connections between antecedent conditions and later outcomes*" **(Newman and Robey, 1992; p: 251)**. On the contrary, most of the related works identified in the literature review are limited to

lists of non-interrelated independent variables, without any explanation of how these factors interact over the period of implementation to achieve IS success. This does not mean that to take a CSF approach is mistaken; rather that they should be taken into account *carefully* but not *decisively* during different stages of IS projects, while not neglecting the social aspects of implementation.

An obvious danger in emphasizing the importance of adopting CSFs in ERP projects is that it may lead to the false view that they are a panacea for successful IS project implementation. However, the importance of looking at the social process of IS development and implementation has been emphasized, given that "*the development of an information system is a social process involving users and systems analysts, carried out in an organisational setting*" **(Newman and Robey, 1992; p: 249)**. Therefore, ERP implementation is, to some extent, similar to IS development in that both satisfy the conditions identified by Newman and Robey: the involvement of stakeholders within an organisational context. While the importance of the social aspects of implementation should be considered for these reasons, there is nevertheless opposition to this approach in regard to the epistemological stance adopted, as it assumes, in general, a simplistic, deterministic and rationalist view of IS implementation, whereas IS success is in fact difficult to define due to its elusiveness.

Hence, overlooking the social aspects of IS implementation, as well as representing it as a mere set of unrelated factors, is mistaken. As evidence, if these factors really did drive IS projects to certain success, then no cases of failure would ever be reported, which is counterfactual; according to Davenport (Davenport, 1998), the high failure rate of ERP projects has been widely cited in the literature.

A review of the relevant literature reveals certain contradictions within the works of many authors regarding CSFs. Many of these papers begin by showing the importance of ERP systems and the difficulties and risks of implementation, then go on to focus narrowly upon identifying and classifying sets of unrelated independent variables which are said to be critical in order to achieve success. Thus, a large and complicated topic is reduced to a simplistic perspective. In other words, many authors have concentrated their efforts on answering *what* questions and have paid no attention to *how* these

factors, acting together, will lead to successful ERP implementation. This appears to be the most serious contradiction in such work. For instance, Akkermans and Helden (2002) declare the complexity of ERP projects and mention the existence of difficulties; yet they explicitly base the solution on identifying certain factors which lead to success:

> *ERP system implementations are complex undertakings and many of them are unsuccessful. It is therefore important to find out what the critical success factors, or CSFs, are, that drive ERP project success* ***(Akkermans and Helden, 2002; p: 45)***

2.3.4.2 Classification of CSF Studies

Notwithstanding the above discussion, a review of relevant literature shows that most CSF studies fall into one of two major categories, the first of which is mainly concerned with exploring these factors in order to list those which most strongly or most often affect the implementation process. Table 2-8 summarizes some of these studies and their conclusions.

Table 2-8: Examples of studies identifying CSFs

CSF Studies	Number of CSFs
(Shanks et al., 1999)	Found 11 CSFs for ERP projects
(Somers and Nelson, 2001)	Proposed a comprehensive list of 22 CSFs
(Nah et al., 2001, Nah et al., 2003)	Identified 11 CSFs
(Esteves and Pastor, 2005a)	Listed 11 CSFs
(Garcia-Sanchez and Perez-Bernal, 2007)	Named 14 CSFs
(Ngai et al., 2008)	Suggested 18 CSFs

The second group of studies has concentrated on classifying these CSFs into sets or categories. For example, Somers and Nelson (2001, 2004) adopt the view of the implementation process proposed by Cooper and Zmud (1990) in order to categorize their 22 CSFs according to their importance in each phase, while Light et al (1999) and Al-Mashari et al (2003) place CSFs into two main groups, of strategic and tactical factors. The approach taken by Nah et al (2001) is to classify a list of CSFs according to the ERP project lifecycle model developed by Markus and Tanis (2000), which divides the ERP implementation process into four phases. In the work of Esteves and Pastor

(2001), CSFs are classified by SAP system implementation phases, based on the ASAP methodology, which consists of five phases. Shanks et al (Shanks et al., 2000), for their part, classify a set of predetermined CSFs according to ERP implementation phases, based on their synthesised process model of the ERP project lifecycle.

A rather different approach is taken by Milis and Mercken (2002), who propose a framework in which CSFs are classified into four categories: factors that influence goal congruency, project team related factors, factors that focus on project acceptance and its results and finally, those factors that are related to the implementation process. The main focus of Wang et al (Eric Wang et al., 2008) is on six major CSFs of ERP implementation in the Taiwanese context which they classify into two major groups, internal and external CSFs, to show how these groups affect the success of ERP implementation. Finally, Chetcuti (2008) attempts to identify the most influential CSFs for ERP implementation in order to develop a conceptual model which is then analysed according to multiple stakeholders' perspectives.

The above review indicates the widespread adoption of the notion that it is possible to identify the CSFs for achieving IS success, regardless of how such success is actually achieved. It is evident that the adoption of such an approach to IS success is actively advocated by many researchers. Nevertheless, the practical applicability of these CSFs to achieve real success remains questionable.

2.3.4.3 Notable Limitations to the CSF Approach

The CSF model has some limitations; particularly in regard to researching IS success, which this subsection considers as fivefold. The first is that only one study (Sedera and Dey, 2006) appears to address the identification of CSFs from the perspectives of multiple groups of stakeholders, while the remainder of the available CSF studies consider a single and undifferentiated stakeholder view of CSFs. Secondly, the CSF approach has been shown to suffer some philosophical and practical weaknesses and limitations, which some researchers in the field have highlighted. Al-Mudimigh et al (2001) have argued that ERP implementation should be seen from a balanced perspective as a socio-technical rather than a purely technology-driven process. This view emphasizes the importance of the social aspects of implementation and their role

in shaping the process and then its deliverables (Al-Mudimigh et al., 2001, Marchewka, 2006). This is compatible with the viewpoint taken by Davenport (1998) and Markus et al (2000) of ERP implementation as not merely a technological replacement project but rather as an organisational process change which encompasses different sorts of change (Boonstra, 2006).

The third limitation is the absence of any discussion of CSFs in the context of developing countries. For instance, neither the understanding of top management support and its nature nor the extent to which managers support certain projects has been addressed in this context. The significance of this lies in the fact that the power of the top management in developing countries is often greater than that of its counterpart in developed countries, sometimes to the point of being virtually unrestricted. Such a powerful management may thus continue to support an IS project for years until its goals are achieved, regardless of the resources used or wasted. This is possible largely because of the absence in the developing world of the structures of accountability and corporate governance in place in industrialized countries.

The fourth limitation is that, in CSF research, there are very few studies such as those of Akkermans and Helden (2002) and King and Burgess (2006), attempting to develop a rich framework of CSFs that is more than a list of bullet points in a certain order according to their importance in a particular case. The main aim of such rare studies has been to identify causal relations among CSFs in order to show how they interact, thus improving understanding of the mechanism of IS implementation (Akkermans and Helden, 2002, King and Burgess, 2006). The failure of most CSF research to address clearly how these factors interact during IS implementation is seen as a major weakness (Al-Mudimigh et al., 2001, King and Burgess, 2006, Eric Wang et al., 2008). It is indeed an obvious shortcoming of the CSF model in its application to IS success.

Finally, in the CSF model, each factor tends to be given a fixed ranking which remains invariable during the whole implementation process, although its importance may in practice change with time. For instance, Somers and Nelson (2004) note that this view of CSFs is not sufficiently informative to understand the ERP implementation process, since the importance of each factor will change during the project lifecycle.

The criticisms listed here, if taken together, indicate a failure of the CSF approach to model adequately the ERP implementation process or perceptions of ERP success. In most CSF studies, researchers have tended to examine the factors in isolation from each other and from their context, which precludes a comprehensive understanding of the subject matter being investigated. Thus, such studies are to some extent uninformative and fail to reflect reality accurately and in depth.

2.3.5 IS Failure Studies

> *Millions of pounds are wasted in IS projects that fail and millions more are lost due to malfunctions of systems that have progressed beyond the implementation stage* ***(Fortune and Peters, 2005; p: 1)***

IS failure, whether during or after implementation, will inevitably be very costly in terms of the organisation's resources. Any IS project is subject to failure at any time; the questions here concern the nature and definition of failure and how it is perceived. Despite the common belief that IS failure occurs if and only if the system as a whole is abandoned, a system can be deemed to have failed simply if it is not used as was intended (Wilson and Howcroft, 2002).

In most IS literature, the concepts of IS success and IS failure have been treated quite separately, except in rare cases. Accordingly, some key works which have played a major role in advancing research in this subject matter are seen to constitute a distinct body of IS failure literature, such as the work of Lyytinen and Hirschheim (1987), Lyytinen (1988), Sauer (1993), Heeks (2002), Wilson and Howcroft (2002) and Adam and Spedding (2005). According to the last of these authors, such a sharp separation between these two literatures has to be resolved, at least to some extent, in order to make notable advances in avoiding failure and replicating success (Adam and Spedding, 2005). In fact, it is noticeable that more research has been dedicated to investigating IS success that IS failure, at least in terms of numbers of publications. In my view, this is justifiable, as the main aim of any IS implementation is not simply to avoid failure but instead to succeed and to replicate success.

Not only is success an elusive concept, as discussed above; the notion of failure is also vague and both have suffered from lack of consensus regarding how they are constituted (Wilson and Howcroft, 2002). Indeed, only one sort of failure can be judged explicitly in a way agreed by researchers across this domain of knowledge, which is when a project is completely terminated either before or after going live. In the literature on IS failure, the earliest studies concentrated on the technical flaws in the implemented systems as being solely responsible for causing such failure. However, in the light of claims that IS implementation should be treated as a socio-technical phenomenon, its failure should not be viewed exclusively from a technical perspective (Wilson and Howcroft, 2002). Therefore, different social components of the implementation process must be considered when researching IS failure. One obvious example is the case of the London Ambulance Service computer-aided despatch system, which was comprehensively validated technically but where, a few weeks after going live, a crisis occurred and where it became evident that the issue was not technical but related to human error (Beynon-Davies, 1999).

In a simple and purely deterministic definition of IS failure, an IS project is deemed to have failed if it runs over budget or is delivered later than planned (Fortune and Peters, 2005, Morreale, 2008). According to a recent report, 57% of ERP projects took more than the expected time and 54% exceeded the budget (Panorama.Consulting.Group, 2010). Taking these two measures to identify failure, it can be seen that more than half of ERP projects fail. This suggests that the concept needs to be considered more broadly.

However, the work of Lyytinen and Hirschheim (1987) can be seen to have broadened the concept by the inclusion of wider social factors as well as the technical ones that shape the phenomenon of failure. Dalcher and Drevin (2003) and Fortune and Peters (2005) both cite the classification of IS failure which Lyytinen and Hirschheim (Lyytinen and Hirschheim, 1987) developed, based on four types of failure. Indeed, this model, illustrated in Figure 2-10, has been widely cited in IS failure research. Its four categories are:

- *Correspondence failure*, which refers to the development of a product that does not meet its predefined objectives of functionality.

- *Process failure*, which refers to systems that are never delivered at all or are late and result in substantial budget overruns, so that the system fails within the development process.
- *Interaction failure*, where systems are delivered but are hardly or never used at all, primarily because of user dissatisfaction with aspects such as the change in work processes introduced by the system.
- *Expectation failure*, which essentially incorporates of all three types above and is described as the inability of the system to satisfy a specific stakeholders' needs and expectations.

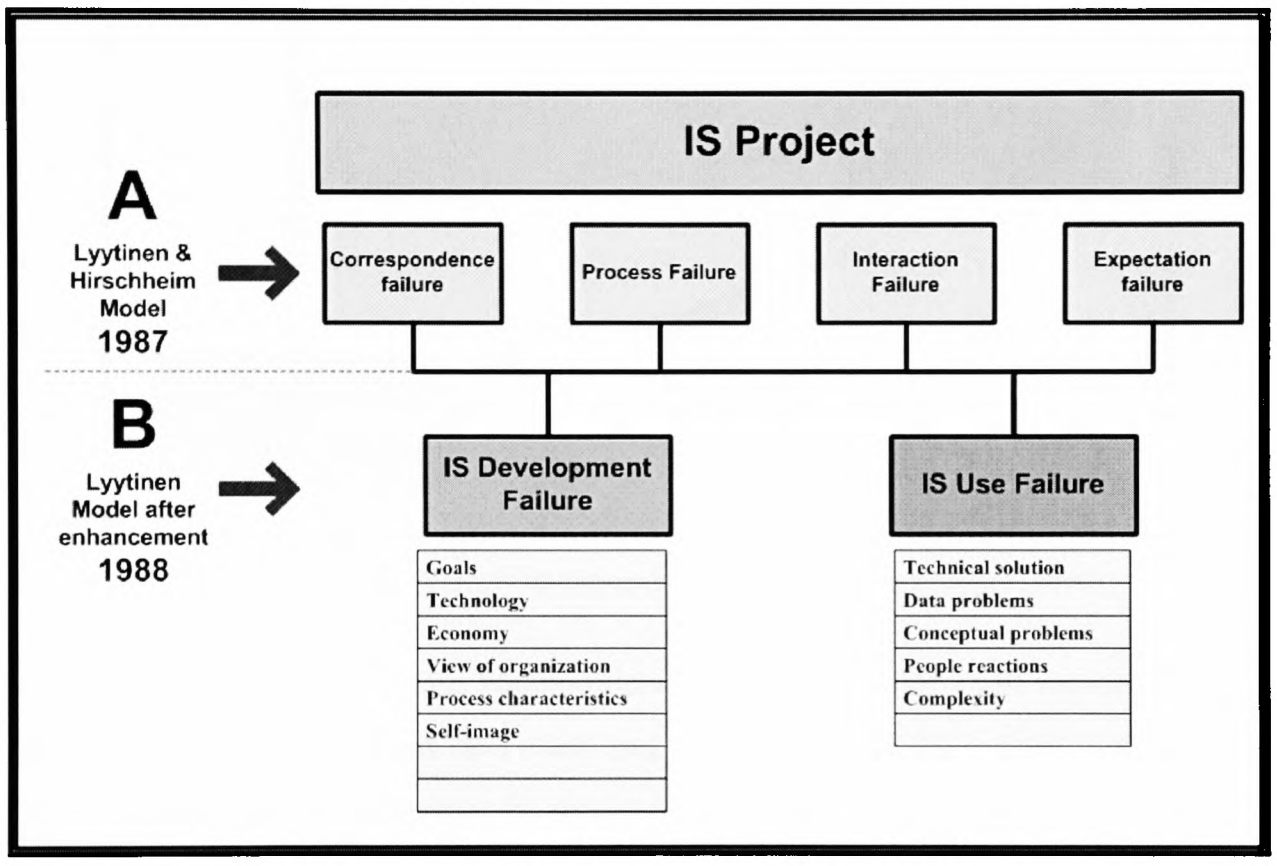


Figure 2-10: IS failure models (Lyytinen and Hirschheim, 1987, Lyytinen, 1988)

Subsequently, Lyytinen enhanced the earlier model and classified IS failure into two major groups: development failure and use failure (Lyytinen, 1988). Figure 2-10 B shows this later classicisation of IS failure, which also took account of different aspects of projects such as social, political and technical factors. It has since been argued that meeting expectations is a major and obvious issue in the IS failure literature (Wilson and Howcroft, 2002), which supports the work of Lyytinen and Hirschheim (1987) and Lyytinen (1988).

Another author who has concentrated on investigating IS failure is Sauer (Sauer, 1993), whose work has been widely cited in IS failure research. His proposed IS failure model contains a clear definition of IS failure, whereby an IS project is considered a failure if and only if the operation or the development of that system is completely terminated (Sauer, 1993). His model, which he calls the Triangle of Dependencies, is illustrated in Figure 2-11.

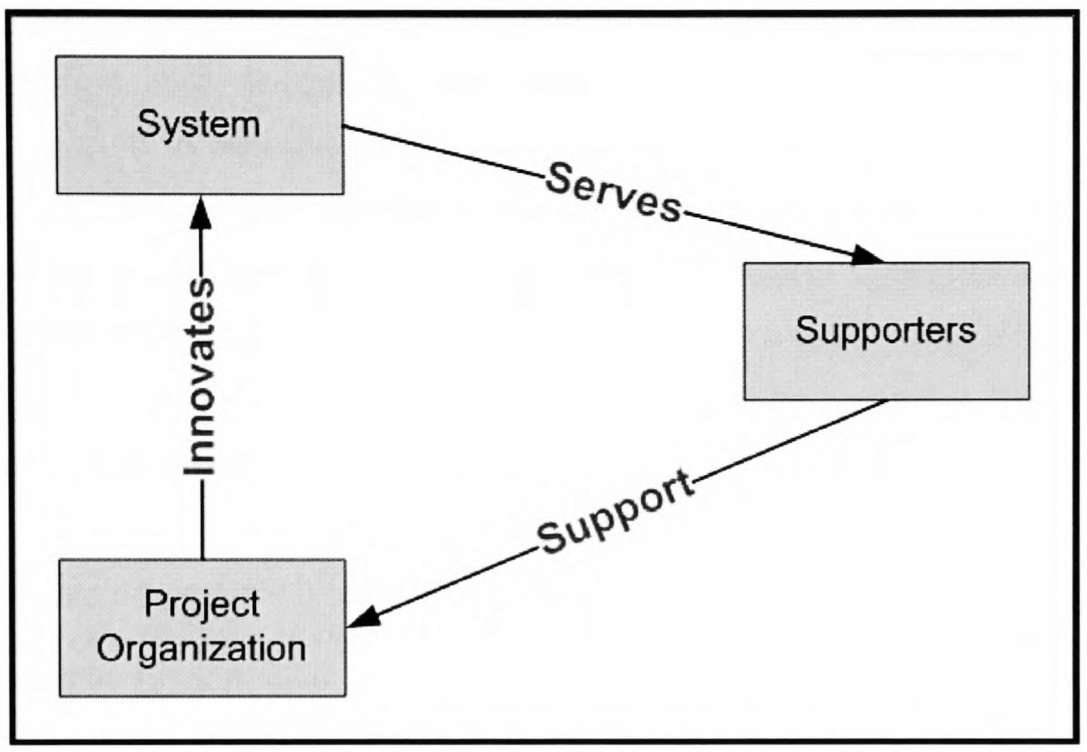


Figure 2-11: The Triangle of Dependencies failure model (Sauer, 1993)

The model indicates that while stakeholders continue to offer their support to an IS project, the process of system operation and development will continue until a certain level of supporters' satisfaction is achieved such that the system will serve their interests. The existence of such continuous support will lead to the elimination of failure by any definition, as any flaw, whatever it is, will be resolved thanks to this support. Critics have raised questions as to the nature of such support and when it should be stopped, both of which need to be addressed carefully in order to avoid what has been called the "escalation of commitment" (Pan et al., 2004).

Finally, research into IS failure and success must take into account some major challenges, including the existence of different stakeholder groups (Heeks, 2002, Dalcher and Drevin, 2003), since what is viewed as failure by one group may be viewed differently by another (Lyytinen and Hirschheim, 1987, Sauer, 1993), simply because

expectations may differ among stakeholder groups. Indeed, it is important to recognise the potential variety of expectations of different individuals within such groups, which raises yet further questions.

2.4. ERP Initiative and Organisational Change Programmes

At this stage of reviewing the relevant literature of ERP project's success and failure, it has been obvious that such project encompasses variety of changes not merely technical ones. Therefore, such changes, by their turns, affect the targeted organisation and its people in most of its business units. Previous sections in this research exposed the fact that most of ERP projects encompass sort of BPR which has been classified as an organisational change attempt due to its obvious impact upon organisation (Pettigrew, 1998). Hence, ERP project can easily be classified as a sort of organisational change program according to its apparent impact upon the targeted organisation. This is clearly shown in Pettigrew definition of change program.

> *a change programme is defined as a focused, often high investment attempt to create system-wide change using pre-packaged products and technologies* ***(Pettigrew, 1998; p: 273)***

In fact such definition is highly compatible with the nature of ERP project particularly what has been discussed in section 2.2.4 page 19. Therefore, studies in organisational change and development, including ERP project, have to be planned, designed, and implemented as a context-bound program which will then fit into the targeted organisation and assist in guiding change efforts (Pettigrew, 1998). At the same time, no absolute generalisation can take place from one setting to others even similar ones as each has its conditions, circumstances, and uniqueness over others. However, reviewing such literature reveals that, most of these studies have focused their efforts in investigating the change and, at the same time, ignoring the varying contexts in which changes have been introduced (Pettigrew, 1985b). Although most of these studies have not paid any attention to the change process, their main aim was to generalise findings to other settings (Pettigrew, 1985c).

According to Pettigrew, in studying change in organization, generalisation is hard to sustain over time, and is even difficult to uphold across cultural, institutional, and international boundaries (Pettigrew et al., 2001).

Therefore, organisational change field is far from mature in understanding the effects and dynamics of process, time, discontinuity, and context (Pettigrew et al., 2001).

> *Remarkably, **few** studies of change actually allow the change process to reveal itself in any kind of substantially temporal or contextual manner. Studies of a innovation are, therefore, often preoccupied with the intricacies of particular changes, rather than the dynamic and holistic of changing* ***(Pettigrew, 1987; p: 655)***

Therefore, it is impossible to understand the dynamic nature of organisational change if the collected data just reflects snapshot time-serious data. This is due to the nature of such data as they fail to reflect the mechanisms and processes in certain setting and point of time through which changes are created (Pettigrew, 1985c, Pettigrew, 1985b, Pettigrew, 1987). Therefore and in order to approach a high level of reality's reflection, without longitudinal data, it is impossible to identify the processual dynamics of change, the relationship between forces of continuity and change, and therefore the indissoluble link between change and structure (Pettigrew, 1985c, Pettigrew, 1985b).

In organisational change literature, it was notable that researching any organisational change initiative is ahistorical, aprocessual and acontextual (Pettigrew, 1985b, Pettigrew, 1987, Pettigrew, 1989) and this was one major criticism to the literature on organisational change (Pettigrew et al., 2001). Hence, the existence of such gap was considered as one major weak point in the literature of studying change in organisations (Pettigrew, 1987). Accordingly, researchers' focus in such domain of knowledge has to be moved to encourage researches which are contextualist and processual in nature (Pettigrew, 1985c). In response to such claim, contextualisim or contextualist approach has been advocated by Pettigrew to overcome such issue when researching change in organisations. According to Pettigrew (1998):

> *There is now ample empirical research evidence demonstrating that change processes are highly contextually embedded* ***(Pettigrew, 1998; p: 283)***

2.4.1 Organisational Change and Contextualisim

Among four types of world hypotheses that have been articulately described by Pepper in his book "*World Hypotheses*" (Pepper, 1942), contextualisim or contextualist approach has been highly advocated in studying change in organisations due to its competency to explore the dynamic nature of change in its context and along side with change process taking into consideration the importance of historical events (Pettigrew, 1985c). This is due to the fact that organisational change investigation is so complicated and context-bound process in which context and actions are inseparably intertwined (Loasby, 1976, Pettigrew, 1990, Pettigrew, 1992). This complexity also has been highlighted in previous works of Pettigrew (Pettigrew, 1985c, Pettigrew, 1987).

> *To understand organisational change, examine the juxtaposition of the rational and the political, the quest for efficiency and power, the enabling and constraining forces of intraorganisational and socioeconomic and political context, and explore some of the conditions in which mixture of these occur* ***(Pettigrew, 1985c; p: 235 & 1987; p: 650)***

Therefore and in order to understand organisational change as it occurs; adopting contextualist approach in such investigation has been highly supported by Pettigrew. This is due to the fact that contextualisim researchers, contextualists, in general see the world of practice in term of complexity, uncertainty, uniqueness, and instability (Pettigrew, 1985b). They are interested in the placement of acts in their context, the multiple meaning of events, and the recognition that situations of practice can be unique (Pettigrew, 1985b, Pettigrew, 1985c).

Hence, finding problems and understanding certain situation can be possibly attained through detailed immersion in contexts (Pettigrew, 1989, Pettigrew, 1990). In other word, understanding the emergent, situational, and holistic features of a process or an organism in its context rather than partition the world into limited groups of dependant and/or independent variables isolated from their context; is one major feature of the contextualisim (Pettigrew, 1985c). In this regard, Pettigrew in some of his works (1985b, 1985c) precisely shades light on the nature of contextualisim as:

> *it is concern with event in its setting, the truth theory has to be qualitative confirmation, given that the context will change and knowledge will need to*

> *change as well, and the root metaphor is the historical event* ***(Pettigrew, 1985b; p: 59 & 1985c; p: 230)***

All in all, contextualisim broadly, implies the importance of the situational and multifaceted character of meanings in research settings, and the holistic study of emergent processes in particular and changing contexts. Therefore, one major value of considering that approach is in its usefulness for theoretical development in addition to practice (Pettigrew, 1985c, Pettigrew, 1985b). Furthermore, contextualisim has another value that worth to be mentioned here as it has considered multifaceted nature of truth among people involved in the research process. According to Spencer and Dale (1979), in the qualitative contextualisim research process, it is clearly recognized that there are multiple perspectives in the research setting. Additionally, contextualists have usually claimed and drawn researchers' attentions to the importance of considering place and also time in their investigation when using standard theories or techniques (Pettigrew, 1985c, Pettigrew, 1989, Pettigrew, 1990). This is due to contextualists believes that time and place, both, have contributed in shaping the change process in any organisational change initiative. Therefore, these two major components are highly importance to be considered.

Therefore, in studying organisational change, Pettigrew, by his turn, developed his ideas based on contextualisim principles for the purpose of using them mainly as a mode of analysis to overcome some of qualitative research weak points and gaps as well as to draw more attention to the dynamic nature of change, context, knowledge, and process of change. In the following section, some details about Pettigrew's ideas will be highlighted.

2.4.2 Pettigrew's Ideas in Organisational Change Research

Pettigrew's ideas for studying organisational change have been mainly developed based on contextualisim approach. His ideas indicated that much of the explanation for forms of change activities can be derived from an analysis of the continues interactions of the organizational (inner) and environmental (outer) contexts with the content of the implementation project over time (Pettigrew, 1987, Pettigrew, 1990). These ideas have been developed as an attempt to overcome and bridge gaps that are obvious in

organisational change literature in order to help in providing a good and reflexive understanding of such phenomenon. Consequently, Pettigrew has built his understanding based on three major constructs, as illustrated in Figure 2-12, all play dynamic role in shaping and influencing change in organisations.

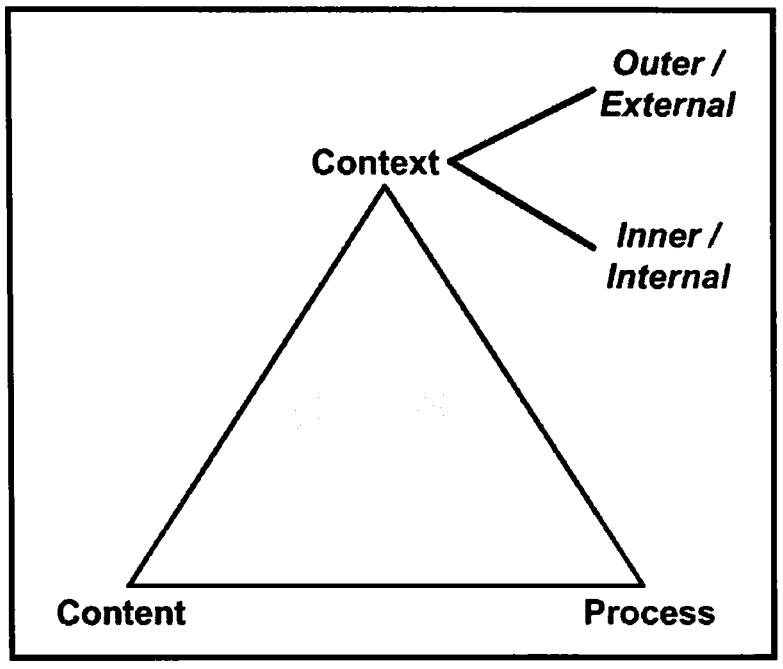


Figure 2-12: Pettigrew's Ideas of Contextualisim. Adopted from (Pettigrew, 1987)

In the above conceptualisation of Pettigrew (Pettigrew, 1987), he has stressed the importance of three major components that dynamically influence organisational change. In regard to ***context*** construct, he has divided it into two major types as internal/inner and external/outer contexts. ***Internal context*** refers to corporate culture, organisation structure, and internal political system within the organisation. Whiles, ***external context*** refers to competitive environment, external political system, economic, and social in which the organisation operates (Pettigrew, 1987, Pettigrew, 1989). On the other hand, the second construct is the ***content of change*** which refers to certain areas of transformation under investigation. Finally, the ***process of change*** which denotes the actions, interactions, and reactions from different interested parties due to their desire to move from organisation form its present state to its future state. In other word, process of change can be considered as the motor which mobilises the organisation from one state to another (Pettigrew, 1989, Pettigrew, 1990).

In fact, the abovementioned explanation of Pettigrew's ideas can be understood, to some extent, by the following excerpt.

> *Broadly speaking, the 'what' of change is encapsulated under the label content, much of the 'why' of change is derived from an analysis of inner and outer context, and the 'how' of change can be understood from an analysis of process* ***(Pettigrew, 1987; p: 658)***

Accordingly, to undertake a useful research in the field of organisational change, including ERP success and failure, such research should involve continues interplay of ideas about the process of change, the content of change, and the context of change both inner and outer, together with skill in regulating the relations among these them (Pettigrew, 1985b, Pettigrew, 1985c). Additionally, one major significant feature of Pettigrew's ideas is its concern of historical data based on the assumption that past shapes present and the emerging future. In fact, history is not just an event in the past but instead it is alive in the present live (Pettigrew, 1989), therefore, such approach claims to consider longitudinal data. In fact, considering Pettigrew's ideas in analysing change has some key points to be emphasised. Firstly, the importance of studying changes in their context. Secondly, it stresses the need to explore context and action as well as exploring how context is a product of action and vice versa. Thirdly, the central assumption about causation in this kind of holistic analysis, causation of change is neither linear nor singular. Finally, the importance of temporal interconnectedness, locating change in past, present, and future time is also stressed (Pettigrew, 1990).

Finally, it is important to re-stress the fact that contextualisim as a theory of method can be used, such as what Pettigrew did, as a mode of analysis to investigate and understand change in organisation in any organisational change initiative. In such case, two levels of analysis should be considered. Vertical and horizontal levels, and the interconnections between them through time (Pettigrew, 1987). Vertical level of analysis refers to the effect of higher level (outer such as competitive power context) upon intra-organisational context (inner context such as structure) and interest's groups. Whiles, horizontal level of analysis refers to the sequential interconnectedness of phenomena in past, preset, and future time. This is due to the importance of looking at the interdependent sequence of events and actions of the implementation itself and then can be used to explain the origins, continuance, and outcomes of some phenomenon. A key point to be considered to the analysis is to track the interactions between levels over time. Therefore in Contextualist study it is important to identify clearly the context,

content, and the process of change together with the interconnections among them (Pettigrew, 1987).

In fact, an approach that offers both multilevel or vertical and processual (horizontal) is said to be contextualisim approach (Pettigrew, 1985c, Pettigrew, 1987). According to Pettigrew (1985c), this approach has been designed to capture more of the whole, the history, the process, the environment, and the emergent behaviour in organisations. Therefore and in order to do so, a longitudinal research and the set of multiple methods are both important in such case (Pettigrew, 1989). Nonetheless, adopting these ideas as a mode of analysis is not free of issues and requirements. Therefore, some major issues pertain to the adoption of these ideas for analysis purpose has to be emphasised. Selecting proper and rich of data sites, adopting multiple methods for data collections, managing the anticipated huge volume of generated data, and presenting research process and findings all are instances of these issues and requirements (Pettigrew, 1987, Pettigrew, 1989, Pettigrew, 1990).

2.5. IS Success and Failure Research: the Status Quo not yet

The detailed and critical review of IS success and failure research presented above leads to the clear conclusion that such work is dominated by the positivist research tradition. Indeed, this dominance not only applies to IS success and failure studies but encompasses other domains of knowledge. The review has also shown that this grounding in positivism has certain limitations, which have been noted throughout this chapter. Thus, it does not inform the subject matter properly and fails to reflect reality accurately. This is due to the narrow, simple and deterministic view of the phenomena concerned, whereby reality is seen as bounded by sets of variables, either dependant as in the case of the D&M model or independent as in the case of CSF studies. A major weakness of such studies is that these variables have often been investigated separately from each other and in isolation from their context. Furthermore, there has been too little consideration of the important role of social factors in shaping IS success and failure.

In light of this positive dominance and its failure to reflect reality, it is vitally necessary to find an alternative philosophical and methodological assumption that may be more

fruitful in investigating IS success and failure. Therefore, the next chapter seeks the proper synthesis of philosophical and methodological approaches that will yield appropriate instruments to increase the understanding of IS success and failure. It addresses this issue carefully, taking into account the limitations of positivism in designing this research.

2.6. Summary

This chapter has explored some major issues pertaining to ERP systems and to IS success and failure. It began by introducing the concept of ERP and some important related matters. There was then a critical review of the IS success and failure literature, beginning with an introduction to IS success and failure, followed by discussion of some issues directly related to investigating these phenomena, such as the need to consider different stakeholders' perspectives and the role of time in shaping such investigations. Two very commonly cited approaches to IS success studies, the D&M model and the CSF model, were examined in some detail and critically evaluated. This revealed some major gaps and shortcomings in these approaches, which were discussed in detail. This review of the relevant literature then turned to particular criticisms of IS failure studies. One of the main findings was the necessity of considering both IS success and IS failure in any study, rather than treating the two phenomena separately. The chapter concluded with a brief account of the present situation of IS success and failure studies, raising the need to seek an alternative combination of philosophical and methodological approaches, which is addressed in the next chapter.

3 Research Methodology

3.1. Introduction

This chapter highlights and evaluates some of the available philosophical and methodological traditions in IS research. It begins with an illustration of different philosophical stances, particularly those commonly adopted in IS research. Thus, three different schools of thought – positivism, interpretivism and critical research – will be evaluated in a process intended to yield the philosophy that underpins this research. The discussion then turns to a review and evaluation of the major approaches that are commonly adopted in IS studies, these being case study, ethnography and survey. This evaluation process will conclude with the selection of the appropriate research approach to drive and guide this investigation. In particular, there will be a discussion of some facts pertaining to grounded theory, as it has been chosen to partially inform and guide the process of data collection and analysis.

The techniques adopted for data generation, such as interviews and documentary analysis, will also be explained. That explanation will encompass some detailed aspects of how semi-structured interviews will be used in this research. The discussion will also cover the use of software in qualitative studies, including a brief introduction to the NVivo package, which has been chosen to manage and analyse a large volume of qualitative data. The issue of the quality of this research will also be covered in some detail, taking into account that it is philosophically grounded in interpretive principles.

The chapter concludes with a summary of the research philosophy, approach, methods and data sources, which together constitute the research design used to drive the empirical part of this study. It is important here to stress the major role that the literature review, presented in the previous chapter, has played in shaping this methodology chapter. Accordingly, the adoption of a research design is considered to be the result of reviewing previous related works, taking into account the nature of this study and the research questions, as they have also played a major role in developing the design of this project.

3.2. Philosophical Underpinnings

Since its emergence, IS research has faced issues, from defining IS as an independent discipline to choosing among different research philosophies. Indeed, there has been considerable disagreement among IS researchers over both philosophy and methodology (Checkland and Holwell, 1998), particularly since the emergence of interpretive research as a stand-alone research tradition.

An intensive review of the IS literature reveals a general consensus on the classification of research philosophies into three main types: positivist, interpretive and critical research (Chua, 1986, Orlikowski and Baroudi, 1991, Klein and Myers, 1999, Oates, 2006, Cohen et al., 2007). Among these three main research traditions in IS, there is active debate, especially between positivist and interpretive researchers. This is conspicuous from the volume of publications that have discussed this issue and its consequences, such as the work of Orlikowski & Baroudi (1991), Walsham (1993), Walsham (1995a), Fitzgerald and Howcroft (1998), Myers (1997a), Klein & Myers (1999), Weber (2004) and De Vries (2005). As a result, some authors, including Fitzgerald and Howcroft (1998), have advocated the convergence of these philosophies and have suggested alternatives to resolve or even dissolve the existing debate. It is important to note that the debate between positivists and interpretivist is not exclusive to the IS discipline but affects others (Walsham, 1995a), such as business research (Gunmesson, 2003).

Distinctions among research philosophies should be built around sets of assumptions which constitute their philosophical stances. In particular, assumptions concerning ontology and epistemology are important in determining how research should be conducted (Orlikowski and Baroudi, 1991, Oates, 2006). Ontology refers to the researcher's view of the world and of reality, while epistemology refers to the view of knowledge that leads to reality – its definition, its nature and how it can be obtained (Chua, 1986, Orlikowski and Baroudi, 1991, Dobson, 1999, Allen S. Lee, 2004, Oates, 2006). The following subsections offer a brief introduction to these philosophical concepts and a discussion of their present relevance.

3.2.1 Positivists Research

Positivism is the oldest research philosophy and is dominant in many disciplines. Positivist researchers view the world as a structured and systematic one which can therefore be investigated objectively. Such investigation is done in a deterministic manner using natural science methods to identify and measure quantifiable units called variables, dependent or independent, and/or sets of fixed relationships among these variables that constitute the desired phenomenon (Allen S. Lee, 1994, Myers, 1997b). Critics argue that when researching IS phenomena, positivists have neglected the importance of their context and their dynamic nature. If they have considered context at all, they have generally perceived it as a static variable which can be controlled and objectively identified (Cohen et al., 2007). The advantage of this view of IS phenomena is that it gives positivists the ability to generalize their findings from sample to population or from micro to macro settings (Pettigrew, 1985b, Walsham, 1995a, Dobson, 1999, Saunders et al., 2003, Allen S. Lee, 2004, Oates, 2006, Cohen et al., 2007). Thus, generalization is a main point of contention between the advocators of positivism and those who follow the interpretive philosophy, discussed in the next subsection.

Many academics have advocated the use of positivist research when investigating physical, natural or scientific aspects of the world, such as physical, mathematical and chemical phenomena. In such cases, all the variables can be identified and controlled in a certain setting, regardless of the social environment. Thus, positivists often assume that the existence of the physical or even the social world is independent of human actions and that researchers therefore have the ability to discover facts in the world objectively, using a set of objective measurements and models, applying statistical measurements and/or sets of variables to prove or refute hypotheses which have been developed in order to generalize their findings from sample to the whole population (Pettigrew, 1985c, Orlikowski and Baroudi, 1991, Dobson, 1999, Saunders et al., 2003, Oates, 2006). Thus, for each phenomenon in the world, there is only one explanation of reality, regardless of time, space or even people (Oates, 2006).

3.2.2 Interpretive Research

The interpretive approach to research is mainly derived from the social sciences and based on the belief that reality is socially constructed and that it can be understood by data interpretation (Fortune and Peters, 2005). According to, Sahay:

> *Interpretive research approaches emphasize the study of the subjective meanings that human actors ascribe to IT, and the social processes whereby inter-subjectivity is achieved. A basic assumption in interpretive research is one of non-determinism* ***(Sahay, 1997; p: 232)***

Interpretivism is currently gaining ground in relation to the dominant positivist tradition, particularly in the field of IS, where it is now "a well-established part of the field" (Walsham, 2006). It contrasts strongly with positivism in its ontological and epistemological stances (Orlikowski and Baroudi, 1991, Oates, 2006, Bryman, 2008). Thus, in IS studies, the interpretive researcher aims to understand the social context and social processes which influence and are influenced by IS phenomena (Walsham, 1993). The nature of interpretive research according to Walsham can be summarized as follows:

> *Interpretive methods of research start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors ....Thus, there is no objective reality which can be discovered by researchers and replicated by others. ... . Our theories concerning reality are ways of making sense of the world and shared meanings are a form of intersubjectivity rather than objectivity. Interpretivism is thus an epistemological position, concerned with approaches to the understanding of reality and asserting that all such knowledge is necessarily a social construction and thus subjective* ***(Walsham, 1993; p: 5-6)***

Thus, these social processes are constructed and reconstructed by people's actions and behaviours based on their social settings, which IS plays an important role in shaping and reshaping (Orlikowski and Baroudi, 1991, Walsham, 1993, Myers, 1997a, Saunders et al., 2003, Oates, 2006). In other words, interpretive researchers assume reality is socially constructed and that multiple realities therefore exist (Walsham, 1993, Walsham, 1995b, Myers, 1997b). Hence, according to the epistemological view of interpretive research, understanding any IS phenomenon should be based on the

different meanings that people assign to it (Orlikowski and Baroudi, 1991, Walsham, 2006).

In short, during any interpretive study, researchers do not seek to discover an objective and unique reality or truth but, instead, to understand the phenomenon in its social setting. In the work considered here, IS phenomena influence and are influenced by context through the different meanings that participants assign to them (Orlikowski and Baroudi, 1991, Walsham, 1993, Walsham, 2006). For instance, the work of Pettigrew (1987) has emphasized the importance of IS context and its associated processes in analyzing the organisational change associated with technology adoption.

Finally, this issue is discussed by Myers (1997a) and by Wynekoop and Russo (1997), who offer a review of different IS research methods which may be used to investigate system development, use and evaluation. During that work, they define interpretive research as:

> *An attempt to understand a phenomenon, by studying it in its natural context from participants' perspectives [without] controls, a priori theories or attempts to generalize* ***(Wynekoop and Russo, 1997; p: 51)***

3.2.3 Critical Research

The third philosophical tradition to be considered here is critical research, which was the last to emerge and which therefore suffered what interpretive research had suffered approximately twenty years earlier (Oates, 2006): to date, the debate in IS research has tended to neglect critical research, which is not seen as a main player in this field. Critical research has its own definition and assumptions which make it distinct from positivism and interpretive research. According to Oates (2006), critical research can be defined simply as:

> *A research tradition in IS and computing which is concerned with identifying power relations, conflicts and contradictions, and empowering people to eliminate them as source of alienation and domination* ***(Oates, 2006; p: 296)***

Therefore, its important distinction from the other two traditions is in its ability to evaluate critically and transform the social world and the reality that is under study

(Orlikowski and Baroudi, 1991, Klein and Myers, 1999, Oates, 2006). Generally, critical research focuses on understanding social reality, which it sees as historically constructed, and the role of people in creating and recreating this reality, taking into account the roles of power, politics, conflicts and contradictions in constructing oppressive social relations (Myers, 1997b). Therefore, critical researchers aim not only to observe the objects of their research but to interact with them, a major difference from both interpretive and positivist research (Stahl, 2008). Indeed, they believe that their research can help in eliminating and overcoming domination and alienation (Orlikowski and Baroudi, 1991, Oates, 2006). In other words, emancipation is an important aim of critical research.

3.2.4 Three Philosophical Paradigms Compared

Deciding which research paradigm should be employed and adopted for investigation purposes is a controversial issue. Although some authors have advocated the combination of these paradigms, others have emphasized essential differences between them in terms of their original assumptions and fundamentals, which finally lead to incompatibility. Thus, it is barely possible to combine them in investigating certain IS phenomena and this is called 'incommensurability' (Saunders et al., 2003, Oates, 2006). Table 3-1 compares positivism, interpretivism and critical research in terms of their ontological and epistemological stances.

Table 3-1: Comparison of research philosophies

	Ontology (Beliefs about reality)	**Epistemology (Beliefs about knowledge)**
Positivism	World is structured and well organized.	Knowledge exists and can be discovered objectively and in a deterministic manner.
Interpretive research	World is changeable by human actions and messy relationships exist.	Knowledge is a social construction; therefore, it should be measured subjectively.
Critical research	World is historically constructed and shaped by human actions.	Knowledge is constructed and reconstructed by humans taking into account patterns that shape such constructions (power, politics etc).

It is evident that positivism is the dominant research tradition in many disciplines and particularly in IS research (Orlikowski and Baroudi, 1991, Cavaye, 1996). This supremacy is due to its maturity and rationality, as it is the oldest of the three schools by hundreds of years. According to Oates (Oates, 2006), positivist research emerged approximately 400 years ago and has therefore had ample time for development and enhancement. Bryman (Bryman, 2008) also recognises the dominance of positivism over interpretivism, defining the latter as an alternative to the former. However, this dominance in all disciplines and in IS research in particular does not mean that positivism is necessarily the right tradition to follow when researching a particular phenomenon. While interpretive research is certainly junior to positivism in years, it has grown and developed dramatically (Walsham, 1995a, Klein and Myers, 1999, Walsham, 2006), in response to certain limitations and weaknesses associated with positivism, especially when investigating the social world. This contention is supported by the increase in numbers of publications reporting interpretive IS research, reflecting the rapid growth in its popularity (Walsham, 1995a, Walsham, 2006). According to Walsham:

> *Interpretive research has clearly become much more important in the IS field than it was in the early 1990s when Orlikowski and Baroudi (1991) noted that it represented a very small proportion of the published IS literature in mainstream US-based publications* ***(Walsham, 2006; p: 320)***

Mingers (2003) reviewed publications from the period of 1993 to 2000, reporting that 17% of the total publications in six European-based and USA-based journals had adopted interpretive philosophy in their research. This is to be seen in the context of work by Walsham (1995a) in this regard, reflecting the strong dominance of positivism in IS research, based on an overwhelming volume of positivist studies then being published, particularly in IS research. This predominance appears to have been taken as a non-negotiable fact by many researchers, including interpretive researchers, such as Orlikowski and Baroudi (1991), Walsham (1993), Klein and Myers (1999) and Skok and Legge (2002). However, they have made strong efforts to originate a solid base for interpretive research as an emerging research tradition in IS, such as in the work of Klein & Myers (1999). Although publications continue to be dominated by positivism, an incremental growth in numbers of interpretive studies has been observed year after year and it is now more acceptable than it was before (Mingers, 2003).

3.2.5 The Choice of Interpretive Qualitative Research

According to Harvey and Myers (1995):

> *In more traditional positivist techniques, context is treated as either a set of interfering variables that need controlling, known as noise in the data, or other controlled variables which are experimentally set up in order to seek for cause and effect relationships. The context of a situation is seen as something that can be factored out of the analysis or operationalised as a variable. In interpretive approaches, however, context is treated as the socially constructed reality of a named group, or groups, of social agents and the key task of observation and analysis is to unpack the webs of meaning transformed in the social process whereby reality is constructed* ***(Harvey and Myers, 1995; p:17)***

An intensive review of IS success literature reveals that most of the studies in that domain are concerned with what constitutes success, with identifying the factors that should be considered during the implementation process and which will lead to success. All of these studies have taken a simplistic and deterministic (technical/hard) view of ERP implementation, without paying attention to its social dimension. The present research aims to unpack that black box in order to explore the social aspects of ES implementation for the purpose of understanding different internal stakeholders' perceptions of the success of the implementation process.

Thus, indentifying the proper research philosophy and methodology is another benefit of the literature review. This chapter has already noted the dominance of positivism in IS research. Nevertheless, in researching IS success, although such studies are really beneficial and appreciated, I have not personally found them to provide an accurate reflection of reality, due to their simplistic and deterministic perspective. They fail in my view to reflect reality because most of them have dealt with IS success, for instance, in a way that neglects, to a large extent, the social nature of the IS implementation process and focuses instead on hard issues such as technical factors. For instance, the majority of these studies have adopted a variance theory approach to the investigation, such as the factoring approach, of which the D&M model and CSF research are obvious examples in the IS success literature. Markus and Robey (1988) and Newman and Robey (1992) have extensively examined that topic, particularly in regard to the nature of and differences between variance and process theories. Of these two different

approaches, the latter has been historically neglected in the domain of IS research, while the former is dominant in IS publications (Boudreau and Robey, 1999).

The purpose of researching a phenomenon such as IS implementation is not to produce a set of unrelated bullet points but instead to generate a deep understanding of that particular topic, taking into consideration the importance of its context and surrounding conditions. This is simply what the interpretive philosophy seeks. Therefore, researching perceptions of IS success from an interpretive perspective will add value to the present study by enabling the researcher to reveal otherwise hidden themes and their interactions with each other. In other words, it will allow a more reflexive type of research which thoroughly informs the subject matter under investigation and increases understanding of it.

Generally, it is believed that adopting the interpretive philosophy in researching IS success will facilitate the process of unpacking the black box of the IS phenomenon. This in turn will help in understanding what is really going on between the different parties whose beliefs and behaviour constitute this phenomenon. Hence, the researcher has decided to adopt the interpretive stance and the present study is based on its principles and canons. This is completely in harmony with the aim of this research project, which is to understand perceptions of IS success.

3.2.6 Criticisms of Interpretive Research

In general, researchers should not believe that any research philosophy or methodology is always ideal or optimal, because the main factor in making such choices is the nature of the research itself and the questions to be answered, not the prejudice of the researcher or his/her supervisor. Therefore, it is important to consider here a number of criticisms which have been made of the interpretive philosophy, most of which concern the quality of such research and the generalization of its results.

Interpretive researchers do not accept the use of positivist evaluation criteria such as generalisability to assess their research (Walsham, 1995a, Walsham, 2006), because the interpretive paradigm is specifically intended for use in social research and in this respect is unlike positivism. Therefore, research based on this philosophy should not be

judged according to criteria designed for another research philosophy, although some researchers have done so, an example being the work of Oates (Oates, 2006), which was in turn based on the work of Lincoln and Guba (Lincoln and Guba, 1985).

It is important to draw readers' attention to that fact that the interpretive research philosophy is a stand-alone paradigm that has not inherited any of its principles and canons from positivist research. Thus, it is fair to view the two paradigms independently instead of evaluating them similarly. According to Bryman (Bryman, 2008), *"Interpretivism is a term that usually denotes an alternative to the positivist orthodoxy that has held sway for decades"*. Consequently, in order to ensure the quality of interpretive research, Klein and Myers (1999) propose an evaluative framework of seven principles. Therefore, adopting all or even some of these principles in IS interpretive research should ensure its quality, since these are specifically interpretive evaluation criteria (Klein and Myers, 1999).

As noted above, interpretive research has been criticised for its lack of generalisability. However, in the interpretive tradition, it is evident that the term 'generalisation' carries a different meaning from the one it has in positivism, where it refers to generalising the research findings from the micro-context, the sample being investigated, to the macro-context, the whole population. In contrast, in interpretive research, it may be understood in terms of introducing new concepts (Zuboff, 1988), of generalisation to similar contexts, of theory development and/or evaluating existing theory. Therefore, such critiques have been answered, at least to the satisfaction of the interpretive research community.

3.3. Approaches to IS Research

An important element of the overall design of any research is the approach taken to the research process. The research approach can be considered to denote the overall strategy which is adopted to answer the research questions (Oates, 2006). It is evident that there is a clear cut distinction between the use of the terms 'approach' or 'strategy' and 'methods'. Cavaye (1996) explains this difference by defining research strategy as a way of going about one's research, embodying a particular style and employing different methods. Whiles research method is defined as a way to systemize the

observation, describing ways of collecting evidence and indicating the type of tools and techniques to be used during data collection (Cavaye, 1996).

In fact, the nature of the research, the research question(s), the topic and the underlying philosophy are all major determinants of the research approach. As already mentioned one benefit of reviewing previous studies is to understand alternatives among research approaches and then decide which of them is most appropriate. Some research approaches may be used in many different fields; in researching IS phenomena in particular, the set of commonly used approaches includes survey, ethnography and case study. The following subsections will outline and explain each of these.

3.3.1 Case Study

While there is no general and unique definition of case study, Yin (1984) describes it as:

> *...an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used* ***(Yin, 1984; p: 23)***

In regard to IS research, Darke et al. (1998) state that among qualitative research methods, case study is the most widely used in understanding the interactions between organisational context and IS adoption. Similarly, Newman and Noble (1990) highlight the adequacy and appropriateness of adopting a case study approach to understanding changes of context that occurred as a consequence of developing new IS. Dalcher and Drevin (2003) note the existence of some objections to the adoption of the case study strategy and recognise its limitations (some of which are discussed below in section 3.3.6 page 85). Nevertheless, they concluded that a case study can be adequate and indeed may be ideal, particularly when studying the interactions between people and their understanding of a situation in a particular context. Others have argued that the in-depth case study is an excellent vehicle to investigate the complexities of a phenomenon in its real-world context (Benbasat et al., 1987, Pettigrew, 1987, Pettigrew, 1990, Walsham, 1993, Darke et al., 1998, Mingers, 2003, Marshall and Rossman, 2006, Oates, 2006).

Given the nature of case study as a research strategy, it can be used in work which takes either a positivist or an interpretive stance, but it should adhere to and be governed by the appropriate philosophical assumptions and constraints (Cavaye, 1996). In a positivist case study, on one hand, the researcher aims to measure predefined variables using a predefined instrument, whereas an interpretive case study is based on understanding the phenomenon through the meanings that participants assign to it (Orlikowski and Baroudi, 1991, Walsham, 1995b, Cavaye, 1996). Thus, interpretive case study research aims to understand the phenomenon in its social setting and focuses on different cultural, political, organisational and social factors that influence it (Darke et al., 1998, Oates, 2006). Such in-depth penetration will give the researcher the ability to collect useful and rich data based on the different meanings that participants assign to the phenomenon under investigation.

Another of the benefits of adopting the case study approach is its competency to answer 'why' and 'how' questions, which in turn helps to understand the nature and complexity of a process or phenomenon within its context (Yin, 1984, Benbasat et al., 1987, Yin, 2003, Oates, 2006), which here is the perception of different stakeholders of ERP success. In other words, a case study gives the researcher the ability to penetrate profoundly the subject of study in order to unpack different patterns and concepts. Thus, a researcher who conducts an interpretive case study is more likely to obtain a rich and in-depth understanding of the phenomenon being investigated in its social setting.

3.3.2 Survey

Surveys are generally designed to investigate a phenomenon in breadth rather than in depth. The survey is a strategy commonly used in social research and in IS studies in particular (Oates, 2006), where it is considered to be the main positivist strategy, allowing researchers to generalise their findings statistically from a sample to the whole population (Pettigrew, 1985b, Pettigrew, 1985c, Mingers, 2003).

Although the survey strategy seems useful and informative, it has a set of drawbacks which reduce its usefulness for investigating IS phenomena and their contexts (Saunders et al., 2003, Oates, 2006). Firstly, it does not provide researchers with the required richness and depth of understanding. Secondly, it is usually used to examine variables in

terms of quantifiable measures and then analyze them statically in a form of quantitative analysis (Mingers, 2003, Bryman, 2008) to large extent, via set of clear readily proceduralised (Pettigrew, 1985c). Thirdly, it focuses on a certain period of time or snapshots, rather than on an ongoing process. The fourth weakness is that some types of survey, such as those conducted by internet, post and telephone, may provide inaccurate data. Finally, surveys do not provide evidence of cause and effect relationships, but only of associations (Oates, 2006). Accordingly, this has been considered a purely positivist approach to researching IS phenomena in particular (Mingers, 2003).

3.3.3 Ethnography

The ethnographic approach to research can be defined as seeking to describe a certain culture in its own terms and conditions (Mingers, 2003). It is a mainly qualitative approach that is used in studying social anthropology (Saunders et al., 2003, Xiu-Xian and Michael, 2004, Oates, 2006). Oates (2006) has defined it as *"a description of people and cultures"*. Therefore, researchers who use this strategy, usually called ethnographers, must penetrate and immerse themselves in the phenomenon and investigate it in its context as participants or observers but not as detached researchers. In other words, they must become part of the context in which the phenomenon occurs (Mingers, 2003, Oates, 2006). This requires the immersion of researchers themselves in the language, practices and values of organisation and its context (Mingers, 2003).

Although ethnography has advantages, it also has some drawbacks. It is a time-consuming strategy, because of the need to interpret the data as participant, not as researcher. In other words, the interpretation must be through the eyes of the people involved as participants, not as researchers (Cavaye, 1996, Mingers, 2003). Therefore, it is necessary to observe the phenomenon in its context for a long period of time (Klein and Myers, 1999, Yin, 2003). Moreover, researchers must also be able to manage and control large amounts of data in order to analyze them (Saunders et al., 2003, Oates, 2006). A final important limitation of ethnography is the inability to generalize its findings, even to similar cases, due to the requirement of immersion and involvement in a precise and particular context (Oates, 2006).

3.3.4 Rationale for Conducting an Interpretive Case Study

The interpretive case study has been selected as the main research strategy in the present study. This decision is not arbitrary but emerges as a result of reviewing the relevant literature and comparing this approach with a number of plausible alternatives, taking into account the nature of this study, the research questions and the philosophical tradition adopted. Table 3-2 below provides a broad comparison of the three main research approaches considered here, based on a set of important criteria (Benbasat et al., 1987, Pettigrew, 1987, Walsham, 1993, Walsham, 1995b, Cavaye, 1996, Saunders et al., 2003, Oates, 2006).

Table 3-2: Survey, ethnography and case study compared

	Survey	Ethnography	Case study
Rich understanding	**No**	**Yes**	**Yes**
Prior knowledge required	**Yes**	**No**	**Sometimes**
Intensive/Extensive	Extensive	Intensive	Intensive/Extensive
Interpretation from researcher's perspective	No interpretation but data quantitatively and systematically analyzed	From participant's point of view	**Yes**
Scientific meaning of generalization (micro-macro)	**Yes**	No similar setting exists due to long-term, in-depth involvement within phenomenon as participant or observer	Interpretive meanings of generalization may be: • Introduce new concept (Zuboff, 1988) • Develop theory (Orlikowski & Robey, 1991) • Evaluate theory • To similar cases
Contributes to knowledge	**Yes**	**Yes**	**Yes**
Main research methods	Questionnaires Observations Interviews Documents	Observation Interviews	Interviews Documents
Data analysis	Quantitative	Qualitative	Qualitative

According to Walsham (1993), the interpretive in-depth case study is the appropriate approach to conducting empirical research in the IS field, where it is the most commonly used methodology (Orlikowski and Baroudi, 1991, Myers, 1997b). Furthermore, Benbasat et al. (1987) have argued that the case study is a particularly useful strategy when:

- No sufficiently informative studies already exist,
- There is a need to understand a phenomenon in its natural setting without any intended control,
- The researcher aims to understand the nature and complexity of processes surrounding the phenomenon of interest.

Another major advantage of case study is the ability of researchers to capture a range of real-life events and characteristics, including different conditions and circumstances, as the approach provides them with broad and deep view inside the phenomenon under investigation (Eisenhardt, 1989). Therefore, when it is adopted properly, it has the benefit of allowing researchers to produce sufficient related data for later interpretation, leading to deep insight into the subject matter (Miles and Huberman, 1994, Andrade, 2007). More particularly in the field of IS, Orlikowski and Baroudi (1991) declare that field studies are appropriate to generate a well-founded interpretive comprehension of human/technology interaction in the natural social setting.

In this research, the main aim is to understand different participants' perceptions of the success of ERP implementation over a period of time. Therefore, hidden patterns and concepts which are unpredictable in advance or might be overlooked by other researchers may emerge. Accordingly, the proper approach to answering the research questions is an interpretive case study, which was duly adopted here.

3.3.5 The Nature of Interpretive Case Study

As mentioned above, the interpretive case study has been criticized by some authors for an absence of systematic procedures and guidelines to ensure research quality (Klein and Myers, 1999). Nevertheless, interpretive research is widely accepted in the IS field due to its characteristics and is considered suitable for investigating and understanding

IS phenomena in their social setting (Klein and Myers, 1999, Oates, 2006), despite having evolved recently when compared with positivism (Walsham, 1995b, Walsham, 1995a). Indeed, such criticism can be considered a healthy phenomenon because it will lead to the development of the research philosophy. Therefore, such criticisms could be considered as a call for development to which interpretive researchers should respond in order to enhance their methods. In fact, IS interpretive research needs more time to build a solid theoretical basis and so to enhance the trustworthiness of the tradition as it matures.

Table 3-3: Interpretive research quality criteria (Klein and Myers, 1999)

	Principles	Description
1	The hermeneutic circle	Suggests that all human understanding is achieved by alternating between considering the independent meaning of the parts and the whole that they form.
2	Contextualisim	Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.
3	Interaction between researchers and subjects	Requires critical reflection on how the research materials or data were socially constructed through the interaction between researchers and participants.
4	Abstraction and generalization	Requires relating to the idiographic details revealed by the data interpretation through the application of principles 1 and 2 to theoretical, general concepts that describe the nature of human understanding and social action.
5	Dialogical reasoning	This principle requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ('the story which the data tells') with subsequent cycles of revision
6	Multiple interpretations	Requires sensitivity to possible differences in interpretation among participants, typically expressed as multiple stories or accounts of the same sequence of events under study.
7	Suspicion	Requires sensitivity to possible 'biases' and systematic 'distortions' in the narratives collected from participants.

In regard to evaluating the quality of an IS interpretive field study, as noted above, using positivist criteria to ensure such quality is not appropriate (Klein and Myers, 1999, Oates, 2006). Therefore, Klein and Myers (1999) have developed a set of principles to

ensure the quality of IS interpretive case study from a hermeneutics perspective. Thus, the present research adopts these principles in an attempt to increase the quality of this project. Such adoption in fact is going to exclude the suspicion principle as this research is conducted from interpretive not critical perspective (Klein and Myers, 1999, Light, 2003). Table 3-3 above illustrates these principles with some details as they have been highlighted by their proponents (Klein and Myers, 1999).

3.3.6 Case Study Critiques

Interpretive researchers mainly seek to understand the context and process of a particular phenomenon through the meaning that people assign to it (Orlikowski and Baroudi, 1991), rather than trying to generalize their research findings in the way that positivists do. Generalization in interpretive studies has a different nature and meaning from that under positivism. From a positivist perspective, it means generalizing research findings in terms of statistics and/or a set of predefined variables, either dependent or independent, from micro-level to macro-level or, in other words, from the sample to the whole population (Pettigrew, 1985b, Pettigrew, 1985c, Orlikowski and Baroudi, 1991, Walsham, 1993, Walsham, 1995b).

In contrast, generalization from an interpretive case study perspective aims to generalize to theoretical propositions (Cavaye, 1996, Yin, 2003). However, in interpretive research, researchers aim to generalize their research findings in terms of developing new theory from the collected data, such as in the work of Orlikowski & Robey (1991); developing new concepts in IS, such as the concept of 'automate' in the work of Zuboff (1988); evaluating theories, such as the work of Markus (1983); or seeking in-depth understanding of a phenomenon in its context to inform similar settings (Pettigrew, 1987, Orlikowski and Baroudi, 1991, Walsham, 1993, Yin, 2003).

The case study strategy has also been criticised for a lack of rigour (Darke et al., 1998), due to the absence of well established and defined procedures to reduce the researcher's bias and increase rigour (Yin, 2003). In fact, this is clear when adopting a case study strategy, especially when compared with survey or experiment. For instance, the survey strategy provides researchers with systematic methodologies and procedures which

reduce or even eliminate the bias that may influence the researcher's findings and conclusions (Yin, 2003). In any research, avoiding such bias is an important condition to ensure the credibility and quality of research and researcher. In practice, research bias is not always detected with the case study strategy as easily as it may be with an experiment or survey, especially during the design of questionnaires in the latter case (Yin, 1984, Yin, 2003).

The obvious problem with case study research is the shortage of published texts which would improve it and treat its limitations. This is notable when comparing case study materials and resources with survey or experiments. Yin (2003) warns that this lack of available texts on case studies, which would help to control and govern the approach for the purpose of yielding trustable and credible research findings and conclusions, may lead to difficulties in conducting a good case study.

Finally, although critiques of interpretive case study have been made from many different perspectives, this does not mean that case study is bad or a low quality approach. On the contrary, it is an excellent approach to take in conducting certain sorts of research. Although case study has limitations and weaknesses, it has strengths as well. As mentioned earlier, the research questions are the main drivers to determine which approach the researcher should adopt, along with the nature of the research and the type of control over different events included in the study (Yin, 1984, Yin, 2003).

3.4. Methods of Data Collection and Analysis

3.4.1 Grounded Theory Method

GTM is one of the most widely used approaches for conducting qualitative research (Strauss and Glaser, 1967, Strauss and Corbin, 1997, Strauss and Corbin, 1998, Oates, 2006, Corbin and Strauss, 2008). It was developed by two sociologists, Straus and Glaser (Strauss and Glaser, 1967), based on the analytical induction principles proposed by Znaniecki (1934) as a means of formalizing the operation, and later elaborated by others (Hughes and Howcroft, 2000, Ratcliff, 2006). Once it was well established, it became commonly used in the social sciences (Oates, 2006). Indeed, its use has extended beyond sociology research to encompass other disciplines. This can be

considered a positive sign of its attraction to different researchers, a point stressed explicitly by Hair et al (2007):

> *Although grounded theory has been developed and principally used within the field of sociology, it also has been used successfully by researchers in a variety of different disciplines, including business, education, medicine, political science and psychology* ***(Hair at al., 2007; p: 289)***

The main objective of the approach is to generate theory from grounded data, whether the data are collected from literature or empirically (Strauss and Glaser, 1967, Dobson, 1999, Oates, 2006). Strauss and Glaser (1967) classify theories into two main types, either deduced from logical assumptions or created inductively from collected data. The grounded theory method is a qualitative research approach which focuses on generating theories from grounded data without any preconceived knowledge (Strauss and Glaser, 1967). As Dobson (1999) states in this regard, *"Grounded theory aims to avoid contaminating theory - the primary aim is to construct theory which is 'grounded' in the collected field data"*. Thus, using this approach will eliminate the role and effect of existing theory(s) in directing the research process (Dobson, 1999).

This was held to be true at the initial stages of grounded theory development, when its originators claimed to avoid any sort of prior knowledge when conducting grounded theory research: *"Initial decisions are not based on a preconceived theoretical framework"* (Strauss and Glaser, 1967). Therefore, a researcher who adopts this approach should start his/her investigation from scratch without any preconceived knowledge, which then allows new theory to emerge, grounded in the data. This is the main idea behind the approach (Strauss and Glaser, 1967, Dobson, 1999, Oates, 2006). Subsequently, grounded theory has been divided into two main versions (Hughes and Howcroft, 2000, Oates, 2006): while Glaser maintains the original assumptions of grounded theory (Glaser, 1992), Strauss has changed his own beliefs and suggested some modifications which affect the core of the approach (Strauss and Corbin, 1994, Strauss and Corbin, 1997, Strauss and Corbin, 1998).

3.4.2 GTM and Interpretive Research

According to LaRossa (2005), *"GTM encourages the study of how reality is socially constructed"*. This point supports the appropriateness of adopting GTM in interpretive research to obtain a better understanding of the phenomenon. Burck (Burck, 2005) has emphasized the usefulness of adopting GTM if the main research target is to explore subjective experience and meanings. Furthermore, within the IS field, GTM can be used in positivist studies but has become more widely used in interpretive research (Dobson, 1999, Oates, 2006). The works of Orlikowski (1993), Hughes & Wood-Harper (1999), Tingling & Parent (2004), Cadili & Whitley (2005) and Esteves & Pastor (2005b) are some examples of such research.

It is evident that qualitative researchers started to adopt this approach partially to benefit from its systematic procedures, at least compared with other qualitative approaches. Therefore, it has been used mainly as a method of data collection and analysis in qualitative research. According to Strauss & Corbin (1998), using grounded theory partially in this way is useful and valuable; however, it may not be the best approach (Saunders et al., 2003). Additionally, Backman & Kyngas (1999) stress its usefulness if it is adopted partially, especially to help novice researchers in data collection and analysis.

Although qualitative methods in general have been criticized as failing to provide researchers with enough information regarding how qualitative data will be analyzed (Saunders et al., 2003, Oates, 2006), GTM has countered such criticism as one of these qualitative methods. However, comparing GTM with other qualitative methods shows some variations, particularly in regard to the way it is used. Although it is time consuming and requires experience, it is at the same time a systematic and structured approach, at least compared with other qualitative methods (Strauss and Corbin, 1998, Saunders et al., 2003, Oates, 2006, Corbin and Strauss, 2008). Nevertheless, different procedures of GTM are not necessarily obligatory. In this regard, Strauss and Corbin have stated, *"Our version of qualitative analysis offers a cluster of very useful procedures-essentially guidelines, suggested techniques, but not commandments"* **(Strauss and Corbin, 1998; p: 4)**. This means that GTM provides researchers with

guidelines and procedures that illuminate and facilitate the process of data collation and analysis of qualitative research without any sort of obligation.

LaRossa supports this viewpoint, arguing that GTM methods are a valuable set of procedures for thinking theoretically about textual materials, but they can be difficult to decipher (LaRossa, 2005). Thus, the collection and analysis process are systematic and rigorous as well (Strauss and Glaser, 1967, Strauss and Corbin, 1998, Saunders et al., 2003, Calloway and Knapp, 2005, Dick, 2005). In this context, Calloway & Knapp contend that grounded theory provides the structure often lacking in other qualitative approaches without specifying flexibility or rigor (Calloway and Knapp, 2005).

Therefore, it is evident that GTM is often employed in interpretive studies (Oliver and Romm, 2008). In that regard, Orlikowski (1993) has determined three important characteristics which place GTM at the core of interpretive research, in regard to its ability to inductive, contextual and processual the investigated phenomena (Orlikowski, 1993). Thus, the partial adoption of GTM in this interpretive and qualitative research was anticipated to lead to some fruitful and useful findings. This is because of the competency of such a synthesis in revealing the implementation process and use of ERP systems, the social context surrounding these phenomena and finally how they are related to each other in order to achieve an informative understanding of how internal stakeholders perceive ERP success. This is a valid alternative to past research, which has concentrated on identifying sets of dependant or independent variables while simplifying or even neglecting the importance of social context (Markus and Robey, 1988, Orlikowski, 1993, Walsham, 1993, Sahay, 1997, Larsen and Myers, 1999).

3.4.3 Nature of GTM in this Research

The main aim of adopting GTM in this project is to help in guiding the process of data collection and analysis in a more systematic and rigorous manner, while providing more flexibility during the journey of discovery. In this regard, Charmaz (Charmaz, 2006) has emphasized some features and capabilities of GTM, particularly its flexibility, which gives researchers more focus than many qualitative methods do. Consequently, new concepts and patterns will emerge from the field without any prior intention, providing a

better understanding of the phenomenon in its real context, based on the meaning that people assign to the phenomenon, which is the main aim of interpretive research (Orlikowski and Baroudi, 1991, Walsham, 1993). This point is made in other words by Dobson (1999):

> *The intention of grounded theory is very much set within the interpretivism frame whereby the researcher is directed towards a faithful rendition and interpretation of the research situation from the participant's perspective without the potential contaminating influence of theory* ***(Dobson, 1999; p: 261-262)***

Thus, one of the drawbacks of using existing theoretical frameworks is in the contamination of data. The present researcher accepts this viewpoint because the existence of preconceived theoretical frameworks is likely to blind researchers to the richness of the data (Strauss and Glaser, 1967, Dobson, 1999).

The challenges and risks associated with GTM adoption were managed as follows. First, regarding the time required, a number of iterations took place in order to collect more data, to verify existing data and to conduct further investigation. This meant that the first iteration might have to be repeated more than once. Approval was sought and obtained from the case study organisation for this. Secondly, in regard to the required experience in GTM, it was considered possible to overcome this shortcoming to some extent by reviewing published grounded theory studies and understanding how GTM had been adopted within IS research, thus developing the present researcher's experience over time. Although this experience was based on reading the literature, it will have increased and developed his ability to use grounded theory and his understanding of its weaknesses and strengths. In the worst case, this action will at least have shed light on some important aspects, even if they are few.

3.4.4 Data Sources and Data Generation Techniques

For the reasons set out above, interpretive case study was chosen as the main approach to answering the research questions in the present study. However, it was clear that answering these questions would require an in-depth investigation process involving a very large volume of qualitative data from different sources. Therefore, the decision was

made to collect the required qualitative data by using more than one method. This is not unusual in qualitative research, where more than one source of evidence is often used within a single case study (Cavaye, 1996, Saunders et al., 2003, Yin, 2003, Punch, 2005, Oates, 2006, Cohen et al., 2007). In this research, interviews were conducted and documentation examined, as these techniques are commonly used in case study investigations (Saunders et al., 2003, Yin, 2003, Hair et al., 2007, Saunders et al., 2007). The advantage of employing such multiple methods is that it enables data triangulation to take place (Saunders et al., 2003, Yin, 2003, Oates, 2006, Saunders et al., 2007). The purpose of triangulation is to ensure the validity of data and it sometimes helps in bridging gaps during the data collection process (Pettigrew, 1985c, Cohen et al., 2007).

The interviews were conducted one-to-one and face-to-face; they were mostly semi-structured, but in some cases were supplemented by the partial adoption of the technique of asking unstructured questions, where the context of the interview made it necessary. This was done for the purpose of gaining a deeper understanding, particularly in the case of topics emerging from the data that had not been discussed during previous interviews. In such cases, these new topics were then considered more carefully in the main body of subsequent interviews and were explored via the semi-structured technique.

All interviews were electronically recorded and then transcribed unless interviewees denied their assent to recording. Additionally, the researcher took notes during the interview process to shed light on some important aspects which might need further investigation in the current or future interviews. In respect to confidentiality, information concerning the organisation, the interviewees, interview data and the documents examined was considered carefully and handled securely. No information will be published without written approval of the participant(s) concerned and of the case study organisation. To this end, a consent form was specifically designed for this research, to be read and signed by each participant and the researcher before the commencement of each interview. Data protection is an important and sensitive issue which must always be addressed carefully to protect the collected data from misuse by others. Particular attention was also paid to the issue of anonymity and pseudonyms are used to refer to interviewees and their departments.

3.5. Role of Qualitative Software

3.5.1 Qualitative Software

A general criticism of qualitative research concerned the absence of any use of software for data management and analysis processes, particularly when taking into account the nature, complexity and volume of the data produced. Therefore, efforts were made to develop software to facilitate qualitative studies and to increase the durability and reliability of their results. According to Bryman (2008):

> *One of the most significant developments in qualitative research in the last twenty years is the emergence of computer software that can assist in the use of qualitative data analysis* ***(Bryman, 2008; p: 565)***

The above quotation highlights the importance of the emergence of such computer software, which is considered one of the most important developments in qualitative research. The programs are usually called Computer-Aided Qualitative Data Analysis Software (CAQDAS). Nowadays, many such applications are available to be used for the purpose of facilitating qualitative data analysis in particular (Cohen et al., 2007, Saunders et al., 2007). Table 2-1 lists four CAQDAS applications that have been commonly cited in qualitative studies (Cohen et al., 2007, Creswell, 2009). Each of them was briefly evaluated and NVivo was selected for use in the present study. For a more functional comparison between these programs, see Lewins and Silver (2007).

Table 3-4: Four major CAQDAS applications

Software name	URL
NVivo	http://www.qsrinternational.com/
ATLAS.ti	http://www.atlasti.de/
MAXqda	http://www.maxda.com/
HyperRESEARCH	http://www.researchware.com/

Among the better known CAQDAS packages, NVivo has been characterized as having proved its usefulness in many respects when conducting qualitative research. It was chosen here because of its capabilities in managing and analysing the anticipated large

volume of qualitative data. The following subsections offer a brief introduction to this software, including the rationale for selecting it over the three major alternatives.

3.5.2 NVivo Software

Among the reliable qualitative research software packages currently available which have proved their efficiency and usefulness, NVivo is a widely used example. Originally, it was developed by the QSR company as an enhancement of its first qualitative software release, NUD*IST. Unlike SPSS in the case of quantitative research, NVivo is not considered to be the industry leader among qualitative research applications (Bryman, 2008).

The first reliable QSR software, NVivo 2.0, was released in 2002 and had enhanced features and additional functions over earlier releases (QSR.International.Co., 2006). A period of further development led to the release of NVivo version 7 in February 2006 (Richards, 2006), marking a revolution in qualitative software development. The present researcher considers NVivo 7 to be radically different from and much superior to version 2.0. QSR released its latest version approximately a year after NVivo 7. The new version is multimedia-oriented, which means that it incorporates more facilitates and functions that allow researchers to analyse not only textual data, as version 7 does, but data in many different media (QSR.International.Co., 2006).

3.5.2.1 Nature and Structure of NVivo

Essentially, CAQDAS is built according to the principles of Database Management Systems (DBMS) in regard to table creation, indexing and query building (Gibbs, 2002, Davies, 2007). However, although these features are important, they are not sufficient in themselves. Therefore, the developers of NVivo, for instance, took into consideration the importance of encompassing additional functions and features to make such software more useful, efficient and well integrated. Consequently, a word processing feature was added, as were reporting facilities. Thus, NVivo is a well integrated application that is sufficient to undertake qualitative research. However, it lacks some non-critical functions such as a spell checker. Figure 3-1 illustrates the NVivo software components conceptually and simply.

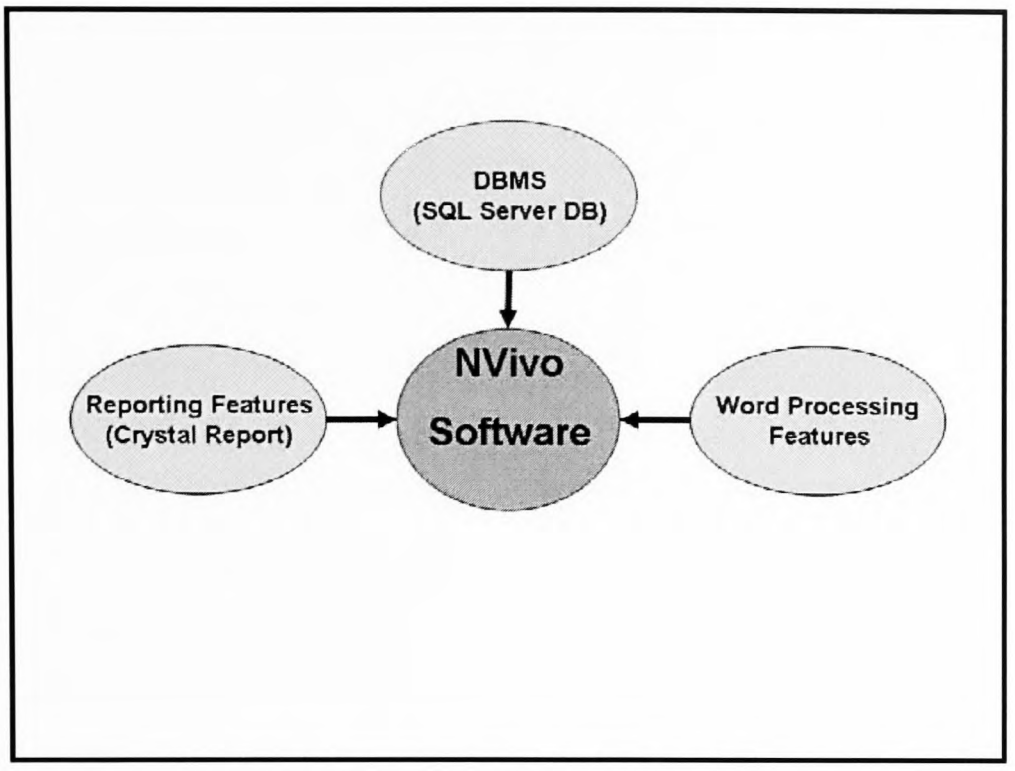


Figure 3-1: NVivo software components

Although CAQDAS applications are generally used for data management and analysis, they never do any sort of analysis on behalf of researchers (Cohen et al., 2007, Goulding, 2007). In other words, such applications help researchers to enhance the accuracy, reliability and transparency of their results by providing them with different tools to manage data and produce reports, but it is the responsibility of the researcher to interpret these results. The software, by its nature, does not take the researcher's role in interpreting the data or reports which are generated on line (Strauss and Corbin, 1998, Walsham, 2006, Bazeley, 2007, Goulding, 2007, Bryman, 2008, Corbin and Strauss, 2008). According to (2007):

> *Like all computer programs, NVivo is a tool that depends on the researcher having developed the skills to use it effectively. And it doesn't do your thinking for you* ***(Davies, 2007; p: 206)***

In the case of quantitative data analysis software such as SPSS, the software does play a part in the data analysis process, but even here, it is the researcher, not the software, who alone can interpret the data (Bryman, 2008). In other words, interpretation is a human task, not a software one.

3.5.2.2 Rationale behind NVivo Selection

NVivo 7.0 was chosen as the main tool for managing and analysing the qualitative data in this research, from among a number of qualitative software packages available in the market, for three main reasons. First, NVivo 7.0 is formally licensed to Salford students via Salford University ISD, therefore it was easy to obtain and free of charge to the researcher. Second, the required training courses and support were also freely provided by the university information and learning services ILS. The availability of such training and support is generally considered an important factor in adopting any sort of software, whatever the setting or purpose. Finally, although NVivo 8.0 had been released during this research, it was decided to use version 7.0 because all of the data had been collected in the form of text transcripts and there was therefore no need for any sort of multimedia capability. Although spoken interviews provided the bulk of the data, it was necessary to translate and then transcribe this material in a text format before starting the open coding and analysis processes. By the time that QSR released NVivo 8, the majority of the interviews had already been translated and transcribed, which means that the data was ready for textual analysis. Therefore, having downloaded and used a trial version of NVivo 8.0 to explore its capabilities, the researcher continued to use NVivo 7.0.

3.5.2.3 NVivo and GTM Harmonization

Observers who have some background in GTM principles will recognise similarities between these principles and NVivo software functions. This is due, to a large extent, to the congruity between NVivo components and GTM principles, as seen in Table 3-5 below. According to some authors, NVivo was designed with GTM principles and canons in mind (LaRossa, 2005, Seale, 2005). This argument is supported by Bryman (2008):

> *... these programs presume and are predicated on a certain style of analysis – one based on coding and retrieving text – that owes a great deal to grounded theory* ***(Bryman, 2008; p: 567)***

Thus, NVivo supports many GTM principles, which may help GTM researchers to benefit from features such as document and memo editing tools and colouring. The possibility of using memos within any segment of text also supports the use of GTM.

Other features which support harmonisation include the ability to link any document (internal or external) with its memo or memos and vice versa, case attributes, the creation of any sort of association, the ability to develop conceptual networks in different forms and shapes, the creation and auto-generation of diagrams and many other functions. However, the choice of which NVivo functions to use basically depends on the researcher's viewpoint, plans and skills. This means that there is no optimal way to use the software and each researcher must determine the best way to do so, depending on the situation, the requirements of privacy and the setting.

Table 3-5: Similarities between GTM principles and NVivo software functions

GT method	NVivo
Open coding	Free nodes
Axial coding	Tree nodes + others
Connections between tree nodes (associations)	Relationships
Memoing	Memo
Sources of data (interviews, focus group, documents etc)	Normal documents, external documents, sets and cases
Visualizing nodes with their associations to each other and network conceptualization	Modelling after building relationships

According to Goulding (Goulding, 2007), most traditional qualitative software has been designed to support researchers with coding and retrieving tools that are fit only for the purpose of structuring the data and nodes. However, NUD*IST (NVivo) has extended these services to encompass other flexible features that help researchers in theory building and development (Richards and Richards, 1991).

To sum up this point, Gibbs (2002) has highlighted that, the design of NVivo was strongly influenced by GT and therefore the software gives good support for the GTM (Gibbs, 2002). Thus, it is evident that the NVivo package was developed by taking into account GTM principles and that using this software in the present project is therefore justifiable and adds credibility to the study.

3.6. Research Quality

As this is a qualitative research project in the interpretive tradition, it was decided to assure its quality by adopting the principles model proposed by Klein and Myers (Klein and Myers, 1999) for conducting and evaluating interpretive IS field studies. It was believed that the use of GTM, discussed above, would fit tightly with these seven principles, due to the distinct feature of GTM in which data collection and analysis move together line by line, in an intertwining of data collection and analysis. Most qualitative methods usually start with data collection and not until that process is complete does the researcher begin the analysis. One of the main principles and canons of GTM, by contrast, is to conduct data analysis in-line with data collection for the sake of theoretical sampling and of deepening the investigation. This feature gives the researcher the ability to reflect what has been observed during data collection upon the analysis and vice versa. This, in practice, helps in considering all of the seven principles (set out in Table 3-3, section 3.3.5 above page 83) excluding the suspicion principle due to the suggestion of the proponents of these principles as the suspicion principle is only appropriate to research conducted from a critical perspective (Klein and Myers, 1999, Light, 2003).

3.7. Research Design

The main purpose of this section is to show how the different components of this research have been aligned with each other to form what is called the research design. Figure 3-2 below shows the conceptual research design, incorporating the different instruments that were used to answer the research questions. This design is intended to address some of the criticisms that have been made of interpretive qualitative research, particularly in three major areas. First, such research has been criticised for its lack of rigour and for not being undertaken systematically. The second objection is to the absence of any sort of proper software for analysing the data and the third concerns the lack of quality assurance when compared with positivist research.

The current research has adopted a synthesis of GTM and Pettigrew's ideas for the purpose of data analysis. As abovementioned in chapter 2, adopting Pettigrew's ideas of contextualisim will help in identifying the outer and inner context of change as well as

the content of change. Whiles, adopting the analytical paradigm of GTM in a form of actions, reactions, and interactions among context and content will help the change process to be revealed alongside the implementation and use of ERP project. One major objective of incorporating them is to add a theoretical context base for the explanation of organisational change process.

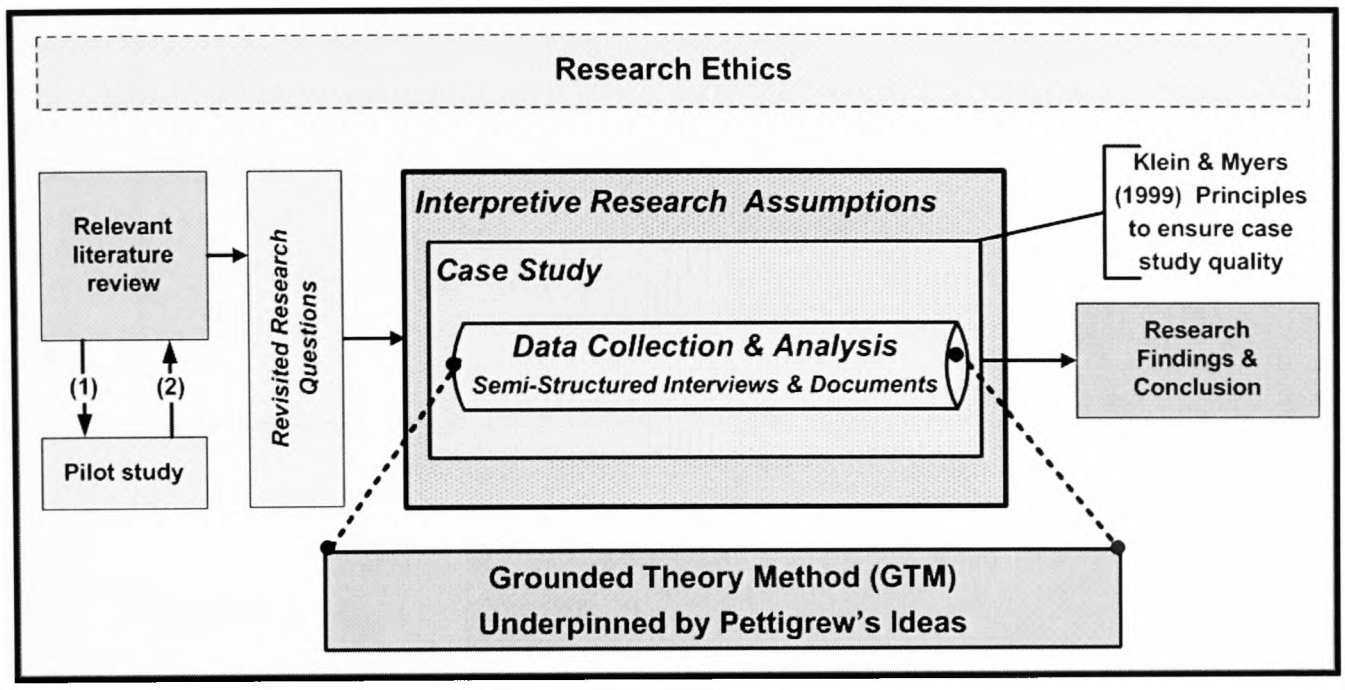


Figure 3-2: Conceptual research design

While the existence of these major weaknesses in interpretive qualitative research are still being actively debated, the research design adopted here goes some considerable way towards bridging these gaps, as seen in Figure 3-3. Thus, the choice of GTM to inform and guide the process of data collection and analysis bridges the first gap to a large extent, thanks to the systematic nature of this method. The second criticism, concerning the lack of analytical software, is addressed by the use of NVivo during the process of data management and analysis. Although such qualitative software does not 'think' on behalf of the researcher, due to the nature of the collected data, its adoption can be seen to facilitate the handling of the anticipated volume of qualitative data. Accordingly, data analysis was not as difficult as it would have been in the absence of such software. Finally, considering in advance the Klein and Myers principles will have helped to assure the quality of this research in particular. This means that the third gap has also been bridged.

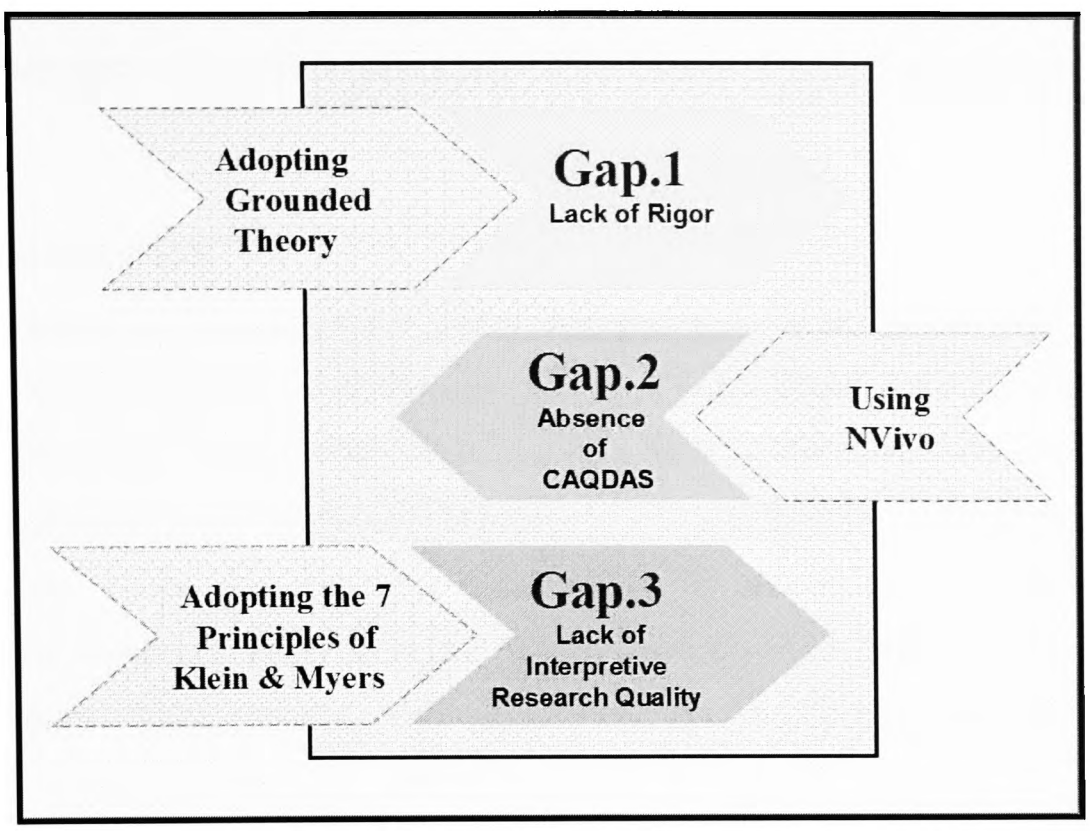


Figure 3-3: Gaps in interpretive qualitative research

3.8. Summary

In this chapter, some major philosophical and methodological issues have been carefully considered. A number of philosophical schools of thought, particularly those adopted in IS research, have been evaluated. The decision to base this study on interpretive principles was shown to derive from their competency and usefulness in informing the research. Following the evaluation of three commonly cited approaches to IS research, the adoption of the case study approach was justified as suiting the nature of this project and the research questions. Explanations were then given of the choices of research methods and techniques, beginning with the partial adoption of GTM to lead the process of data collection and analysis, followed by the selection of semi-structured interviews and review of the available documents as the main methods of data collection. The final element of research design covered in this chapter was the decision to use NVivo software to help in managing the anticipated volume of qualitative data and to facilitate its analysis. The next chapter begins the account of the application of this design in the empirical part of the research, by discussing the national context and the organisation chosen for the case study.

4 Context: Saudi Arabia and the Case Study Organisation

4.1. Introduction

As the previous two chapters were mainly dedicated to covering the theoretical aspects of the research, including a critical evaluation of existing related work, this chapter can be considered as a transit point where attention turns to the empirical aspects of the research. It covers six main themes. Because the study is concerned with perceptions of ERP success in a private company in Saudi Arabia, the chapter begins by justifying the choice of this context. It then provides general information on Saudi Arabia, including its importance and its economy, before considering the status of ICT in the country.

Against this background, the chapter then turns to an account of the pilot study that was undertaken prior to the actual fieldwork. Aspects considered include the benefits of conducting a pilot study, the companies studied, the site selection and evaluation process, and finally the preliminary site access negotiations. As a result of the pilot study, a single organisation, Hadeed, was selected for the main study; therefore its situation and IT history are further explained. The chapter ends with an explanation of the decision to focus on two of Hadeed's four SAP R/3 projects in the main case study.

4.2. Reasons for Choosing the Saudi Private Sector as Context

I decided from the beginning of this research to investigate perceptions of the success of ERP projects in the private sector in Saudi Arabia. The fact that I am of Saudi nationality is in itself not an adequate justification of this decision in the context of PhD research, so the fourfold rationale is set out in the subsections below.

4.2.1 Ethical Rationale

As I am a Saudi who was awarded a scholarship by the government of Saudi Arabia, setting the research in that country can be considered a mark of respect for my country and my sponsor, which is a government agency. In other words, I am thankful to and appreciative of my country and hope that this research will benefit it and its people.

4.2.2 Availability

This subsection justifies the choice of a private organisation over public or semi-public ones. This is because of the more widespread implementation and use of ERP systems in private rather than public organisations, not only in Saudi Arabia but in other countries, which means that a wider choice of potential cases is available for study in the private sector. Indeed, in Saudi Arabia in particular, the researcher is aware of only one instance of ERP system adoption or even intention to adopt in a government agency, and it is reported that this project failed during implementation and was suspended.

4.2.3 Personal Rationale

The rationale for the choice of context for this study of ERP implementation is also a directly personal one, as the researcher has worked for more than nine years in IT in Saudi Arabia. That experience and the nature of the work have both contributed to building a good network of contacts with other IT and business people around the country, making it relatively easy to stay up to date with events pertaining to ERP implementation in Saudi Arabia. In fact, this was a major factor in facilitating access to the organisations considered during the evaluation purpose. This justification is thus more closely related to the researcher's characteristics than any of the other reasons.

4.2.4 Cultural Rationale

Finally, as this research project adopts the interpretive case study strategy supported by GTM for data collection and using interviews as the main source of data, the researcher should at least be able to understand what participants say and how they feel and behave. This requires that researcher and participants share a language, culture, habits and norms, all of which tend to facilitate different aspects of preparation, data collection and finally the interpretation of these data. In other words, most of the participants in a Saudi context would be expected to speak Arabic, the language of the researcher. Additionally, from a cultural perspective, a Saudi researcher would find it easier to manage and negotiate site access, acquire participants' trust and interpret accurately their understanding of a range of issues if that research was set in Saudi Arabia.

4.3. The Kingdom of Saudi Arabia: an Introduction

4.3.1 Location and Size

The Kingdom of Saudi Arabia is one of the Arab countries that are located in the west of Asia. It is also categorized as a Middle Eastern country according to its geographical location. As is evident from Figure 4-1, it lies between the Arabian Gulf in the east and the Red Sea in the west and has land borders with seven countries: Iraq, Jordan and Kuwait to the north, Qatar and the United Arab Emirates to the east, Oman to the south-east and Yemen to the south.

Figure 4-1: Saudi Arabia map (Factbook, 2005)

Saudi Arabia is by far the largest country on the Arabian Peninsula (Factbook, 2005), with an area of about 2 million square kilometres (Saudi.Chambers, 2005, Wikipedia, 2007, BBC, 2008, Mazor, 2008). According to Mazor (Mazor, 2008), this makes it about a quarter of the size of the United States.

4.3.2 Administrative Structure

The country is divided administratively into 13 provinces, each with its own governor. One major benefit of this arrangement is to facilitate the provision of the required services at a good standard and within a reasonable time. Figure 4-2 illustrates the

locations of these territories. The national capital, Riyadh city, is located in the province of the same name in the eastern centre of the kingdom.

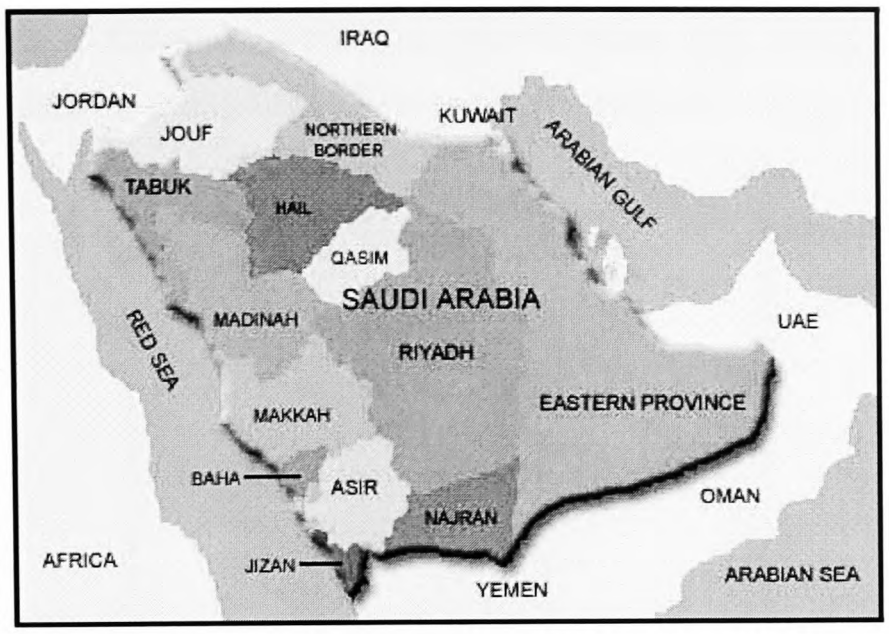


Figure 4-2: Saudi provinces (Saudi-US.Relations, 2008)

In the west of the country lie the two major holy cities of Makkah (Mecca) and Madinah (Medina), whose importance are discussed in the next subsection.

4.3.3 The Importance of Saudi Arabia

The Kingdom of Saudi Arabia has acquired global importance for two major reasons. On one hand, it plays a leading role among Islamic counties not because of its wealth or power but because of the two sacred mosques that are located in the holy cities of Mecca and Madinah respectively. This does not imply the ownership of these two cities by Saudis; instead they are considered to belong to all Muslims everywhere, whatever their language, colour, race, country or gender. For that reason, the King of Saudi Arabia has the formal title of "Custodian of the Two Holy Mosques".

The other reason for Saudi Arabia's international importance is that it is the largest producer and exporter of crude oil in the world, which means that it plays a major role in shaping the world economy. It produced more than 9 million barrels per day in 2008, representing more than 28 per cent of OPEC oil production (OPEC, 2008). It also possesses approximately a quarter of the world's reserves of crude oil (Wikipedia, 2007).

4.3.4 Demography

The population of Saudi Arabia was around 21.5 million, according to a formal census that took place in 2000 and 2001 (Saudi.Chambers, 2005, MoEP, 2006, BBC, 2008, Mazor, 2008). Saudi Chambers (2005) has reported that a little over a quarter of those living in the country are foreigners, as illustrated in Figure 4-3.

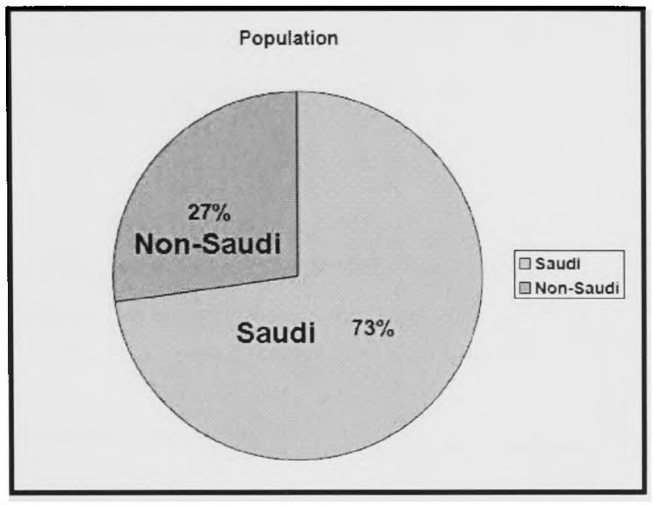


Figure 4-3: Saudi population by nationality (Saudi.Chambers, 2005)

The population is anticipated to grow by 3.3% annually, according to Mazor (2008). Therefore, it is expected to approach 33 million by 2020 (Saudi.Chambers, 2005, MoEP, 2006). Figure 4-4 below shows that growth graphically by comparing these predictions with the results of the 2000 census.

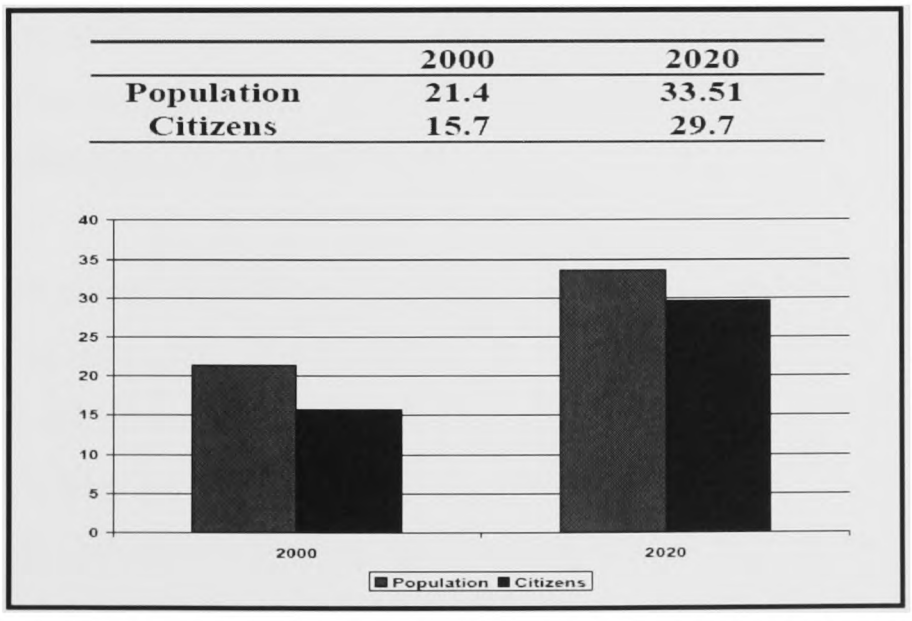


Figure 4-4: Saudi Arabia's anticipated population growth (MoEP, 2006)

4.3.5 Economy

The aforementioned crude oil reserves mean that Saudi Arabia is deemed to be a wealthy country. Nonetheless, the economy does not depend entirely on oil production and exporting; the non-oil sector has also contributed to economic growth. The Saudi Committee for Development of International Trade published a formal report in 2005 showing the importance of the non-oil private sector and its contribution to the Saudi Gross Domestic Product (GDP). Figure 4-5 below lists the recent past and future predicted contributions, with a comparison between oil, non-oil public and non-oil private sectors.

	% Contribution to GDP		
	1999	2004	2020
Oil sector	31	45.5	20.9
Non-oil Government sector	17.8	19.3	9.9
Non-oil Private sector	51.2	34.2	69.2

Figure 4-5: Saudi economic indicators (Saudi.Chambers, 2005)

The figures make it evident that the Saudi government intends to reduce its dependency upon oil and non-oil public sector activity, as indicated by the dramatic drop expected in the contributions of these two sectors to the national GDP in 2020, both of which are predicted to halve compared with 2004, while the non-oil private sector contribution is expected to double (Saudi.Chambers, 2005).

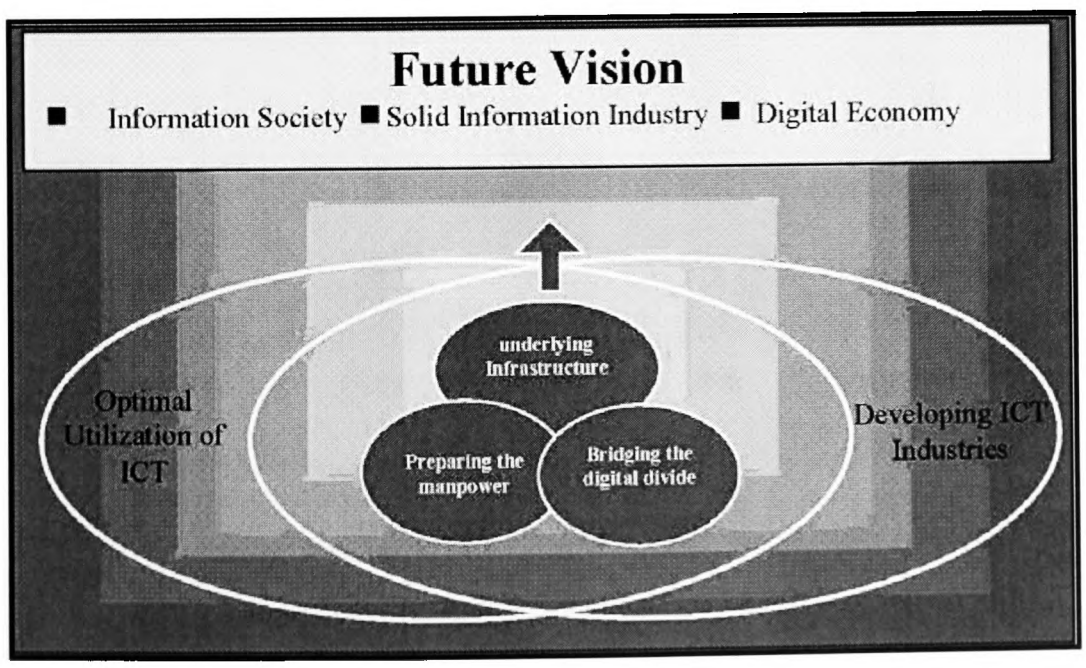
This reflects the current attitude of the government towards the non-oil private sector and its continual encouragement of growth in it as a major alternative to continued dependence on the oil sector. In 2007, the private sector in Saudi Arabia contributed 40% to GDP (Wikipedia, 2007), marking significant growth over the 2004 figure cited above. Hence, the private sector appears to have a bright future in the Kingdom of Saudi Arabia, which acceded to the World Trade Organisation in 2005 (Wikipedia, 2007).

4.4. ICT in Saudi Arabia: Status Quo and Ambitions

There has been an extraordinary revolution in Information and Communication Technologies (ICT) in the new century, particularly in developing countries, but the readiness of these countries for such a technological boom is in question. Saudi Arabia, which as noted above is considered to be a developing country, is itself witnessing rapid growth and development in a number of domains, one of which is that of ICT. A review of the available information, including some official sources, suggests that the country enjoys good preparation and readiness in this regard. In response to the challenge of the ICT revolution, the government of Saudi Arabia has formulated and begun to implement a National Communications and Information Technology Plan (NCITP), responsibility for which was given in 2004 to the Ministry of Communications and Information Technology (MCIT, 2009). According to the published plan, the long-term vision for the ICT in the Kingdom is:

> *the transformation into an information society and digital economy so as to increase productivity, to provide communications and IT services for all sectors of society in all parts of the country and to build a solid information industry that becomes a major source of income* ***(MCIT, 2008; p: 4)***

It is noticeable that this vision is based on two major constructs: achieving the best possible employment and utilization of ICT in different fields and building an ICT industry (MCIT, 2008). Figure 4-6 below illustrates the overall future vision and its major components.



(106)

Figure 4-6: NCITP future vision for Saudi Arabia; adapted from (MCIT, 2008)

In fact, the Eighth National Quinquennial Plan (2005-2009) of Saudi Arabia addressed a number of strategic fields, of which ICT was one, due to its strategic importance (MoEP, 2006, MCIT, 2008). Several statistical measures are generally considered as indicators of ICT development in any country, including the numbers of mobile phones, landlines, broadband subscriptions and internet users. A report published by the Central Department of Statistics & Information (2009) shows noticeable rising trends in all these indicators in Saudi Arabia between 2001 and 2009 (MCIT, 2009, MoEP, 2009). The following subsection discusses two of them: internet use and broadband subscriptions.

4.4.1 Saudi Internet Services

There has recently been a marked growth in the numbers of internet users and broadband service subscriptions in Saudi Arabia, according to the Central Department of Statistics & Information (MCIT, 2009, MoEP, 2009). Figure 4-7 and Figure 4-8 graphically show this development in some detail, covering the period from 2005 and 2001 respectively to the third quarter of 2009.

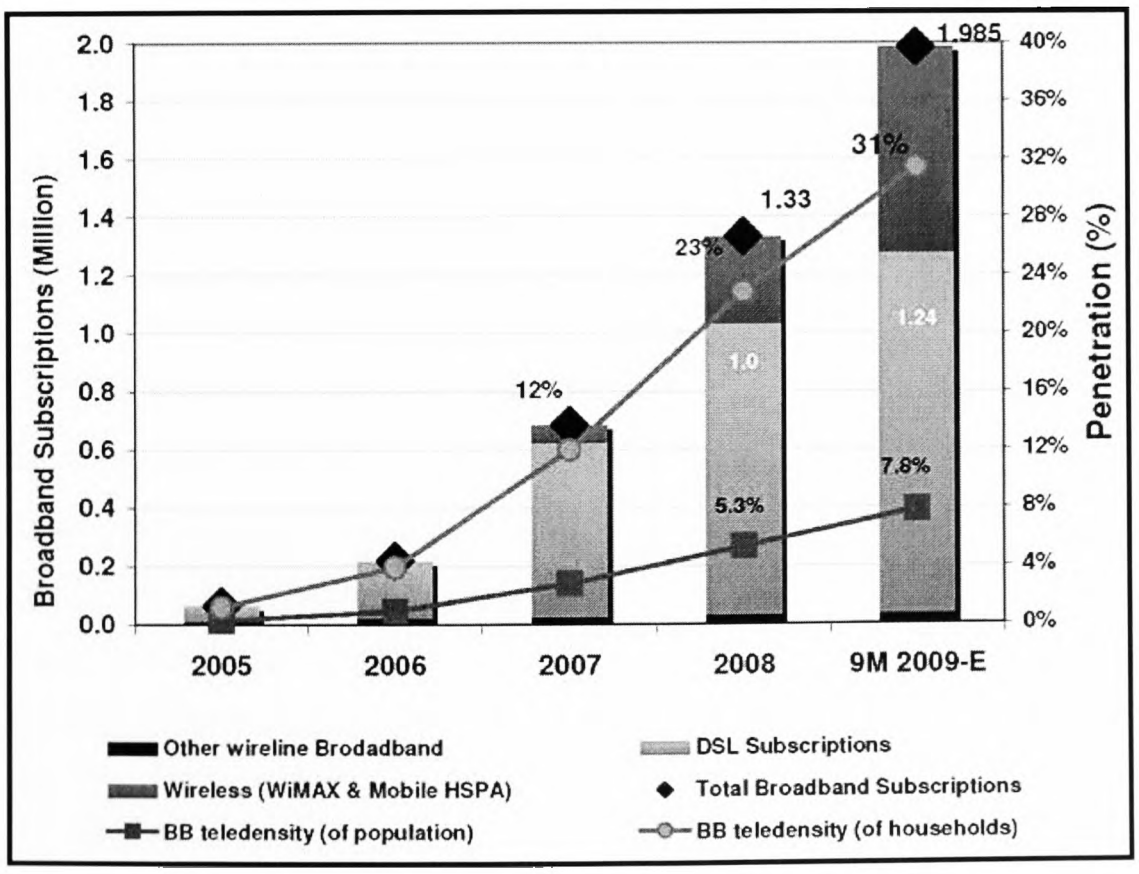


Figure 4-7: Broadband service in Saudi Arabia (2005 – ¾ 2009)

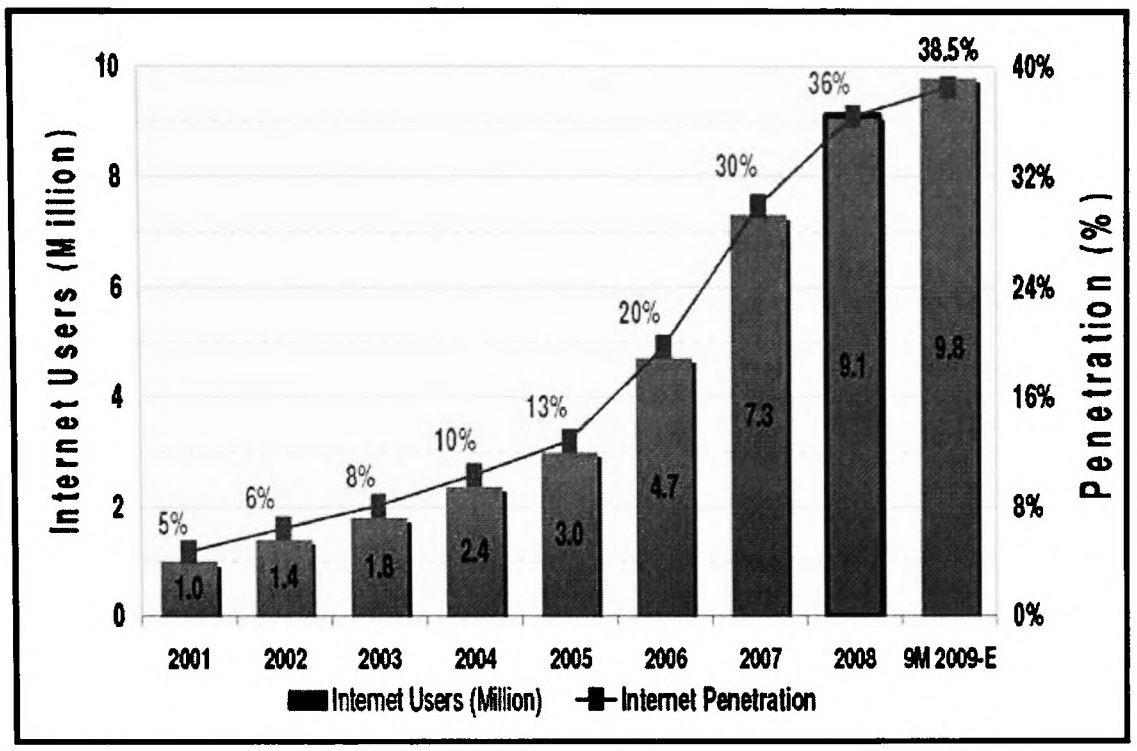


Figure 4-8: Internet users in Saudi Arabia (2001 – ¾ 2009)

The public broadband service was introduced 2005, access to the internet having previously been available only via a dial-up landline service. Figure 4-8 shows that the new service coincided with a marked increase in the rate of growth in internet users, as a natural consequence of the provision of a better service than the existing dial-up one, which suffered from poor quality and performance.

Having established the broad national context, including the country's ICT status, this chapter now turns to an account of the pilot study, before describing in some detail the background and history of the company chosen for the main case study.

4.5. Pilot Study and Selection of Case Study Organisation

The pilot study was an essential element in guiding the decisions of the researcher, significantly affecting the subsequent research process. At the outset, the researcher had no predetermined organisation in mind for the case study, but rather began with an overall conception of the research. Starting in this way with broad ideas is often the approach to qualitative research, where the topic is then narrowed down as the research proceeds.

The decision to undertake a pilot study prior to the actual fieldwork was thus for the purpose of exploring a number of potential candidate organisation to see whether their ERP experiences made them suitable as case studies. This preliminary field exploration was undertaken in the period between June and August 2006 and was beneficial in developing evaluation criteria and using them to identify the appropriate organisation. Once it had been selected, the pilot study was extended in two ways. First, it provided a good opportunity to discuss general site access and the requirements of the actual fieldwork. Secondly, it allowed the researcher to collect some detailed and valuable data relating to the selected company, particularly in regard to its ERP history.

4.5.1 The Candidate Companies

The process of selecting a company for the case study started when planning the pilot study. This initial process was mainly designed to identify the available candidate companies, evaluate them and finally select the most suitable. Upon arrival in Saudi Arabia, the researcher made contact with friends, colleagues and relatives for the purpose of drawing up a list of candidates. Four companies were identified, all of which accepted informally the research proposal and gave their initial approval. Table 4-1 lists these four organisations and their main commercial activities.

Table 4-1: The candidate companies

	Company Name	Description
1	Mobily	Telecommunications service provider
2	Eastern Electricity Company	Utility company
3	General Saudi Investment Authority	Semi-public authority
4	Hadeed	Steel manufacturer

4.5.2 Selection Process

The candidate organisations were evaluated by considering certain criteria that the selected company should satisfy. It should be a private Saudi organisation which had implemented a major modular ERP system and whose management was willing for it to participate in the research. This process and its result are summarised in Table 4-2 below.

Table 4-2: Candidate organisations and evaluation criteria

Activity	Telecommunications	Utility provider	Semi-public authority	Steel manufacturing
Name	*Mobily Co.*	*Eastern Electricity Co.*	*Saudi Investment Authority*	*Hadeed Co.*
Main Site Location	Riyadh – central area	Eastern territory	Riyadh – central area	Eastern Territory
CRITERIA				
Saudi organisation	**Semi [X]**	Yes	Yes	Yes
Private organisation	Yes	Yes	**Semi [X]**	Yes
Existing legacy system	Client-server	Mainframe	Client-server	SAP
Has an ERP system	Yes	Yes	Yes	Yes
ERP supplier	Oracle	SAP	SAP	SAP
ERP modules implemented	All needed for its business	All needed for its business	All needed for its business	All needed for its business
ERP project status	**Under implementation [X]**	**Under implementation [X]**	**Under implementation [X]**	Already implemented
Willing to participate	**Not sure [X]**	**Not sure [X]**	Yes	Yes

As Table 4-2 shows, it was evident that the steel company, Hadeed, best met the selection criteria. In particular, the management were particularly keen to participate in the proposed study. Moreover, Hadeed had already had more than one SAP R/3 experience, which was expected to add value to the research by providing abundant data on its main concern, perceptions of ERP success. Although the fact that Hadeed had implemented more than one SAP R/3 system was apparent prior to the final selection process, the details of this experience were not discovered until the researcher started to meet Hadeed people after deciding to select it for the case study.

4.5.3 Preliminary Site Access Negotiation

Once Hadeed had been chosen, it was necessary to negotiate with its management in order to obtain permission for the required access to its premises and staff. Therefore, during the pilot study, the researcher asked a friend who was a Hadeed employee to arrange a series of meetings with the management and some employees who had participated in the SAP projects that had taken place between 1992 and 2005. These meetings took place in three different locations in Al-Jubail Industrial City, where Hadeed has its main premises. Most were on the Hadeed site, while others were held in the premises of the Shared Services Organisation (SSO), recently created as a result of the conducting of a BPR project related to the SAP Fanar project, which is outlined below in section 4.6.1.5. SSO members were included because some former Hadeed employees had been transferred to that organisation after finishing the implementation of the SAP Fanar project.

During these meetings, particularly the first one, with the Hadeed management, the researcher provided answers to the following questions:

- Why was Hadeed selected over the alternatives?
- What would be the nature and duration of the research?
- What were the implications of the research for the company? In other words, what benefits would it bring to Hadeed?
- What sort of data did the researcher really want and why?

The pilot study ended with a short visit to different Hadeed facilities, including furnaces, the direct reduction plant and a rolling mill. This visit was beneficial because it allowed the researcher to conceptualize the nature of the business processes, the extent of Hadeed's operations, the size of its workforce and the length and complexity of its production processes. Indeed, acquiring some general information pertaining to steel industry processes helped later in analysing and interpreting the collected data.

4.5.4 Benefits of Conducting the Pilot Study

As the pilot study encompassed some informal contacts with some members of the Hadeed Company, the researcher was able to collect some data which helped a general understanding of the context, most importantly, those data which pertained directly to Hadeed's IT experiences, especially in regard to its SAP R/3 system. The following are some of the notable benefits of undertaking the pilot study:

- It provided the opportunity to build trust with some key persons at Hadeed and to meet the president of the company, who gave his preliminary approval;
- It contributed to the design and development of the general interview protocols used during the main fieldwork process;
- It helped in designing a provisional empirical work plan, subject to change according to unanticipated events; and
- It facilitated the detailed negotiations concerning access to Hadeed's premises, people and data sources which took place prior to the commencement of the main fieldwork.

4.6. Hadeed's Structural and Organisational Background

The organisation selected for the case study, Hadeed, is a Saudi iron and steel company. Its name is the Arabic word for iron, which the essential raw material in steel production. It was established in 1979 as a national producer of long steel (structural and bars) and later of flat steel products (SABIC, 2001, Hadeed, 2003, SABIC, 2005). Hadeed is the oldest and leading steel producer affiliated to the Saudi Basic Industries Corporation (SABIC) group of companies (Hadeed, 2004, Hadeed, 2005a, Hadeed, 2005b). It operates a single large complex in Al-Jubail Industrial City, approximately 580 kilometres from Riyadh in the east of Saudi Arabia. It has been described as the

first integrated iron and steel complex in the Gulf region (SABIC, 2001, Hadeed, 2003, SABIC, 2005).

Hadeed's parent company, SABIC, employs more than 16000 people worldwide (Hadeed, 2004, Atos.Origin.Co, 2007). All of its 17 affiliates specialize in petrochemicals, except Hadeed, which as a major manufacturer of dry products is unique among SABIC affiliates. Figure 4-9 depicts the overall structure of SABIC and its affiliates, each of which has its own structure, management, processes, strategies and IT infrastructures. In regard to IT, there was historically no group-wide integration, so affiliates could not exchange information electronically. The main process involving all of the affiliates and the parent company was the generation of SABIC's annual financial report, which took several months because of the need to consolidate incompatible data from the affiliates' separate financial reports.

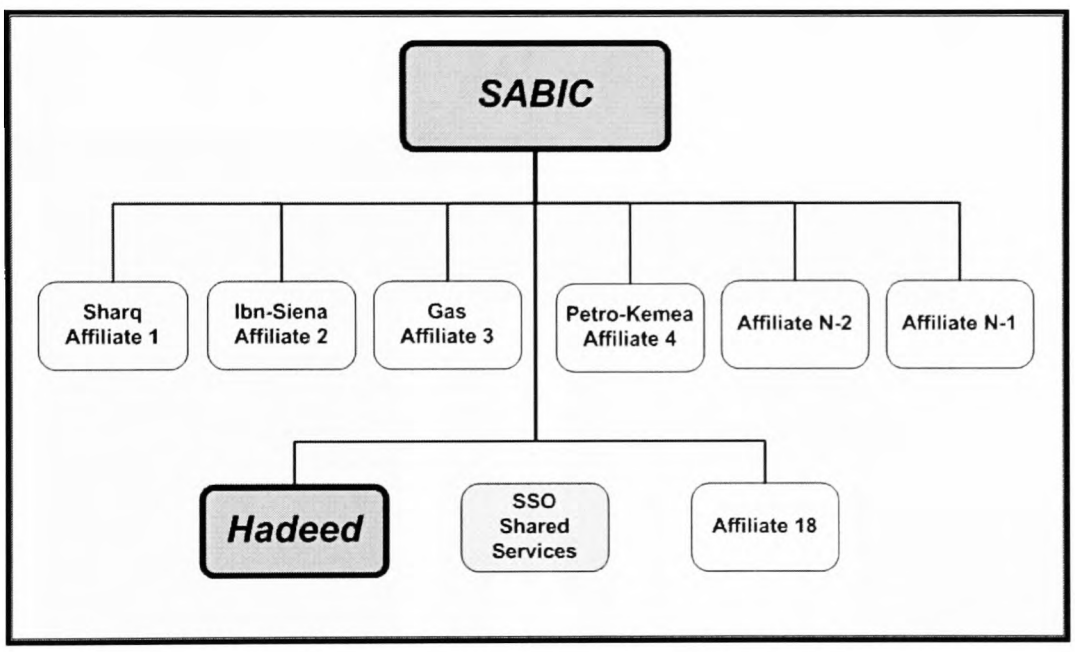


Figure 4-9: Organisational structure of SABIC

In 2001 SABIC therefore decided to consolidate all of its affiliates' IT applications and infrastructure under one well integrated system using a unified set of business processes, in a group-wide project called Fanar, which is discussed in detail in a subsequent section.

4.6.1 Hadeed's IT Background

Understanding Hadeed's IT history was not easy, due to the lack of available documentation, especially of historical data pertaining to past IT projects. The research entailed going back to 1983, when Hadeed implemented its first IT infrastructure and applications. The process of IT development, for the purpose of the present study, is then considered to have continued until data collection ended in June 2007. Between these dates, Hadeed undertook a number of simple and critical IT projects. The last one was the adoption of SAP R/3, when Hadeed joined the SABIC IT infrastructure and thus became directly linked to its parent company. A difficult process of data collection from different sources revealed the overall picture of that history as depicted in Figure 4-10. This section presents a general view of Hadeed's IT history, while the details are analysed in depth in chapter 6.

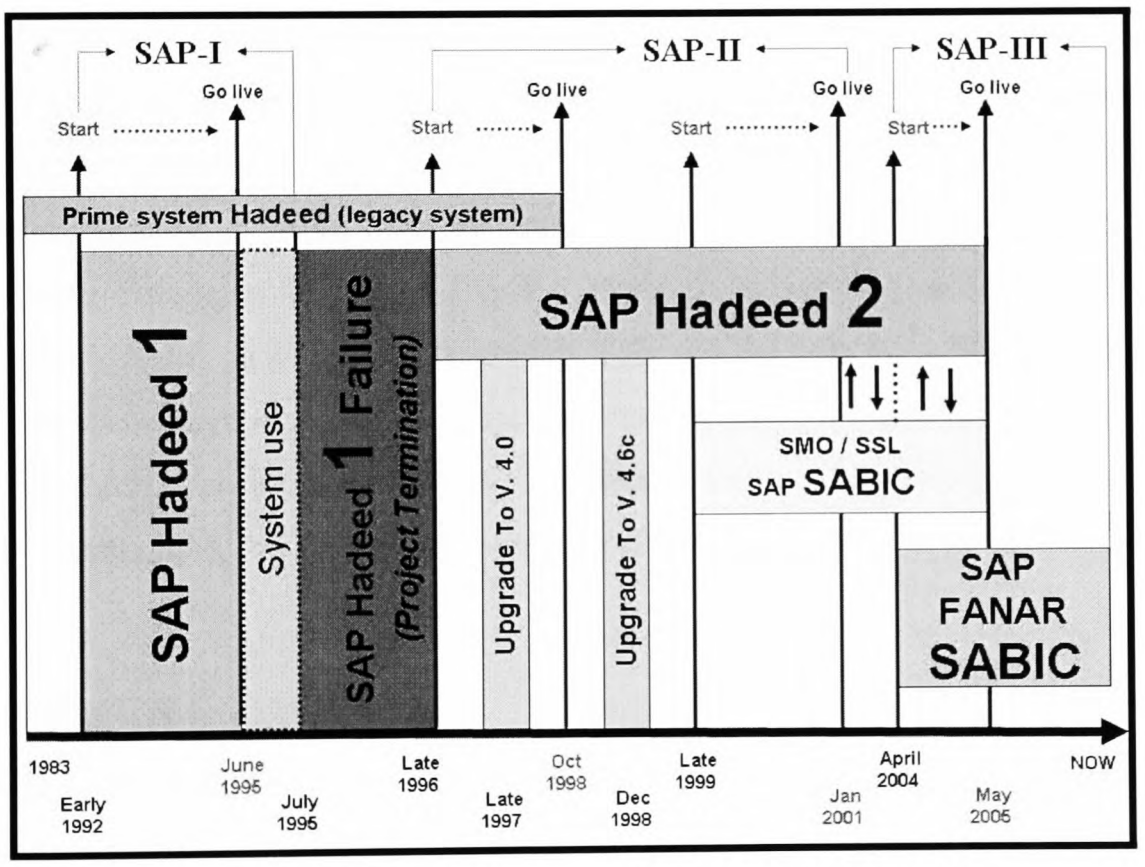


Figure 4-10 Hadeed IT background and history (1983-2007)

Figure 4-10 shows that Hadeed has undertaken four SAP R/3 projects, of which three were vital, while the fourth was partially implemented. A brief account of each is given in the following subsections.

4.6.1.1 1983 – Early 1992 (PRIME System/Mainframe)

When Hadeed was founded in 1979, the management considered it important to build an IT infrastructure and therefore introduced the PRIME system, a centralized mainframe to help in managing some of the company's functions. Therefore, it was necessary for Hadeed to incorporate an IT department into its organisational structure to provide support in managing and maintaining the system and developing the required applications internally. It appears that as a result of the lack of advanced technology available at the time, and of the fact that managers overlooked the importance of IT in running the business, little attention was paid to the IT department. Consequently, a set of fragmented applications were developed to serve the separate needs of some of Hadeed's departments and there was an evident lack of integration and comprehensiveness.

Hadeed continued using the PRIME system and additionally began supporting the work of some of its departments by means of ready packaged applications. For instance, the maintenance department was supported by the Mask and Task terminal shutdown application in addition to the development of some additional PRIME functions for that department. Consequently, Hadeed ended up with a scattered and complicated IT infrastructure based on a quick-fix approach. This was the case from 1983 until the early 1990s, when managers began to realise the limitations of the PRIME system and the high cost of its support. Given the size of Hadeed in terms of numbers of employees and of daily transactions, they started to reconsider seriously the issue of IT development.

4.6.1.2 1992 – June 1995 (SAP-I)

Thus, in early 1992, the importance of changing Hadeed's IT infrastructure was accepted, but there was no consideration of any related business change, direct or indirect. Among the available solutions, the Hadeed management considered two alternatives. The first was to develop an in-house custom system, but such a project was rejected by the IT department and some Hadeed executives because of the large expenditure of time and money required to complete it. Therefore, it was decided to adopt the second approach, which was to implement ready packaged software.

During that time, the concept of ERP was new and there was little research data or expertise, whether in the IT or business sectors, especially in developing countries. Nevertheless, ERP systems had begun to attract the attention of organisations in developed countries and their reputation inspired some confidence in the developing countries. As a result, Hadeed decided on a SAP system after a brief selection process and hired the Price Waterhouse (PWH) consultancy to manage its SAP project.

At this point, it is important to emphasize certain factors which affected the project critically and caused major difficulties for Hadeed. Firstly, there was a lack of well qualified consultants and experts capable of running such projects or indeed of understanding the SAP system and this had a major effect on the implementation process. It became evident that different parties in the project were following a trial-and-error approach. Secondly, the SAP system itself was passing through a transition period during which SAP R/2 was available to be implemented using older infrastructural technology such as mainframes, while client-server architecture had also been introduced to replace that centralized architecture, allowing SAP AG to introduce the SAP R/3 system. During the early stages of this new system, it was neither comprehensive nor mature, so Hadeed decided to delay the signing of the contract in order to send members of its project management team and some executives to the SAP AG head office in Germany to ensure that the R/3 solution would provide Hadeed with a fully functioning system once it had been released. Finally, in early 1994, the SAP R/3 system was purchased and Hadeed began preparing to implement it, in cooperation with PWH.

Because of the architectural changes needed, the implementation strategy adopted by Hadeed was the 'big bang' approach. Additionally, PWH advised Hadeed to switch off the PRIME system as soon as SAP was launched. A consequence of this was that Hadeed intended to adopt SAP R/3 embedded best practices to replace its own business processes, relying on the principle of best practice adoption and on the reputation of SAP, which encouraged clients to adopt the technology in its standard form (as-is) without question. These decisions were mainly consultant driven, while Hadeed management simply followed PWH's recommendations, a strategy that can be seen as justified in the absence of any direct in-house knowledge or experience of SAP. Indeed,

the whole implementation process was essentially directed by the consultants, who decided that the system should go live in June 1995, despite an obvious lack of comprehensive testing.

It appears that some Hadeed people did speak out against the decision to go live, but that PWH took a political decision not to delay, in order to protect its reputation. In other words, if the consultants delivered the live project within the agreed timeframe, they would gain credit for this in their record, which would mean that the project was successful in their view. Thus, the system went live on time and the top management of Hadeed sent a formal message to every member of staff announcing the success of the project and congratulating them on their part in it.

4.6.1.3 June 1995 – July 1995

After SAP-I went live, Hadeed started to use the system incrementally, uploading all of the required data from the legacy system. Unfortunately, after a few weeks of using the system, Hadeed's users and managers started to notice that it was performing incorrectly. Therefore, PWH and the project team developed a plan to review instances of incorrect performance and to discover why they occurred, but these problems grew day by day and directly affected Hadeed's financial situation.

The main problems were in regard to sales and finance, which meant the SD/LE and FI/CO modules. What happened is illustrated by the following examples. A customer would order ten tonnes of steel bars but the system would produce only 1 tonne for that request, while other customers would receive shipments which they had not ordered. The consequences of these faults were twofold. On one hand, they had a direct effect upon Hadeed's financial situation and reports. In other words, in June 2007, the time of the main fieldwork, Hadeed was still contacting customers who had inadvertently benefited from such errors, in order to recover part of Hadeed's losses. On the other hand, the technical consequences for the SAP project were such that the project was terminated in July 1995.

Having terminated the SAP-I project, Hadeed management announced formally its intention to reinstate its PRIME system. It also decided to establish a team to investigate the failed project, but no outcome has yet been published. Although this project was extremely costly for Hadeed, the company gained some benefits from it, an important one being that it had accepted the concept of change in the organisation. Irrespective of the nature of the actual change made, it is significant that the decision to change had been taken despite the difficulties associated with making it acceptable to stakeholders at different levels.

4.6.1.4 Late 1996 – April 2004 (SAP Hadeed)

In spite of the failure of the SAP-I project and its costly consequences, Hadeed decided approximately 16 months later, in late 1996, to re-implement the SAP R/3 system but in a different form. (This second SAP R/3 project is referred to hereafter as SAP Hadeed.) Accordingly, the management assigned a project manager to lead the new project, but not one who was a member of the IT department as had been the case for the earlier SAP project. The person appointed was a German who had previously been responsible for directing the strategic planning department at Hadeed.

It became evident that SAP Hadeed was a major project and pivotal in Hadeed's history. The project started with new approach to project management, although there was still a lack of sufficient available knowledge pertaining to the SAP system and the project management skills required. The costly failure of the previous SAP project had also had some effect upon Hadeed management. All of that played a major role in shaping Hadeed's attitude to and perceptions of the new project. Furthermore, the new project manager started his mission by developing different project teams, taking into consideration previous project team members, with a condition that they should be full-time members, dedicated to serving the project, in contrast to the SAP-I project, where the majority of team members had only a part-time involvement.

In the SAP Hadeed project, the company decided to consider a different implementation approach and strategy. Therefore, in recognition of the serious conflicts and resistance among different Hadeed departments and management, as well as the explicit effect of

the failure of SAP-I, the project manager succeeded in convincing Hadeed management to implement the system in the way that Hadeed's users and departments preferred, focusing most of the effort on going live with SD/LE and FI/CO first. It was evident that the project manager was struggling to reduce the effects of resistance upon the progress of the project; therefore, instead of adopting it in its original form, he decided to adapt the system to satisfy different internal stakeholders' needs. His focus on SD/LE and FI/CO was prompted by their importance in the eyes of the management because of the failure of SAP-I. Finally, all SAP modules, including SD/LE and FI/CO, went live in October 1998.

During the implementation of the SAP Hadeed project, SAP AG released SAP R/3 v4.0, updating the version that Hadeed had purchased in the early 1990s and implemented during both the SAP-I and SAP Hadeed projects. Hadeed decided to use v4.0 in the implementation of SAP Hadeed. Then, during December 1998, SAP AG released R/3 v4.6c and Hadeed decided to upgrade its current SAP R/3 system accordingly.

The process of developing SAP Hadeed continued after the formal go-live of the system in late 1998. This was evident from the process of continual improvement and incremental development of the project to satisfy any new users' requirements. Finally, once SABIC had decided to introduce SAP R/3 to integrate all of its affiliates into one system, Hadeed decided in 2001 to cease any further development of its SAP Hadeed system.

4.6.1.5 Late 1999 – January 2001 (SAP SMO SABIC)

During the first year of operation of the SAP Hadeed system, the project teams supported Hadeed users and attempted to improve the system according to any new users' requirements. Meanwhile, SABIC, the parent company, decided to consolidate the materials and procurement management systems of its different affiliates, including Hadeed, into one SAP R/3 system directly under the management of SABIC. This new organisation was called the Supply Management Organisation (SMO). As a result, different processes in materials and procurements, in addition to all of the employees

working on these two functions, become directly integrated into the SABIC structure via SABIC SMO.

This was clearly a business reengineering project, but in a narrow domain, as it affected only two major functions of all SABIC affiliates. The parent company had three main objectives: to increase business control in materials and procurements, to reduce costs and to improve business efficiency. In fact, before implementation of the SMO, different SABIC affiliates had their own inventories and procurement departments, which were not directly accessed and monitored by SABIC. Thus, SABIC intended to combine all of these scattered functions into one well integrated system that would be managed and controlled directly by SABIC.

In January 2001, the SMO system was fully implemented and went live. Accordingly, MM and procurements became SABIC functions; while the people and equipment involved remained in their original locations, the functions became structurally part of SABIC.

4.6.1.6 April 2004 – May 2005

In early 2001 SABIC started to realize the forthcoming risk of external competition in addition to the dynamic nature of the business and economic environments. Therefore, it decided to develop its strategy and vision to face these challenges. The company had by now realised the benefits of implementing the SMO SAP project, thus integrating its different materials and procurement processes under central management. Therefore, the idea of consolidating different affiliates directly under SABIC access and control was the only available alternative to face the abovementioned challenges. SABIC's vision was to be the lead enterprise in the petrochemical industry of the Middle East and North Africa (SABIC, 2007) and it could not achieve this without building a well integrated enterprise. Consequently, the idea of the a new SAP project emerged, its purpose being to integrate the different affiliates into a single structure with unified processes and a group-wide IT infrastructure with closely integrated applications. The result of a competition among SABIC group employees was that the project was named Fanar, an

Arabic word meaning 'lighthouse'. This project, the fourth SAP R/3 project at Hadeed, will thus be referred to as SAP Fanar hereafter.

As SABIC intended to unify different affiliates' processes into one set of group-wide processes, it was important to consider a set of best available practices. Accordingly, SABIC decided to implement the SAP R/3 system 'as is', using the embodied SAP R/3 best practices. The approach was to divide SABIC's affiliates into four groups and to implement the system in the first group affiliate by affiliate, taking a big bang approach within each affiliate. Once the first group had all gone live, implementation was rolled out to the remaining groups one by one, again with big bang implementation in each affiliate.

Hadeed, which is the main concern and focus of this project, was in the fourth group. Accordingly, SAP Fanar teams started implementing the system at Hadeed in April 2004 and planned to go live in November 2004. However, certain problems and misunderstandings relating to Hadeed's business processes, which will be covered in more detail in subsequent chapters, meant that this date was postponed twice, first to January 2005 and then to May 2005.

Finally, in May 2005 Hadeed went live with the new system, new processes and new structure. At the same time, SABIC created a real and physical organisation within the group structure which it called the Shared Services Organisation (SSO). SSO was the result of a BPR project that took place in line with the SAP Fanar project and which aimed to enlarge and extend the scope of SABIC SMO to encompass six additional business functions. In fact, the SAP Fanar project would not have been delivered in its final shape without the help of the consultancy firm, Atos Origin, which played a major role in driving the project and helping SABIC to achieve its targets.

4.6.1.7 May 2005 – June 2007 (SAP Fanar SABIC)

Once SABIC had completed its SAP Fanar and SSO projects, its various affiliates came under direct central control. Additionally, the employees of all affiliates had unique SABIC ID numbers. Now, SABIC started seriously to benefit from this integrated

infrastructure to accomplish its vision. While the researcher was engaged in the data collection process at Hadeed, SABIC announced Emdad, a new SCM project that was to be implemented on top of the SAP Fanar system.

4.7. The Selection of SAP R/3 Projects for the Present Study

As noted above, Hadeed had conducted four SAP R/3 projects since 1992, but it was decided to consider only two of these in detail during this research. This decision was made according to a set of criteria, compliance with which is outlined in below in Table 4-3 for each of the projects. The first criterion was that any project included in the study must have involved the implementation of major SAP R/3 modules. Secondly, the system implemented by each selected project must have been in use for some time without any obvious problems serious enough to require its suspension or termination. Two out of the four Hadeed projects met these conditions and accordingly were selected to form the core of this research: SAP Hadeed and SAP Fanar. The SAP-I project was excluded because it had not been fully implemented; indeed it failed just weeks after going live and was terminated. As for the SMO project, it was limited to the implementation of a common warehouse and procurement system for all SABIC affiliates, which did not require the involvement of stakeholders from all of the organisation's business units, so it too was excluded.

Nevertheless, the SAP-I and SMO projects are not totally overlooked. Indeed, references to them were made often during interviews, as this helped to understand the sequence of activities, events and conditions. By considering them in this way, it will be easier for this thesis to present the whole picture and to facilitate a comprehensive interpretation of the data collected on the two main projects.

Table 4-3: SAP R/3 projects at Hadeed (1992-2005) – Criteria for inclusion in study

SAP project	SAP-I	SAP Hadeed	SAP-SMO	SAP Fanar
Dates	Early 1992 - June 95	Late 96 – May 2005	Late 99 – May 05	April 04 – Present
Implementation strategy	**Adopting** SAP (as is)	**Adapting** SAP (to fit business needs)	**Adopting** SAP (as is)	**Adopting** SAP (as is)
Implementation approach	Big bang	Big bang	Big bang	Big bang for first four affiliates and then rolled out to other affiliates
Modules implemented	All modules available during that time	All modules	Materials management and procurement	All modules
Business units involved	All units	All units	Only warehouse and procurements	All units
Final result of implementation	Project failed and was terminated	Used until SAP Fanar went live	Used until SAP Fanar was introduced	Still in use during fieldwork

4.8. Chapter Summary

This chapter has provided background data concerning some major aspects of the empirical part of this study. It began by presenting the rationale for the decision to set the empirical research in the context of the Saudi private sector. It then shed light on the status of ICT in Saudi Arabia and its likely future. The next sections gave an account of the pilot study, its results and its benefits, then of the evaluation process by which Hadeed was chosen for the case study and of preliminary access negotiations. The IT history of Hadeed was then outlined, showing that the company had made four attempts to implement SAP R/3 projects. These were evaluated and two selected for detailed consideration in the main empirical study.

The detailed process of site access negotiations will be further explained in the next chapter, which also describes the empirical work of data collection which took place within the Hadeed Company.

5 Data Collection and Coding

5.1. Introduction

This chapter begins the account of the empirical work and its related processes, in four major sections. In the first section, the discussion will mainly be directed to describing the preparation of the data collection process, including the negotiation of site access, the development of the consent form, determining the nature of the required data, and finally the development of the interview protocol. The second part then discusses the process of data collection in more detail, highlighting aspects such as data management, the selection of participants and the sampling process. This section also describes the road map of the data collection process and its results, the application of a filtering mechanism to select the interviews to be considered, and some of the difficulties that were faced during this process.

The third section is concerned with the analysis of the data. It explains the adoption of the GTM and its influence on the data collection, in line with the analysis process, then elaborates on the process of preparing the collected data for analysis. This includes a discussion of the translation of the data from Arabic to English and of how to assure the quality of that translation; the two major rounds of open coding; and finally the clustering of these free nodes into more abstract high-level categories. Finally, the fourth section will be dedicated to explain the adoption of Pettigrew's ideas in the analysis process. This will be in a form of transforming the result of the second round analysis to accommodate Pettigrew's suggestion of his proposed framework in term of outer context, inner context, and content of change.

5.2. Preparation for Data Collection

5.2.1 Negotiating Access with Hadeed

Although the researcher had obtained initial approval for the main study from the president of Hadeed during the pilot study, this had to be renegotiated when he arrived

on site to undertake the data collection, because a new president had been appointed and his assent was required. It was difficult for the researcher to arrange a meeting with the new president for that purpose and he then had to wait for his request to be considered. Finally, after approximately three weeks, the researcher received approval but with some constraints and conditions, which are discussed below. The empirical work plan was modified to take account of this delay.

5.2.1.1 Site Access Conditions and Constraints

In approving the study, Hadeed stipulated some formal conditions and constraints to protect its confidentiality and business interests, listed in Table 5-1.

Table 5-1: Access conditions imposed by Hadeed

Conditions and Constraints	Negotiable?
Allocation of an employee to represent Hadeed and to coordinate and arrange any required tasks once they had been requested by the researcher	No
The researcher was not allowed to ask any financial questions, even those directly related to SAP R/3 projects such as cost of package, training, etc.	No
The researcher was not allowed to conduct any interview without informing the coordinator	To some extent
The researcher was not allowed to ask any questions not related to the company's IT experiences	To some extent
The researcher must provide Hadeed with formal letters from his agency and supervisor to prove his identity and to state the purpose and nature of the project	No
The company was not responsible for funding or supporting the project except by providing the researcher with basic meals and with refreshments during interviews.	Yes, due to the hospitality of Saudi culture at an individual level, but not at an organisational one
The researcher was not allowed to drive his vehicle on company premises, where the company was fully responsible for his transport.	No
The researcher was not allowed to collect any documents, either hard or soft copies, without informing the coordinator.	In fact, this was not difficult, particularly if the required documents related directly to SAP projects, such as copies of intranet pages or even emails.
The researcher must prepare two copies of the consent form to be shown to the interviewee before each interview. The researcher must also sign one copy and then hand it to the interviewee.	No, but most interviewees did not wish to keep a copy for their records.
The company would not be responsible for any injury or harm to the researcher occurring during the study, whether on company premises or not.	No

The company assigned one of its employees to act as a coordinator of research-related activities such as interviews. However, as he was a very cooperative person, the researcher was in practice able, to a large extent, to do what he wished. The table above shows that obtaining access to participants and to data was not free of difficulties and obstacles. Nonetheless, the company was essentially very cooperative, particularly when managers started to understand what the researcher was intending to do and to appreciate the potential benefits of such research for both the country in general (the macro-context) and Hadeed in particular (the micro-context).

5.2.1.2 Role of the Coordinator

Although assigning one of the company's employees to act as research coordinator was, outwardly, beneficial to the research, it was feared that it would negatively affect the research, in that his appearance as an intermediary in arranging interviews might, in some cases, damage attempts to build trust with participants. In other words, some participants might participate passively and withhold facts in order to protect their jobs, although this was not the reason for assigning the coordinator. In fact, it appeared that his appointment had two main goals. First, the company wanted to control and monitor the process of data collection to protect its business. This was clear on many occasions, particularly during the detailed scrutiny which the researcher faced when entering or leaving the company's premises. The security procedures taking place at the main gates were very strict, apparently due to the value of the company and its effect upon the Saudi economy. The second goal was to facilitate data collection and contribute positively to the study, although this required Hadeed to expend resources. The decision was necessary because of the strict security procedures, which would not have allowed the researcher to move freely from one place to another without the assistance of the coordinator.

Consequently, one of the main roles of the coordinator was to facilitate and arrange the interviews. He also had a supportive role in dissolving any barriers and affording all the required tools such as stationery, internet access and an internal email account. Although the involvement of the coordinator in the research had some evident benefits, the researcher decided in cooperation with the coordinator to keep him away from interviewees and the arrangement of interviews, in order to protect participants from any external influence, so that they would feel free to recount their experiences and express their opinions without constraint. Therefore, the role of the coordinator was narrowed down to providing the researcher with the required information about subsequent participants such as their contact information, their roles and positions. This meant that the researcher alone was responsible for contacting participants, while the coordinator played his role behind the scenes.

The researcher thus succeeded, to a large extent, in building trust with most participants and then encouraging them to provide the required data free of any political influence.

Additionally, the well elaborated consent form played a major role in convincing participants that the research formed part of a PhD project and that their identities would not be revealed. Thus, by increasing participants' trust, it helped the researcher to collect accurate data based on participants' genuine understanding of real events.

5.2.2 Consent Form Development

Owing to the adoption of the interview method as the main source of data, it was very important to develop a sort of contract with participants where major information pertaining to the research and the researcher was provided. Thus, the researcher decided to develop a consent form before the beginning of the data collection process, to fulfil the ethical requirements of the research. In fact, developing such a form was also a major condition imposed by the company. Because of the prior intention to undertake the empirical part of this research in Saudi Arabia, two versions of the form were prepared, one in Arabic and the other in English. Participants who did not speak Arabic were given the English version, while Arabic speakers were asked which version of the consent form they preferred.

The form, which is reproduced in Appendix A, had three major sections, concerning the researcher, the research and the participant's rights. The researcher employed his IS experience to develop a bespoke application for the purpose of managing certain research activities, particularly those pertaining to assuring data protection and confidentiality. This application was used to manage interviews and interviewees' data, and to generate the required documentation automatically. Thus, the required consent forms were prepared and printed in advance, using this application, so that they would be ready prior to each interview.

5.2.3 Nature of the Required Data

It was very important to determine the nature of the data required to answer the research questions and to provide reliable results. This took place before the fieldwork started. Although the data requirements were determined in advanced, there was a flexibility in regard to amending the research plan as well as the required data. This was entailed by the adoption of the GTM, which is characterised by the flexibility of the data collection

process. This flexibility is one advantage of employing GTM in data collection and analysis. Accordingly, this research was guided and directed to a large extent by the collected data, which is a feature distinguishing GTM from other qualitative methods. In this research, the decision was made to employ interviews as the main data collection technique, supported by some company ERP project documents. In fact, while the researcher was looking for more than this one sort of document, he was obliged to adhere to Hadeed's conditions.

Therefore, he sought the required data through a number of interviews and focused his efforts on collecting as much data as he could which reflected participants' experiences and understanding of the SAP R/3 projects of interest. It was important to support interview data with any available documents in order to clarify areas of ambiguity and to use interviews to help in the interpretation of the collected texts. In regard to documents, the researcher looked for any available emails as well as any copies of Hadeed's internet or intranet pages that were related to any SAP R/3 project. However, collecting emails that had passed among Hadeed employees and external parties during the SAP R/3 projects was difficult and in some cases impossible, because of the unavailability of such emails in participants' mailboxes. Thus, in order to find such emails, the researcher would have had to apply again to Hadeed's president, seeking permission to restore such data from the backup files. He decided not to seek this authorisation, because of the limited time available for fieldwork, taking into account the delay of three weeks in beginning it, as explained in section 5.2.1. Thus, when looking for available documents, the researcher's main concern was for the quality of the materials, not their quantity. Finally, he succeeded in collecting more than three gigabytes of soft documents as well as a sufficient number of hard copies of emails.

5.2.4 Development of Interview Protocols

Although the first few interviews were to some extent unstructured, they were conducted within predefined boundaries, in that the researcher was looking for relevant data pertaining to participants' experiences of SAP R/3. The intention was to make these interviews relatively open, allowing the flexibility to treat and manage new issues and themes which emerged then and in subsequent interviews. The researcher also took into consideration the results of the pilot study, although these were not sufficiently detailed

or accurate to do more than provide some clues and ideas in regard to what to consider during the first few interviews in particular.

As the empirical work proceeded, the interviews changed, becoming somewhat more structured in nature. The researcher started each interview with some ideas and predefined questions, but remained flexible and ready to change the trajectory of any interview at any time to investigate emerging issues as appropriate. Thus, it was necessary to organise the interview questions into groups, each covering a certain aspect of the research topic. Table 5-2 lists these groups and outlines their content.

Table 5-2: Classification of interview questions

	GROUPS OF QUESTIONS	NATURE
1	Biographical questions	Brief
2	Previous Hadeed IT experiences (1983 to early 92)	Brief
3	SAP-I (1992-1995)	Less detail
4	SAP Hadeed (1996-2005). Detailed open-ended questions	Detailed
5	SAP SMO SABIC (1999-2001)	Less detail (only MM interviewees)
6	SAP Fanar (2004-2005). Detailed open-ended questions	Detailed
7	Comparisons, particularly between SAP Hadeed SAP Fanar	Detailed

The table shows how the researcher benefited from the results of the pilot study in generally shaping and formulating the process of data collection. Moreover, it is evident that each interview participated in shaping and guiding the subsequent interviews to some extent, in accordance with the principles of the GTM. In general, the researcher concentrated his efforts on understanding participants' perceptions of different SAP R/3 projects, although as explained in the previous chapter, the analysis is mainly concerned with two of these projects, data related to the other two being considered for the purpose of supporting interpretations of participants' understanding. Examples of common interview questions are given in Appendix B.

5.3. Data Collection Process

Before going into more detail in describing this stage of empirical work, it is important to stress again the mutual relation between data collection and analysis, especially in this project, where GTM was partially adopted for that purpose. The process of breaking

the data into segments can be logically considered as transforming the product into its detailed ingredients. Therefore, having decided to start this process, it was necessary to consider some important issues pertaining to data collection techniques and management, prior to the actual data collection process.

The nature of qualitative research is characterised by the huge size and complexity of the body of data collected compared with its counterpart in quantitative research (Silverman, 2006). Therefore, it is very important to consider in advance the means of managing such a large and complicated dataset in a way that facilitates keying, storing, manipulating and retrieving the data when required. The next section will explain in some detail the techniques adopted for this purpose.

5.3.1 Development of Data Management Techniques

Qualitative research tends to produce a large volume of data, in this case because interviews provided the main source of data. Furthermore, adopting GTM as a method of data collection and analysis enlarged dramatically the volume of data. Consequently, it was important to develop techniques to facilitate that process and to simplify the reporting of the results in a reliable and coherent way.

As explained in chapter four, the study concentrated on two of the four SAP R/3 projects at Hadeed; therefore, it was important to find a way to distinguish between these two projects during the interviews. In other words, each interview would cover these two projects while pertaining to only one participant. Thus, it was important to find an appropriate way to manage such a situation when using NVivo.

Relying on his IT experience, particularly in DBMS, which is to a large extent similar to the structure of NVivo, the researcher employed the *free nodes* feature of NVivo to distinguish between sections of interview texts referring to either the SAP Hadeed or SAP Fanar projects. This was simply a matter of creating two free nodes and naming them *SAP Hadeed* and *SAP Fanar*, then during the open coding phase of data analysis, once the researcher had finished coding a segment or chunk of an interview, he simply dragged and dropped that segment into one of these two nodes. It was also important to consider exceptions that might occur during an interview. Thus, if a certain segment of

an interview concerned both projects in a particular context, a separate node was required, so a free node called *compare_node* was created for that purpose.

Moreover, it was expected that, after using the open coding process for some time, it would be difficult to discriminate between free nodes in terms of which of them reflected real concepts such as *Satisfaction* or *Resistance*; and which were nodes for special use such as *compare_node, SAP_Hadeed* or *SAP_Fanar*. Therefore it was decided to use a special character to discriminate between different nodes: any free node starting with the character @ would be one which was used for a special purpose and whose content did not represent a real concept, property or dimension. For that reason, the researcher decided to utilize and benefit from the description field that is created automatically when a free node is created to describe the actual meaning and use of the selected node.

As a result, it was relatively easy to filter, search and retrieve any data referring to any SAP project separately. This method of data categorization seemed straightforward, while working without it would have been difficult during the subsequent axial coding process, and in particular when structuring free nodes into tree nodes (categories and sub-categories) and when building connections between these different tree nodes (major categories). Figure 5-1 below illustrates this technique using three special free nodes as an example to show how to employ and use any available feature in NVivo to serve certain special interests, to facilitate and simplify data management, analysis and coherent reporting.

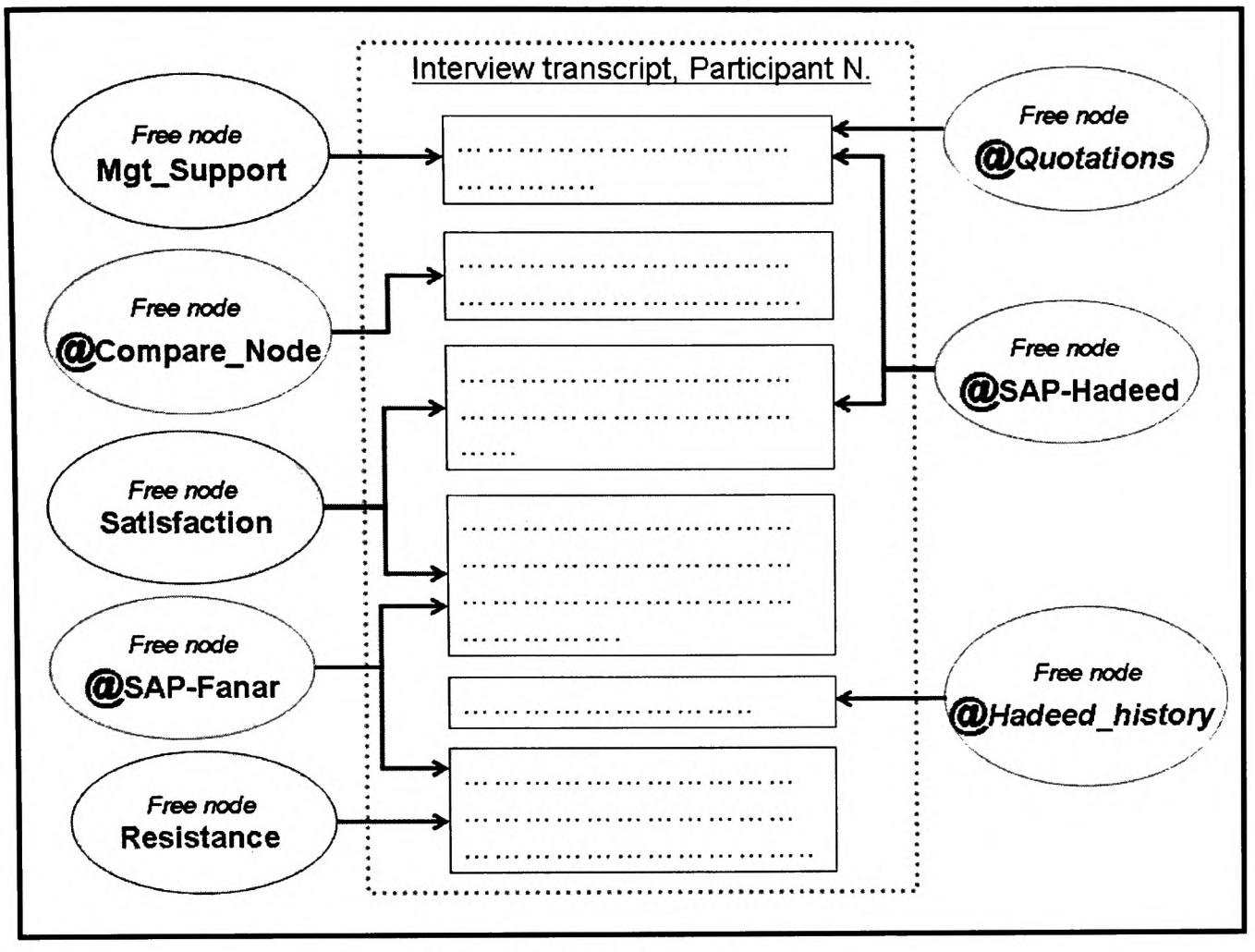


Figure 5-1: Node coding technique

Another example of the importance of developing bespoke techniques using the built-in functionalities of NVivo is the tracing of the company's IT history by using the @Hadeed_history node to store any sort of reference that might be made during an interview to Hadeed's IT history. Doing this made it easy to draw and understand the overall picture of Hadeed's IT experiences with just a few clicks. Another example was storing important remarks made by participants. A free node named @Quotations was created to store these and to facilitate their retrieval when needed. These are just a few examples of how the researcher anticipated future needs and then planned how the data would be managed to simplify access to it as required. Table 5-3 below lists some of these nodes, describes them and gives real examples from the data.

Table 5-3: Examples of special nodes

Special Nodes	Description	Example	Related free nodes
@SAP-I (1992-1995)	Used to link texts referring to the first SAP project	Look, end users knew **Hadeed's intention of replacing PRIME due to its limitations** and they already knew that Hadeed had already purchased SAP. But after that, they **did not formally know** any thing pertaining to the project **prior to the go-live.**	Implementation drivers Communications with users Neglecting end users ***@PRIME_System*** ***@Before_go-live***
@Role of Project Manager	Used to determine the role of the project manager in any pre-identified project activities or tasks	I participated before as a part-time member, but when the **new project manager** was chosen to lead the project, one of his first requirements and conditions was to combine **different team members in one location as full-time members.** This **was after 1996.**	Project manager skills ***@SAP_Hadeed*** Team development Consequence of changing project Manager
@Important point worthy to be investigated	This node was an important one because it encompassed any new area worthy of further investigation that did not appear frequently.	I would like to draw your attention to an important point. During the Sharq Co SAP project, IBM Arabia was the consultant but during the Fanar SAP project IBM America was the consultant. **We refused to work with IBM Arabia (SBM-Al-Jafali), which is based in Saudi Arabia,** and insisted on signing a contract with the IBM America competency centre, to avoid any problems.	Previous project experience Consultant selection Learning from others' mistakes ***@SAP_Fanar***

Table 5-4 lists what Bazeley (2007) calls the "*rule of thumb*", a set of recommendations proposed by Richards (2005) whose main purpose was to facilitate the management, organization and development of tree nodes during the second phase of analysis, axial coding. These should be taken into consideration when developing the hierarchical coding system and the relationships between tree nodes and major categories (Bazeley, 2007).

Table 5-4: Set of recommendations for tree nodes development

Organize tree nodes based on conceptual relationships
Use a separate node for each element (who, what, how, when..) of what the next is about
Each node should encompass one concept only
Each concept appears in only one tree node in the whole system
A particular passage of text will be coded at multiple codes
Keep the system 'light'; be flexible

5.3.2 Nature of the Participants

In this project, whose main aim was to investigate internal stakeholders' perceptions of ERP success, it was important to decide in advance on the sort of participants. As mentioned in the literature review, any organisation will have different groups of stakeholders. Phillips (2004) lists seven groups, all or some of which must be considered during any IT project investigation: managers of the organisation, project managers, project sponsors, project teams, customers, end users and the community. While this classification encompasses major and common groups of organisational stakeholders, Kerzner (2004) offers an alternative classification, into three major categories: organisational, product/market and capital market stakeholders' groups. Figure 5-2 depicts this classification in more detail, including its subcategories.

Whatever the detailed classification, it is possible to categorize the stakeholders of any organisation into two major groups: internal and external. The current research considers only internal stakeholders, who are classified into two major groups: members of ERP project teams and end users. According to the Kerzner classification in Figure 5-2, the stakeholders considered in this research comprise only some of Hadeed's

employees and some of its line managers, while external stakeholders such as customers and suppliers are outside the scope of the research and thus will be ignored. As for executives and strategic stakeholders, these are excluded because they had no direct daily interaction with the system, unlike end users, so their perception of project success would be less easy to explore. This is because such people would need a long time to perceive any benefit of the system, their perceptions being influenced mainly by their strategic vision. Therefore, it would not be possible to explore their perceptions just a few months after going live.

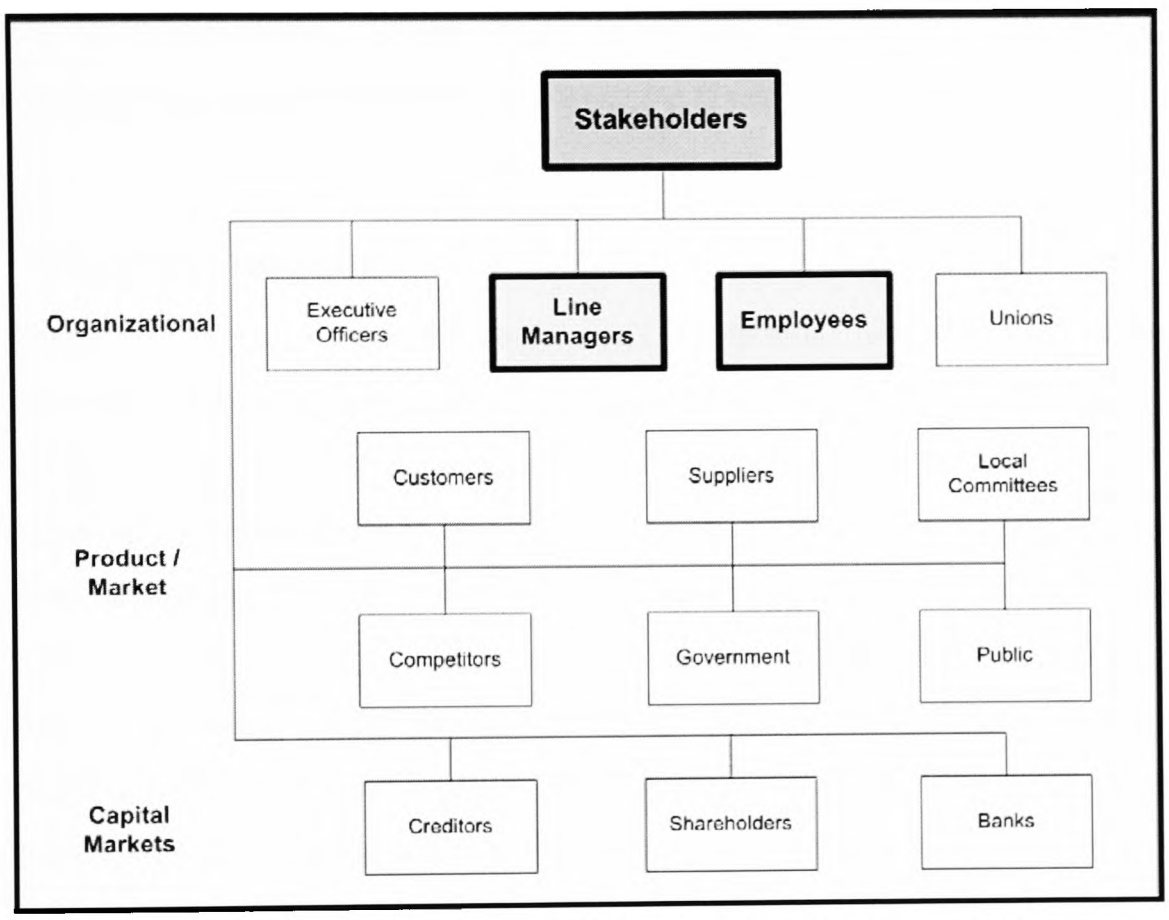


Figure 5-2: Classification of project stakeholders (Kerzner, 2004)

Among those included in the sample were various power users and team leaders, as they were seen as major components of the team members' group. Additionally, the project managers for the two selected SAP R/3 projects were included in the sample, mainly in order to validate weak data, to clarify vague issues and to expose different viewpoints in regard to some disputed matters. They were seen as particularly capable of serving this function from their central position, linking the project with the management of the company and the consultants.

As argued in section 2.3.1.2 of the literature review, classifying internal stakeholders as either end users or team members and restricting participants to these two groups is justified by the limited availability of relevant literature. On one hand, as a PhD project, the present research was time-limited. On the other, it would have been difficult to expand its scope to encompass other groups of stakeholders, particularly external ones such as customers, suppliers and consultants, given considerations of geography and availability. For instance, the consultants had left the country before the research began, while the companies which supply Hadeed with more than 80% of its raw materials are based in foreign countries such as Brazil, Sweden and India (Hadeed-Sales/Distribution.Members, 2007). Thus, it was decided to limit this research to considering the perceptions of end users, power users and team leaders.

5.3.3 Theoretical Sampling

One source of criticism of qualitative research, in general, is the lack of an obvious systematic way of selecting participants, although there are some techniques that may be adopted for that purpose, such as purposeful or random sampling. The adoption of GTM in this research was beneficial in this regard, as it provides an overall procedure called theoretical sampling. This is a feature of GTM which distinguishes it from other qualitative research methods, whereby the researcher is guided by the data already collected in selecting subsequent participants. Figure 5-3 shows this process conceptually, taking into consideration that the empirical work should not exceed 90 days, which was the duration allowed for completing the field study according to the regulations of the Saudi Ministry of Higher Education.

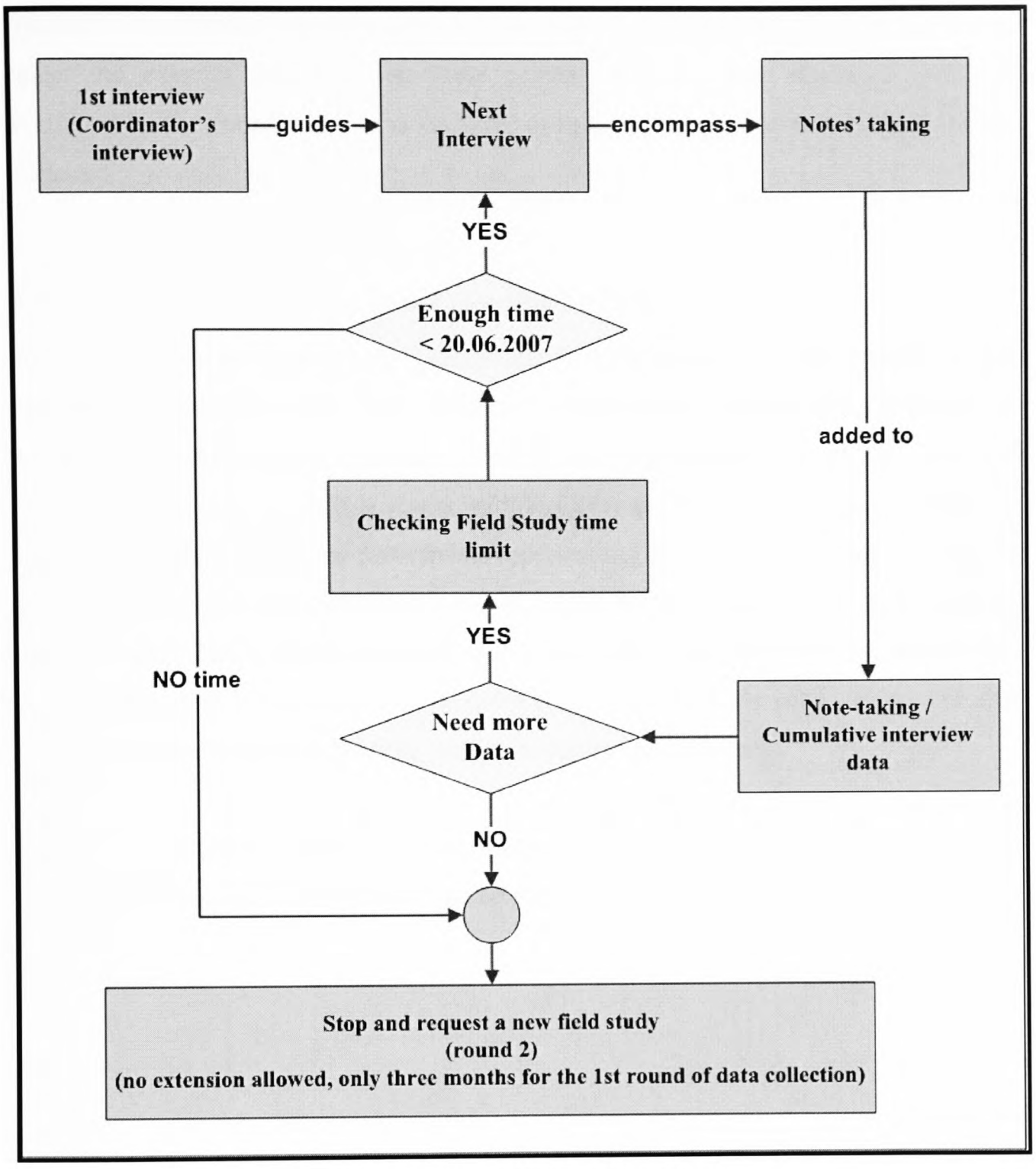


Figure 5-3: Theoretical sampling process

However, in order to begin the theoretical sampling process, it was necessary to select the first participant and to justify this selection. The researcher decided to begin by interviewing the coordinator, who had SAP R/3 experience and had participated in all four of Hadeed's SAP R/3 projects. This experience justifies the selection and in reality the first interview was very beneficial to the research.

During the subsequent sampling process, the researcher considered any persons recommended by participants during interviews. Their names were carefully considered,

but such recommendations were not the main driver of the sampling process, which was rather the existing data. In fact, these proposed names were discussed with and evaluated by the coordinator, who knew all of them from his vital role in the SAP R/3 projects.

5.3.4 The Road Map of the Data Collection Process

As this research investigated the perceptions of stakeholders in ERP projects, it was necessary to consider which ERP modules the different participants had experience of. As a steel manufacturing company, Hadeed had implemented all of the SAP R/3 modules appropriate to such an organisation. Consequently, the researcher decided in advance to collect data from participants representing all of these modules, not merely some of them. The data collection process began on 10th March 2007 and continued until 17th June 2007. During that period, a total of 57 interviews were conducted with Hadeed personnel who between them had played many different roles during and after the implementation of each SAP module in different business units.

Figure 5-4 illustrates a road map of the data collection process, listing the numbers of participants from each stakeholders' group with respect to each SAP R/3 module.

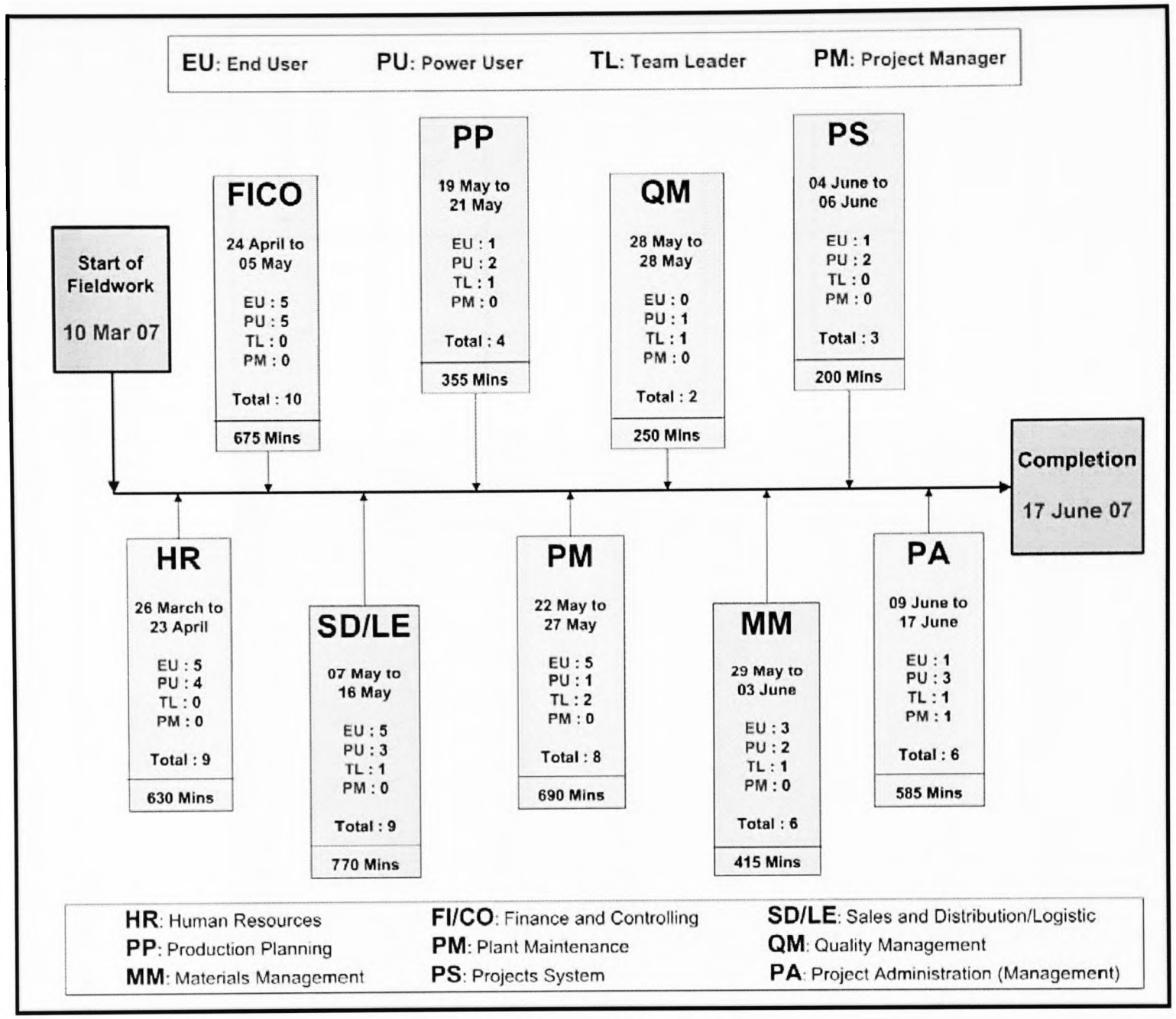


Figure 5-4: Data collection road map

Table 5-5: Participants by type and role

SAP R/3 modules	Total No. of Participants	Nature of Participation	SAP Hadeed	SAP Fanar
FI/CO	**10**	End Users	6	5
		Team Members	2	5
		TOTAL	**8**	**10**
HR	**9**	End Users	3	5
		Team Members	3	4
		TOTAL	**6**	**9**
MM	**6**	End Users	4	3
		Team Members	1	3
		TOTAL	**5**	**6**
PM	**8**	End Users	3	5
		Team Members	3	3
		TOTAL	**6**	**8**
PP	**4**	End Users	3	1
		Team Members	1	3
		TOTAL	**4**	**4**
PS	**3**	End Users	2	1
		Teams Members	1	2
		TOTAL	**3**	**3**
QM	**2**	End Users	-	-
		Team Members	2	2
		TOTAL	**2**	**2**
SD/LE	**9**	End Users	5	5
		Teams Members	3	4
		TOTAL	**8**	**9**
Project Management	**6**	Project Managers	1	1
		End Users	1	1
		Teams Members	1	4
		TOTAL	**3**	**6**

5.3.5 Results of Data Collection Process

The 57 interviews lasted a total of 76.17 hours and were tape recorded. All interviewees were male, as no females were employed in the positions concerned. As shown in Figure 5-4 above, there were different numbers of participants from each business unit and with experience of each SAP R/3 module. Table 5-5 above gives more details of their distribution. The researcher relied on a custom application developed for the purpose of managing such data. Its use was in line with the use of NVivo software, as both helped in reporting the research process and in accessing the data as required.

5.3.6 The Interviews Considered for Coding

During the data collection, it became evident that some of the interviews were not really useful or informative and did not add value to the study, for various reasons. In some cases, the interviewees were not willing to provide the required data for political reasons or because a business problem had arisen prior to the interview, such as the breakdown of machinery. Other participants had indeed enriched the study with valuable data, but had no experience or understanding of Hadeed's situation during its SAP project. Therefore, it was necessary to eliminate these interviews from the open coding process, while nonetheless retaining them for other purposes such as the verification of certain events. Figure 5-5 below shows the distribution of participants by involvement with each SAP R/3 module before any elimination.

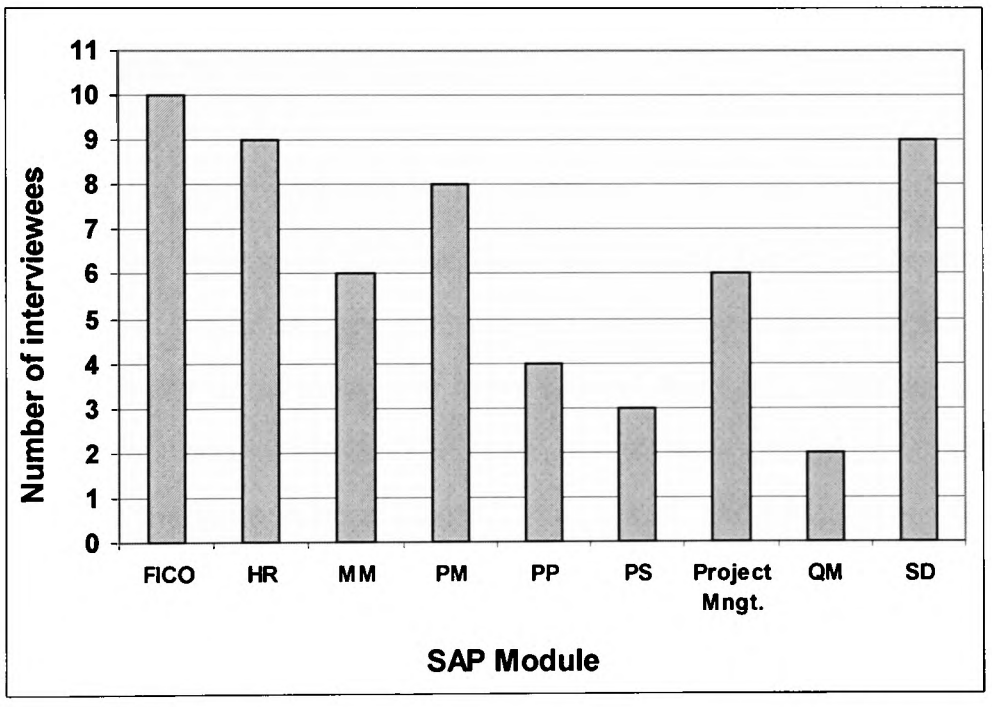


Figure 5-5: Total numbers of participants by SAP R/3 module

After careful review of the 57 interviews, the reviewer decided to partially eliminate 16 of them from the open coding process. Figure 5-6 shows the distribution by module of the interviews which were retained for coding.

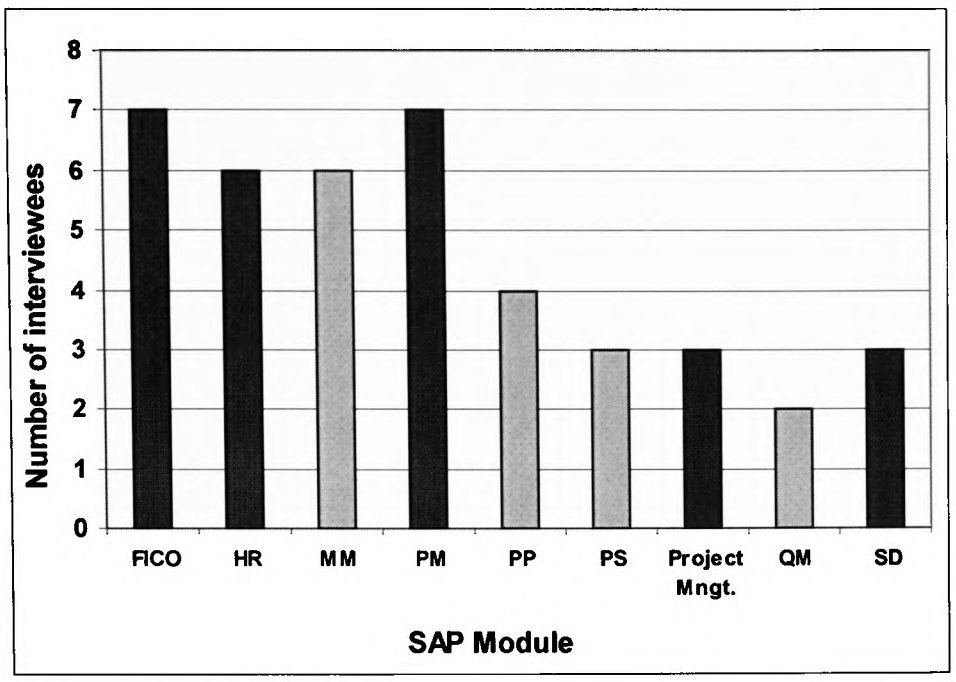


Figure 5-6: Distribution of interviews retained for coding by module

Hence, 41 interviews were considered during the open coding process. The elimination of the other 16 interviews needs to be justified; therefore, Table 5-6 lists these interviews and the reasons for their exclusion.

It is important here to draw attention to the differences between Figure 5-5 and Figure 5-6 above. During the process of elimination of the 16 interviews, the researcher did not consider which SAP modules they referred to. The only criterion was whether they would add value to the data, given the behaviour of the participants or any emerging circumstances, as mentioned above. Therefore, the striking reduction in the number of interviews with participants concerned with the SD/LE module, from 9 conducted to only 3 considered for analysis, should not attract the attention of readers and lead them to overlook the quality of the remaining interviews concerning other modules. The researcher's main concern was directly with the quality of the interviews, not merely the quantity.

SAP R/3 Module	Interview Code	Role during SAP Hadeed	Role during SAP Fanar	Reasons for Exclusion
FI/CO	FI_14	Not involved	Team member	He was not a member of Hadeed staff during the SAP Hadeed project
	FI_16	Not involved	Team member	The participant joined the company a few months after the commencement of SAP Fanar and had no experience of SAP Hadeed
	FI_20	Not involved	Team member	He was not a member of Hadeed staff during SAP Hadeed
HR	HR_04	Not involved	End user	The participant joined the company a few months after the commencement of SAP Fanar and had no experience of SAP Hadeed
	HR_09	Not involved	End user	He was not a member of Hadeed staff during SAP Hadeed
	HR_10	Team member	End user	The participant had rich information but was very busy during the interview and unable to contribute as expected
PM	PM_36	Not involved	End user	The participant joined the company a few months after of the commencement of SAP Fanar and had no relation to SAP Hadeed
SD/LE	SD_22	Not involved	End user	The participant joined the company a few months after of the commencement of SAP Fanar and had no relation to SAP Hadeed
	SD_23	Not involved	Team member	The participant joined the company a few months after the commencement of SAP Fanar and had no experience of SAP Hadeed
	SD_25	Team member	Team member	He was called away from the interview and soon afterwards travelled abroad
	SD_26	End user	End user	The participant used his computer during the interview and did not pay attention. It was often necessary to repeat a question
	SD_27	Not involved	End user	The participant joined the company a few months after the commencement of SAP Fanar and had no experience of SAP Hadeed
	SD_28	End user	End user	Personal circumstances meant that the participant was in a hurry to complete the interview
Project Mgt.	FU_54	Not involved	Team member	The participant joined the company a few months after the commencement of SAP Fanar and had no experience of SAP Hadeed
	FU_56	Not involved	Team member	The participant joined the company a few months after the commencement of SAP Fanar and had no experience of SAP Hadeed
	FU_57	Not involved	Team member	The participant joined the company a few months after the commencement of SAP Fanar and had no experience of SAP Hadeed

Table 5-6: The excluded interviews and reasons for exclusion

5.3.7 Major Difficulties in the Empirical Work

No research can be completed without difficulties and obstacles; the following subsections outline some of the main difficulties faced during this phase of the present study.

5.3.7.1 Nature of Hadeed's Business Processes

It is important to understand how different business units interact with each other, in order to explore certain issues pertaining to the SAP R/3 projects. However, in the case of Hadeed, it was difficult to understand such interactions, because of the complicated processes involved in steel manufacturing. The limited time available for the fieldwork (a maximum of three months) was insufficient to overcome this difficulty.

5.3.7.2 Volume of Collected Data

It has already been noted that it was anticipated that a very large body of qualitative data would be collected in the form of interviews and documents. In practice, this was increased by the fact that in the steel business there are very many daily transactions which are not comparable to those of other industries such as petrochemicals. The complexity of Hadeed's business processes, noted above, further increased the volume of data, as did the adoption of GTM during the process of data collection and analysis. Indeed, GTM has been criticized as increasing the volume of data in research. These three factors taken together meant that the researcher had to deal with a very large volume of non-numerical data, a difficulty which required careful management.

5.3.7.3 Availability of Participants

The third major difficulty, particularly when seeking historical data, was the unavailability of participants, who would commonly have to deal with contingencies such as breakdowns, exacerbated by the fact that the production process is continuous at Hadeed. A related problem was the large physical size of the site (approximately 2.5 by 2 km), coupled with the ban on using private vehicles inside the complex, where the internal transportation service was not always available, although the coordinator did his best to resolve any such difficulties. Some intended participants were also found to have

moved to other companies, either within the SABIC group or outside it. Thus, locating the selected participants was in some cases very difficult and time consuming.

5.4. Data Preparation and Coding

In this section, the first phase of data analysis will be described. As already explained, using GTM means that data collection and analysis run in parallel. The nature of the company being studied (Hadeed) and of most of the interviews made this difficult, but the researcher made all necessary efforts to ensure a convergence between the principles of the method and the conditions and context of Hadeed's operations.

This project was conducted in a private Saudi organisation where most of the employees were Saudis. This means that most of them preferred to be interviewed in Arabic, although some of them had excellent English language skills. Thus, the recorded interviews had to pass through a set of successive processes, illustrated in Figure 5-7.

The idea, simply, was to rely on note-taking during each interview. In general, there are some advantages in using the note-taking technique, even in the case of recorded interviews. In this project, notes were taken for three major reasons. The first was as a contingency plan in the case of the corruption or loss of electronic files, where written notes would provide a backup. The second reason was that some interviews were not recorded. Finally, there was a heavy use of note taking due to the time limit on the empirical work and because most interviews were in Arabic and would require translation into English before being transcribed. In practice, beginning the analysis during the data collection process was not possible, due to the lack of available time.

Although the open coding process was delayed until the completion of data collection, it was time consuming, because the recorded interviews had to be transformed into text format before being analysed using the NVivo software. The researcher considered the use of automatic transcription software, but could not use such applications because most of the interviews were in Arabic, while speech recognition software, including *Dictation* and *Dragon Naturally Speaking*, does not support Arabic (Research.Lab, 2005, Nuance.Communications, 2007). Therefore, the researcher struggled to collect as much data as possible during the fieldwork period, taking into account the quality of the

data rather than its quantity. This entailed focusing his efforts on taking notes during all interviews, which was very useful, at least for the purposes of theoretical sampling and developing the protocols for subsequent interviews. Thus, the process of transforming the recorded interviews into well written and verified text took place after the field study had been completed, when the researcher had plenty of time to perform that task.

In practice, the process of transcribing the interviews from MP3 files and entering them into NVivo took months of intensive work. Nevertheless, it was beneficial, as the researcher became thoroughly familiar with the data and its context. Generally, that process consisted of a set of activities which needed to be clarified. It was necessary to classify and organize the interviews according to the SAP modules and stakeholder groups concerned. For instance, an interview with an end user had to be classified according to whether the interviewee used and referred to the QM, HR or PM module, and so on. Thus, the first phase of data analysis, open coding, began by categorizing interviews in this way.

The process of formal translation, verification, transcription, review and coding of each interview was thus a very lengthy process. The use of the NVivo software was important in conducting this process on such a large volume of data efficiently.

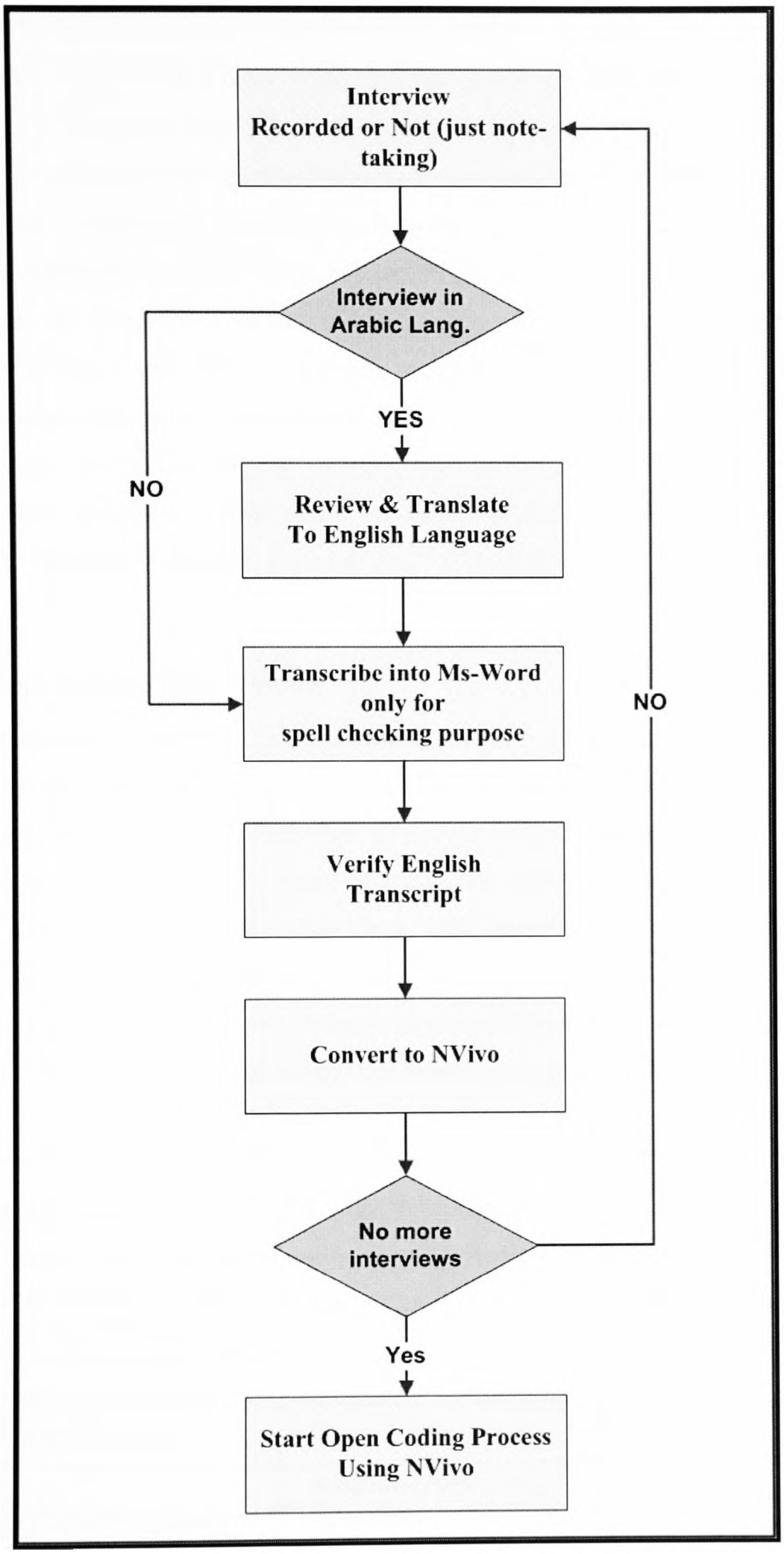


Figure 5-7: Preparing the data for open coding

5.4.1 Assuring the Quality of Interview Translations

Thirty-eight of the 41 interview transcriptions had to be translated from Arabic to English before analysis using NVivo. Accordingly, the researcher personally undertook the tasks of translation and transcription, as it was not critical in terms of translation quality to hire a translator. Additionally, adhering to research ethics required that the data be protected and not sent to external parties. In order to ensure the accuracy of the translations, the researcher decided informally to send anonymised fragments of the recorded interviews with their translations attached to colleagues who were studying Arabic/English translation at the School of Linguistics - University of Salford. The response was favourable to the researcher's translations: despite some spelling, grammar and punctuation mistakes, he was told that the translations were acceptable overall and that their meaning reflected that of the original Arabic text to a large extent.

5.4.2 Open Coding: Initial Round

Before starting this section, it is important to remind readers that henceforth in this thesis, the terms *code* and *node* will be used to convey the same meaning. The only difference is in the context of their use, as *node* is used in reference to NVivo, while *code* is used in GTM. The first round of the coding process began once the collected data had been filtered, translated and transcribed into NVivo. The main aim of this process was to transform raw data in the form of plain text into codes, where each code referred to a particular subject, which could be a condition, context, person etc.

Table 5-7 below summarizes the entities considered during open coding.

Table 5-7: Coding entities

Specific ***Behaviours***	***Events*** (Short time period)	***Activities*** (Longer than events)
Strategies or ***Tactics*** (Activities aimed towards goals)	***States***: General conditions	***Participation***: People's involvement or adaption to a setting
Relationships or ***Interactions***: Between people	***Conditions & Constraints*** (Cause of events or actions)	***Consequences***
Settings: The entire context of code	***Reflexive interventions***: Researcher's role in the process – How intervention generated the data	***Meanings***

Consequently, the process of initial open coding or transforming the raw text into sets of nodes generated a total of 502 free nodes, which were used at least once during the this initial open coding process.

5.4.3 Open Coding: Second Round

Once the data had been transformed exactly into 502 free nodes, it was now important to go back and perform a revision process for that list of initial plain codes/nodes. The main aim of this rechecking was to filter the list of codes. This process involved merging some codes, eliminating non-reflexive ones and highlighting some that were created for special purposes, as mentioned earlier. Table 5-8 below illustrates the result of that revision process.

Table 5-8: Classification of free nodes

Free Nodes Status	No. of Nodes	Action
Used and reflexive nodes	132	**Used**
Repeated nodes	185	Merged
Non-reflexive nodes	122	Eliminated
Nodes created for special purposes	63	**Used**
Total	502	

The table shows that a total of 502 free nodes were created accumulatively by NVivo during the data collection and analysis stage of this research. This does not reflect the number of actual nodes, but the total number of free nodes that were created and used during the open coding phase. Among these, 63 were created and used for special purposes. Therefore, it was important to exclude these from the total number of free nodes, as their actual need would be obvious when developing connections between the developed major categories.

There were also 185 free nodes that were repeated and 122 free nodes which were either not useful or rarely mentioned. Although the rarely mentioned codes were eliminated, this does not mean that they were totally overlooked. Hence, only 132 free nodes were counted as emerging from the open coding phase and these were considered during the

next phase, the clustering process, taking into consideration that in GTM the researcher can move back and forth freely between collection and different phases of analysis.

5.4.4 Clustering of Open Codes

The main aim of this phase was to cluster the nodes resulting from open coding in order to form more general categories and to identify connections among these major categories, which will be covered in a subsequent chapter (Strauss and Corbin, 1998, Corbin and Strauss, 2008). Therefore, the list of resultant codes had to be revisited in order to cluster them into more general major categories and subcategories taking into account Pettigrew's ideas in regard to context, content, and process of change, see (Pettigrew, 1987, Pettigrew, 1989, Pettigrew, 1990). A list of seven preliminary major categories/themes was developed from the data, as seen below in Table 5-9.

Table 5-9: The emerging major categories

	Major Themes (Categories)
1	External factors
2	Intra-political factors
3	Organisational factors
4	Technological factors
5	Previous experience
6	IS project factors
7	Major project phases

The development of these major themes was the result of a precise and intensive process. The researcher, with the help of his supervisor, recognised the necessity of clustering the 132 reflexive raw nodes into a number of more general and abstract themes, taking into consideration different free codes that reflected properties or dimensions. In this way, the above seven major themes were developed. It is important to emphasize that these categories really emerged from the reflexive raw nodes and were not fabricated in advance of the fieldwork.

Furthermore, it was evident that some or all of the first six major categories had interacted with each other in some way in each identified phase of both SAP R/3 projects during implementation and use. It was found that these interactions formed a particular temporary context, which in turn influenced stakeholders in different groups and affected their perceptions of system success. Therefore, it is important to explain these seven grounded categories. The following subsections examine each one in detail.

5.4.4.1 Category 1: External Factors

Table 5-10: External factors

External Factors	
• **Competition**	*Global/local*
• **Global demand**	
• **External decision making**	Political context
• **Y2K**	
• **Availability of SAP resources, experiences and experts**	

Owing to the obvious effects of the external environment and related issues which played important roles in shaping Hadeed's SAP projects, this category was developed as a major category due to it importance. In fact, as shown in Table 5-10 above, it concerned the effects and influence of uncontrollable external factors that interacted with other available categories to form certain unanticipated contexts which, in turn, may have influenced different stakeholders and then affected differently their perceptions of the success of Hadeed's SAP projects.

5.4.4.2 Category 2: Intra-political Factors

Political factors tend to play a major role in shaping IS projects of all kinds. That role may take different forms, such as the phenomena of conflict and resistance that are apparent in any IS project. In this research, it was evident that intra-political factors, in particular, played a notable role in shaping internal stakeholders' perceptions of success, either directly or indirectly. That role, as seen in Table 5-11 below, took different shapes such as resistance, conflict and revenge, or even in some cases the seeking of prestige or being a pioneer, particularly during system selection. Relationships also played a major

role at some times, such as during the development of project teams, the selection of team members for training or even at the final stage of the project, particularly when it was finished and it was time for prizes and promotions. Thus, the effect of this category was obvious and important during the SAP Hadeed and Fanar projects, so a major theme/category was developed to highlight its importance and its role in shaping the perceptions of stakeholders. In fact, due to the nature of Hadeed and its Saudi macro-context, the issue of relationships was important and obviously needed to be addressed carefully, given the tribal nature of Saudi culture.

Table 5-11: Intra-political factors

Intra-Political Factors
• **Conflict** *During process change* *During system change* *During team development* *During requirements gathering* *During users' acceptance testing* • **Role of relationships in** *Team development* *System implementation and selection* *Training nomination* • **Prestige seeking (being pioneers)** • **Resistance** *Losing authority and power* *Personal issues* • **Revenge** *Oppression* *Personal issues*

5.4.4.3 Category 3: Organisational Factors

The third major category to be developed was that of organisational factors. The development of this category was necessary to combine different codes related to the organisation such as its vision and strategies, the nature of its work, the volume of its transactions and so on. The emergence of this category was made necessary by its

obvious role and those of its sub-categories and codes in shaping perceptions of the SAP R/3 projects. Although this category and its sub-categories seemed to be less important than others, their role was significant, if often silent, implicit and indirect. Table 5-12 shows the major sub-constructs of organisational factors.

Table 5-12: Organisational factors

Organisational Factors
• **Vision, strategies and future plans**
Perceptions of future demand
Perceptions of global competition
Expansion projects
• **Decision making**
Absence of strict management accountability
Role of politics in decision making
Legal capacity to make decisions
Trial and error approach
• **Nature of work**
Volume of transactions and workload
Existence of paperwork
Lack of both process and IT integration
Documentation of business processes
IT infrastructure
Shortage of manpower
• **Culture**
English language issues
• **View of IT in managing business**
As an automation tool
As a strategic solution

In fact, during data collection and the subsequent coding process, the effect of this category was notable, yet it would not have been possible to detect it without the adoption of GTM and the use of NVivo. Hence, it was vital to identify this category, owing to its distinct role in influencing perceptions of success.

5.4.4.4 Category 4: Technological Factors

Table 5-13: Technological factors

Technological Factors
• **Perceived ease of use** • **Reputation of SAP** • **Technology acceptance** • **Technology fit with needs** • **Technology flexibility** • **SAP maturity and integrity** • **Understanding the nature of technology** • **Technology performance** • **Technology satisfaction** • **Technology trust (Reliability)** • **Technology use** • **Perceived usefulness**

This category encompasses those codes directly related to technology, concerning trust, satisfaction, understanding, use, acceptance and so on; see Table 5-13 above for further detail. The researcher considered transferring these codes to the IS project context category or to a new category pertaining to technology itself, independent of any particular IS project. However, given that Hadeed had run two major SAP R/3 projects, this new category was felt to be useful in tracing obvious differences in stakeholders' perceptions of and attitudes towards the same technology from one project to the other. For instance, the SAP R/3 system itself was at a certain level of maturity during the SAP Hadeed project and had become more mature and integrated by the time of SAP Fanar. Hence, it was important to create a major category concerned with technology itself and how stakeholders viewed it.

5.4.4.5 Category 5: Previous Experience

Again, given that Hadeed had experienced more than one SAP R/3 event between 1992 and 2005, it was imperative to consider this experience carefully and differentiate its observable role during the different SAP R/3 projects. Therefore, a major category was

created to represent that experience and its role in stakeholders' perceptions of the success of each project. Table 5-14 illustrates this category and its sub-categories.

Table 5-14: Previous experience

Previous Experience
• **BPR experience** • **Experience in the importance of change** • **SAP experience** *Concepts and use* *Project management* *Change management* *Configuration* *Customization (ABAP)* • **Current business process experience** • **Other technical experience (Windows, Office, etc)** • **Sources of experience** *Academic education* *Community of practice* *Learning (self motivation)* *Practice (use)* *Training* • **Overconfidence**

However, this major category did not represent only experience of the SAP R/3 system, but also other sorts of less obvious experience which were discovered during the data collection and coding processes. Therefore, in addition to experience of SAP systems, the category was designed to cover BPR experience, experience of the importance of change and other technical sub-categories such as experience in Microsoft Office, Windows and emails.

It became evident that experience had played a major role in different phases of the two projects and that this role was not identically observed. In other words, in some cases it affected a project negatively and in others positively. Therefore, the researcher decided

to develop a major category called 'previous experience' to highlight the variable role that it might play and to emphasize its importance in changing perceptions of success.

5.4.4.6 Category 6: IS Project Factors

Table 5-15: IS Project factors

IS Project Factors
• **Project management** *Project aims and objectives* *Project budgeting* *Project planning* *Implementation strategy* *Implementation approach* *System selection* *Consultant selection* *Project teams formation* *Project manager leadership* *Risk management* *Testing* *Documentation* *Business case building* *Decision making* *Project control (configuration and customization authority)* • **Change management** *Training organisation and planning* *Training materials – availability and preparation* *Quality of training* *Communication & awareness* *Readiness* • **Informal learning** *Personal effort* *Learning from others* *Learning by use* *Learning by practice (SAP development version)*

The general category of IS project factors was created as a standalone major category. As seen in Table 5-15 above, it encompassed different codes representing mainly project management and change management activities. This category and its codes referred to everything pertaining to the two major SAP R/3 projects that took place at Hadeed, in addition to the two minor SAP projects. However, the technique that was developed facilitated discrimination between these projects when a certain inquiry was made, by the use of the special nodes such as *@SAP_Hadeed* and *@SAP_Fanar*. For instance, while this category covered data pertaining to all SAP R/3 projects, it was nonetheless easy to retrieve data on one SAP R/3 project, by building the required query based on a combination of criteria and the use of the identified special nodes. Furthermore, this technique was usable not merely within this category but with the abovementioned major categories.

5.4.4.7 Category 7: Major Project Phases

Finally, there were important and critical periods during both SAP R/3 projects whose identification was grounded on the collected data. Their emergence was, in fact, due to the notable shift in success perceptions of both sets of internal stakeholders during these project phases. In fact, during interviews, initial open coding, the second round of open coding and finally the clustering process, it became evident that stakeholders' perceptions of success had undergone major changes during these phases. Thus, clustering the results of open coding in this regard produced four major and critical grounded phases. As seen in Table 5-16, these four phases were named project initiation, actual system implementation, system go-live and post-implementation.

Table 5-16: Project Phases

Project Phases
• **Project initiation** • **System implementation** • **System go-live** • **Post-implementation**

The changes noted in perceptions of success during these four phases appeared to be due to some critical decisions and major events which resulted in notable changes in the

trajectory of the SAP R/3 projects. Accordingly, new conditions emerged which ignited actions and interactions among the first six major categories identified above, influencing the perceptions of the stakeholders. The following subsections examine each of the four project phases in turn, and then their main points are summarized in Table 5-17.

5.4.4.7.1 Project Initiation Phase

This phase can be defined as running from when the idea for the SAP R/3 project emerged to the project implementation, usually called project kick-off. In this phase, as well as other phases, major decisions and events were seen as important and critical, as this was what the data exposed.

5.4.4.7.2 System Implementation Phase

The system implementation phase was identified as soon as the project kicked off. It thus followed the initiation phase and encompassed the actual implementation activities. It continued until shortly before the go-live time. In the case of SAP R/3 implementation, during this phase, the development version of the SAP system was built using non-real data and should have been ready as the system go-live approached.

5.4.4.7.3 System Go-Live Phase

This period of the project started once the system was completely ready to put into live use and continued until it was ensured that the system was free of any bugs or problems such as issues of authorisation or interface difficulties. In the case SAP R/3, this meant the complete transformation of the development version of the SAP system into a production version that was uploaded with real and accurate data.

5.4.4.7.4 Post-Implementation Phase

The final phase encompassed all decisions, tasks and activities pertaining to system optimization and utilization. It took place once the system had been launched and proved its validity and durability in day-to-day operation. Once the system was stable, this phase continued until the commencement of any upgrading or new IS project.

Therefore, in the present research, where two major SAP R/3 projects were investigated, the recognition of this phase ensured the continuity of the investigation, as the post-implementation phase of the SAP Hadeed project continued until the initiation of SAP Fanar.

Table 5-17: Main components of SAP R/3 project phases

Project Initiation Phase	Implementation Phase	System Go-Live Phase	Post-Implementation Phase
The decision to implement an ERP system	*Detailed project plan*	*System launch: transforming SAP development version into production system*	*Upgrading IT infrastructure*
Project objectives	*Project team development*	*Support after go-live*	*System utilization*
Consultant selection	*Designing and undertaking team training programmes*	*Bug fixing*	*System optimization*
Business case development	*Detailing and execution of change management programme*	*Problem resolution (authorization, for instance)*	*Auditing*
System selection	*System installation*	*New training organisation*	*Additional skills improvement*
Assigning project manager	*Software configuration and customization decision*	*Process and procedure changes*	*Continuous business improvement*
Implementation strategy decision and authorisation of configuration or customization (if any)	*Data cleansing and migrating*	*Staffing and involvement of new people*	*Retaining knowledgeable people*
Implementation approach decision	*Project documentation*	*System performance tuning*	
Overall plan including go-live time	*Individual and integration testing*		
Project budgeting	*Organising end user training and preparing training materials*		
Communication to organisation, such as announcements	*Development and testing of interfaces with other systems*		

5.4.5 Clustering the Major Categories based on Pettigrew's View

The seven categories that have been developed in the previous section need to be re-clustering again to reflect Pettigrew's framework in a form of outer context, inner context, content of change, and process of change. Accordingly, external factors category and all of its sub-categories all have been defined and highlighted as an outer context. Whiles, organisational factors, previous experience, intra-political factors, and technological factors have been defined and placed under inner context. SAP projects' activities which have been defined previously as IS project factors also have been defined as the content of change. Finally, the actions, reactions, and interactions of the context (outer and inner contexts) and content of change alongside the implementation process all have been used to define the process of change.

The process of change is defined to be the motor that transform the organisation from one state to another according to continues actions, reactions, and interactions among context and content. It is so fundamental to stress the fact that all historical events will be considered during the investigation process. In other word, in any project phase the investigation will cover that phase in addition to all previous events that occurred before that phase. However, the exploration of the interactions among context and content of change will take place in more detail in the next chapter. Figure 5-8 below illustrates the new categories classification based on Pettigrew's suggestion.

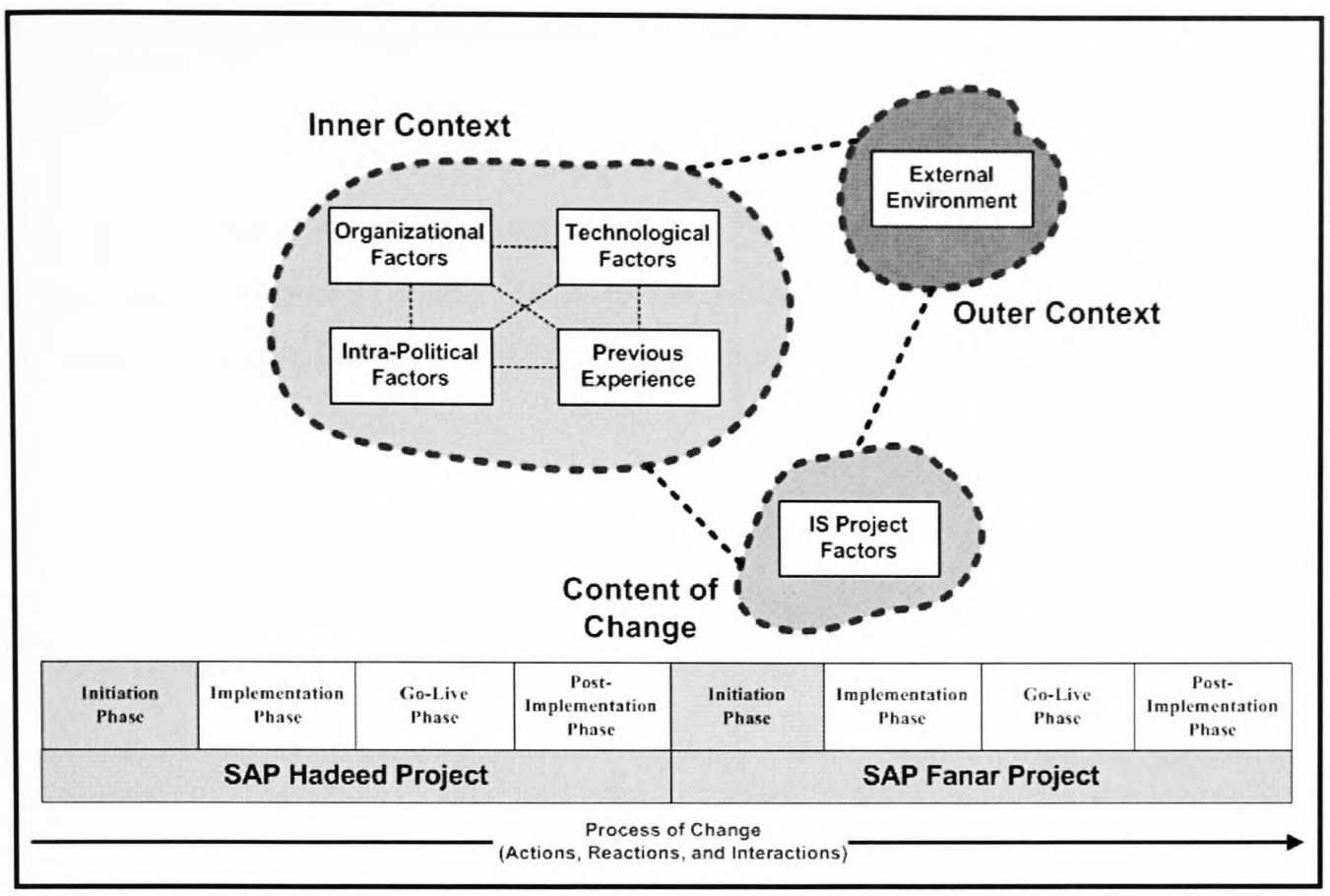


Figure 5-8: Clustering the developed major categories based on Pettigrew's ideas

5.5. Summary

This chapter has dealt with four major issues, the first being the preparations made for data collection, including site access negotiations, development of a consent form and of interview protocols, and the nature of the required data. The second section concerned the data collection process, addressing major issues such as data management; the nature of the chosen participants; theoretical sampling; evaluation and filtering of interviews; and the main difficulties that were faced during this process.

Whiles, the third section detailed the preparation of the collected data for analysis and coding. This included the explanation of two major rounds of open coding and the process of clustering the free codes, which produced six major categories grounded on the collected data. The final major category pertained to the four main project phases, which proved to be critical in the evolution of stakeholders' perceptions of success regarding the two SAP R/3 projects being investigated. Finally, the remainder of the chapter was a reflection of the adoption of Pettigrew's framework upon the seven major developed categories. In other word, the re-clustering of the seven major categories

based on Pettigrew's framework in term of outer context, inner context, and content of change.

The next chapter continues the analysis process by exploring the interactions of the six major categories during the four phases of the projects under investigation. This detailed analysis is supported by reference to the data collected during the fieldwork.

6 Detailed Data Analysis and Research Findings

6.1. Introduction

This chapter can be considered as a continuation of the previous one, which explained the first part of the data analysis process. It described the development of six major grounded categories of factors which influenced internal stakeholders' perceptions of success during four distinct phases of the two SAP projects. As aforementioned in previous chapter, these six categories of factors will be dealt with according to Pettigrew's suggestion in a form of outer context, inner context, and content of change. Just to remind readers that, external factors category and all of its sub-categories have been defined as an outer context. Whiles, organisational factors, previous experience, intra-political factors, and technological factors have been defined and placed under inner context. Different SAP projects' activities which have been defined previously as IS project factors also have been defined as the content of change. Finally, the actions, reactions, and interactions of the context (outer and inner contexts) and content of change alongside the implementation process all have been used to define the process of change.

The interactions among outer context, inner context and the content of change have influenced internal stakeholders differently. In other word, their influence will be based on the process of change in a form of actions, reactions, and interactions process among the context and content f change. Therefore, this chapter continues the analysis by exploring how these six categories interacted with each other over the four phases of the SAP Hadeed and SAP Fanar projects. While these interactions were very complicated, due to the multiple criteria involved, the use of the NVivo software facilitated the process of analysis, in particular the steps of query building, data retrieval and the generation of figures.

This chapter is structured around eight tasks, each of which is dedicated to exploring the interactions among categories during a certain phase of a particular SAP R/3 project. At the end of the account of each task, end users' and team members' perceptions of

success during the phase concerned are explored and interpreted. The chapter ends with an overview of the research findings.

6.2. Actions, Reactions, and Interactions among Context and SAP Project's Activities

It became clear during data analysis that the six categories identified in chapter five which represent outer context, inner context, and content of change had interplayed with each other differently during the lifecycle of each project according to the context of interaction and the surrounding conditions. The researcher strongly believes that the consequence of each interaction in any particular setting will have contributed to the creation of a temporary context, which in turn will have influenced the perceptions of stakeholders in both groups – end users and team members – differently in some cases. Figure 6-1 below shows a conceptualization of such interactions generating a temporary context which then influences stakeholders' perceptions of success.

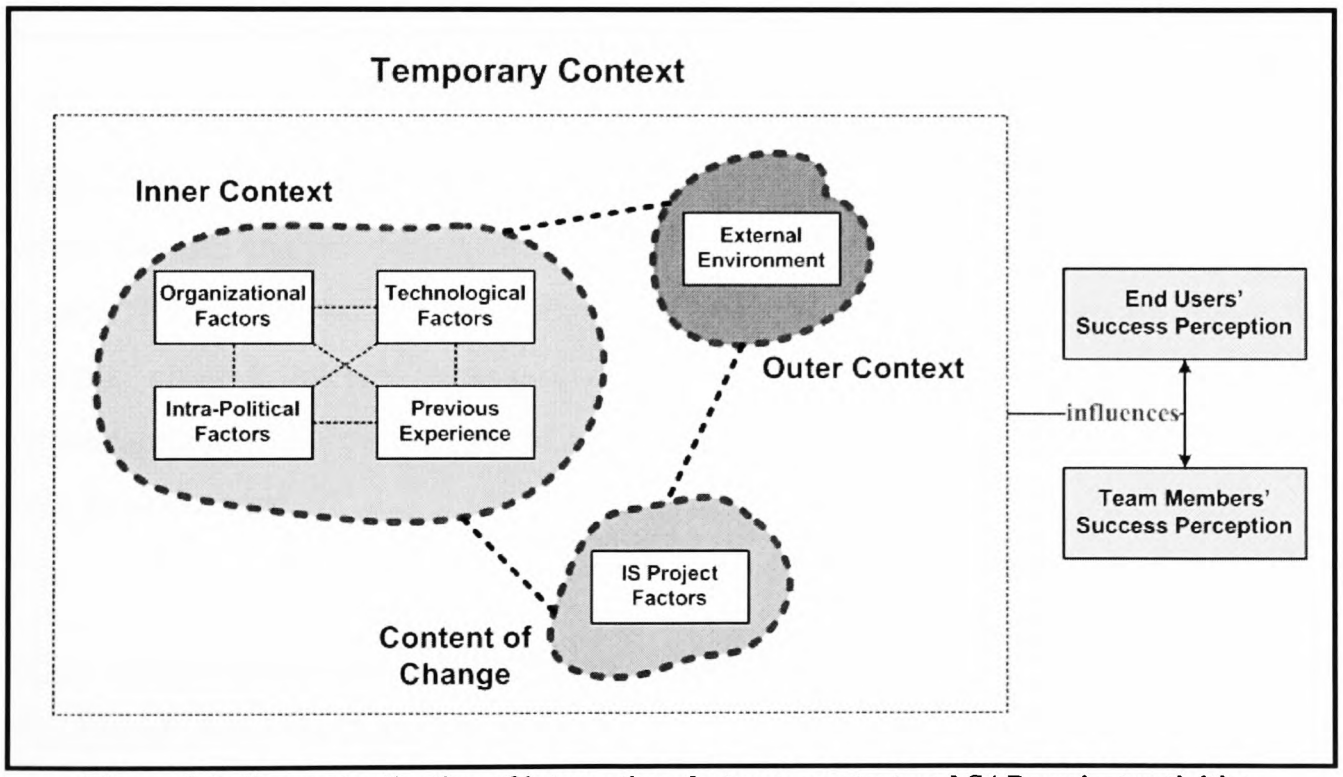


Figure 6-1: Conceptualization of interactions between context and SAP project activities

In fact, their interactions with each other at a given point of time will have led to the formation of a temporary context which is a real reflection of was going on at that time. Additionally, all relevant historical events will be included in the exploration process of the actions, reactions, and interactions among context and content of change in every

project phase. Therefore, each temporary context was dynamic in nature, as its creation depended mainly on how different categories interacted with each other in a certain setting and under particular conditions. During data collection and the initial coding process, major and obvious differences in the nature and type of interactions were noticed among the six categories (outer context, inner context, and SAP project activities) throughout project implementation. This variation was easily observable during the four phases of initiation, implementation, go-live and post-implementation activities.

Figure 6-2 shows the two major SAP projects, each divided into its four phases.

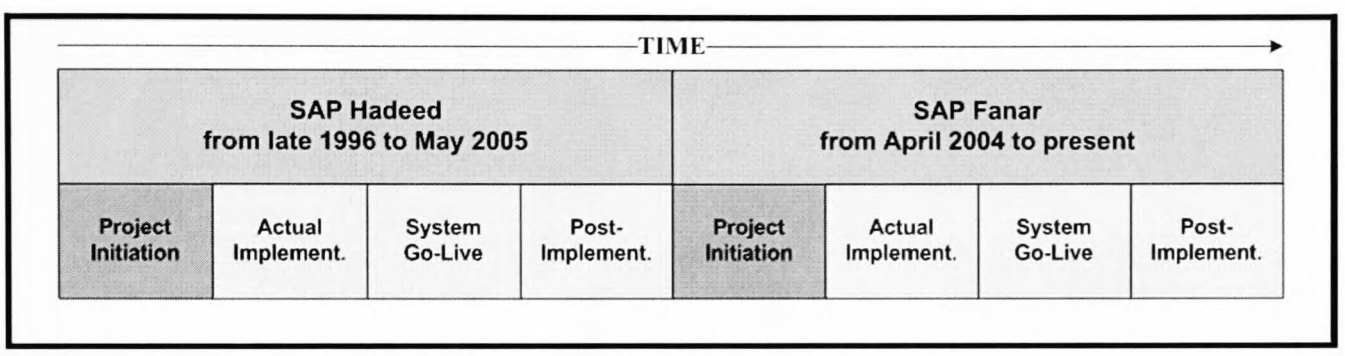


Figure 6-2: Partitioning the two major SAP projects

Each of the boxes in the bottom row of the figure represents one of the eight tasks into which the data analysis process was divided and which are dealt with intensively in this chapter. Each task involves the exploration of actions, reactions, and interactions among external context, internal context and SAP projects' activities, in order to gain an understanding of the perceptions of success during each of these phases and how they may have changed.

6.3. Alignment of Interactions among Context and SAP Projects' Activities with the Four Phases

Once each SAP project had been divided into four phases, the next step was to dig deeply and intensively inside each of these phases to explore how the six major categories interacted with each other. Doing so facilitated the understanding of stakeholders' perceptions during each phase of each project. Figure 6-3 below shows how the investigation process will be reported in the subsequent sub-sections, locating each of the eight tasks according to the chronology of the SAP projects.

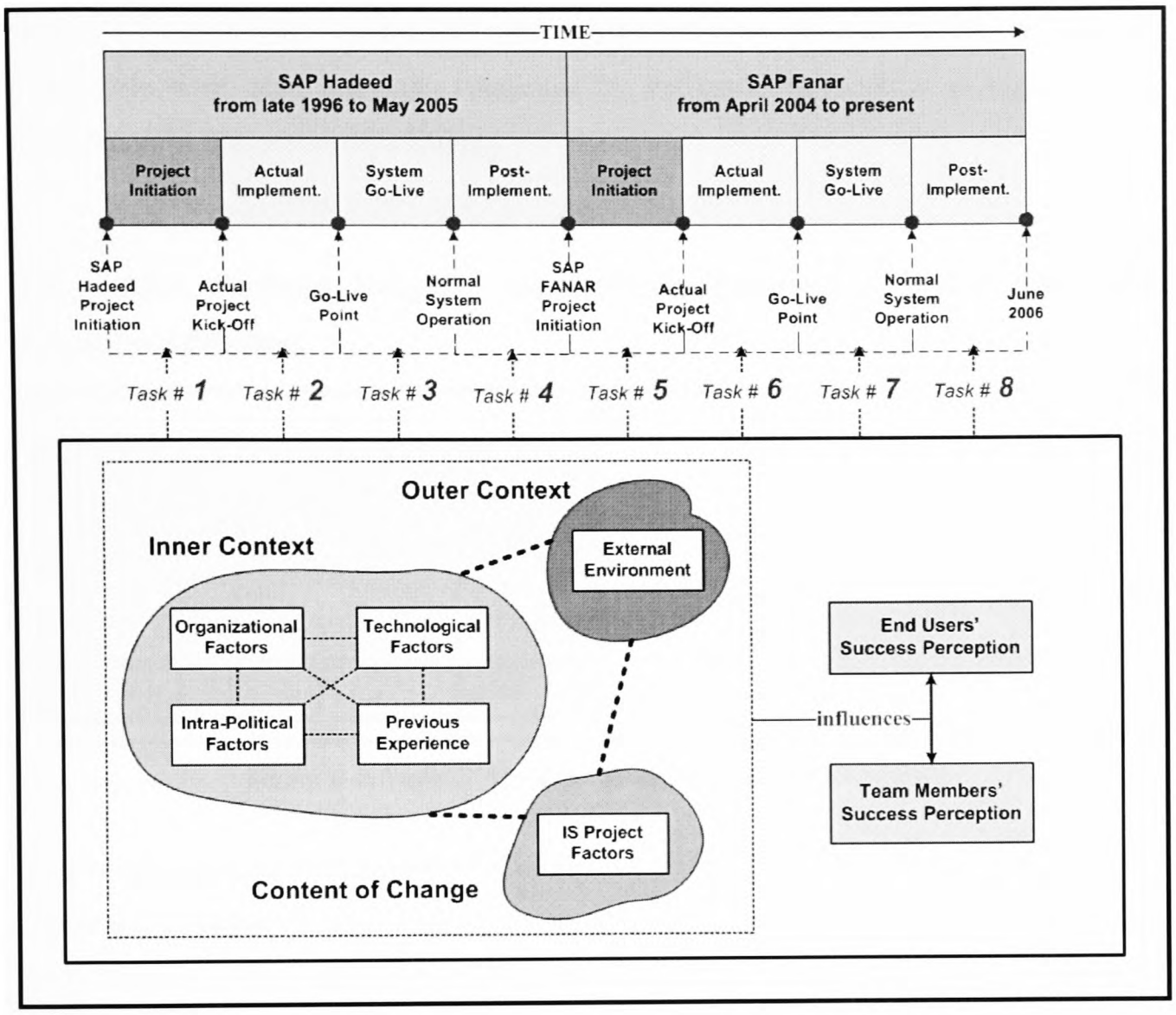


Figure 6-3: Interaction of context categories during SAP projects

Figure 6-3 thus shows that each of the eight tasks was dedicated to exploring the understanding of internal stakeholders' perceptions of success in a particular context and setting. The process of exploration begins in section 6.4 with the SAP Hadeed project, each phase of which is analysed in a separate subsection. The same phases of the SAP Fanar project are then discussed in section 6.5. These sections will give an account of the eight temporary contexts generated by means of the NVivo software, which was used to filter and retrieve the required information.

Finally, it is very important to draw readers' attention to an essential concern in this regard. In fact, during the process of change analysis during the eight project phases, there was careful consideration of all of the conditions that caused different interactions and of their consequences in each particular setting. This is a reflection of the use of GTM in regard to what is called the analytical paradigm, as suggested by Corbin and

Strauss (Corbin and Strauss, 2008). By doing so, the process of change will has the ability to reveal itself alongside the implementation process which is, though, compatible with what has been suggested by Pettigrew particularly in regard to the exploration of the process of change.

6.4. SAP Hadeed Project: Interactions between Context and SAP Project's Activities

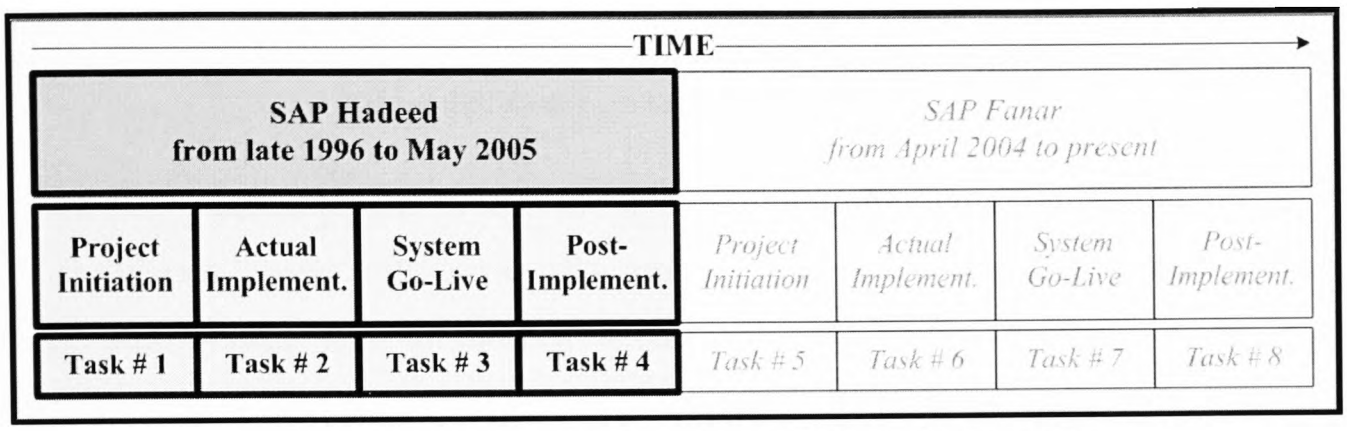


Figure 6-4: Tasks [1-4] – Four phases of SAP Hadeed project

This section and its subsections are completely dedicated to exploring different phases of the SAP Hadeed project in order to show how the outer context, inner context, and SAP Hadeed project activities acted, reacted, and interacted with each other and to understand how different internal stakeholders' groups perceived that project. Each of the four subsections represents an individual task, as seen in Figure 6-4 above. Each begins by exploring how the outer context, inner context, and SAP Hadeed activities (the six categories and their sub-categories) in a particular phase interacted with each other to form a temporary context. There is then an investigation of how different stakeholders perceived the project's success within that context. Nevertheless, the context developed in each phase did not necessary remain unchanged in the subsequent phases as newly emerging conditions sometimes contributed either directly or indirectly to the emergence of another temporary context.

6.4.1 Task 1: Interactions between Context and SAP Hadeed Project's Activities during the Initiation Phase

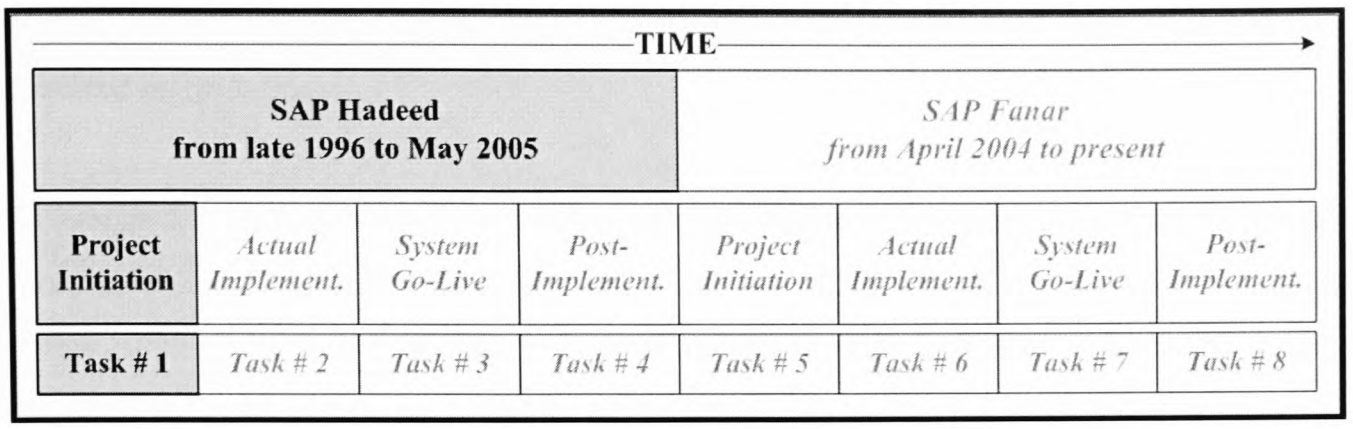


Figure 6-5: Task 1 – SAP Hadeed initiation phase

In the SAP Hadeed project as seen in Figure 6-5, the initiation phase (labelled 'Task # 1' in Figure 6-3 page 169) started when Hadeed management decided to implement the SAP R/3 system and it finished when the management decided to start the implementation process. During the exploration process of that task, different interactions among outer context, inner context, and SAP Hadeed project's activities will be exposed. However, as this phase did not encompass any sort of project team development, it was not possible to discriminate end users from team members during the investigation process. Instead, the development of different project teams, except the project manager in some cases, took place during the next phase, when it became possible to classify internal stakeholders into users and team members. Although during the data collection, some participants were classified as project team member according to their roles in SAP projects; these roles were noticeable only after the initiation phase. Thus, in this subsection, the investigation will be directed to understanding how the temporary context of the initiation phase was developed and then influenced the perceptions of end users.

6.4.1.1 SAP Hadeed – Initiation Phase: Temporary Context Development

As discussed above, some or all of the first six major categories of factors which constitute outer context, inner context, and SAP project activities that have been identified earlier, interacted with each other at each phase of each project. These interactions during a particular phase of a particular SAP project resulted in the development of a temporary context which then influenced the perceptions of the

stakeholders. In this section, a deeply detailed analysis of how they interacted with each other during the initiation phase of the SAP Hadeed project will be presented. The NVivo software played a major role in facilitating the analysis and then retrieving the required information.

Although the detailed analysis of each phase is complex and lengthy, it would have been more so if no software had been used. NVivo produced results in most cases within just a few clicks, which shows one benefit of adopting such software in facilitating and ensuring the consistency and validity of the temporary context development. It is likely that without the software, these results would not have been easily obtained. In other words, in the best case, it would have taken much longer to obtain them. Finally, the perceptions of success by Hadeed's end users at that time are explored in the following subsection.

6.4.1.2 Interpretation of End Users' Success Perceptions

Before exploring the end users' perceptions during this phase of SAP Hadeed, it is important to remind readers that Hadeed had previously failed in an attempt to implement SAP R/3 in 1995, which was terminated due to major problems with the system and with information quality. This painful experience of failure played a major role in shaping end users' perceptions of the SAP Hadeed project during its early stages. Moreover, the ignorance of the Hadeed management in implementing such complex technology contributed to an extremely pessimistic perception during this phase of SAP Hadeed. Obviously, the management started the SAP Hadeed initiation phase without communicating with end users. Indeed, they did not formally explain to users the reasons for the earlier failure or even let them know of the intention to implement SAP R/3 again.

In general, Hadeed people were used to a situation in which the management would start some projects only to cancel them soon thereafter. It is evident that in this environment the absence of strict management accountability played a major role in the emergence of such a situation. The researcher was told that end users learned about the commencement of the SAP Hadeed project accidentally. This was during the early stages of the project and before the formation of project teams. The following excerpts

from interview transcripts explicitly reveal how Hadeed management saw its end users during the SAP Hadeed project, particularly during the initiation phase.

> *...I heard informally that Hadeed had started implementing a new system called SAP but I did not know anything about it until early 1998 when I started personally to notice some activities pertaining to that project. I don't think that there was any publicity for the SAP Hadeed project during its implementation or even use.* ***[SD/LE end user]***

> *...In regard to SAP Hadeed, I joined Hadeed in late 1995 and heard informally that Hadeed had started thinking about implementing a new system called SAP, but we did not formally know anything about the SAP Hadeed project or what it meant until just a few weeks before it went live. As end users training courses took place. I think this was in 1998, which was the first formal actual mention of the system.* ***[PM end user]***

From the above excerpts, it is evident that there was no formal communication with Hadeed people and in the best case there was some informal communication between some executives and their employees, sometimes dependent on personal relationships between them. In my view, this is a natural consequence of the lack of understanding of the nature of SAP and how it should be implemented which clearly reflects the effect of inner context upon SAP project activities, the content of change. Additionally, the outer context here has an obvious effect upon Hadeed inner context and SAP Hadeed project's activities. That effect was in a form of a lack of external SAP knowledge and experts at least in the region. The following quotation supports this interpretation and reflects the management's view and understanding of SAP Hadeed.

> *...I knew about the intention of Hadeed management to implement a SAP system when we were invited to a regular meeting with the president of Hadeed. Accidentally, during that meeting, the president alluded to the intention of Hadeed to replace the current system with SAP, although the project was already in place.* ***[MM end user]***

This participant and some others used the word 'accidentally', indicating that the main aim of the meeting was not to introduce the project to Hadeed people but instead that it was alluded to incidentally during the discussion. The following excerpt confirms my interpretation in regard to the absence of any sort of communication as well as the absence of a clear understanding of the nature of SAP and of the necessary project

management skills, particularly as the interviewee claimed to have been asked to read more about the SAP system.

> *...yes I knew about the SAP Hadeed project, but that was accidentally during a meeting with the president. Although he told us, it was not a formal project announcement. It was a sort of brief announcement during the discussion and we were asked to READ about SAP system.* ***[MM end user]***

While the earlier SAP failure, a historical event occurred before the commencement of SAP Hadeed project, had a negative influence on end users' perceptions of SAP Hadeed during its early stages, the management reinforced these negative perceptions. Nevertheless, the concept of failure was rarely mentioned during the interviews, except on a few occasions, most of which pertained explicitly to the first failed attempt of Hadeed to adopt a SAP system. In fact, what was notable was the high level of dissatisfaction among most end users in regard to the way Hadeed management dealt with them. However, the negative effect of the experience of the earlier SAP system failure remained active.

In my view, it is not possible to blame the project management at that particular time, as during that phase, no formal project management teams had been developed. Therefore, it was the sole responsibility of Hadeed management itself. In this respect, the researcher found no evidence that Hadeed management made any formal efforts to announce the project or to introduce the system to its employees. The misunderstanding of how to deal with SAP system implementation was a hallmark of this phase of SAP Hadeed. This is in fact another sign to the influence of Hadeed inner context upon the project activities.

> *...There was no sort of organisation or preparation in regard to that project. We were completely neglected by the management.... I have not even heard of any effort made by the management in that regard. Really, we were completely neglected by the management and thereafter by different project teams till the go-live of that project.* ***[MM end user]***

Most importantly, from another perspective, Hadeed users were inclined to believe in the bad intentions of the management in regard to any new project. In other words, any new project was perceived by Hadeed end users as politically shaped and influenced. Thus, it would have the same fate as other projects, because the main reason behind

such projects was assumed to be to satisfy the desires of some political parties over the organisation's interest and its resources. Therefore, in such projects, the most important step was to begin the project, regardless of how it would be managed. The actions of Hadeed management during the initiation phase of SAP Hadeed supports this interpretation. Therefore, most Hadeed end users anticipated that the SAP Hadeed project would suffer the same fate as the earlier SAP project, which was termination.

> *...most Hadeed people were thinking that SAP Hadeed is just a project that is going to fail like many other Hadeed projects. Hadeed management was the main reason for the failure of some of its projects.* ***[HR end user and then power user]***

It can be concluded that some political parties played a particular role in the selection of a SAP system. In the following quotation, the participant indirectly mentions this, as some other participants did.

> *Look, SAP during that time was a new system and Hadeed took that challenge and implemented it. Thus, Hadeed was a pioneer at least in the region. We are talking about SAP in 1995. Hadeed implemented the system before even ARAMCO and SABIC itself.* ***[FI/CO team member]***

Although Hadeed had had a painful experience with SAP, its management insisted on implementing SAP again. My interpretation according to different indicators is to attribute this decision to the role of some political parties, presumably for the purpose of seeking prestige. The project manager suggested this indirectly:

> *We succeeded in replacing our technical infrastructure completely with SAP R/3 which is a world-famous system. We were the first in the region. Read some published stories in that regard. We have had lots of contacts from outside Saudi in that regard. In my view, SAP Hadeed was a successful project.* ***[SAP Hadeed project manager]***

Table 6-1: Task 1 – End users' perceptions of SAP Hadeed - initiation phase

Major Perceptions	Reasons Underpinned by Pettigrew's Ideas
Pessimistic, as they were not told of the intention to implement the new system, although they learned by chance that a SAP system was to be implemented. The project was expected to fail.	**Positive Factors:** None
	Negative Factors: • Painful earlier failure of SAP R/3 system in 1995 • Bad management attitude toward end users; no apparent communication with them, even basic • Political influence behind selection of SAP Hadeed system; prestige seeking (to be pioneer in SAP implementation in the region)

Table 6-1 summarizes end users' perceptions of SAP Hadeed during its initiation phase and lists the main factors behind their perceptions' development. In short, it is evident that the negative experience of SAP in 1995, the ignorance of the management in implementing such projects and the role of politics in the decision to implement SAP R/3 all contributed to eliminating any trace of hope regarding the project, particularly during its initial stage. Thus, Hadeed people did not perceive any positive success indicators during this phase of SAP Hadeed, but were ready to receive bad news at any time pertaining to the project, including its termination, as had happened earlier, in 1995. Here, the impact of Hadeed intra-political system and its previous negative experience with SAP system which were classified as a part of Hadeed inner context was evidently noticeable upon the project activities.

6.4.2 Task 2: Interactions between Context and SAP Hadeed Project's Activities during the Implementation Phase

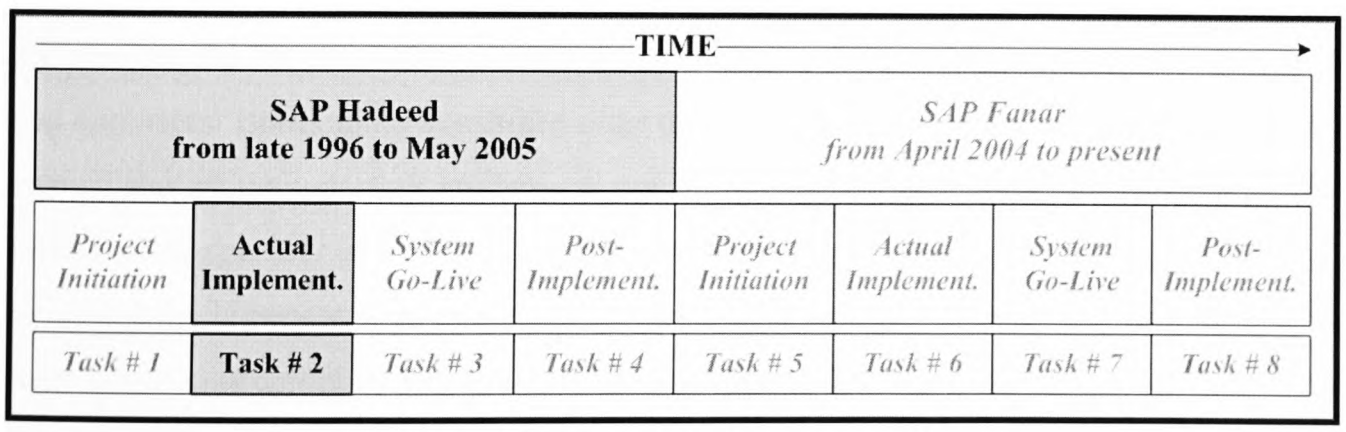


Figure 6-6: Task 2 – SAP Hadeed implementation phase

This section, as seen in Figure 6-6 above, explores task 2, pertaining to how the temporary context of the implementation phase of SAP Hadeed was constructed.

According to Figure 6-3, this phase started when the project formally started, at the end of the initiation phase, and continued until the formal announcement of the system going live.

6.4.2.1 SAP Hadeed – Implementation Phase: Temporary Context Development

During this phase, there was no obvious effect of the IS project activities upon the remaining categories. This can be attributed to the absence of any sort of formal project and change management activities during this phase of SAP Hadeed, with a few exceptions shortly before the project went live. This was particularly notable from the end users' perspective and will be explained in the following section. During this phase of SAP Hadeed project, the outer context of Hadeed continued its influence upon both Hadeed inner context and SAP Hadeed project as in the previous phase. This was due to the lack of SAP system knowledge and experts in the region. Most importantly, an additional and a clear influence was exerted by outer context, Y2K, particularly during the final stage of this phase, when the management of Hadeed put pressure on the project management to determine and commit to a specific go-live time before the approaching year 2000. This gives an indication that the project started without a fixed go-live time. The only possible interpretation for this is a lack of proper project management and a poor understanding of how to manage such projects which reflects the influence of inner context upon SAP project's activities, the content of change.

There is one more important point that is worthy of mention regarding this phase. Although the implementation phase itself was ended once the system went live, during this project the implementation process, including system configuration, customization and end users' training, all continued after this date. This was because of the decision to change the implementation strategy at the final stage of this phase, in addition to the failure of the project in 1995, when the management decided to go live with SAP and terminate the legacy system at the same time. Consequently, Hadeed now went live with SAP while continuing to run the PRIME mainframe for approximately a year. This is further evidence in support of the interpretation given above, that there was poor project management and an absence of clear organisational objectives in the implementation, except that of achieving a successful technical replacement of the PRIME system. In fact, the decision to go live with SAP Hadeed in parallel with PRIME was another major

indicator of strong management support, as it aimed to achieve a successful technical replacement of the legacy system taking into consideration the earlier failure.

> *I believe that Hadeed perceived SAP Hadeed as a technical solution and accordingly many issues emerged... Actually, the management insisted on implementing SAP anyhow, although there was poor understanding of the nature of the SAP system and how to manage the project. Hence, I am sure that Hadeed did not utilize it due to the pure technical view of it, while everything dramatically changed during SAP Fanar, which I think was the most professional project that I have ever participated in.* ***[MM team leader]***

In this phase it was obviously clear that there were noticeable effect of outer context upon Hadeed inner context which finally affected SAP Hadeed project's activities.

6.4.2.2 Interpretation of End Users' Success Perceptions

During this implementation phase, Hadeed end users did not notice any significant formal activities pertaining to the project, except the absence of some of their colleagues as a result of their joining different project teams. Although some formal project activities did take place, particularly prior to the go-live, these were very limited and mostly personal efforts by team members. Therefore, no benefits were realized from such efforts. The following excerpt addresses this particular issue explicitly.

> *...look, SAP Hadeed was a project that was implemented without any pre-planned and organized training and there was not any sort of communication with end users. There was a sort of trial-and-error approach by both Hadeed and the project management. Moreover, SAP was not well understood and neither the project team nor Hadeed management knew the nature of such systems or how to manage it. All of these factors had a negative impact on the system, which finally affected users' perceptions of SAP Hadeed's success.* ***[SD/LE end user]***

Moreover, end users appear to have believed in the influence of intra-political system, part of Hadeed inner context, on the project activities during this phase, as they did with regard to the decision to implement an ERP system in the previous phase. However, during implementation, this belief was particularly notable, more specifically during the team development process. In fact, relationships played a major and obvious role in the formation of most of teams and the selection of their members.

> *Look, in Hadeed, without power you will not survive. We are the worst among SABIC affiliates. During the SAP Hadeed project, relationships played a major role in the nomination process. If you don't believe me, just ask different people. Without power, you will be in the depths of depression and frustration.* ***[MM end user]***

Furthermore, end users did not even know the when the system would launch or go live, as the go-live time had been announced and then delayed many times. In fact, these repeated delays negatively affected end users' perceptions, leading them to suspect that the project would fail as the earlier one had done in 1995 - a historical event. Therefore, they continued to believe that they had been completely disregarded by the management of the company and the project managers, so the project was likely to be terminated. Although the project go-live had been delayed more than once and they remembered the earlier failed SAP project, end users' success perceptions were dominated by a desire to implement and then use a system that was free of faults that might affect the quality of the system or the information retrieved from it. Thus, they did not consider the delays or even the negative project management attitudes towards them as signs of failure; instead, the quality of the final product and its outputs was their main concern. This can be considered as a result of their painful previous experience which was part of Hadeed inner context.

The project managers attributed the delayed go-live date to the lack of readiness of some modules. A member of the MM team stated that "*the delay of SAP Hadeed go-live many times was a consequence of adapting the system to meet Hadeed's requirements*". Unfortunately, the project management did not explain to end users why such delays had occurred.

> *...Some modules were ready but others were not. As I have told you, you cannot go live with missing modules if your approach is big bang, or if some other related modules are not ready.* ***[PM team leader]***

At the end of this phase, there was a noticeable pattern which revealed different end users' perceptions of SAP Hadeed success during the implementation phase. In fact, the common feeling among end users was pessimistic and some of them explicitly stressed that their perceptions were negative and that they expected bad news, such as the complete failure that had happened before. Thus, their perceptions were negatively

influenced mainly by the bad change management related to the project. The following extract is from an interview with an end user who explicitly addressed the core issue.

> *... as an end user, I have observed an unbelievable attitude toward us. End users have been shocked and they were thinking that the SAP Hadeed project would definitely fail like some other Hadeed projects. We weren't even told about progress or given any new news about the project. What happened was that you heard a noise at first and then the noise disappeared for a long time and suddenly it all came back, like what happens in a tsunami.* ***[HR end user]***

To sum up, during this phase of SAP Hadeed, end users were extremely pessimistic due the obvious lack of proper project management and communications. Accordingly, they were preparing themselves for bad news such as project termination, seeing failure as typical of Hadeed projects, taking into consideration the enduring negative effect of the first SAP implementation failure in 1995. They did not trust their management and were concerned about political influences on the project. Here the influence of Hadeed inner context in a form of negative previous SAP experience; misunderstand of SAP system and how to implement it; and the role of intra-political system upon SAP Hadeed project's activities was clearly evident.

Moreover, the frequent postponement of go-live increased end users' negative expectations. Thus, their perception of the SAP Hadeed project during its implementation phase was very negative, particularly when compared with their perceptions during the previous phase.

Table 6-2: Task 2 - End users' perceptions of SAP Hadeed – implementation phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Extremely pessimistic; worse than perceptions during the initiation phase (ready for bad news and project termination). They were reminded of the context of the first SAP project failure in 1995. Thus, they expected failure to occur again.	**Positive Factors: None** **Negative Factors** • Frequent delay of go-live • Previous SAP failure • Most of the management's efforts were directed only towards team members • Neglecting end users during this phase was seen as a negative attitude towards them • Absence of any formal change management sense and effort (communications) • Political influence behind development of SAP Hadeed teams, such as the role of relationships in nomination and selection of members

6.4.2.3 Interpretation of Team Members' Success Perceptions

As this phase encompassed the creation of a formal project management team, it is evident that the second group of internal stakeholders of concern to this research now began to play a role as project members, whereas in the previous phase the only stakeholders were end users. Therefore, in this subsection, the investigation of success perception will be directed towards understanding how team members perceived project success during the implementation phase. In fact, it was evident that during this phase both Hadeed management and the project management directed most of their attention to the project members, at the expense of end users and of the project itself. Accordingly, the required resources were supplied to members of the various teams whenever needed; these included intensive periodical training courses, which took place outside the country in most cases. During this phase, once the different teams had been formulated, the project management and Hadeed management worked together in a closed environment without appearing to make any effort to communicate with end users.

> *...once SAP Hadeed project teams were created, until the system went live, we as PM end users perceived massive efforts directed towards the project team members. For instance, end users' training was very limited and was not adequate. In contrast, a lot of effort was put into training team members.* ***[PM end user]***

This may be attributed to two major factors. First, both Hadeed management and SAP Hadeed management teams had a poor understanding of the nature of the software and how it should be implemented. Secondly, Hadeed management and its project team perceived SAP Hadeed as merely an IT project whose main aim was to replace the PRIME system in order to resolve technical problems related to it. As evidence, the SAP Hadeed implementation strategy was decided in the previous phase to take no account of Hadeed's current processes, then this major decision was changed just weeks before the formal go-live. This is a convincing justification for the researcher's interpretation of the situation. The following excerpt is from an interview with the PM team leader, who was asked about the SAP Hadeed implementation strategy:

> *Hadeed decided from the beginning that its project strategy should be a green field approach and we worked hard thereafter to evaluate different as-is and to-be processes. Actually, it was not easy to change everything at once, particularly at Hadeed during that time... Unfortunately everything changed swiftly and our role was to implement the system as the end users wanted. Yes, we were looking to fulfil users' requirements, which in most cases reflected Hadeed's current business processes. This was prior to the final specified go-live time.* ***[PM team leader]***

In regard to training, team members attended intensive courses covering different aspects of SAP which taught them in detail how to configure the system and, for some of them, to customize it using the ABAP language. They were also involved frequently in project management decisions and they did not suffer from any extra workload as a result of their full project involvement. In addition to their intensive training, they were able to practise the system using the development version of SAP or what they called the Sandbox or client version of SAP R/3, with dummy data. Most importantly, they were given full authority to customize the system whenever needed without having to seek specific approval. Finally, among their major personal responsibilities were the preparation of the required end users' training courses and materials, in addition to the nomination of end users for training courses. In other words, they decided who would receive what training and when.

> *We benefited from the official training that we got and I think knowledge sharing among us as team members was beneficial as well. Additionally, I have tried many times to play with the system, the sandbox, and once I discovered a new thing I immediately contacted colleagues to negotiate that with them and so on. None of that was formal, but rather most of our efforts were personal.* ***[PS team member]***

A PP team member supported the above remarks:

> *... the project management and Hadeed management looked after team members in different ways related to the project. We practised the system before it went live and played with it free of any control. We had some external training courses that took place outside Saudi Arabia. However, once we approached the go-live, we paid more attention to users' requirements in order to satisfy them, so we not only configured the system but customized it. This was due to the late management decision to adapt the system to fit users' requirements. So we had to simulate PRIME screens and reports, as well as the business processes.* ***[PP team member]***

Furthermore, as members of different teams were asked to join the project with full-time involvement, they became aware that they might lose their original positions. Therefore, the management decided to hire some employees to replace them temporarily. This decision of the management to save their original places was appreciated by team members, causing a dramatic increase in their trust of management, although this was at the expense of both end users and the organisation's resources. Accordingly, the main objective of team members was a successful go-live with a proper SAP system in terms of its quality, whatever the consequences and price, which was the main objective of the management as well. All of this is evident from the following except.

> *... saving our original positions was an excellent decision. Consequently, we tried hard all the time to do our best during that project. In fact, we felt that management appreciated and respected us, so in return we had to do our best.* ***[Member of project management team]***

Nevertheless, the lack of project management vision in this technology adoption exercise was a factor that contributed to creating such a disorganised project.

> *...To be honest there was an overall plan, but it was not thought out in enough detail. For instance, we were informed that the go-live might be within the next two months, but we had to work on the project without any precise go-live time. Most of the decisions were like that.* ***[QM team leader]***

Table 6-3 below summarises the major perceptions of team members during this phase. It shows an increase in positive perceptions as they had already achieved most of their goals, such as acquiring proper training, practising the system, obtaining the required authority to customize any part of the system and the ability to configure the required modules. Most importantly, the continued strong commitment on the part of the management played a major role in averting any attempt to declare the project a failure. Evidence for this is that the positive attitude of the organisation's management towards the project and the teams was apparent during the exploration of this phase. Although it was evident that there was a weak understanding of the SAP system and how to manage the implementation project, this was considered a positive factor which indirectly influenced team members' perceptions of the system in a positive way.

In this phase of SAP Hadeed project, SAP Hadeed project's activities have been obviously influenced by Hadeed inner context such as the misunderstand of the nature of the implemented technology, lack of management vision in regard to SAP Hadeed system, and its strong commitment an support.

Table 6-3: Task 2 – Team members' perceptions of SAP Hadeed – implementation phase

Major Perceptions	Reasons Underpinned by Pettigrew's Ideas
Cautiously and then moderately optimistic as time passed. Their major perception of success was to achieve the management goals in go-live with SAP, meaning technical success in replacing legacy system with SAP, free of mistakes and bugs (workable system)	**Positive Factors** • Excellent experience in customizing and configuring SAP system • Project management's ignorance of SAP system's nature, potential capabilities and how the project should be managed leads to full empowerment of team members in system customization • Lack of control over the project, mainly system customization control • The availability of resources for project members was the main concern of the management • Practising the system using the development version
	Negative Factor • Previous failure still has an effect, but less than before

6.4.3 Task 3: Interactions between Context and SAP Hadeed project's Activities during the Go-Live Phase

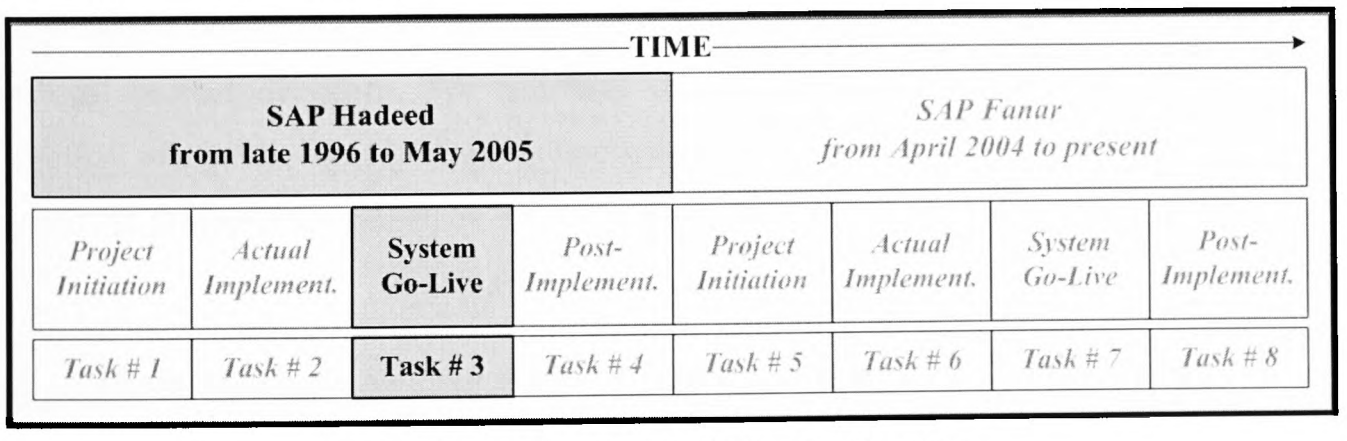


Figure 6-7: Task 3 – SAP Hadeed go-live phase

As seen in Figure 6-7 above, the analysis in this section is of the interactions among the outer context of Hadeed, Hadeed inner context, and SAP Hadeed project activities during the go-live phase of SAP Hadeed project, running from the time of going live until the system was stable and ready to run normally. During the SAP Hadeed project,

this phase took much more time than it should have done, due to a change in the implementation strategy prior to going live. This meant that it would not be possible to attain normal use and system stabilization within a short time, because of the need of project team members to pay more attention to end users in order to obtain their acceptance and approval, which was a major result of the change in implementation strategy.

Furthermore, bearing in mind the earlier experience of SAP failure, the project manager and Hadeed management decided to run SAP Hadeed in parallel with the PRIME system until they were sure that the new system would run properly and produce correct outputs. In fact, running both systems simultaneously took years of end user training, system configuration, customization and testing. Hence, this phase of SAP Hadeed was lengthy and crucial, involving many tasks and activities that would normally have taken place during the previous phase. The go-live phase eventually approached its end when Hadeed management announced formally its success in replacing PRIME with SAP R/3.

Again, the painful experience with previous SAP system, part of Hadeed inner context, continued its influence on the SAP Hadeed project activities. That influence was obvious in regard to the decision to run SAP Hadeed system and Hadeed legacy system in parallel for awhile to avoid any issues such those of previous SAP system. Additionally, the outer context of Hadeed in term of lack of available SAP knowledge and experts during that time also continued its influence and that was evident in most of critical project decisions. For instance, the decision to change the implementation strategy just before awhile of going live was a clear evidence f such outer context effect upon the project activities.

6.4.3.1 SAP Hadeed – Go-Live Phase: Temporary Context Development

After exploring the various interactions among Hadeed outer context, its inner context, and different activities of SAP Hadeed during the go-live phase, it was obvious the influence of the context upon the project activities. That influence was directly clear which caused running SAP Hadeed inline with Hadeed legacy system (PRIME) to assure the quality of the implemented SAP system. Additionally, the effect of the outer context of Hadeed upon its project activities also continued and was obviously clear in

particularly in the decision of changing the implementation strategy of SAP Hadeed project just few weeks before the go live time.

Therefore, different interactions among Hadeed context and its project activities contributed in forming a temporary context which in its turn influencing SAP Hadeed success perception of internal stakeholders. This represents the formation of a temporary context which affected end users' and team members' perceptions of SAP Hadeed's success during that phase. These perceptions are examined in the next two sections.

6.4.3.2 Interpretation of End Users' Success Perceptions

It is evident that end users found it difficult to accept the SAP Hadeed system for two main reasons. First, the earlier failure of a SAP project made them mistrust the SAP system and made them inclined to reject the very idea of SAP. Secondly, the misunderstanding and ignorance of the project management towards this new technology and how to implement it contributed to end users' rejection of the new system prior to the commencement of the go-live phase. In fact, the common perception of the SAP system during that time was that it was no more than a software package that could be easily implemented to replace any legacy system in order to address technical issues. These two factors contributed in a complementary way to end users' ignorance and increased their resistance to change, leading to a negative perception of the system and its technology. This perception was notable before the SAP Hadeed go-live phase.

Subsequently, as the project approached go-live, there was a radical change in the project management activities as a consequence of a change of project manager and then of implementation strategy. The project focus then changed radically from the team members to the end users. The researcher attributes this change to two essential project management decisions that played a major role in changing the trajectory of the project and consequently in attracting end users to accept it thereafter. The first was the decision to go live in parallel with the legacy system and the second was to configure or even customize the SAP system to meet the requirements of Hadeed and its end users as a result of the change of implementation strategy. The QM team leader shed some light on the latter reason:

> *Once the decision had been made to implement the system according to end users' requirements, we were empowered by the management of the project and Hadeed management as well to make the required customization decisions without consulting anyone. Thus, we were heavily involved in the configuration and customization process. This decision was not difficult.* ***[QM team leader]***

In the researcher's view, these two decisions were crucial but beneficial, as the project management succeeded in bridging some gaps with end users and mitigating some sources of resistance. These played a major role in facilitating and encouraging end users' participation in the project and then increasing their acceptance of the system. Hence, they reacted positively to these two decisions and their attitudes towards the project gradually became more favourable.

Once SAP Hadeed went live, there was a pattern of very gradual increase in satisfaction with the system and acceptance of it among different end users. It was evident that the project management did not have the required skills to run the project, due to the absence of some project management sense as well as a lack of SAP expertise at that time. For instance, end user training was not well planned or organised and there was a noticeable lack of appropriate training materials. Thus, the end user training which was conducted was, in most cases, neither sufficient nor appropriate, according to end users of different SAP modules. All of these contributed to the sluggishness of growth in system satisfaction and acceptance among end users, although some improvement was observed.

> *...There was a certain schedule for training but frankly that training was not sufficient. I can say most of these efforts were not well organized and were basically individual efforts. Actually, they were very limited.* ***[MM end user]***

> *...In fact, there were no formal and comprehensive training efforts and no well prepared materials either. Therefore, I had to work hard to get the information I needed.* ***[PS end user]***

An important point to be made here is that when SAP Hadeed went live, the majority of end users lacked not only the essential skills and knowledge pertaining to SAP itself but even the basic ones needed for the new platforms and applications such as Microsoft Windows, Microsoft Office and the email client. Furthermore, they lacked basic knowledge of SAP and its capabilities, taking into consideration that Hadeed was still

using a centralized mainframe system, while SAP is a client-server system running on new hardware and software platforms.

> *...most Hadeed users had no information or even had not seen a PC or Microsoft Windows before the system went live. Thus, technology change was a major challenge for Hadeed...*
> *...getting used to SAP and becoming familiar with it actually took a long time. But during that time I observed a slight drop in users' complaints and even their requests for support.* ***[HR end user]***

A member of the QM team expressed a similar viewpoint, which supports the above interpretation.

> *Look, end users had no experience of Microsoft Windows. Briefly, users were using the same processes but on different platforms, for instance, a new database, new SAP system as well as a new OS (Windows), so it was difficult for users to accept such a massive change easily in their daily work.* ***[QM team member]***

The above quotations pinpoint the main source of dissatisfaction; however, it was evident that end users' perceptions of the system changed once the project management started to pay them some attention. As mentioned above, the SAP Hadeed go-live period was an essential turning point, particularly in end users' perceptions, although there were some complaints. In the worst case, during this phase end users realized how the system worked in practice and started using the development version of SAP, which had been provided with some dummy data. Consequently, they were at least able to learn about some of the system's capabilities and functionalities, such as its GUI. Additionally, they received some other training in basic IT skills and applications such as Windows and Office. This did not free the project management from it responsibility; instead it was struggling to address quickly any negative consequences of its earlier mistakes.

Finally, it is evident that both the project management and Hadeed management perceived this phase as a good opportunity to make sure that the new system was running properly, free of any mistakes, particularly during data manipulation, which meant doing comprehensive live testing. In other words, the project management did its best to deliver a system which exactly mirrored the legacy system and then started to

think seriously about further system development. In fact, Hadeed succeeded technically in implementing a SAP system that to large extent did mirror its legacy system processes, although this was a major impediment to its future business growth and development.

> *...Well, when SAP Hadeed was first implemented and went live, it was not a detailed system but it was doing what PRIME did. However, later on, the system was developed piece by piece according to users' requirements until the commencement of the Fanar project.* ***[PM end user]***

All in all, this phase can be seen as a turning point, where Hadeed end users dramatically changed their perceptions of the SAP system's success and went from being pessimistic to being optimistic. In fact, what the project management did during this phase helped end users, to a large extent, to trust the system and to begin to disregard the earlier failure. Thus, users gradually approached a perception of certainty that the implementation of SAP Hadeed would succeed. At the end of this phase, no uncertainty regarding success was apparent among end users, who were confident in the system, even though this phase took approximately a year. Eventually, once the project management was sure that SAP Hadeed was ready and working properly, Hadeed announced the complete retirement of PRIME and thus SAP Hadeed became the company's only IT system. Table 6-4 below outlines end users' perceptions during the go-live phase of SAP Hadeed.

In fact, during this phase of SAP Hadeed project, there were clear influences of Hadeed outer context, the lack of available SAP knowledge and experts in the region, upon Hadeed inner context and its project activities. Moreover, Hadeed inner context, previous SAP painful failure case, in its turn, also influenced SAP Hadeed project activities and caused them some major changes such as changing project manager and implementation strategy.

Table 6-4: Task 3 - End users' perceptions of SAP Hadeed – go-live phase

Major Perceptions	Reasons Underpinned by Pettigrew's Ideas
Users cautiously and gradually became moderately optimistic that the result of change would be a high quality system producing correct outputs. Therefore, to succeed, they looked forward to a workable system that would meet their needs	**Positive Factors:** • Implementing the system to meet end users' requirements and current business processes • Realizing the parallel running of SAP and PRIME systems • Excellent communications with end users • End user training, although it was highly dependent on individual efforts of team members and was not sufficient • The simplicity of customization decisions • Gradually understanding SAP's nature, benefits and some of its capabilities as the system began to be used in the actual workplace
	Negative Factors: • None, as the parallel running of SAP and PRIME made users feel safe

In the discussion of the post-implementation phase, it will be shown how a stronger perception of success emerged as a consequence of a better understanding of the technology itself and of the virtual disappearance of the negative consequences of memories of the SAP failure during 1992-1995. In other words, Hadeed end users were able gradually to replace their negative perceptions of SAP based on painful experience with a new positive experience which would then play a major role in changing the trajectory of this project and the subsequent SAP Fanar project. Meanwhile, the following subsection returns to the go-live phase of SAP Hadeed and the perceptions of team members.

6.4.3.3 Interpretation of Team Members' Success Perceptions

The perceptions of team members of the success of SAP Hadeed during the go-live phase were different from those of end users. After the system went live, team members were looking to deliver a proper, well configured or customized system that was tailored to the needs of Hadeed and its end users. Thus, their perceptions of success were influenced by end users' apparent acceptance, which meant the compatibility of the SAP functions delivered with what end users wanted. This, in turn, ensured the successful delivery of the required functions.

> *SAP Hadeed in reality was fully customized to suit Hadeed requirements. We succeeded in tailoring SAP as a system according to the requirements of Hadeed business processes.* ***[QM team leader]***

Another measure of perceived success which was of particular concern to team members was the validity of messages exchanged between segments of the configured system, which they called comprehensive testing.

> *...During SAP Hadeed, we had to work hard in order to satisfy different end users' needs... They did not reject the idea of implementing SAP but they insisted on implementing SAP to simulate everything in PRIME, including screens, reports, menus etc. This meant that we had to provide them with the same PRIME functionalities using SAP. In some cases, we were even asked to copy the reports and screens in terms of colour, fonts, style etc.* ***[PM team leader]***

The members of each SAP module team were fully responsible for delivering the required end users' training sessions and preparing the required training materials on an individual basis. Taking that into consideration, particularly in the absence of clear plans and strategies for such training on the part of project management, there was a noticeable variation among different teams in that regard. End user training, particularly after system go-live, had an ad hoc quality because of this dependence on members of each SAP module team. Thus, training was not well organised or planned, particularly those sessions pertaining to modules which interacted with each other, such as MM and PM or SD, PP and QM. Consequently, authorization was a common problem among different end users, particularly after SAP Hadeed went live.

All in all, as seen in Table 6-5 below, the success perception of team members of SAP Hadeed during its go-live phase was mainly measured according to their final deliverables. They considered going live with a system free of errors that met their end users' requirements and Hadeed's needs as a measure of the success of their efforts, notwithstanding the absence of proper planning, organisation and control at the project management level, as each team was fully empowered to do as it saw fit.

> *...by the time we returned to our departments after completing our mission, Hadeed had implemented a powerful IT infrastructure that met its needs. Personally, I saw everybody well satisfied with that system, and later their*

> *satisfaction was increased due to the continual support and development of that system.* ***[PP team member]***

It is evident that during this phase, members of the different teams perceived SAP Hadeed as success, in that they had achieved their goal, a high quality system producing high quality information. The following quotation supports this interpretation.

> *...we had to satisfy our end users either by configuring SAP to meet such requirements or by developing these requirements in the SAP system using the SAP programming language, ABAP, if the required functions were not SAP built-in functions. Thus, we finally succeeded in delivering a comprehensive system which met their needs for years.* ***[HR team member]***

During this phase, it was obvious that the effects of previous bad experience with SAP and the effect of lack of available SAP knowledge and experts in the region both were positive upon teams' members. That positive effect was due to the high concern that Hadeed management paid to SAP Hadeed teams' members but not its end users. In other word, same causes causing different effects upon different groups of stakeholders although those groups sit close to each others.

Table 6-5: Task 3 – Team members' perceptions of SAP Hadeed – go-live phase

Major Perceptions	Reasons Underpinned by Pettigrew's Ideas
Extremely optimistic. Members perceived the system at the later stages of this phase as successful according to its final deliverable both as a system and in information produced. Both must meet end users' needs.	**Positive Factors:** • Successful technical replacement of legacy system • Good experience in SAP system and its related aspects (e.g. Windows) • Empowerment to customize the system
	Negative Factors: • None

6.4.4 Task 4: Interactions between Context and SAP Hadeed Project's Activities during Post-Implementation Phase

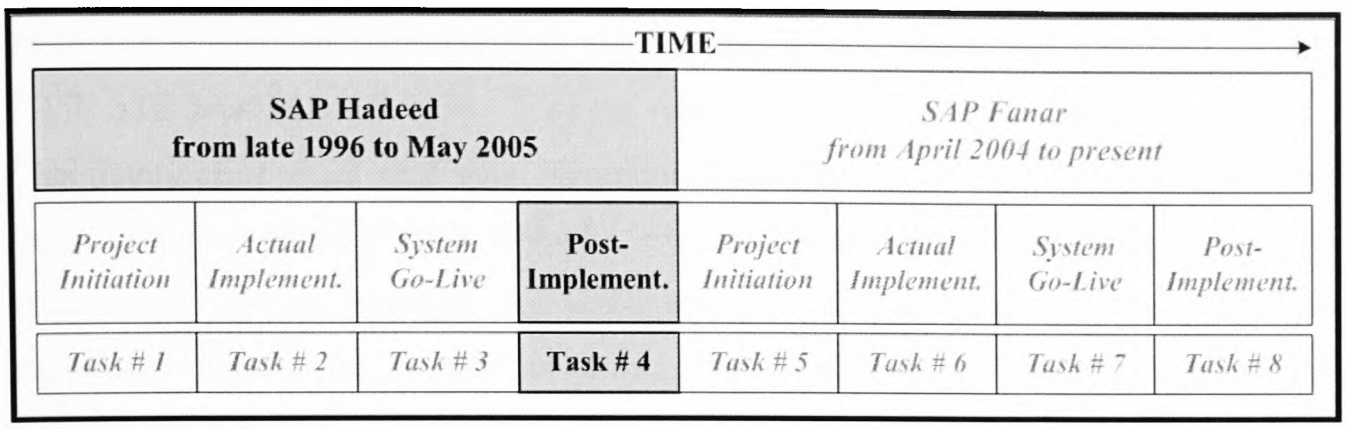


Figure 6-8: Task 4 – SAP Hadeed – post-implementation phase

As seen in Figure 6-8 above, the post-implementation phase of SAP Hadeed is the last to be examined in this part of SAP Hadeed project investigation. By definition, this final phase is considered not to have finished until the commencement of an upgrading or the initiation of a new project. Therefore, it began when SAP Hadeed began to run normally and ended with the commencement of the initiation phase of the SAP Fanar project in April 2004, the second major SAP projects in Hadeed. Adopting this definition will give the ability to link the SAP Hadeed and SAP Fanar projects in a single coherent investigation.

Nevertheless, determining the start point of this phase was not straightforward, as it was difficult to determine when the system achieved stability and normal running. Therefore, the researcher had to dig deeply into the collected data in order to identify the proper point in time that can be said to mark the beginning of this phase. In fact, the project management decision to go live with SAP in parallel with the legacy system was an important indicator of this point. Hence, this phase of the SAP Hadeed project is deemed to have started when the project management decided to completely terminate the legacy system and to begin relying solely on SAP as the official unique information system in Hadeed. In other words, the decision to terminate PRIME was an obvious indicator of the stability of SAP Hadeed in its normal use.

> *...both systems, PRIME and SAP Hadeed, were running simultaneously for a while after the go-live of SAP Hadeed. Finally, Hadeed decided to terminate the PRIME system. This was when we made sure that all data were migrated*

> *correctly from PRIME to SAP and that SAP was in stable state and functioning as required.* ***[QM team leader]***

In fact, this occurred approximately a year after SAP Hadeed had gone live, in late 1999; a PP team member said, *"...at the end of 1999 we had a stable system that has been considered since that time the main IT system of Hadeed"*. Hence, the post-implementation phase of SAP Hadeed started at the end of 1999 and finished in April 2004 when SABIC initiated the replacement SAP Fanar system. The following subsections explore the interactions among Hadeed outer context, its inner context, and SAP Hadeed project activities which then influenced the perceptions of success of different groups of internal stakeholders during this phase.

6.4.4.1 SAP Hadeed – Post-Implementation Phase: Temporary Context Development

As with the other phases discussed above, the temporary context of this phase is considered to have been created by interactions among Hadeed outer context, its inner context, and SAP Hadeed project activities. This context then played a major role in influencing the perceptions of success of the various internal stakeholders' groups, as discussed in the following two subsections.

In fact, a detailed exploration of the interactions among Hadeed outer context, its inner context, and SAP Hadeed project activities exposed that each of these three major components has acted, interacted, and reacted differently in somehow compared with their situations during previous SAP Hadeed phases. During this phase, there was an obvious effect of Y2K phenomenon and the lack of experts and knowledgeable people in the region during that time upon Hadeed inner context and its project activities. This was obvious in a form of number of teams' members' resignations from Hadeed due to the external demand on such people as well as the empowerment of teams' members to customize the system the way end users like it without strict control.

Moreover, some project activities have contributed positively in replacing gradually previous bad experience that Hadeed had with SAP to be positive via full authorization to customize the system the way users like it. Additionally, there was an obvious role of the intra-political system of Hadeed, part of Hadeed inner context, on project activities

in a form of strong commitment to the project as well as on nominating some of Hadeed people to join external rich and academic training on SAP.

6.4.4.2 Interpretation of End Users' Success Perceptions

> *SAP Hadeed was more than an excellent system because of its huge functionalities and capabilities. I can say that nothing is impossible with SAP.* ***[HR end user]***

The above excerpt is an appropriate way to begin this exploration of end users' perceptions of the success of SAP Hadeed during this phase. In fact, this period of time was the lengthiest period of the SAP Hadeed project, lasting roughly five years. Therefore, end users' perceptions at the beginning of this phase were very different from those at the beginning of the initiation phase of the SAP Fanar project. However, there was a common feeling among most of Hadeed's end users in regard to SAP Hadeed during this phase.

Once the project management decided to switch off the PRIME system and consider SAP Hadeed as the unique IT system to run Hadeed's business, the majority of end users believed that SAP Hadeed was now a fait accompli, especially given the notable management commitment and strong support for the project. Thus, they decided to accept it, particularly as it had proved its reliability and functioned as required without any obvious faults, which was their main concern. Thus, they began to trust the system and continued to move away gradually from their previous negative view of SAP as having been linked to the experience of failure.

> *After a while of using the system, users started to ask SAP teams for more functions and reports. This means that they started to realize the benefits of the system. In fact, Hadeed users realized the potential capabilities of SAP which led them to believe that nothing was impossible with SAP.* ***[PS end user]***

During this time, users' trust in SAP grew and the misunderstanding – or to be more precise the ignorance – of the technology on the part of Hadeed and its SAP project management contributed unintentionally to users' positive experience of SAP and related technologies such as the Windows platform, all of which helped them in

realising the importance of change. The researcher detected an obvious focus upon end users and their departments' requests, although there was no sort of support plan or policy in place during this phase. Hence, informal communications operated among end users and team members during that period and Hadeed acquired an excellent IT solution that completely satisfied its end users, as any new requirements would be easy to implement internally, especially given the possibility of customization as former team members were empowered to customize any new requests.

> *Finally, Hadeed built a successful system that was able to deliver the required functions with its users and fit into their needs for years, with the possibility to add any new requirements.* ***[MM end user]***

During this phase, the strong support and commitment of the management for the project was evident. As the system approached normal running, the management decided to send approximately 15 of its end users and former team members abroad for intensive advanced training in SAP configuration. Most of them gained the required qualifications, so that decisions to configure the system to fit new needs were now easier than before. This supports the interpretation of the existence and continual management support during this phase. Indeed, during the nomination of these 15 candidates, the role of relationships was notable.

It is significant that at this time, the region suffered a particular shortage of SAP skills and expertise, prompting a number of Hadeed end users and former team members to leave the company and take posts with companies outside the SABIC group which were intending to start or had started their own SAP implementation programmes as a consequence of Y2K. Although Hadeed offered them good terms, including promotion, not to leave the company, most of them rejected these offers and decided to quit. This phenomenon attracted the attention of the researcher during data collection and he investigated it in some detail, concluding that this turnover was motivated by revenge or retaliation. In the light of the aforementioned role of internal politics, a part of Hadeed inner context, in shaping the SAP Hadeed project activities, some people felt that there was discrimination against them, so they seized the opportunity of the SAP Hadeed project to work hard in order to become well qualified in SAP, simply in order to revenge themselves by leaving the company particularly there was huge demand on such people in the region during that time.

All in all, it was evident that end users perceived SAP Hadeed as a successful replacement to the PRIME system with the addition of extra functionalities. Hence, they were very satisfied during this phase and their satisfaction gradually increased with time. This was made obvious by the fact that the researcher heard it said on many occasions during the field trip that "*nothing is impossible with SAP*". Table 6-6 summarises this perception and lists the most notable factors that contributed to its development.

Table 6-6: Task 4 - End users' perceptions of SAP Hadeed – post-implementation phase

Major Perceptions	Reasons Underpinned by Pettigrew's Ideas
Moderately optimistic, gradually becoming extremely optimistic and very satisfied. This was due to the delivery of an excellent system with continuous support and development, in line with end users' requirements.	**Positive Factors:** • Realizing the benefits of SAP over PRIME • Gaining much positive experience, particularly related to SAP R/3, gradually eradicating memories of the experience of SAP failure in 1992-1995 • The implemented SAP system ran smoothly without any quality issues • The outputs of the system were better than anticipated (information quality) • The continuous support during this phase was excellent in terms of quality, delivery and satisfaction • Lack of constraints on customization decisions, as end users were able to request any customization and their power users could deliver it easily
	Negative Factors: • Some minor effects of internal politics

6.4.4.3 Interpretation of Team Members' Success Perceptions

> *We ended up with a reliable system that provides the required information whenever it's requested and that reflects real-time information. Additionally, we succeeded in implementing a system that helps in streamlining Hadeed business processes as well integrating different functions into one comprehensive system which will be able to serve different departments.* ***[PM team member]***

The above quotation explicitly reflects a notable perception of success by the majority of team members during the final phase of the SAP Hadeed project. In fact, the system

was perceived as successful by team members before end users. This was due to their early involvement in the project as well as their absolute empowerment to customize the system. While the negative consequences of the first failed SAP project persisted for team members, there was a dramatic shift during this phase and the previous one, whereby joining the project transformed this into a good experience.

> *I am sure that we succeeded in implementing SAP and ended up with a system that will help in overcoming the previous failure and its effects.* ***[MM team member]***

However, only once the PRIME system was terminated were they certain of the success of the new project. The only possible interpretation of this success is the delivery of a high quality system that produced the high quality information which they really wanted. Here, the effect of Hadeed outer context, lack of SAP experts and knowledge, on Hadeed inner context, misunderstanding of the nature of SAP system, and its SAP project activities, was obvious. That effect contributed in shaping Hadeed people's success perceptions in regard to SAP Hadeed particularly at this phase of the project.

> *I think Hadeed's use of SAP was more than good. The users needed a long time to absorb the huge SAP functionalities, so at the final stage of SAP Hadeed, I think we delivered an optimal solution that met our needs better than we expected.* ***[QM team leader]***

The following excerpt supports the above viewpoint but from an FI team member's perspective.

> *...we succeeded in SAP implementation and then delivering an ultimate system but this was only during the final stage of SAP Hadeed, not during the initial stages.* ***[FI/CO team member]***

Furthermore, there was a set of goals and targets that were already satisfied during this phase and which were used to measure perceptions of success. For example, integrating different functions into one system, overcoming the legacy system's drawbacks and running a system free of errors were all major targets that different team members were struggling to achieve.

> *I said we succeeded due to a comparison that I made between the old and new situations as well as the new features of SAP Hadeed. And the integration of*

> *different modules into one system was another measure of success. Finally, we succeed in implementing SAP and consequently overcame the previous failure and its negative effects.* ***[PM team member]***

More importantly, once this phase started most of the project members went back to their departments and found their positions reserved for them as they had been promised. This evidence of commitment to its promises on the part of the management increased, indirectly, members' positive perceptions of the project. In fact, as noted with respect to the preceding phases, Hadeed management and the project management both directed their efforts towards satisfying members of the SAP Hadeed project in order to ensure the successful technical replacement of the legacy system. This noticeable concern was perceived positively by many team members.

Finally, the SAP Hadeed project benefited team members in that they obtained experience and knowledge that would help them in participating in other SAP projects outside Hadeed. Regardless of the quality of their experience and knowledge, during the final years of the last century, there was great demand for such people, particularly in the region. This has been considered as a part of Hadeed outer context during that time which influences SAP Hadeed project at this phase of the project. Accordingly, obtaining such knowledge was an implicit factor supporting their perceptions of success.

To sum up, many project team members were extremely optimistic during this phase, as they delivered what they were looking for, which helped Hadeed people for many years in doing their business more effectively.

Table 6-7: Task 4 - Team members' perceptions of SAP Hadeed – post-implementation phase

Major Perceptions	Reasons Underpinned by Pettigrew's Ideas
Extremely optimistic, as they succeeded in delivering the required system that satisfied both the management and end users. Attaining knowledge and experience related to SAP was another achievement that contributed indirectly to their perceptions of success.	**Positive Factors:** • Hadeed management kept its promises to restore team members to their original positions • Management appreciation of their efforts in running the project • Satisfying the end users • Delivering an excellent IT tool (customized SAP system) which successfully provided high quality information • Accomplishing the objective of the management by successfully replacing PRIME with SAP R3 • Gaining expertise, particularly in customization and configuration of SAP
	Negative Factors: • Some minor effects of internal politics

6.5. SAP Fanar Project: Interactions between Major Categories

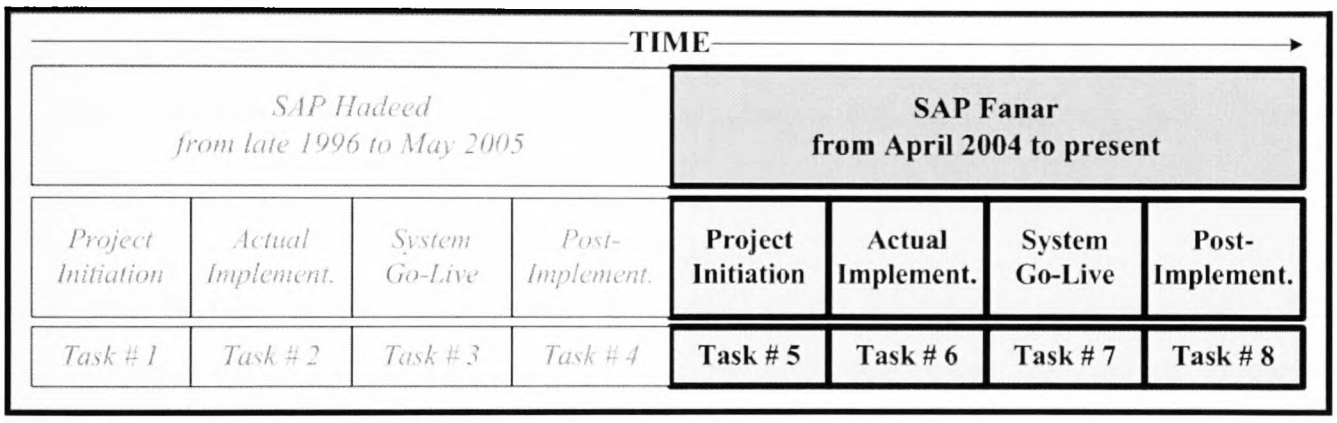


Figure 6-9: Tasks [5-8] – Four phases of SAP Fanar project

As shown in Figure 6-9 above, this section explores the interactions among Hadeed outer context and all of its components, Hadeed inner context, and all of its SAP Fanar project activities (the six major identified categories of factors) during each of the four phases of the SAP Fanar project, labelled as tasks 5 to 8. At the end of each task, the perceptions of success by the various internal stakeholders during the phase in question will be examined, along with the major reasons for the interpretations offered of these perceptions.

6.5.1 Task 5: Interactions between Context and SAP Fanar Project's Activities during the Initiation Phase

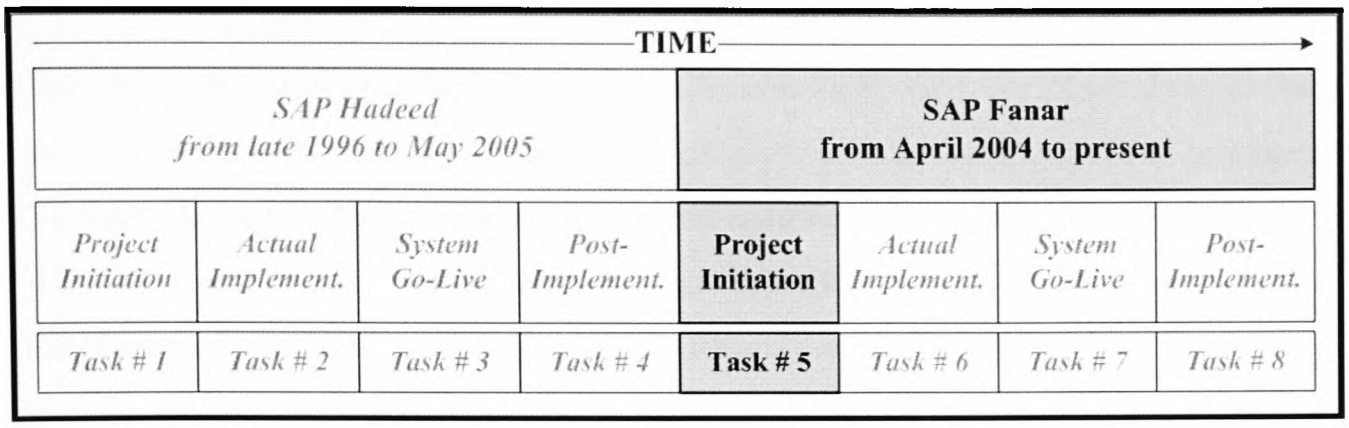


Figure 6-10: Task 5 – SAP Fanar initiation phase

Before starting to explore the interactions between context and SAP Fanar activities during the initiation phase of the SAP Fanar project, it is important to remind readers that Hadeed is an affiliate of the SABIC group, as depicted in Figure 4-9 in chapter four. Before the emergence of the idea of the SAP Fanar project, Hadeed managed its business internally without referring to SABIC, except at the end of each year for the purpose of closing financial reports and budgeting. Otherwise, Hadeed took its own decisions, including on implementing and managing its various IT projects, such as SAP Hadeed.

This was the case before the initiation by SABIC of the SAP Fanar project in 2000, for the purpose of consolidating and unifying its affiliates under one set of business processes using the well integrated and comprehensive SAP R/3 system. This was a strategic decision by SABIC to implement SAP across all its affiliates, replacing their individual legacy systems and business processes, taking into account the embedded SAP best practices. In other words, the implementation strategy was to adopt the system as-is, making modifications only in very restricted cases. SABIC also decided to follow a big bang approach in each of four groups of affiliates before moving to the next, Hadeed being in the last of these groups. Hence, although the project started in 2000, it did not affect Hadeed until 2004. Here, it was obvious the role that outer context of Hadeed, external political system, had played upon Hadeed inner context and SAP Fanar activities. Additionally, the implementation decision was made by SABIC for the reason of confronting the expected competition as well as the increased demand on its

products. Therefore, this is another sign of the influence of outer context upon Hadeed inner context and SAP Fanar project activities.

Thus, the SAP Fanar initiation phase started in late 2000 and ended when Hadeed was asked to develop its various teams for the purpose of implementation, in April 2003. The SAP Hadeed system remained active during the initiation and subsequent phases, until SAP Fanar went live at Hadeed, but the IS project categories explored during the four phases of the SAP Fanar project pertain directly to SAP Fanar only.

In the following subsections, the discussion covers the initiation phase of the SAP Fanar project, showing how both sorts of Hadeed outer and inner contexts; and SAP Fanar project activates, the six major developed categories of factors, interacted with each other to form a temporary context which played a major role in influencing the perceptions of success of the various stakeholder groups during this phase.

6.5.1.1 SAP Fanar – Initiation Phase: Temporary Context Development

The generated temporary context of the initiation phase of SAP Fanar was developed according to the actions, reactions, and interactions between Hadeed outer and inner contexts; and its SAP Fanar activities, the six major categories, during this phase of the project. This is a result of combining all obvious major actions caused by each individual category and its subcategories that took place during this particular phase. Consequently, the temporary context will in its turn have influenced internal stakeholders' perceptions of the success of that phase. It is important to reemphasize that in this phase of the SAP Fanar project, no project teams had yet been formed, so as for SAP Hadeed, this exploration process considers Hadeed employees in general and treats them as end users, although some went on to be team members in subsequent phases.

6.5.1.2 Interpretation of End Users' Success Perceptions

This subsection explores how the temporary context of the initiation phase influenced end users' perceptions of the SAP Fanar project during this phase. Given the nature of this phase, most Hadeed employees did not notice the existence of SAP Fanar in their

work. In fact, the SAP Fanar system had not yet been implemented within Hadeed and the various Hadeed project teams had not yet been constituted. What is notable is the way that SABIC ran the SAP Fanar project, as its project management was perceived as exciting and amazing by many Hadeed people. This was because of their previous experiences, including of the SAP Hadeed project, during the early stage of which Hadeed management had failed to communicate with its people. In contrast, during the early stages of the SAP Fanar project SABIC paid close attention to all of its employees including those at Hadeed. In fact, SABIC announced the project formally and started its marketing campaign as soon as it had decided to implement it, during the early stages of the initiation phase. Here, it was obvious that SABIC people has good understanding of the nature of SAP system and how to deal with it due to the availability of resources and experts which then affected SAP Fanar project activities. This was in a form of running excellent and amazing project and change management programs. In fact, this was an evident example of the effect of the outer context of Hadeed upon its Fanar project activities.

> *There was a huge marketing campaign to describe what Fanar was, what SAP was, why SABIC was introducing Fanar, what its goals were, etc. It was not comparable with what Hadeed did previously, when we weren't told about the intention of Hadeed to implement the SAP system.* ***[PP end user]***

Thus, during the data collection process, no complaints were noted about SABIC's handling of the initiation phase. On the contrary, there was evidence of widespread appreciation of SABIC in that regard. Additionally, SAP Fanar was a well organized and planned project, particularly when compared with SAP Hadeed, where most end users had formally been told nothing about the project until a few weeks before it went live.

> *The SAP Fanar project started with an intensive campaign to make users aware of the project. It was like a marketing effort and SABIC used different methods to communicate with us such as brochures, emails and even a Fanar website... SABIC created a website on its intranet dedicated to the project. I am sure that whatever Fanar project management did it was better than the way that Hadeed managed its SAP Hadeed project.* ***[FI/CO end user]***

This view is supported explicitly by an HR end user:

> *Fanar was a very well organized and planned project. There were lots of awareness campaigns and programmes via email, flyers, workshops, etc. I personally heard about Fanar in 2001 when SABIC decided to implement the system. It was completely different from what had been done during SAP Hadeed. Really, SAP Fanar was a huge, intensive, well organized and planned programme.* ***[HR end user]***

All in all, as shown in Table 6-8 below, during this phase of the SAP Fanar project most Hadeed people appear to have been well satisfied and to have had an extremely optimistic perception of the system. This interpretation is mainly based on two pieces of evidence. The first concerns the way that SABIC managed the project in its early stages in terms of its communication with Hadeed people, keeping them informed of the progress of the project. This was noticeable not only during this phase of the project but also during the subsequent phases. The second reason for such extremely optimistic perceptions was Hadeed people's positive experience of SAP and the confidence gained during the implementation and use of SAP Hadeed. This is highlighted in the following quotation.

> *I'm sure that there was no one in SABIC and its affiliates, including Hadeed employees, who did not know what Fanar was, what SAP was, why SAP, how SAP would affect SABIC's business and so on... As Hadeed employees, we already had a SAP system; therefore we did not have to worry about SAP Fanar – we could handle it very easily.* ***[MM end user]***

Table 6-8: Task 5 – End users' perceptions of SAP Fanar - initiation phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Satisfied and extremely optimistic	**Positive Factors:** • Confidence arising from positive experience of SAP Hadeed • Excellent project management activities • Excellent communication and efforts to inform end users
	Negative Factors: • None

The following excerpt reflects a common belief among Hadeed users, particularly after the commencement of SAP Fanar project.

> *We discovered that we did not understand SAP in the proper way till SABIC started to announce the SAP Fanar project. We realized that we were doing a rubbish job during the SAP Hadeed project. The ridiculous thing was our*

> *omission on the users' side. Fanar was an excellent project at a different level although there were some mistakes and issues.* ***[QM team leader on SAP Hadeed and then SAP Fanar]***

All in all, the way that SABIC managed the SAP Fanar project attracted the approval of many Hadeed people in comparison with the way that Hadeed had handled the SAP Hadeed project, where the initiation phase had started and finished without any apparent attempt by the company or project management to announce the project formally or to communicate in any way with potential end users. In fact, SAP Fanar gave Hadeed people the opportunity to discover the truth of how badly some aspects of the SAP Hadeed project had been undertaken. In other words, they discovered that they did not understand the SAP system and how it should be implemented, although SAP Hadeed had been in use for years.

6.5.2 Task 6: Interactions between Context and SAP Fanar Project's Activities during the Implementation Phase

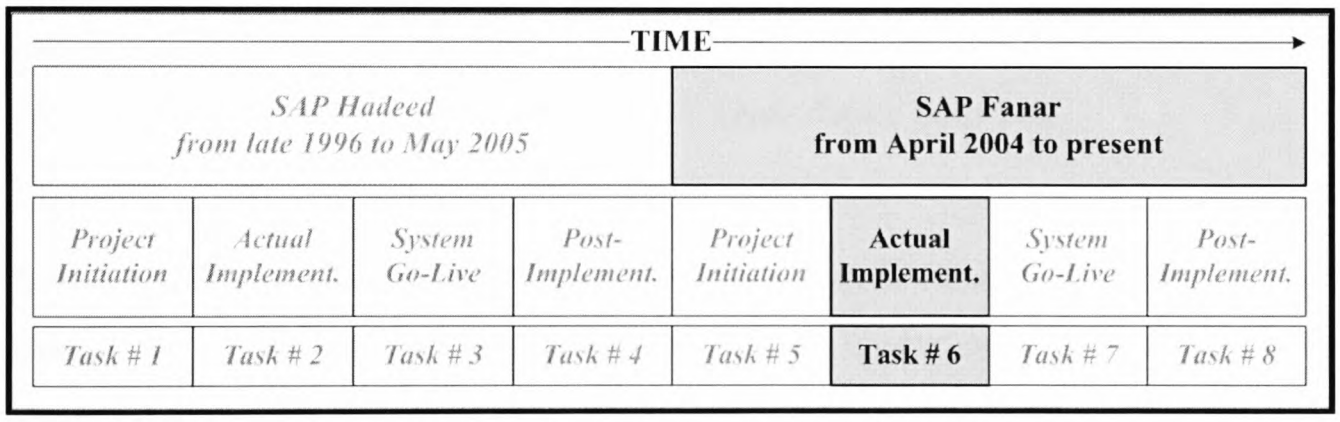


Figure 6-11: Task 6 – SAP Fanar implementation phase

This phase started when Hadeed was asked to assemble the SAP Fanar teams and ended when the system went live. It is important to highlight that although the go-live time was determined from the early stages of the project, it was postponed twice due to the privacy of Hadeed business. Such delays in a well prepared and organized professional project appeared surprising to the researcher, but he was assured that they had indeed occurred.

Although SAP Fanar started in late 2000 or early 2001, its implementation at Hadeed did not begin until April 2004, when rollout was completed in the third group and moved on to the fourth group, including Hadeed. This date is taken as marking the

completion of the initiation phase and the commencement of the implementation phase of SAP Fanar at Hadeed. This phase continued until the system went live in May 2005, which, as noted above, was after two postponements. At this moment, Hadeed immediately switched off the SAP Hadeed system and kept it only for the retrieval of historical data when needed. It is important to note a contrast with the earlier transition from PRIME to SAP Hadeed, when the two systems had been run in parallel for a significant period of time to make sure that all was well with the new system. A plausible explanation of this contrast is that the years of experience gained from running SAP Hadeed had brought about a positive change in perceptions of such technology among Hadeed's people, including its management. The positive experience will have had the effect of eliminating any negative perceptions, particularly those relating to the experience of failure in 1995.

The following subsections explore the ways in which the six major categories and their subcategories of factors (Hadeed inner and outer contexts, and SAP Fanar project activities) interacted with each other to form the temporary context of the implementation phase of the SAP Fanar project, which in turn influenced both end users' and team members' perceptions of SAP Fanar during this phase.

6.5.2.1 SAP Fanar –Implementation Phase: Temporary Context Development

During the implementation phase of the SAP Fanar project, the categories of factors identified in chapter five which are components of Hadeed outer and inner contexts as well as SAP Fanar project activities interacted to form a temporary context which reflects what was going on during this particular phase. This temporary context is assumed to have influenced Hadeed end users and team members in some way, affecting the development of their perceptions of the success of the SAP Fanar project.

6.5.2.2 Interpretation of End Users' Success Perceptions

The temporary context of the implementation phase of SAP Fanar will have influenced end users' perceptions during this time. It was obvious that different end users had implicitly shown considerable satisfaction in regard to SAP Fanar as a project, but not as a system. In other words, they perceived the SAP Fanar system as an optimal

solution, but this positive perception had been mainly influenced by the project and change management process, not by the final deliverables of the system. As evidence, they often compared how SAP Fanar had been managed and implemented against what had happened during the implementation of SAP Hadeed. This appears to have been the factor that most strongly affected their perceptions of SAP Fanar during this phase.

> *Actually, I think it is not fair to make any sort of comparison between the SAP Hadeed and SAP Fanar projects. SAP Hadeed was just like playing a game. The trial and error approach was popular during that time. Although this was the case, SAP Hadeed teams tried to do their best, but they had no idea how to manage and tackle such a project.* ***[PM end user]***

Furthermore, it is evident that previous SAP experience increased users' confidence, particularly as they were the only people among all of SABIC affiliates with experience of SAP. Consequently, in most cases, they were major sources of knowledge during training courses for end users from other SABIC affiliates. This was another factor that contributed to changing their perceptions positively during the implementation of SAP Fanar. Here, it can be so easily to notice the effect of Hadeed inner context upon SAP Fanar activities.

Finally, during the development of SAP Fanar teams, there was no political influence, such as the role of relationships, on their membership. On the contrary, Hadeed selected to lead the project an excellent project manager who was then a business manager in a Hadeed department. Accordingly, he was able to use his experience of implementing the SAP Hadeed system to create SAP Fanar teams, taking into consideration prospective members' knowledge of SAP, without any notable influence of politics. As evidence of this interpretation, interviewees made no reference to objections being made against the selection of team members, in contrast to the significant evidence of such dissatisfaction during the SAP Hadeed project. This non-political approach appears to have played a major role in mitigating some problems pertaining to process changes as a result of adopting SAP as-is; it also appears to have contributed to augmenting the positive influence of the temporary context which developed during this phase. Here, the availability of SAP resources and experts as an outer context component contributed directly in developing a good understanding of the nature of SAP system and how to run

its project as a component of Hadeed inner context. Consequently, such good understanding affected positively SAP Fanar project activities.

Overall, with reference to this phase, most Hadeed end users who were interviewed expressed moderate satisfaction with the project and appeared extremely optimistic. These positive perceptions resulted from the fact that the various Fanar teams directed much more attention to end users during this phase than was the case for the same phase of the SAP Hadeed project, where end users had been completely neglected. Table 6-9 below summarizes this general perception and its major drivers.

Table 6-9: Task 6 – End users' perceptions of SAP Fanar – implementation phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Moderately satisfied and extremely optimistic of success in easily learning to use SAP Fanar	**Positive Factors:** • Previous positive experience during SAP Hadeed project, giving them more confidence in SAP R/3 than colleagues from other SABIC affiliates • Excellent project management activities • Excellent change management activities, such as awareness campaigns and training courses • Fair selection of team members
	Negative Factors: • New SAP system caused some process changes (ways of doing business) which were not noticed until end users' training.

6.5.2.3 Interpretation of Team Members' Success Perceptions

Team members' perceptions contrasted with those of users, although both work in the same setting, as many were not so happy once they joined the team, perceiving SAP Fanar during this phase as a depressing project. This was due to the implementation strategy of SAP Fanar, as well as the role that the consultant played during the project. As mentioned above, SABIC decided to implement the SAP Fanar system as-is and accordingly required that Hadeed's existing processes should be changed as needed to accommodate those embedded in the SAP system. This meant that things which team members had become used to do during the SAP Hadeed project were not possible in the case of SAP Fanar. In particular, it severely limited their authority to customize the system to satisfy end users' needs. Here is another sign of the influence of the outer context of Hadeed upon its SAP Fanar activities.

> *One of the distinct features of the SAP Fanar project was its clear strategy. We decided everything from the early stages of the project. It was a clear message that SABIC intended to integrate all of its affiliates under one system and one set of processes, so configuring the system would be highly restricted, except in rare cases and under the supervision of the outside consultant.* ***[SAP Fanar project manager]***

This does not mean that SAP Fanar was implemented entirely without customization, but that the consultant was the only agency authorized to undertake such tasks. Hence, Hadeed team members reported feeling somewhat depressed by their limited authority and empowerment in managing the project.

This feeling can be attributed their misunderstanding of the nature of the SAP system and how it should be implemented, taking into consideration that during the SAP Hadeed project there had been no resident consultant working with Hadeed. Moreover, during the SAP Hadeed project, members of the different teams had been fully empowered to configure or even customize any segment of the system without reference to specific and well defined official policies and procedures. This is another indicator of the influence of the availability if resources and experts, an outer context component, on both Hadeed inner context and different activities of SAP Fanar project. Therefore, once the implementation phase of SAP Fanar started, they perceived their role as no more than executing the commands of the consultant in performing minor tasks such as data collection, data cleansing, data migration and some change management activities.

The feeling of unhappiness noted above was, however, mitigated by the fact that members now felt that they understood the right way of managing and implementing such technology. They now realised that the implementation of SAP Hadeed had been done poorly to the extent that it resulted in a fully tailored system that simply provided a technical fit to Hadeed's specific needs for a certain time. In fact, such a heavily configured system would not allow Hadeed to develop its business, because of the obvious IT view of that project. Here, it is obvious that project activities influenced the inner context of Hadeed in term of Hadeed perception and understanding of SAP system causing that context to be changed. It is useful to remind readers of a comment quoted above:

> *We discovered that we did not understand SAP in the proper way till SABIC started to announce the SAP Fanar project. We realized that we were doing a rubbish job during the SAP Hadeed project. The ridiculous thing was our omission on the users' side. Fanar was an excellent project at a different level although there were some mistakes and issues.* ***[QM team leader on SAP Hadeed and then SAP Fanar]***

All in all, as seen in Table 6-10 below, although team members reacted negatively to being restrained from amending the system, they finally admitted the professionalism of the SAP Fanar management, particularly as related to change management programmes, which were their responsibility in collaboration with the consultant. Their perception of SAP Fanar during this phase was moderately optimistic, with some discontent at not being authorized to amend the system, although they later appreciated the correctness of SABIC's decision. In general, their perceptions were positively influenced by different project and change management activities, regardless of how the new system would affect Hadeed's current business processes and structure.

Table 6-10: Task 6 – Team members' perception of SAP Fanar – implementation phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Unhappy but moderately optimistic of success in replacing the current system	**Positive Factors:** • Excellent project management activities • Previous excellent SAP experience
	Negative Factors: • Contrast with freedom in managing SAP Hadeed project • No customization allowed (as-is strategy) • Consultants in control, not team members as during SAP Hadeed project. • Their role was no more than data collection and cleansing • The project was under SABIC control, making team members feel like secretaries, executing simple tasks without responsibility.

6.5.3 Task 7: Interactions between Context and SAP Fanar Project's Activities during the Go-live Phase

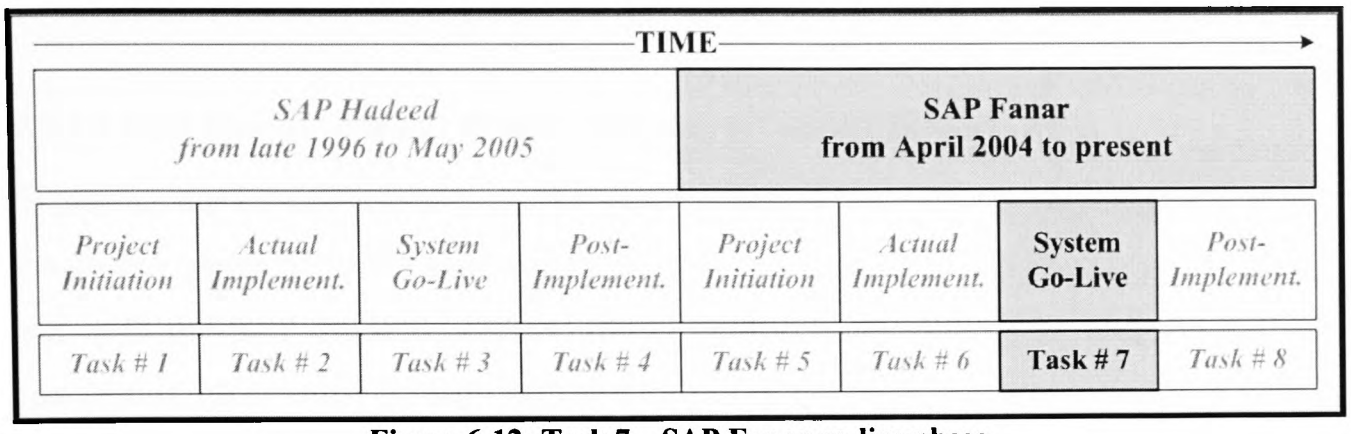


Figure 6-12: Task 7 – SAP Fanar go-live phase

As shown in Figure 6-12 above, the discussion in this section will cover the go-live phase of the SAP Fanar project, which started when the development version of the SAP R/3 system was transformed into the production version and lasted no more than two months. According to an MM team member *"... after SAP Fanar went live, we stayed officially for about two months to solve any problems and to help users to undertake their normal tasks using the new system"*. Thus, the go-live phase was very short compared with the same phase during the SAP Hadeed project.

While the majority of issues dealt with during this phase pertained directly to authorization, there was one major difficulty relating to the interfaces between SAP Fanar and certain production machines, which Hadeed designated level-2 and level-3 machines. The two major modules which suffered significant problems after SAP Fanar went live were therefore PP and SD/LE, due to their direct relation to the production process and equipment. This could not have been detected before go-live because the problem was unique to Hadeed, these two major modules having features that distinguished Hadeed from SABIC's petrochemical affiliates.

Although SAP was generally adopted as-is during SAP Fanar to standardize and unify the processes and systems of all SABIC affiliates, the case was different at Hadeed, which had developed a set of interfaces to link the SAP Hadeed system with its production machines. This conflict was noticed during the implementation phase of Fanar and caused the go-live to be delayed. Finally, Hadeed went live with SAP Fanar

and switched off the SAP Hadeed system and all of its interfaces. As this was a critical issue during this phase, the following subsections will discuss it in greater detail.

6.5.3.1 SAP Fanar – Go-live Phase: Temporary Context Development

Exploring the interactions among the major categories and their subcategories during the go-live phase of SAP Fanar reveals some contrasts with earlier phases of SAP Fanar and with the SAP Hadeed project. The combination of these interactions led to the creation of a temporary context related to that particular phase, which in turn will have influenced Hadeed's internal stakeholders differently, causing changes to their perceptions of the project's success. During this phase of SAP Fanar, the effect of well understanding of the nature of SAP system and how to implement it, a component of Hadeed inner context, was clear upon SAP Fanar project activities which subsequently affected internal stakeholders' success perception. In the following two sections, the success perceptions of end users and team members of SAP Fanar during the go-live phase will be examined in detail.

6.5.3.2 Interpretation of End Users' Success Perceptions

> *I think the Fanar project was excellent and well organized. We, as Hadeed end users, have not suffered any major problems in using the system. After years of using the old SAP Hadeed system, the new SAP system was easy to use but the problem was in regard to the process change which we did not notice before, as well as the creation of SSO.* ***[HR end user]***

During this phase of SAP Fanar, it was evident that Hadeed end users were very satisfied and happy because of the effort made by the different project teams, taking into account their previous work with SAP and other experience. Nevertheless, once SAP Fanar went live, they realized that there were some differences between current business processes and what the Fanar system brought to them. This was particularly noticeable in relation to the PP and SD/LE modules.

Moreover, other business units of Hadeed realized that there was a major issue once the system went live. This was when SABIC created the SSO to centralize six major functions among all of its affiliates. Thus, end users of HR, IT, PS, MM, accounting and general services were all shocked by a major structural change within Hadeed.

Nevertheless, the experience that they had gained previously contributed positively to reducing the effect of such change and increasing the satisfaction of the majority of Hadeed end users. As evidence, a number of Hadeed end users acted either formally or informally as mentors to end users from other affiliates where there was no experience of SAP. This is another sign of the effect of Hadeed inner context, good previous SAP experience, on different SAP Fanar project's activities, the content of change.

> *... either as Hadeed users or ex-Hadeed users, we trained other users on SAP, especially if... SAP Fanar was their first SAP experience.* ***[FI/CO end user]***

This, according to some end users, was considered the result of years of experience of the SAP system, which indeed gave them considerable confidence, although there were some process and structural changes. In fact, during this phase the role of previous SAP experience, inner context, was obvious in facilitating and mitigating most of the implementation issues mentioned above, project activities. The following quotation supports this interpretation.

> *Fanar was more professional than SAP Hadeed in many ways, particularly project and change management. The main reason for that perception was our previous SAP experience. In my view, implementing the Fanar PM Module at Hadeed was one of the successful implementation stories, especially at Hadeed, because of our previous experience.* ***[PM end user]***

Table 6-11: Task 7 – End users' perceptions of SAP Fanar – go-live phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Shocked but satisfied with the system and moderately optimistic	**Positive Factors:** • Previous positive experience • Excellent project management • Excellent change management • Excellent support and services after go live

	Negative Factors:
	• Some process changes were noticed. They did not know exactly that this project conveyed a process change due to a combination of:
	  ◦ strong communication with end users;
	  ◦ previous SAP experience; and
	  ◦ nature of Hadeed's business and its large volume of daily transactions
	• Creation of SSO and its consequences for six functions (PS, HR, MM, etc)

It was evident that there was no major issue or even resistance among end users because of these changes, but there was a problem of communication with them. As seen in Table 6-11, the main reason for the emergence of this problem was a combination of the following three factors:

- Hadeed's work, by nature, entailed a large volume of daily transactions, an inner context component;
- The previous experience of Hadeed end users made them more confident, particularly when they compared themselves with end users of other SABIC affiliates who had no experience of SAP; another inner context component, and
- Very considerable efforts were made by project management and the teams to communicate with end users.

These three factors together contributed to Hadeed end users being excluded from most of the project teams' activities. They really needed a balanced form of communication, due to their particular setting.

> *The problem was not with the SAP system but mainly because of the creation of SSO. Nonetheless, Hadeed ex-users were ... the best among different users and they supported their colleagues in most SAP issues ....*
> *.... we were struggling to complete our daily transactions. It is so difficult to waste 20 to 30 minutes to check SAP Fanar project teams' emails or even their web pages. Most of the emails we received were not related to us at all. We in SD/LE received some emails that should have gone to QM, HR or even other affiliates.* ***[SD/LE end user]***

6.5.3.3 Interpretation of Team Members' Success Perceptions

Hadeed team members were unhappy with the SAP Fanar implementation strategy before this phase began and this feeling continued during it to some extent. Nonetheless, members felt that the go-live of SAP Fanar was, to a large extent, smooth and free of obvious major difficulties. Furthermore, SABIC, in cooperation with its consultant, succeeded in showing team members that most of their customization requests referred to functions already covered by the existing SAP system and that there was thus no real need to customize the system. This made many team members feel, with some regret, that what they had done during the SAP Hadeed project was no more than playing a game; what they thought they had learned from their experience needed some

amendment. Here, the availability of SAP experts and resources as an outer context contributed positively in changing Hadeed people understanding of SAP technology which is an inner context and then affecting project activities and affecting positively stakeholders' success perception. An MM team member highlighted this issue:

> *We did not understand the SAP system as it should be. SAP Fanar helped us to understand the actual nature of SAP, its capabilities and how it should be implemented. We discovered that during SAP Hadeed, we had customized some functions while these were all available in SAP as built-in functions, funnily enough. Really, we should thank the SAP Fanar project for helping us to enhance our previous SAP experience.* ***[MM team leader]***

Additionally, there was a realisation of the excellent support mechanisms that the SAP Fanar project brought via what was called SSRS to respond in an effective manner to end users' requests in cooperation with team members. At that point, respondents said that they had started to reconsider their previous SAP experiences. Now they began to understand the real meaning of the SABIC implementation strategy and other consequent crucial decisions. This in turn helped gradually to mitigate their unhappiness and increase their appreciation of and satisfaction with the SAP Fanar project and its consequences.

> *After the go-live of SAP Fanar, we worked for 2-3 months to support end users in line with SSRS. In fact, this was an excellent project, particularly in supporting end users after go-live. It was amazing and a well organized job. This service is still active and is managed by the SABIC competency centre. Unfortunately, we did not now during our previous SAP project how to organize and provide Hadeed end users with the required support services. We realized that with the Fanar project. Thanks to Fanar, we gained all sorts of knowledge during this project.* ***[PP team member]***

Members' previous SAP experience also played a major role in increasing their confidence, particularly as other SABIC affiliates had not operated SAP systems before. It is another sign of the effect of Hadeed inner context upon different project activities. This was one factor behind an increase in Hadeed team members' satisfaction with the SAP Fanar project, despite not being allowed to configure any part of the system.

> *In regard to our previous SAP experience, no doubt, it helped us a lot as team members of SAP Fanar in doing a better job than we did before, at least compared with our colleagues from other non-SAP affiliates...*

> *... Hadeed people, either users or team members, have got obvious skills in using and dealing with SAP Fanar compared with others affiliates. We were mentors to them in some SAP issues. All of that was an accumulative result of more than 8 years experience of using SAP.* ***[PM team leader]***

All in all, it is clear that the majority of SAP Fanar team members at Hadeed expressed positive perceptions of and satisfaction with the project during the go-live phase. Table 6-12 below summarizes these findings.

Table 6-12: Task 7 – Team members' perceptions of SAP Fanar – go-live phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Satisfied and extremely optimistic	**Positive Factors:** • Previous experience of end user support after go-live • Excellent support and services after go-live • Clear understanding of SAP system as it should be • Clear understanding of how to run such a project properly • Building new knowledge and amending previous experience
	Negative Factors: • None

6.5.4 Task 8: Interactions between Context and SAP Fanar Project's Activities during the Post-implementation Phase

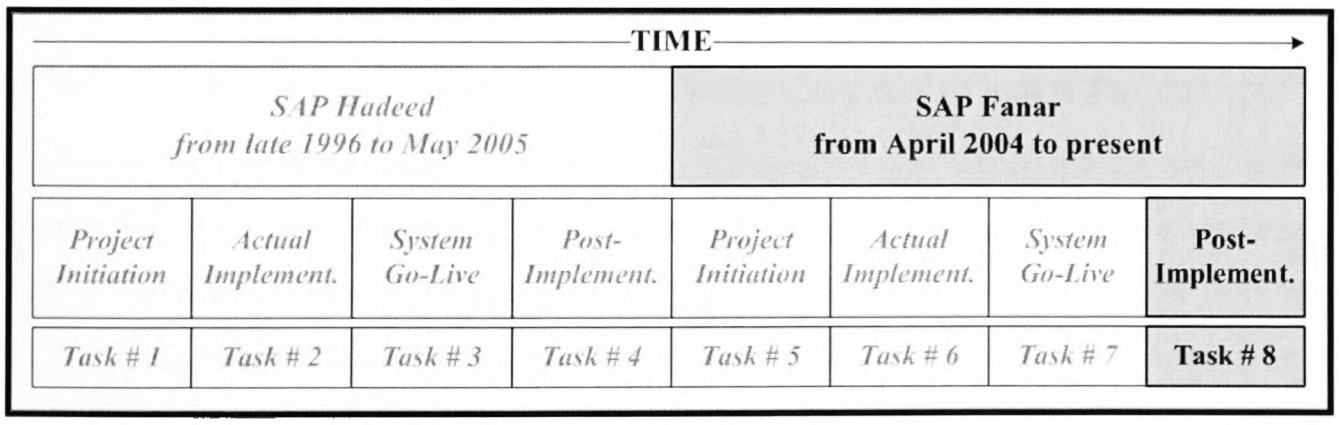


Figure 6-13: Task 8 – SAP Fanar – post-implementation phase

This section examines the success perceptions of the two stakeholders' groups in regard to the SAP Fanar project during its post-implementation phase. As with the other seven tasks, it explores interactions among the six categories and their subcategories which represent outer context, inner context and project activities. The result of such exploration process will form a temporary context pertaining to this final phase, before

moving on to investigate the perceptions of each group of stakeholders of the success of SAP Fanar during this phase.

It is important to remind readers that the SSO, which was established during this phase, is considered a distinct feature that clearly affected the way in which Hadeed people perceived the success of the project, making it unlike the previous phases. In other words, Hadeed people's perception of the success of SAP Fanar during this phase was influenced directly by the creation of the SSO, because it happened during this phase. This is an indicator to the continual effect of outer context, external competition and increased demand on SABIC products, upon SAP Fanar project activities which by its turn affected Hadeed context causing some structural changes and accordingly losing some of its people.

This phase started when the implemented system approached normal operation and a steady state some time after going live and would be considered to continue until the commencement of any formal new project or a major upgrading. For the purposes of the present study, however, the duration of this particular phase of SAP Fanar is determined by the end of the researcher's empirical work. In other words, the data gathered in respect of this phase covers the period from the beginning of normal running to the arbitrary end of the data collection exercise, on 23rd June 2007.

6.5.4.1 SAP Fanar – Post-Implementation Phase: Temporary Context Development

As with the previous tasks, the analysis resulted in an integrated model of the interactions between different components of Hadeed outer context, its inner context, and different SAP Fanar project activities during this particular phase. This does not imply the ignorance of all historical events that took place before the commencement o this phase. In contrast, all different historical events have been carefully considered during the analysis phase of this phases and previous phases. Accordingly, these interactions contributed in developing the temporary context which existed during the post-implementation phase of the SAP Fanar project and which in turn influenced Hadeed stakeholders' perceptions of the project's success during this phase.

In the following two subsections, a detailed exploration of internal stakeholders' success perception of SAP Fanar during his phases will take place.

6.5.4.2 Interpretation of End Users' Success Perceptions

From the commencement of this phase, the majority of end users appear to have perceived SAP Fanar positively in terms of successful project management and of successful technical and process replacement. Indeed, some perceived the project at that particular period of time as one of the most successful that they had ever known. They were very satisfied with the system, and their previous experience helped them greatly in accepting the system, although there were some differences from SAP Hadeed. This shows the effect of Hadeed inner context in a form of previous experience upon the project activities and then the success perception of end users stakeholders.

> *After the SAP Fanar system stabilized, it really succeeded in integrating not only the technical and business process infrastructures of different affiliates but additionally it integrated different employees as well, so they were all under one enterprise called SABIC instead of scattered affiliates each with its own personnel policies and regulations... For Hadeed users, in most cases, SAP Fanar was a piece of cake because of years of SAP experience. Really, it was one of the most successful projects.* ***[PM end user]***

However, after a short while there occurred two significant events which contributed directly to some dramatic changes in these positive perceptions. The first was the creation of the SSO and the second was the way that the management teams of the SAP Fanar project, SABIC and Hadeed dealt with members of different teams after the completion of the project. Although these changes were to some extent negative, they did not apply to perceptions of the SAP Fanar system itself, but rather to some management issues affecting the project or even to SABIC and Hadeed managements. In this case, there was an obvious effect of the outer context of Hadeed upon Hadeed inner context and its project activities. Then, there was another effect on Hadeed inner context by SAP Fanar project activities. It can be seen as a sort of mutual effect among them, the context and the content.

> *Actually, in regard to SAP Hadeed and SAP Fanar, there is no way to make any comparison between them. In fact, SAP Fanar was implemented professionally. This is a fact although I personally blame the SAP Fanar*

project management, SABIC and Hadeed managements, for their negative attitude toward most Hadeed team members, particularly after the project was completed. However, SAP Fanar as a system is a fantastic one – no doubt about that. ***[PP end user]***

In spite of these changed perceptions of success among Hadeed's end users, the project was never considered a failure in any sense. On the contrary, throughout the SAP Fanar project, users' perceptions remained positive and they were very optimistic about the project and its deliverables. However, compared with their perceptions during the go-live phase, for instance, there was a noticeable sense that the project had turned out a little less successful than expected. To sum up, perceptions of success among end users weakened slightly because of some management issues pertaining to the project, but not the system. The introduction of SSO was a major factor which negatively affected many end users' perceptions of SAP Fanar.

Look, we had no objection to the SAP Fanar system at all ... our objection was to the way they implemented the SS concept. Hadeed tried to reject that idea in order to save all of its functions and employees ... within the Hadeed structure, but all of its efforts failed and we had to accept SAP Fanar as well as the SSO. ***[HR end user]***

Table 6-13: Task 8 – End users' perceptions of SAP Fanar – post-implementation phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Despite some discontent, well satisfied with the system and extremely optimistic	**Positive Factors:** • Excellent project management • Excellent system • Excellent support through SSRS • Previous SAP and related experience
	Negative Factors: • The introduction of SSO • Poor management appreciation for team members

6.5.4.3 Interpretation of Team Members' Success Perceptions

Although during this phase of SAP Fanar it was obvious that the two stakeholder groups broadly shared a common perception of SAP Fanar's success, there were some issues that applied directly only to team members which are worth considering here. It has already been noted that users were unhappy with the lack of appreciation shown to SAP Fanar team members at Hadeed. For their own part, team members appear to have felt unhappy and frustrated by their situation after completing the project, when they were

asked to leave the project teams' offices and go back to their departments, only to find that their original positions had been filled and their departments did not offer them alternatives, despite earlier verbal assurances to the contrary. The fact that the managers of these departments had broken promises to their team members caused other Hadeed people to mistrust their own managers, fearing that neither senior managers nor line managers would keep their promises. The position was made more complicated by the fact that while some team members had been promised a return to their original positions or even better positions once the project was over but had been effectively demoted, there were others who were offered better positions than their original ones. This in the researcher's view was another major factor that contributed to increasing the mistrust felt by stakeholders towards the management. The following excerpt is a direct response to question about this situation.

> *...When I went back to my department, I found my position occupied and no one paid any attention to me. Really, I do not know where those promises went. I think they grew wings! My line manager and Hadeed management both broke their promises... So we lost our trust in them. Believe me; I am not going to participate in any future project.* ***[QM team leader]***

This was a serious problem which damaged the reputation of the SAP Fanar project and whose consequences affected many Hadeed stakeholders, as was evident from the fact that many interviewees – and others during informal conversations – explicitly stated that they would refuse to participate in any future SABIC or Hadeed projects.

> *... Look, I and I am sure others who share my feelings will not even think of participating in any future projects – neither in Hadeed nor in SABIC – whatever the consequences. I am very upset and depressed because of that. During my participation in the Fanar project, I lost a promotion in my original department and I lost my position. Where is the appreciation? Nothing, just promises... They only give us worthless certificates and some hand-clapping, but no actual appreciation at all.* ***[PP team leader]***

This failure of management to keep faith with team members appears to have been related to a failure to pay attention to the need for system optimization, which had been expected to take place during this particular phase of SAP Fanar. In fact, there was no plan to optimize the system during this phase, although the project had been characterized as one of the most professional projects that SABIC and Hadeed had ever implemented. On the contrary, there were some resignations of members who had

already attained the required SAP skills as a result of more than a year of project participation and who now felt undervalued. All of these reactions, in the view of the researcher, were a predictable result of dissatisfaction among internal stakeholders.

> *...Honestly, there wasn't any sort of appreciation for the majority of project team members, whereas a few people were offered better positions than what they had before. This action by the management indirectly affected the system's utilization and optimization and increased the number of resignations within the Hadeed community. Really, no one paid attention to us. We were completely neglected.* ***[SD/LE team leader]***

The project manager also confirmed the absence of even a general plan in regard to system utilization and optimization after completion of the project.

> *A while after go-live, SABIC did not pay any noticeable attention to the optimization of SAP Fanar to benefit from its ultimate capabilities or even think to utilize its available capabilities. We, as project management, were asked to hand the project to the competency centre for supporting purposes. In regard to system utilization and optimization, I don't think anyone made any effort at all. I wanted the competency centre to go back and make sure that everything was fine and optimize the system to benefit from different SAP capabilities. But all of that was just a wish.* ***[Project manager]***

Finally, the project manager himself admitted the absence of any plans to manage team members' situations after the project when the researcher asked him a direct question about that issue. He also described it as a failure; however, it was just a failure in managing the situation, which in turn affected the overall success perceptions of both end users and team members.

> *Well, I can say yes, there was a failure in considering that issue carefully beforehand or even afterwards, but some effort was made. I admit that some members were unlucky.* ***[Project Manager]***

Although the project manager admitted this failure, he also explicitly stressed the ultimate success of the SAP Fanar project as measured by what was achieved.

> *...generally, our aim of running the project was to unify different SABIC affiliates into one set of business processes using one system. Actually, we succeeded in ending up with an excellent backbone and infrastructure that will make SABIC, for sure, ready for any future projects and expansion. That success is in regard to the streamlining and integrating processes. We*

succeeded in combining different affiliates into one system and one best-practice...

I'm sure that without SAP Fanar and SSO, SABIC would not have been able to improve its business and its future expansion. SABIC has a strategic vision called SABIC 2020 and accordingly SABIC has established clear and precise strategies and policies to achieve that vision. In fact, SAP Fanar is the major tool in achieving that vision. The next step, now, is to build different applications on top of that well integrated backbone. Clearly, we succeeded in achieving our goal. ***[SAP Fanar project manager]***

Table 6-14: Task 8 – Team members' perceptions of SAP Fanar – post-implementation phase

Major Perception	Reasons Underpinned by Pettigrew's Ideas
Unhappy, distressed, yet extremely optimistic of achieving the project goals as stated by SABIC, which had already started to be realised	**Positive Factors:** • An overall excellent perception of the project and change management activities • Success in delivering a high quality system that fulfils the project goals • Success in integrating disparate affiliates into one system using a comprehensive set of processes • Excellent support via SSRS
	Negative Factors: • Lack of management appreciation, as many people lost their positions although they had been given promises, while a few other team members were offered much better positions.

6.6. Overview of Internal Stakeholders' Perceptions of Success

This section summarises the overall results of the investigation reported in this chapter, offering an overview of the perceptions of both groups of internal Hadeed stakeholders regarding the success of the four phases of each of the SAP R/3 projects investigated. This overview is presented in the form of a table, Table 6-15 below, making it possible to compare the perceptions of each group of stakeholders in regard to each phase of the two projects.

Table 6-15: Overview of success perceptions underpinned by Pettigrew's ideas

Project Phase	Stakeholders	SAP Hadeed late 1996 – May 2005	SAP Fanar from April 2004
Initiation	***End Users only***	Negative and pessimistic even about going live	Well satisfied and extremely optimistic of easy move to SAP Fanar system
Implementation	***End Users***	Extremely pessimistic, as project termination was expected	Moderately satisfied and extremely optimistic of success in smoothly replacing SAP Hadeed with SAP Fanar system
	Team Members	Cautiously and then moderately optimistic about going live with SAP. Believed they would achieve the main goal of the management to go live with SAP and successfully attain technical replacement of PRIME	Unhappy, yet moderately optimistic that the project would run smoothly and successfully replace SAP Hadeed with SAP Fanar
Go Live	***End Users***	Cautiously then moderately optimistic as they gradually believed in the possibility of achieving a proper SAP system (free of mistakes) to replace PRIME	Shocked but still satisfied with the new system and accordingly moderately optimistic, as they were hoping not to go with the new system yet
	Team Members	Extremely optimistic, as the system went live successfully and smoothly. The new system fitted exactly the needs of end users	Satisfied with the system and the project and extremely optimistic of making achievements
Post-Implementation	***End Users***	Moderately optimistic and gradually became extremely optimistic as they were very satisfied with the system and started to request more development and enhancements	Well satisfied with the new system and extremely optimistic, but unhappy with management
	Team Members	Extremely optimistic and well satisfied. There were two major achievements by team members during this phase: the successful go-live and the attaining of more SAP experience, particularly in regard to configuration and customization. These both contributed indirectly to increasing the perception of success.	Unhappy, distressed, yet extremely optimistic of excellent project achievements, some of which had been realized gradually

6.7. Major Findings

This section reviews the major research findings, some of which are implicit while others have been explicitly highlighted during this chapter. Therefore, a general view of these findings will be offered here, while a detailed elaboration will take place in the next chapter. The following subsections highlight the major findings emerging from the data analysis process.

6.7.1 The Complexity of ERP Projects

One of the main benefits of showing some details during the data analysis in this chapter is to reflect the complexity of the implementation of an ERP system. Adopting ES in general in any organisation is a difficult task in which different aspects of the business are affected, including people. Therefore, simplifying ERP success research in the form of a few bullet points or variables does not reflect reality, although such efforts are appreciated and welcomed. In fact, it was evident that the implementation process encompassed a mixture of technical and non-technical issues, all of which played some role in shaping the perceptions of stakeholders of the success of the two projects and their different phases. Hence, this research has succeeded, to a large extent, in showing the complexity and dynamic nature of ERP implementation which affect dynamically ERP success and failure perception. This is due to the involvement in the implementation process of set of socio-technical factors which, in their turn, influence stakeholders' perceptions of IS. These are organisational, political, technical, and other factors related to IS projects, such as change management and project management activities, all contributing differently to the success perceptions of stakeholders.

In fact, during the analysis of SAP Hadeed and SAP Fanar phases, the effect of Hadeed outer context on both Hadeed inner context and different SAP projects' activities was obvious and dynamic. Moreover, it was very clear, as well, the effect of Hadeed inner context upon different SAP projects' activities and in some case that effect was mutual between them. In all cases, the action, reaction, and interaction among them was in fact dynamic and unanticipated. Thus, one major finding was the importance of context and content analysis via actions, reactions, and interaction to get better understanding of

such phenomenon by giving the process of change the opportunity to reveal itself along side the implementation process taking into consideration, also, the historical events.

6.7.2 Multidimensional Nature of Success Perception

One of the main findings of this research was the cumulative nature of the development of stakeholders' success perceptions. In other words, perceptions of the success of certain IS did not emerge fully formed but were cumulatively developed throughout all stages of the IS projects. This development was shaped by the interaction of a range of factors which varied from one phase to another. Hence, this research showed that the perception of IS success and failure is changeable according to the time of evaluation, underlining the dynamic nature of such phenomena, as the same group of stakeholders may perceive the same IS differently at different times.

This research also succeeded, to a large extent, in showing the multifaceted nature of IS success and failure. This is due to the importance of exploring such phenomena through the lens of the various stakeholders' groups involved, as different groups may perceive the same IS differently at the same time. Thus, the perception of success is a multidimensional issue in which the type of stakeholders and the time of evaluation both play major roles in changing that perception, either positively or negatively.

Finally, it is evident that the dynamic and elusive nature of success makes it impossible to predict or to control. Thus, viewing such issues through a very narrow and deterministic lens would not be beneficial, as perceptions of success may be changed dramatically at any time, according to how the various players interact in a particular setting to form what has been defined as a temporary context, which in turn influences the perceptions of success of different stakeholders.

6.7.3 The Dynamic Nature of Relevant Factors and Activities

At the end of the analysis process, it was evident that the factors involved in any setting had affected outcomes dynamically in ways that could not have been determined in advance. This dynamic nature was due to the effect of the conditions constituting a particular setting, each of which played its part in changing the effect of these factors.

Therefore, in a certain setting, one factor might play a positive role in influencing perceptions of success among one group of stakeholders, while in another setting; the same factor might have a negative effect on the perceptions of the same group of stakeholders. For instance, during SAP Hadeed implementation phase, previous experience as a part of Hadeed inner context had a negative effect on SAP Hadeed project activities, while by contrast that previous experience has a positive effect on the Fanar project activities during the initiation phase of SAP Fanar.

Additionally, different project management and change management decisions and activities have been shown to influence different stakeholders' success perceptions differently. For instance, the quality and quantity of communication with end users during one ERP project should not be generalized to other settings. Hence, it is evident that, regardless of the factors involved in an ERP project, their nature and impact upon other factors should not be treated similarly in different settings, as each setting has its own peculiarities and conditions.

6.7.4 Effects of Political Factors on ERP Projects

The effect of politics has been discussed among IS researchers for years. According to Pettigrew (1998), change and politics are inexorably linked in any change program, for instance ERP project. The present study has also shown the importance of these factors by identifying them as constituting a major category which emerged from the data without considering any preconceive framework. Then, it has been defined as part of Hadeed inner context when thereafter according to Pettigrew's ideas. Intra-political factors were shown to play two major and obvious roles during the ERP projects, which were particularly noticeable in the case of SAP Hadeed more than its role during SAP Fanar. First, the management of Hadeed decided to implement SAP R/3 again in 1995 in order to fulfil a political desire for prestige based on the fact that SAP systems were new to the region. Therefore, if Hadeed implemented this system, it would be the leader in the region. There was a noticeable influence of this politically shaped decision upon Hadeed stakeholders' perceptions of the success of the project, although that influence was not directly noticed. Political factors also played a major role in shaping the formation of SAP Hadeed project teams, in that selection depended significantly on different sorts of personal relationships. In fact, it was not possible to detect this effect

without digging deeply inside the data and building categories grounded on that data, because of the indirect and hidden nature of such political influences upon various project and change management activities and consequently upon the perceptions of stakeholders.

All in all, part of Hadeed inner context, intra-political system, has affected both SAP projects' activities differently according to the setting and surrounded circumstances. Nevertheless, the effect of Hadeed intra-political factors was not always the same even on the same SAP project.

6.7.5 The Overlapping Nature of ERP Lifecycles

While this research identified four major phases during each of the two SAP R/3 projects, it became evident that these phases should not be treated sequentially. In other words, the nature of ERP projects means that such phases cannot necessary be viewed linearly, as was evident from a certain degree of overlapping among them. Importantly, the extent and location of this overlapping differed markedly from one project to the other, due to the context of implementation and its conditions. For instance, during the SAP Hadeed project the initiation and implementation phases overlapped, in the sense that the management of Hadeed replaced the project manager during the implementation phase, thus radically altering the implementation strategy, which would normally be fixed by decisions carefully made during the early stages of the project. During the SAP Fanar project, by contrast, there was no overlapping between these two phases, but the implementation phase did overlap with the go-live phase. This occurred when the project management realised during the go-live phase the unique nature of Hadeed among its sister companies, all of which were engaged in petrochemicals. Therefore, the project management decided to implement some new functions and to re-implement some others related to Hadeed's interfaces with its production machines. Such tasks should normally be conducted within the implementation phase, as part of the individual and comprehensive testing programmes.

6.8. Summary

This chapter has presented a detailed data analysis based on the coding set out in chapter five. The analysis process involved exploring the interactions among six major categories of factors during four phases of two major SAP R/3 projects. This intensive investigation was directed to understanding how two groups of stakeholders perceived the success of these two projects over the four phases. It was evident that during each of the eight phases delineated by this framework, a virtual temporary context could be said to have developed due to the interactions of Hadeed outer context, its inner context, and its SAP projects' activities, the six categories that were identified at the end of chapter five. Each context, in turn, had a particular influence on the perceptions of project success among each group of stakeholders during the period in question. The chapter concluded with a brief review of the major findings of the long and complicated process of analysis, which will be discussed and elaborated in the next chapter.

In conclusion, it should be noted that the data analysis succeeded thanks to an adherence to the principles of GTM and the use of the NVivo software. Indeed, this detailed analysis and would not have been so easy without the adoption of GTM and the heavy use of NVivo in addition to Pettigrew's ideas (Pettigrew, 1987, Pettigrew, 1989, Pettigrew, 1990). Finally, in ensuring the quality of the work in this chapter it was considered vital to take into account the seven principles of Klein and Myers (Klein and Myers, 1999), which in fact showed a high level of harmonisation with GTM.

7 Discussion

7.1. Introduction

Adopting GTM in this research entailed an intensive, lengthy and complicated process of exploring the very large volume of qualitative data which had been collected. Accordingly, eight tasks were formulated and identified as a result of synthesizing different grounded categories with each other. These grounded categories had been classified according to Pettigrew's ideas (1987, 1989, 1990) into three major groups as outer context, inner Hadeed context, and finally IS project's activities which reflected the context of change. As a result of that long process, some major findings have been highlighted in the previous chapter and will be discussed in more detail here.

This chapter starts by showing and discussing the socio-technical nature of ERP implementation and then moves on to discuss the effect of that implementation process upon perceptions of the success of ERP systems, which is to transform it to a dynamically changeable phenomenon. In this regard, the roles of time and stakeholders' groups as two major dimensions of success perception will also be discussed. There will then be a discussion of political factors and their role in shaping success perceptions during the implementation of ERP systems. Two major issues will be stressed and elaborated in this regard: the prestige associated with being a pioneer of SAP implementation in the region, its effect on system selection decisions and its consequences for success perceptions; and the role of relationships in the establishment of ERP project's teams and in shaping the perceptions of different stakeholders' groups.

The discussion will then address the matter of contingent variables, such as previous SAP events and related experiences, and their dynamic role in shaping the success perceptions of stakeholders. Finally, two major findings will be discussed at the end of this chapter. The first is the overlapping nature of ERP implementation phases and the second is the classification of internal stakeholders which has been adopted in this research and which will be reviewed in terms of its strengths and limitations.

7.2. Socio-Technical View of the ERP Implementation Process

One finding of this research is that although a factoring approach to IS success and failure studies is appreciated and welcomed, it has been empirically proved to overlook certain social aspects of ERP implementation. Thus, the approach suffers a lack of comprehensiveness due to its deterministic and objective view of the phenomenon. It understates the complexity of ERP implementation, which should be addressed via a socio-technical approach. This confirms the argument of some authors that adopting a socio-technical approach in investigating such projects will lead to an improved understanding of the social, cultural, political, economic and historical factors that are involved in the implementation process (Pettigrew, 1987, Orlikowski, 1992, Mitev, 2003).

While many researchers have viewed the implementation of ERP systems through a deterministic lens, unpacking two ERP projects that took place over more than ten years of implementation and use has demonstrated clearly that the implementation of such technology encompasses organisational change. Such changes will impact not merely on the technical aspects of the organisation, such as its IT infrastructure and platforms, but also on organisational structure, culture, business processes and people, all of which are affected when such new technology is introduced (Pettigrew, 1987). Thus, such phenomena must be viewed as socio-technical events, not exclusively as technical artefacts. In the present research, the result of a complex and a lengthy unpacking process that aimed to understand the implementation process of two SAP R/3 systems has resulted in a better understanding of the implementation of such technology in its context, which in turn helps to confirm its socio-technical nature. It is a confirmation, as well, to Pettigrew's ideas (1987, 1989, 1990) on organisational change research in which such phenomenon have to be investigated in its context taking into account the interplay among outer context, inner context, and the context of change.

Indeed, it is evident from the previous chapter that the implementation process of each SAP R/3 project was shaped and influenced by a range of sub factors, both technical and non-technical. Although these sub factors are impossible to delineate and comprehensively determine in advance, this is not the main issue, which lies instead in their dynamic nature. In other words, the analysis brings the realisation that the factors

investigated here acted and interacted differently according to the conditions and the context within which they operated. Thus, these factors can be said to constitute a 'black box' of ERP implementation, affecting the process unpredictably and uncontrollably in ways which were impossible to identify, so that it was not easy to understand their order or behaviour during any of these interactions.

For instance, during the analysis which aimed to unpack the black box of implementation, some organisational and internal political factors, part of inner context, were observed to be significant in driving and shaping the implementation process, which consequently influenced the perception of success. At the same time, certain technological factors also played a major role in shaping perceptions. Thus, the process of ERP implementation is evidently a socio-technical one and one of the findings of this research is to support the claims of some authors that there should be a shift in the view of ERP implementation from an explicitly technical and deterministic one to a more socio-technical perspective. Al-Mudimigh et al (2001), Doherty and King (2005), Hwang (2005) and Williams and Pollock (2008) are among those who have argued for such a shift.

This entails a need to pay more attention to detail when investigating ERP implementation or any other related phenomena. Accordingly, in order to gain a deep understanding during such investigations, these phenomena that are shaped by forces of a socio-technical nature must be examined as process in a form of actions, reactions, and interactions in its context both outer and inner context, as argued by researchers such as Pettigrew (1987); Wagner and Newell (2004); and Doherty and King (2005).

7.3. Dynamic Nature of ERP Success Perception

As stated in chapter one, this research aims to understand the success perceptions of different stakeholders in ERP projects. As the analysis approached its end, or even before, it was evident that these perceptions were dynamic in nature. In fact, it was notable that they changed according to the continuous interactions among the different categories that constituted the implementation black box. As time passed, these changes were influenced by unpredictable and uncontrollable factors to produce, at the end of such interactions, another perception. Indeed, these interactions influenced not only the

perceptions of stakeholders but also their consequences, which in their turn caused some unanticipated changes to some or all categories. Thus, perceptions of the success of ERP systems can be seen not to arise fully formed but rather to develop cumulatively with time, either positively or negatively (towards pessimism or optimism), according to different stakeholders' perspectives.

Hence, an understanding of the phenomenon comes not merely from viewing the system itself, since the context and conditions may play major roles in developing such perceptions. For instance, it was apparent that project management, change management and some of the contingent variables such as previous SAP experience all influenced stakeholders' perceptions and contributed to changes in them. Figure 7-1 and Figure 7-2 below show conceptually how end users' and team members' perceptions of success of the SAP Hadeed system developed over more than ten years, taking into consideration that the perceptions of success of both groups continued after the system was replaced by SAP Fanar in May 2005.

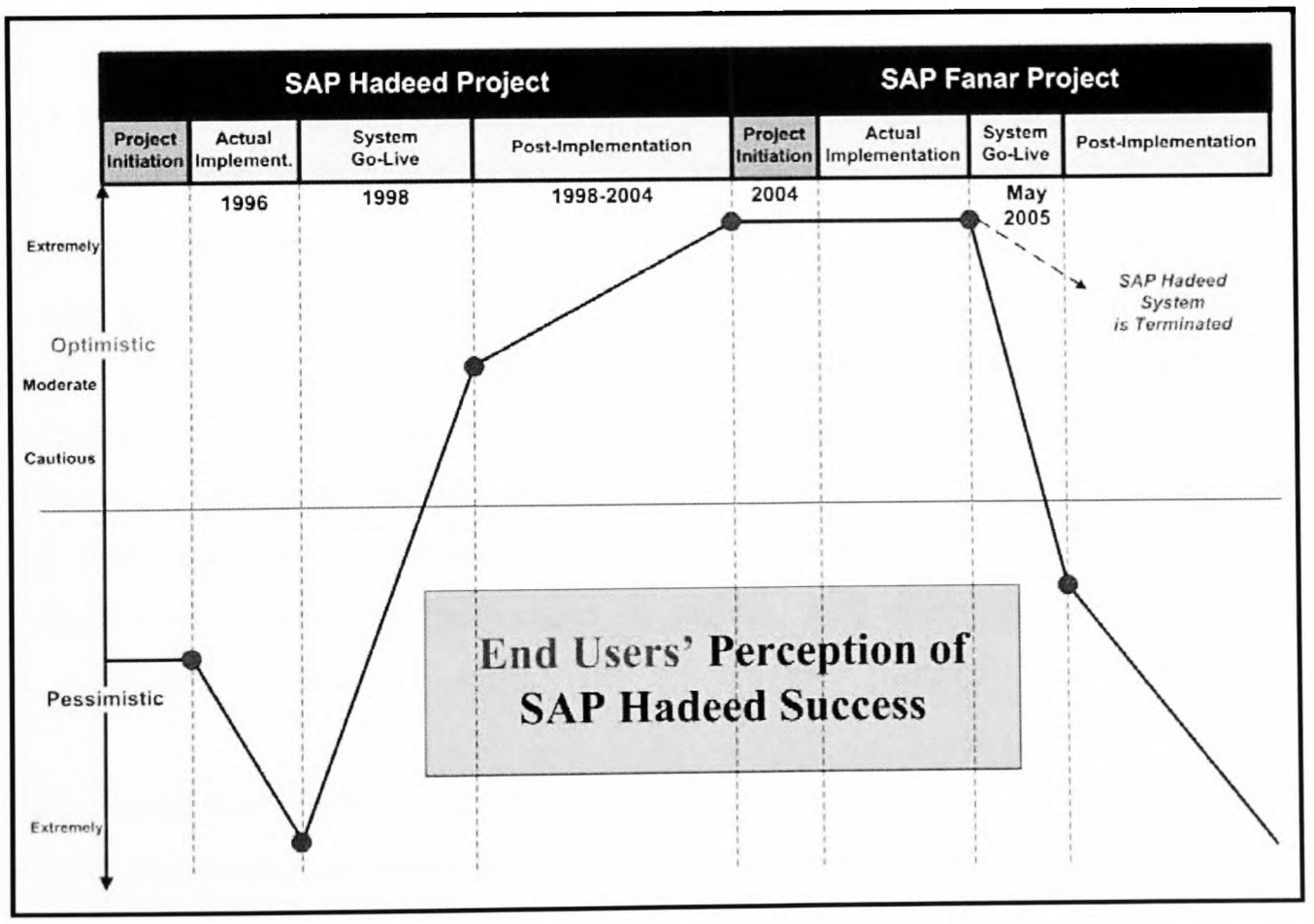


Figure 7-1: End users' perceptions of SAP Hadeed success

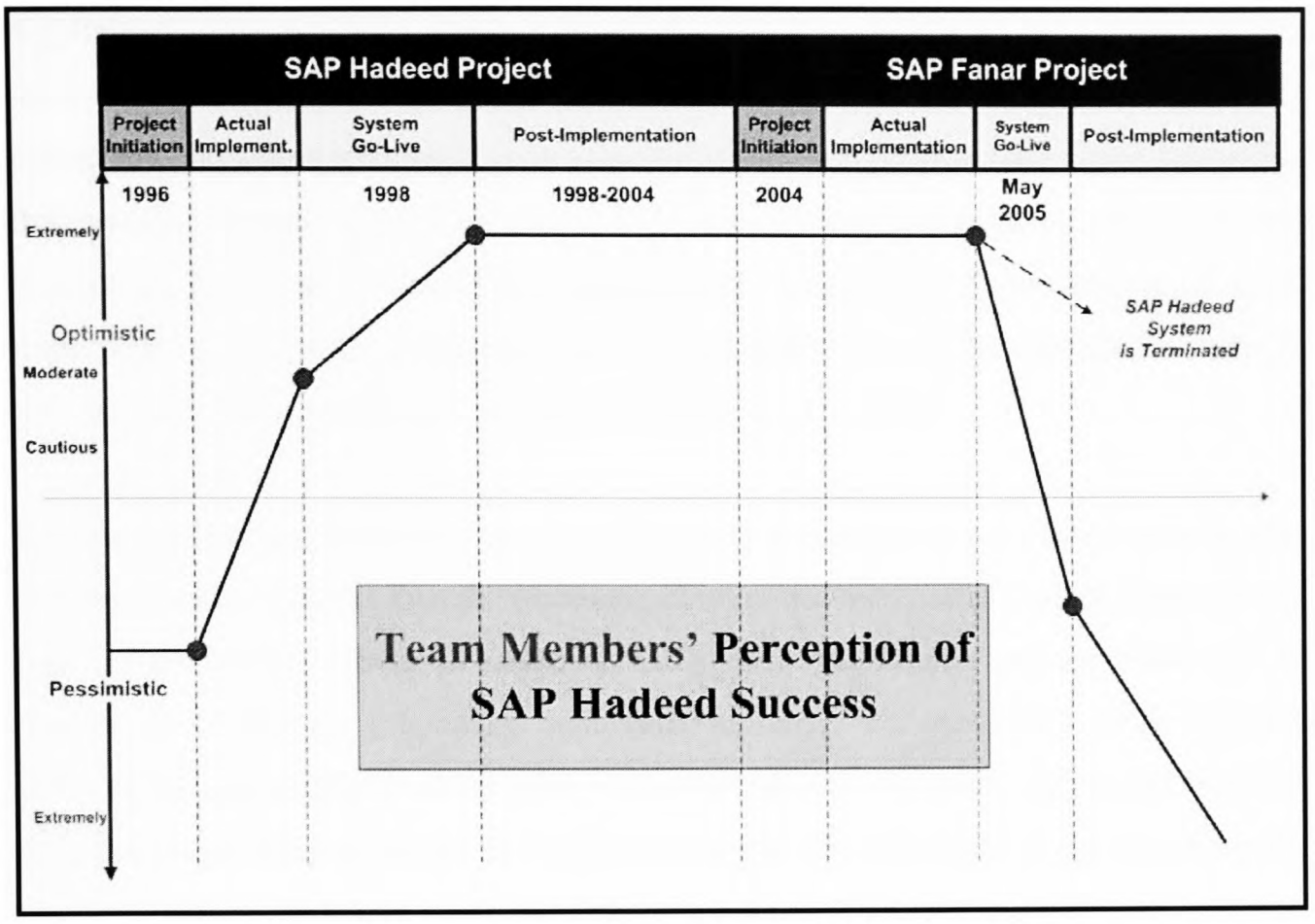


Figure 7-2: Team members' perceptions of SAP Hadeed success

For instance, Figure 7-1 shows how, during the SAP Hadeed project, the perceptions of end users were influenced by their previous painful experience of SAP, reinforced by the belief that Hadeed management and the project management had a weak understanding of the nature of such technology and how to implement it. Consequently, during the first two phases of the project, end users were expecting bad news, i.e. project termination, as had happened before in 1995. Nevertheless, once the management had appointed a new, more knowledgeable and empowered project manager, everything changed dramatically. In fact, it was evident that the misunderstanding of the technology and how it should be implemented had a negative influence on stakeholders' perceptions of success, particularly during the first two phases of SAP Hadeed.

Then, when SAP Hadeed reached its post-implementation phase, different groups of internal stakeholders perceived the system positively as the optimal solution and the best that they had ever seen. The system was in use during post-implementation and the perception continued to evolve as time passed. A few years later, the SAP Fanar project was initiated and was implemented professionally from different perspectives, as

highlighted in the previous chapter. During the SAP Fanar post-implementation phase, some people who had perceived SAP Hadeed as an optimal system now changed their perception and saw it as being a very poor system by comparison. One major reason for this dramatic change in perception was their new understanding of the nature of such technology and how it should be implemented. Indeed, the understanding of such technology and how to implement it is an important reason for changes in success perceptions and this confirms the work of Markus et al. (2000).

Finally, it is evident that the evaluation of success perception is a dynamic process that is influenced by factors lying on two major dimensions: the type of stakeholders and the time of evaluation. Thus, it seems to be a multidimensional phenomenon that is impossible to measure objectively and deterministically. As mentioned previously, the study of IS implementation and ERP implementation in particular shows the obvious effect of socio-technical issues in shaping the implementation process. In the following two subsections, these two major dimensions are discussed in some detail.

7.3.1 Success Perception and Time of Evaluation

This study confirms the importance of considering the dimension of time when investigating stakeholders' perceptions of the success of ES project. It is evident that the time of evaluation can have a significant effect on the result. Thus, what is seen as successful today may fail tomorrow and vice versa, and this is particularly true in the field of IS studies. Figure 7-1 above shows that Hadeed end users started by perceiving the SAP Hadeed project negatively, then their perceptions changed as a consequence of a dynamic web of interactions among a number of categories of factors in different inner and outer contexts. In this research, the exploration of the development of success perceptions within each project was confined to four phases, representing the major events of that project. Therefore, it has succeeded to some extent in showing how these perceptions developed, either positively or negatively, over the four phases.

Finally, this research explicitly confirms and supports the work of other researchers who have stressed the importance of time in success's assessment as that assessment may changes over the time, including Pettigrew (1985a, 1990), Larsen and Myers (1997), Sahay (1997), Adam and Spedding (2005) and Hakkinen and Hilmola (2008).

Additionally, this research supports the emphasis placed by Wilson and Howcroft (Wilson and Howcroft, 2002) on the importance of understanding the dynamic relationship between technology and society, discussed in section 7.2 above, over different periods of time. The results reported here underline the need to evaluate success perceptions continually over time, because such perceptions are changeable by nature; to take a snapshot of perceptions of a project at one moment and then attempt to generalise them over a longer timescale will give misleading results. This also confirms Pettigrew's viewpoint (Pettigrew, 1998) in regard to the possibility of individuals success perceptions' changes over time.

7.3.2 Success Perception and Stakeholders' Groups

This subsection discusses the second major dimension that must be considered in any attempt to evaluate IS in general and ERP systems in particular, in regard to success perception. It is evident from the analysis in chapter 6 that these perceptions may vary from one group of stakeholders to another. The present researcher decided from the beginning to consider only internal stakeholders and to divide them into two major groups: end users and project team members. It is now evident that these groups perceived the same system differently during some phases of the two SAP R/3 projects.

Figure 7-1 and Figure 7-2 above show conceptually how the two groups of stakeholders perceived the success of the SAP Hadeed system over the four phases of the two projects, based on the findings reported in chapter six. A comparison between the two figures makes it evident that the two groups perceived the same system differently at some points in time. Although their perceptions were not different at all times, it is the researcher's contention that the existence of a significant divergence of perception at only one time would be sufficient to highlight the importance of considering this dimension during any investigation of ERP success perception.

Hence, this research supports those authors who claim that the views of different stakeholders should be considered during any attempt to evaluate IS, although the classification of stakeholders into the groups identified here remains questionable. In this regard, Wilson and Howcroft (Wilson and Howcroft, 2002) have stressed the importance of considering multiple stakeholder viewpoints. Additionally, this study

confirms the results of Tai et al (Tai et al., 2002), who considered two groups of stakeholders – end users and key users – and found them to have different levels of satisfaction with the system in question. Finally, this research confirms empirically the claims of Sauer (1993), Myers (1995), Larsen and Myers (1997, 1999), Adam and Spedding (2005) and Sedera et al. (2007) that IS implementation success and failure, as an instance of change programs, cannot be determined without considering the opinions of different stakeholders. Thus, this also confirms Pettigrew (1985a, 1990, 1998) claims in which judgments about success of any change programs, here ERP implementation project, are likely to be conditional on who is doing the evaluation.

7.4. Lack of Strict Management Accountability and its Influence on Success

One of the main findings of this research directly concerns the implicit and indirect influence of politics in shaping the implementation process and consequently the success perceptions of different stakeholder groups. This was clearly noticeable during the SAP Hadeed project, although its effects were not observable immediately. It appears that the informal aim of management in initiating the project was to seek prestige by making Hadeed a pioneer of SAP implementation in the region (SAP.AG, 2008). In fact, during 1995-1996 there was no attempt to implement SAP in the region. This interpretation is supported by the fact that Hadeed management made an earlier attempt to implement a SAP system beginning in 1992, an attempt which ended in explicit failure when the project was terminated.

It appears that the management of Hadeed insisted in 1992 on implementing the SAP R/3 system to replace its PRIME legacy system although it had been advised by its consultant, PWH, not to do so because SAP R/3 was not yet a mature system. Hadeed disregarded this advice, purchased the system and started to implement it. Unfortunately, a few weeks after going live, the project was terminated completely because of some major problems of system and information quality, which caused a financial crisis for Hadeed. However, in 1996, the same management decided again to implement SAP R/3 from scratch without first evaluating the earlier failure to determine its causes. Fortunately, the company and its project management decided this time to run the new system in parallel with PRIME, as an insurance in case there should be

problems with the SAP system. Although this decision was technically beneficial in allowing the eventual replacement of PRIME, the company wasted significant resources in implementing it.

Accordingly, it is evident that the only explanation of the decision to adopt SAP R/3 in the SAP Hadeed project is that it was influenced by a hidden political agenda regarding the desirability of seeking prestige, although this was at the expense of the organisation's resources. As suggested earlier, the combination of this driver with a clear failure to understanding the SAP system resulted in an unfortunate situation where the management was determined to go live with SAP and to replace PRIME, regardless of problems or costs. Therefore, once the implementation phase started and the project teams had been established, neither the company management nor the project management had any direct concern for end users. Instead, all their efforts and resources were directed to the project teams, whose members were empowered to do whatever they saw fit in order to implement SAP Hadeed.

One major finding that may add value to this study pertains directly to the question of why the management insisted on implementing SAP again, although Hadeed had failed previously to implement the same system. In other words, what caused the management to offer continued and unlimited support for a certain project? An analysis of the data collected on this question leads to the interpretation that the reason was the absence of strict management accountability, which is a hallmark not only of this organisation but of most others in similar contexts in both private and public sectors. This in turn is a major factor behind the noticeable number of cases of corruption in the region, which is a characteristic of many developing countries and their organisations. Therefore, in IT adoption research in particular, the researcher believes that there is a need to discriminate between developing and developed countries in many cases, given differences in contextual factors including culture, transparency and accountability. This research supports the findings of Gray and Larson (Gray and Larson, 2008), who report the existence of cultural differences between Saudi Arabia and the USA, arguing that such differences require careful attention in project management, as culture may influence projects differently.

For Hadeed stakeholders, the definition of IS failure was shaped by the termination of the first SAP project because of problems of system or information quality. Therefore, the SAP Hadeed system was run in parallel with the PRIME system for a long period of time, at considerable cost. During that time, the SAP system was under continuous development, which itself was not free of cost. Thus, the decision to commit the necessary resources to run the systems simultaneously reflects the existence of a strong management commitment to the project. In other words, the intention of management was to go live with a SAP R/3 system that would provide accurate information and succeed technically in eventually replacing PRIME, regardless of the resources consumed. In fact, such continuous and strong support would not be withdrawn until the goal had been achieved, which confirms explicitly what has been highlighted by Sauer (1993) in this regard. In fact, Hadeed management already knew that it had complete control and that no body or agent had the right to question its decisions.

Thus, a poor understanding of the technology being adopted, the availability within a wealthy organisation of resources, particularly tangible ones, and finally the absence of strict management accountability, particularly in respect of strong and continuous support for the SAP Hadeed project, all contributed to reshaping the definition of failure and confining that definition within a narrow domain. Therefore, stakeholders in both groups would have perceived the SAP Hadeed system to be a failure if and only if it had functioned incorrectly or produced inaccurate information, which finally would have entailed project termination and a return to the legacy system.

7.5. Role of Relationships in the Composition of Project Teams

During the investigation of the SAP projects, it became evident that internal political factors played a major role in shaping the implementation process and consequently the success perceptions of stakeholders. In fact, digging deeply during the exploration of the different phases of both projects revealed that that role of these factors varied, as did their effects. Thus, their consequences were in some cases directly and immediately observable, while in other cases they were observed only indirectly and after some time.

For instance, during the SAP Hadeed project, once the management had implicitly started the implementation phase and changed the project manager, he started his

mission by developing different project teams. The nomination of most team members was the responsibility of the various departments and line managers. In fact, it was evident that that nomination process was shaped and influenced politically, as most of the nominated members were not really qualified, according to a combination of different viewpoints in that regard. In the Saudi context, relationships have an obvious influence, not merely on matters such as the composition of the project teams, but on aspects of life at many levels. This is due to the absence of any sort of strict accountability, as discussed above, combined with the tribal nature of the culture.

The consequences of such improper means of selecting team members was notable only during end user training sessions and from the support offered during the go-live and post-implementation phases. Thus, in some cases, end users did not receive the correct and accurate knowledge, simply because of the source of such knowledge. In other words, poorly qualified team members were not able to transfer the required knowledge or provide the required support and services to the end users, which influenced negatively the end users' perceptions of success. Nevertheless, it is notable that these perceptions gradually became more positive once SAP Hadeed went live. In fact, the full empowerment of the teams to satisfy their end users and accordingly to tailor the system to suit them contributed greatly to mitigating – but not eliminating – the effect of some political factors such as those discussed in this section.

7.6. Perceptions of ERP Success and the Contingent Variables

During the lengthy analysis of the large volume of data, it became obvious that some notable contingent variables had influenced the implementation of both SAP R/3 systems in Hadeed on many occasions. The influence of some of them extended beyond the implementation process to affect different stakeholders' perceptions of the success of the SAP systems. In fact, stakeholders' experiences of SAP and their related experiences influenced either directly or indirectly the perceptions of both groups of internal stakeholders.

For instance, some Hadeed stakeholders had had very negative and indeed painful experiences of the first SAP R/3 project which began in 1992. The effects of that experience were dynamic, as discussed earlier, in which its effects changed according to

its interactions with other factors in different contexts during the implementation of both SAP R/3 projects. It was evident during the SAP Hadeed project, particularly the first two phases that end users' bad previous experience; the poor understanding of SAP and how it should be implemented; and the weak management of the project all contributed negatively to end users' perceptions of success. Accordingly, they were extremely pessimistic of achieving any goal, including replacing the legacy system, as they were expecting to hear bad news.

Subsequently, as implementation proceeded, the same stakeholders' experience gradually evolved, influencing their perceptions differently in the subsequent phases of SAP Hadeed and then of SAP Fanar. Throughout the latter project, for instance, previous experience had a notable positive influence on end users' perceptions of success, causing an increase in their satisfaction with the system and the project. Hence, it was evident that experience played a dynamic role during the different phases and that it varied throughout the implementation process because of the dynamic nature of the actions of different players in different settings and of the interactions among them.

This finding provides particular support for the inclusion of these variables in any attempt to investigate IS success, as they may play different roles in shaping the implementation process and in influencing perceptions of success, as stressed by DeLone and McLean (2002) and Wang et al (2008). Nevertheless, although there were some claims in this regard, the main issue was not the inclusion of such variables but the dynamic nature of their actions and interactions during the project lifecycle and the unpredictable consequences thereof. In other words, previous experience, for instance, played two obviously different roles: as an inhibitor during the initiation and implementation phases of SAP Hadeed and as a facilitator throughout the SAP Fanar project.

Given the existence of these contingent variables and their dynamic roles, the question is whether it is reasonable to generalize the results of this research to other organisations. The researcher believes that observations such as the varied and dynamic effects of previous experience on the implementation of two successive SAP R/3 projects affecting the same groups of people within a single organisation show that it is

not possible to make such a generalization to other settings. In other words, the consequences of particular contingent variables in one context may not be the same as those in another context. Hence, IS success is a dynamic phenomenon that is difficult to identify and measure objectively and deterministically. This conclusion supports the argument of Marshall and Rossman (Marshall and Rossman, 2006) that no qualitative research is absolutely generalizable, although its findings may to some extent be transferable to similar contexts.

Finally, this finding directly confirms what has been suggested by Pettigrew (Pettigrew, 1985c, Pettigrew, 1985b, Pettigrew, 1987) in his proposed ideas that were mainly developed based on contextualisim. Pettigrew claims to treat each case separately and to consider the uniqueness of each case. This is due to the existence of some variations among organisations in a form of contingent variables such as the existence of previous SAP experience in the case of Hadeed Company and then its varied influence upon the implementation process of SAP Hadeed and SAP Fanar projects. In fact, contingent variables can be thought of as variables that can be used to distinguish one organisation from another.

7.7. The Nature of ERP Project Lifecycles

As mentioned in section 2.2.10, page 29, many authors including Ross (1999), Markus and Tanis (2000) and Shanks et al (2000) have viewed ERP projects as a set of linear successive phases, where it is presumed that the end of each phase means implicitly the commencement of the next one. The present research suggests that this view should be modified, as it was evident that the implementation of the SAP systems consisted of a set of dynamically overlapping phases; that is, that the pattern and extent of overlapping varied from one project to another. In other words, ERP implementation phases are not always successive and their pattern cannot be generalized, as each project has its own conditions and circumstances. While both of the projects examined in the present research were found to consist of four major phases, there was some overlapping of phases within the same project. This does not imply that the adoption of a linear classification of the components of the ERP project lifecycle is misleading; rather, it exposes the complex and dynamic nature of the implementation process.

Figure 7-3 below, based on an analysis of data from the SAP Hadeed project, shows how, before the system went live, the management of the company decided to change the project manager, thus modifying the implementation strategy which had been determined before implementation. Moreover, the implementation phase of SAP Hadeed did not end when the system went live, effectively continuing instead through the post-implementation phase. During the SAP Fanar project, a different type of overlapping was observed. Again, this does not imply the incorrectness of identifying such phases in projects of this kind, but instead supports the argument that each project, even within the same organisation and affecting the same people, should be treated separately, as each has its own context and conditions.

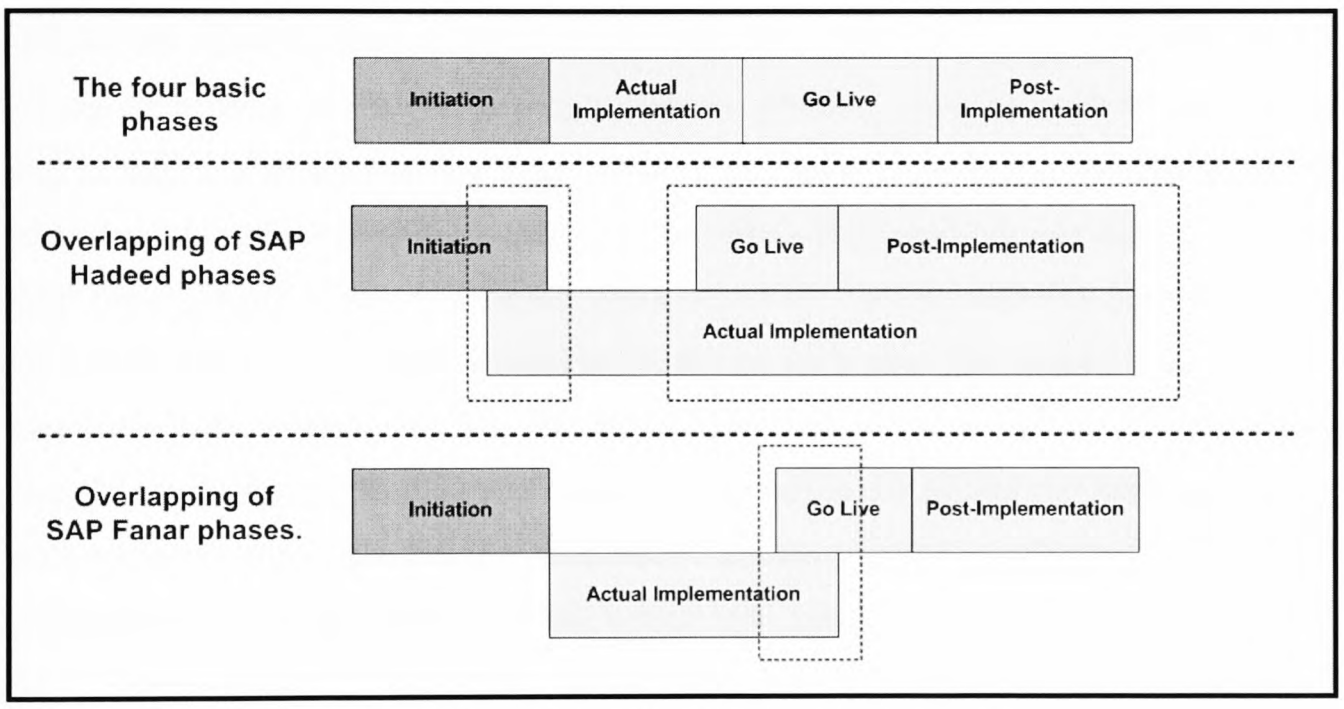


Figure 7-3: Overlapping of ERP project phases

In fact, the process of implementing complex technologies such as ERP systems cannot be seen as merely a set of successive and unrelated phases. Given the complexity of ERP and its comprehensive effects upon business units and people, the existence of such overlapping is not uncommon. In regard to the four basic phases identified in this research, it is evident that this division of the ERP lifecycle confirms to a large extent the proposals of Markus et al (Markus et al., 2000).

7.8. Classification of Internal Stakeholders

In light of the above discussion of the cumulative development of perceptions of the success of an ERP project over its lifecycle, the classification of internal stakeholders into team members and end users proved to be useful and appropriate. Given the obvious effects of ERP implementation upon different aspects of business and people, this classification was beneficial and informative, enriching the understanding of success perceptions in relation to such systems and revealing some beneficial findings, mentioned earlier in this chapter. This does not imply the absolute correctness of this classification, however, or that one should neglect other classifications such as those discussed in chapter 2.

Indeed, the classification into two broad groups of internal stakeholders was discovered during the process of analysis to have certain weaknesses, them most obvious of which was in regard to treating all end users or all team members similarly, rather than taking into account the ERP modules with which they were concerned. For instance, during the SAP Fanar project, it was evident that end users of the MM module and members of the team working on it raised few significant objections during the project, in contrast to those using or working on the PP, SD/LE and HR modules, who did make some complaints. In fact, a detailed and intensive analysis revealed that the main reason for such variation within the broad stakeholders' groups was the involvement of the MM stakeholders in the SAP SMO project, which took place between the SAP Hadeed and SAP Fanar projects. This project, whose aim was to consolidate the operation of materials warehouses among SABIC affiliates into one central warehouse managed and controlled by SABIC SMO, followed the as-is implementation strategy without any sort of configuration. This experience benefited both MM internal stakeholders' groups but did not add to the knowledge or experience of other stakeholders, as they were not involved.

Thus, given variations in the effects of any ERP project upon different business units and people, the broad classification of internal stakeholders as either end users or team members needs to be revisited. It would have been better in this case to divide these two major groups into subgroups based on ERP modules.

7.9. Summary

This chapter has discussed in detail the major empirical findings of the intensive data analysis process. The discussion began with the socio-technical nature of the ERP implementation process and its consequences for stakeholders' perceptions of success, causing them to change over time and to vary from one group of stakeholders to another. There was then an elaboration of the dynamic role of previous experience of SAP and related matters in influencing success perceptions, as an instance of a contingent variable. The role of political factors in shaping and influencing the phenomena under discussion was also considered. Examples discussed in some detail were the absence of strict management accountability and the role of relationships during the establishment of project teams, particularly in relation to perceptions of ERP success.

The chapter ended with a discussion of two major findings, regarding the nature of the ERP project lifecycle and the classification of internal stakeholders into end users and team members. Chapter eight concludes the thesis by considering the consequences of the results discussed here. It also evaluates various aspects of this research, assesses its limitations and makes recommendations.

8 Conclusion and Research Contribution

8.1. Introduction

As this research approaches its end, it is necessary to highlight its major aspects. Therefore, this chapter will start with a closing statement reviewing its major deliverables and then the research design will be evaluated. There will next be a consideration of how this study contributes to the body of knowledge in the research domain, followed by the identification of some major implications for practitioners. After an analysis of the study's limitations, the thesis ends with recommendations for future research opportunities.

8.2. Concluding Statement

This section attempts to show how the research questions have been answered with the help of the adopted instruments. By successfully unpacking the black box of ERP implementation using the pre-identified instruments underpinned by Pettigrew's ideas, the research leads to some valuable conclusions. In fact, it is clearly obvious that following Pettigrew explanation of contextualisim in cooperation with GTM leaded to understand the success perception change in ERP implementation and use. This is due to the fact that the comparisons that took place in this research were directed toward involving multiple incidents that occurred in the same physical and dynamic context at different points of time. In other word, where comparisons, during the analysis phases, are being attempted, it was not difficult to show how variability in context influences the pace, direction, and shape of the social processes under investigation.

Hence, the socio-technical nature of ERP implementation was clearly evident. Accordingly, investigating perceptions of ERP success reveals their dynamic nature, as they change over time and according to the perspectives of different groups of stakeholders. Thus, it is a dynamic and multidimensional issue in which a continual dynamic interplay among the implementation context, inner and outer, and different project's activities has taken place. Furthermore, this study emphasizes the implicit role that the political factors may play during the implementation of ERP which then

influences success perception differently. This research has also succeeded in exposing the dynamic role of contingent variables such as previous experience during the process of ERP implementation, affecting differentially the success perceptions of stakeholders. Evidence was also found of the elusive nature of definitions of success and failure, as these will vary with context. Therefore, a single global definition of IS success is not possible.

8.3. Research Contributions

This section considers the main contributions of this research project to the relevant domains of knowledge. The present study contributes to the literature on ERP implementation, as it reveals the complex, dynamic and socio-technical nature of the process. It stresses the dynamic nature of various factors that are impossible to determine and measure objectively. It also confirms that IS success and failure cannot be evaluated properly without considering the views of the different affected stakeholders and the time of evaluation, since perceptions change with context and surrounding conditions and actions. Furthermore, it highlights the potential role of politics during the selection of IS project teams and how this may indirectly affect both the project and stakeholders' perceptions of its success.

This study has another distinct feature which, to the researcher's knowledge, has not been previously researched: it considers two successive major ERP projects, SAP systems, within the same organisation and affecting the same groups of people. A review of the relevant literature shows that such investigations often focus upon one implementation experience where the targeted organisation seeks to replace its legacy system with an ERP system, whereas in this study, the second project aimed to replace one ERP system with another. Given that extended ERP systems such as CRM and SCM have started to attract the attention of many organisations, leading to their implementation on top of existing ERP systems, the findings of this research may be extended to encompass this increasingly common process.

Finally, the synthesis approach which combined GTM with Pettigrew's ideas of contextualisim also proved its usefulness in facilitating the 'black box' unpacking process of ERP implementation and use. This was obvious during the analysis phase of

the research in which Pettigrew's ideas asserted the dynamic continues interplay among context and content of change. Whiles the analytical paradigm of GTM has been adopted in order to reveal the process of change through the analysis of continual actions, reactions, and interactions of different components that comprise context and content of change. In fact, the ideas of Pettigrew have shown a significant positive impact upon the study and its findings as reported in chapters 6 and 7.

8.3.1 Implications for Practitioners

This research has a number of implications of direct relevance to practitioners in this domain of knowledge. Most of these are in the form of lessons learnt as a result of a deep investigation of two comprehensive SAP R/3 projects that took place in one organisation over more than ten years. This section presents the most important and noteworthy of these lessons.

Organisations should carefully evaluate their decision in regard to whether or not to implement an ERP system. Such systems are very different from custom IS and often require the input of more resources and participation at different organisational levels and from many business units. Additionally, ERP vendors will usually work hard to sell their products, for instance by suggesting that implementation is easy and that the systems concerned have only positive features.

The management should carefully seek the services of a consultant with adequate qualifications and experience in ERP implementation and related work. Moreover, the management of the organisation and the members of its project teams should benefit from the consultant not only by seeking help in implementing the ERP system; they should also seize the opportunity to gain as much as possible from the consultant's experience. This means not being passive but proactive with the consultant and not taking the validity of recommendations for granted without discussion.

Establishing firm goals and vision from the beginning and making them clear to everyone in the organisation is another important aspect of such a project. Therefore, it is important to complete the development of a business case before the formal implementation of the project. Two of the main decisions that need to be made

particularly carefully are in regard to the implementation strategy and approach. Both decisions are context and project sensitive, which means that they should take into consideration the organisation's vision and strategy, as well as the goals of the project.

It is essential to select the right project manager, as this person will be required to keep the project on the right path and to overcome any difficulties that may arise. The selection of a project manager and project team members should be free from any political influence as far as it is possible for the management to ensure this.

As the adoption of an ERP system involves many business and technology changes, designing a highly effective change management programme should be one of the main concerns of the project management. Not only should this depend on what others have done or on the advice of the consultant; such a programme should be designed in a context-sensitive way which takes into account the contingent variables and characteristics of the organisation. It should take place from the early stages of the project and continue beyond go-live. Most importantly, it should be dynamic, as its contents will change over time, according to the activities and tasks undertaken. Thus, it needs to be revisited periodically.

It is important to emphasise one more major issue in this regard. Approaching the go-live of the implemented system does not indicate the imminent end of the project. Instead, those managing the project should take another trajectory, ensuring continuous system support and optimization. Finally, as the members of the project teams prepare to leave the project offices after finishing their mission, it is important to offer them thanks and show them appreciation free of political influence.

8.4. Research Evaluation

This section offers an evaluation of the research design as a vehicle to address the research questions and to inform the subject matter. This process will consider the major components of the design, as it seems to be a synthesis of philosophical and methodological elements. The process begins by evaluating the philosophical tradition adopted and then evaluates the research approach and the use of GTM in data collection and analysis. Additionally, the evaluation section will encompass an evaluation of

Pettigrew's ideas that have been incorporated with the research design. Moreover, the evaluation process will continue to encompass the quality of the research based on the considered principles that have been proposed by Klein and Myers (1999). Finally, there is an evaluation of the use of the NVivo software.

8.4.1 The Interpretive Paradigm

This research began with a grounding in interpretive principles, particularly those related to the ontological and epistemological stances of interpretivism. This starting point was instrumental in determining the trajectory of this research and then affecting the researcher's perception of the subject matter and related issues. Ontologically, the perceptions of the success of ERP system were explored as socially constructed facts having a consequent dynamic nature, changing according to context and conditions. In fact, the findings were wholly compatible with this view of reality as socially constructed by the players in a certain context and variable accordingly.

Epistemologically, this belief in the dynamic nature of facts in the social world meant that it would be impossible to achieve a purely objective and deterministic view of them. Instead, such realities would have to be understood subjectively in their context through the meanings that people assigned to them. Therefore, the reality in which the study was grounded was the participants' narratives, which were critically considered and compared with each other to produce a common world view, which in this case concerned their perceptions of the ERP projects and their success.

All in all, by adopting these two main philosophical principles, the study has succeeded at least in showing the dynamic nature of success perceptions and their dependence on the socio-technical context, which is a reflection of the reality of the social world. Thus, adopting the interpretive research tradition in this study allowed it to reflect reality although interpretive research has not yet matured. In fact, the dominant deterministic view of social world realities and their objective measurement need at least to be questioned and then revisited.

8.4.2 The Case Study Approach

Within the interpretive paradigm, the case study approach helped to give the study focus in investigating deeply a particular setting. As noted in chapter three, although this approach has some limitations, it also has many benefits. In practice, its adoption here has proved its appropriateness, particularly in answering the research questions. It is particularly appropriate where a single case is under consideration, such as in this research project, where a single case study provided the opportunity to explore deeply and intensively the way that internal stakeholders perceived the success of two related ERP projects. In particular, the complex nature of the selected industrial setting lent itself to this type of exploration, in addition to the complexity of the perceptions of success of multiple projects. Furthermore, it proved its usefulness in informing the subject matter of the study, given the paucity of adequate and informative studies of stakeholders' perceptions of ERP success. All in all, the decision to adopt the case study approach was a result of the harmonization of interpretive philosophical beliefs, the subject matter, the research questions and the setting; and doing so was entirely appropriate to this research, although it was only a single case.

8.4.3 The Grounded Theory Method

Among the qualitative methods that could have been used for the purposes of data collection and analysis, GTM was selected for partial use in this research. Although some other qualitative methods such as discourse analysis and conversational analysis were considered during the early stages, GTM was considered the most appropriate to the chosen setting. In fact, it was a useful tool that helped in freely exploring the subject matter without blinding the researcher to important issues that might contribute in some way to shaping the findings.

In general, qualitative research has been criticized for the absence of systematic methods of sampling and data analysis. In fact, compared with other qualitative methods, GTM has been shown to offer some degree of systemization. This can be seen in different aspects of the method such as theoretical sampling, data collection flexibility, comparison of constants, theoretical saturation and the coding process. Therefore, it played a major role in informing the subject matter of this research, as everything emerged from the data and was thus grounded in it.

While GTM has benefits, this research also provided empirical evidence of some of its major weaknesses. The comprehensiveness of the method means that the volume of data collected can be very large, which in turn increases the complexity of the analytical process, so that GTM requires more time than some other methods. Therefore, the timeframe of the research is a major factor that should be considered carefully when deciding whether to adopt this method. Careful preparation, in conjunction with the adoption of appropriate qualitative software which the researcher understands very well, may help in mitigating such drawbacks, but cannot eliminate them. Another major difficulty that arose during analysis concerns the distillation of the final findings from the very large volume of qualitative data collected.

To sum up, adopting GTM in this research helped in revealing some major issues in regard to the understanding of the development of success perceptions during ERP projects. The researcher believes that these issues would not have been revealed, as it did, without adopting that method. Although he personally admires this method, this admiration has not arisen free of costs. However, with sufficient practice, it would become easier to use in future research. Practically, this research has shown the usefulness of partially adopting GTM to benefit from its capabilities in exploring the required phenomenon, although its application has some difficulties. Therefore, researchers should enrich the IS field with more studies that adopt this method in order to explore its pros and cons, thus enriching the IS community with such studies.

8.4.4 Evaluation of Research Quality

As a aforementioned in section 3.6 page 97, Klein and Myers (1999) principles have been considered during the process of undertaking data collection and analysis of this research to ensure its quality. In fact, among seven principles that have been proposed by the proponents, only the first six principles have been considered. Whiles the seventh principle has been excluded due to its appropriateness only to research conducted from critical perspective. In the following six subsections, a brief explanation of how each considered principle was adopted.

8.4.4.1 The Fundamental Principle of the Hermeneutic Circle

"*This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form*". This research is all about the success perception of internal stakeholders in ERP projects which can be referred to as the "whole". Therefore, in order to develop a better understand of that "whole", it was necessary to understand all of its parts and interrelationships that it, the whole, encompasses. Therefore, looking for different parts and their interrelationships during that process was not an easy task but it was not impossible.

However, it is impossible to understand the totality of the stakeholders' success perceptions neither in theory nor in practice. Therefore, the problem was determining when there was "a whole" that was useful and thus when the data collection process could stop. In fact, the adoption of GTM helped me in determining, in this regard, when to stop that process particularly when theoretical saturation is achieved. In this case, it became clear that nothing of great significance was being added to as a result of additional data (Strauss and Corbin, 1994). This, finally, leads to incorporate most, but not all, of the independent meaning of parts to form the whole that they form.

8.4.4.2 The Principle of Contextualisation

"This principle requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged". In fact, during he early stages of this research, I planed a one month pilot study to the selected site and that visit was approximate nine months before the commencement of the actual filed word. One major benefit of such visit was pertaining directly to building rich background of the selected site; its past and present IT projects and experience; and its major historical events. This can be easily noticed in section 4.6 page 112. In fact, the hospitality nature of Saudis makes them speak with their guests unreservedly and provide them with the required information freely and informally. Such cultural aspect contributed as well in developing such rich background. Moreover, in order to increase the accuracy of the reported context, I considered more than one source of data to increase such accuracy and clear up any misunderstanding.

Cross checking, formal interviews, informal chats, and considering different available documents all have been adopted in this regard.

In fact, building such rich background of the selected site, the adoption of GTM for the purpose of data collection and analysis, and finally the adoption of Pettigrew's ideas in this research all contribute in demonstrating and presenting different historical and social settings to different audiences as they occurred. Consequently, audiences will notice during the analysis phases and the remaining phases of this research that nothing emerge from vacuum and everything is explored in its context.

8.4.4.3 The Principle of Interaction between the Researchers and the Subjects

"*This principle requires critical reflection on how the research materials (or "data") were socially constructed through the interaction between the researchers and participants*". In this research, case study was adopted as the main research strategy to investigate two subsequent SAP projects. In fact, there was not any sort of obvious interaction with the subject due to the fact that the first SAP project is already terminated and the second SAP project is still under normal use.

However, an interaction with subject was conceptually available in which the research often have asked different participants some of what-if questions. For example, what do you thing if you have the chance to practice the actual system before the go live?. In fact answering such question will help in clarifying some vague aspects as well as open new opportunities to investigate newly emerged ideas.

8.4.4.4 The Principle of Abstraction and Generalization

"This principle requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action". In fact, in interpretive research generalization and abstraction are not prerequisites. However, this research offers some opportunities to generalize some of its related aspects to similar setting although such generalization can not be considered as universal laws such as in

the case of the positivism where the generalization is from the sample to the whole population.

Hence, in this interpretive research, the understanding of the concept generalization varies from positivistic research. Therefore, the generalization could be to the development of new concepts or to the related theory such as the synthesis of GTM with Pettigrew's ideas of contextualisim to explore the process of change in ERP implementation and use for the purpose of attaining better understanding of stakeholders' success perceptions.

8.4.4.5 The Principle of Dialogical Reasoning

"This principle requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ("the story which the data tell") with subsequent cycles of revision". This research as aforementioned has been design to relay partially on the use of GTM for data collection and analysis. This in fact, entailed starting the exploration process freely of any effect or influence of any previous theoretical preconception. Nonetheless, although the decision to adopt Pettigrew's ideas of contextualisim in this research was made, the actual appearance of such ideas was in fact at the end of the second round of data analysis. This was due to the fact that I was looking for developing different initial major categories grounded from the data before incorporating Pettigrew's ideas in the analysis process.

However, one major issue should be carefully explained in this regard. It pertains to the available theories in regard to IS success and failure. As aforementioned in chapter 2, previous related researches, factoring approach has, to date, dominated IS success research and its preconceptions in fact in some cases was influencing the researcher and the research. Nevertheless, the researcher was able to protect himself from such effect by trying to contradict these preconceptions and compare them with what was going on in the story, the data, instead of considering them although factoring approach has been excluded from this research. Moreover, this principle, as well, requires a careful explanation of the philosophical background underpinned this research including its strengths and weakness. Additionally, that explanation should be extended in some

details to encompass the adopted synthesis of research methods which have guided this research. All of that was presented and shown in chapter 3.

8.4.4.6 The Principle of Multiple Interpretations

"This principle requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it". In this research, this principle requires the exploration of the influences of the social context upon the actions which means searching for multiple viewpoints and the reasons behind them. In fact, the adoption of GTM helped in undertaking deep exploration in order to expose different viewpoints and why such viewpoints emerged as they do. This was via the comparison between similar actions and events according to participants' viewpoints.

Furthermore, the nature of this research also contributed in the emergence of different interpretations of same actions. The exploration process encompassed two subsequent SAP projects, all modules, and manly focused upon the perception of success of two groups of internal stakeholders. Therefore, the investigation process required to encompass mix of people representing different business units and SAP modules. For instance, end users working in HR, HR team members, IT team member, HR team leader, and project manager. Such mixture of internal stakeholders in fact requires being sensitive to different interpretations. In fact, using NVivo software during the data collection and analysis process was very useful in this regard.

8.4.5 The NVivo Software

As noted above, the method adopted and the nature of the study contributed to generating a very large volume of qualitative data from approximately 57 interviews. Transcribing these interviews, coding their contents, memoing, developing major categories and their connections, and finally reporting and diagramming were all lengthy and complicated processes, but they were not difficult. This was attributed to the proper use of the NVivo software, which was vital to the successful conduct of this research.

Notwithstanding its great benefits, in order to realise fully the potential of this software, researchers must understand that the analysis is in their minds, for the software will not analyse their data for them. Its main role is to deal with different sorts of data according to the researchers' classification. Therefore, they should first identify their own templates for their data prior to the use of the software and then implement them in the software to facilitate the storage, coding and retrieval of data, the development of searches and queries, data segregation and integration, comparisons and finally diagramming and reporting.

In general, as qualitative research, particularly when GTM is adopted, is criticized for not ensuring that the context and the richness of the collected data are not lost, the adoption of such software can be very useful in reducing these losses, as it was in the present research. It also helped to ensure the consistency of the data, as each type of data was stored in only one location, so that any change would be automatically and directly reflected upon different related aspects of the software. For instance, plain or raw codes were located in a free node folder; therefore, if the researcher changed the name of one code, this change was automatically reflected in all figures using that code.

All in all, the availability of qualitative data analysis software such as NVivo and its continual development are important in driving the development of qualitative research and boosting its popularity, particularly in the social sciences. The researcher considers the proper adoption of such software in any qualitative research to be a component of research validity. Hence, the researcher strongly recommends others who undertake or plan to undertake qualitative studies to rely heavily on the use of qualitative software such as NVivo, not merely to manage their data, but also to facilitate different analytical requirements and in reporting and diagramming. In order to obtain the most valuable results, it is important to understand the software prior to its use and then to design the system based on the nature of the research and its contents, using such features as folders and coding techniques, identifying the required attributes etc, in a way that best suits the researcher's needs.

8.5. Limitations of the Study

> *All proposed research projects have limitations; none is perfectly designed* ***(Marshall and Rossman, 2006; p: 42)***

Whatever the efforts that researchers have put into their work, it is bound to have limitations. Some of these have been considered in the early stage of the research, while others have been identified in the later stages. The main limitations of this research project are listed in this section.

- The research took the form of a case study and was limited to only one case. Although exploring one case has some benefits, such as the ability to investigate a phenomenon in depth, it has been argued against the adoption of this approach that most of the data collected are specific to the context or organisation, so that generalizing the results to the whole population is not possible. The present researcher decided to investigate stakeholders' perceptions of the success of two successive major SAP R/3 projects in one organisation taking into consideration that such broad generalization was not necessary. Instead, generalization in interpretive research may be to theories or to similar contexts. The exploration of two concurrent systems allowed for comparisons to be made between them and then for more evidence to be collected in order to further the exploration of success perceptions, which finally contributed to enriching this research.
- Another limitation of this research was in the nature of the context, which was that of a private sector manufacturing organisation in a developing country. Therefore, all public sector bodies, academic institutions and multinational organisations where more than one culture exists are beyond the scope of this research. Although there may be some similarities among these sectors, there are also differences which may play a major role in influencing the perceptions being explored, due to the distinctive features of private sector organisations.
- This research was also limited to investigating the success perceptions of two broad groups of internal stakeholders, viz. end users and members of project teams. Therefore, all external stakeholders were beyond its scope. Moreover, individual characteristics took no part in the exploration process, although in some cases their effects were noticed.

- Hadeed, the organisation within which the empirical work was conducted, set certain constraints, forbidding the collection of any financial data pertaining either to the SAP R/3 projects or to the organisation itself. Therefore, it was not possible to explore the financial variables that may have shaped the perceptions of participants. Factors such as whether a certain project went live within the specified budget, or whether a return was achieved on the investment made, may also have influenced these perceptions in some way. Thus, the exclusion of financial data was a significant limitation.
- This investigation process covered two major SAP R/3 projects that took place over more than ten years. Therefore, there were limitations in respect of collecting data on the first of these, the SAP Hadeed project, which ran from 1996 to 2005, as many participants no longer remembered exactly what had happened. Therefore, during the interviews, the researcher avoided asking direct questions about historical aspects of the project, trying instead to help the interviewees to recall the events by using a set of indirect and unstructured questions. Although the study benefited from some internal documents on the project which the researcher collected, these were few and not sufficient to provide a clear account. These limitations were partly overcome as a consequence of adopting GTM, due to its nature in guiding the data collection process, which was developed cumulatively over time, based on its competency in theoretical sampling and its flexibility in this regard. However, the study was constrained by the difficulty in collecting historical data from participants in some cases due to the limitation of time.
- A final limitation was bias, introduced either by the researcher himself or by the participants. Indeed, it has been argued that the nature of the interactions between researcher and participants in every interview may to some extent affect the results. It is not uncommon when interviewing people to learn only some of the truth, as part of it may be omitted, whether intentionally or not. Although the research benefited from the use of GTM, which facilitated the making of regular comparisons and then basing questions on the differences in subsequent interviews, the effect of participants' bias remained noticeable, even if it was, to a large extent, under control.

Despite these limitations, the decision to adopt GTM partially for the purposes of data collection and analysis proved beneficial. The researcher's years of experience in IS development and databases facilitated and simplified the understanding and the use of GTM and the NVivo software. Additionally, it helped him to apply the system properly, so that a sort of harmony was developed between NVivo and GTM. Consequently, the coding process was designed in a way which helped in retrieving the required information, with its context, more easily and more efficiently.

8.6. Avenues of Future Research

From the findings and limitations of the present study, there emerge a number of opportunities for future work which need to be stressed as they are worth investigating in detail. Five suggestions for such work follow.

- As this research considered only internal stakeholders, research should be conducted into external stakeholders' perceptions of ERP success, using instruments similar to those used here.
- It was evident during this research that the internal stakeholders whose perceptions are of interest need to be distinguished according to the business units in which they work. In other words, the perceptions of end users of HR, for instance, should be compared with those of users of other modules. Similar comparisons should be made in terms of team membership in order to investigate the importance of the selection of team members and its effect upon knowledge transfer thereafter, once the project approaches go-live.
- Although there has been a great deal of academic research into ERP implementation in general, more work is needed on the process and on the phenomenon of success perception in the particular context of developing countries, where this research has shown that the understanding of ERP systems and their implementation have been poorly investigated.
- The present research also raised an important issue that contributed to shaping the whole ERP project, concerning the sort of management support and to what extent that support should be limited. This major issue arose during the empirical part of

this study and was accordingly highlighted in the findings, but needs further investigation.

- Finally, this research has raised the question of political influence upon the composition of project teams and that of its indirect influence on success perceptions, both of which are worth careful investigation.

Appendices

A: Consent Form [English Version]

B: Sample of Interviews Questions

Appendix A

Consent Form [English Version]

University of Salford
IRIS
Majed A. Al-Braithen
m.a.al-braithen@pgr.salford.ac.uk

Participation Consent Form

ECF1

Code #	FI_12	Interview Date	25-Apr-07	Day	Wednesday
Start Time	09:30 AM	End Time			
Location	Participant office 3rd Floor - TSD - Hadeed				

Research's Information

Researcher name	Majed A. Al Braithen	Nationality	Saudi
Email	m.a.al-braithen@pgr.salford.ac.uk		
Supervisor	Professor Alison Adam	Email	A.E.Adam@salford.ac.uk
Department	Informatics Research Institutes	School	Business School
University	University of Salford		
Address	25 Wyverne Road Chorlton Manchester M21 0ZW		

The objective of this research study is to investigate different perceptions of the success of ERP projects among internal stakeholders. The researcher decided at the outset to set this research in a private Saudi organization. Hadeed was chosen for many reasons, particularly its experience of several SAP R/3 projects over a period of more than ten years.

I would like to draw your attention to an important point: although I am conducting PhD research, I remain a member of the security forces working under the umbrella of the Ministry of the Interior at the King Fahd Security College Computer Centre. This means that I am really working to fulfil the conditions of my PhD study and nothing more than that, so please trust me.

Majed

University of Salford
IRIS
Majed A. Al-Braithen
m.a.al-braithen@pgr.salford.ac.uk

Participation Consent Form

Participant's Personal Information	
Full Name	
Current Main Role	
Current Position:	
Current Department:	
Organization:	
Mobile (1):	Mobile (2):
Formal Email:	
Another Email:	

SAP Hadeed Project	SAP SABIC Project (FANAR)
Participant Role:	Participant Role:
Participant SAP Module:	Participant SAP Module:

Notes:

University of Salford
IRIS
Majed A. Al-Braithen
m.a.al-braithen@pgr.salford.ac.uk

Participation Consent Form

Please read carefully and tick the appropriate boxes if you agree:

•I understand that agreeing to take part in this research project means that I am willing to be interviewed by the researcher individually (one-to-one and face-to-face) ☐

•I agree to the interview being recorded ☐

•I give my consent for the researcher to use the interviedata again in the future ☐

•I understand that my name and identifying details will be changed and that access to the original tapes or MP3 files and transcripts will be restricted to the researcher and his supervisor to protect my identity from being made public ☐

•I also understand that my participation is voluntary, that I can choose not to participate in the entire project or part of it. Therefore, I can withdraw at any stage of the project without having to give reasons and this withdrawal will not entail any form of penalty or loss ☐

Please tick only the appropriate box:

The information I provide can be used in future research projects which have ethical approval as long as my name and contact information are removed before it is given to them ☐

The information I provide cannot be used by other researchers without my permission being given first ☐

The information I provide cannot be used except for this project ☐

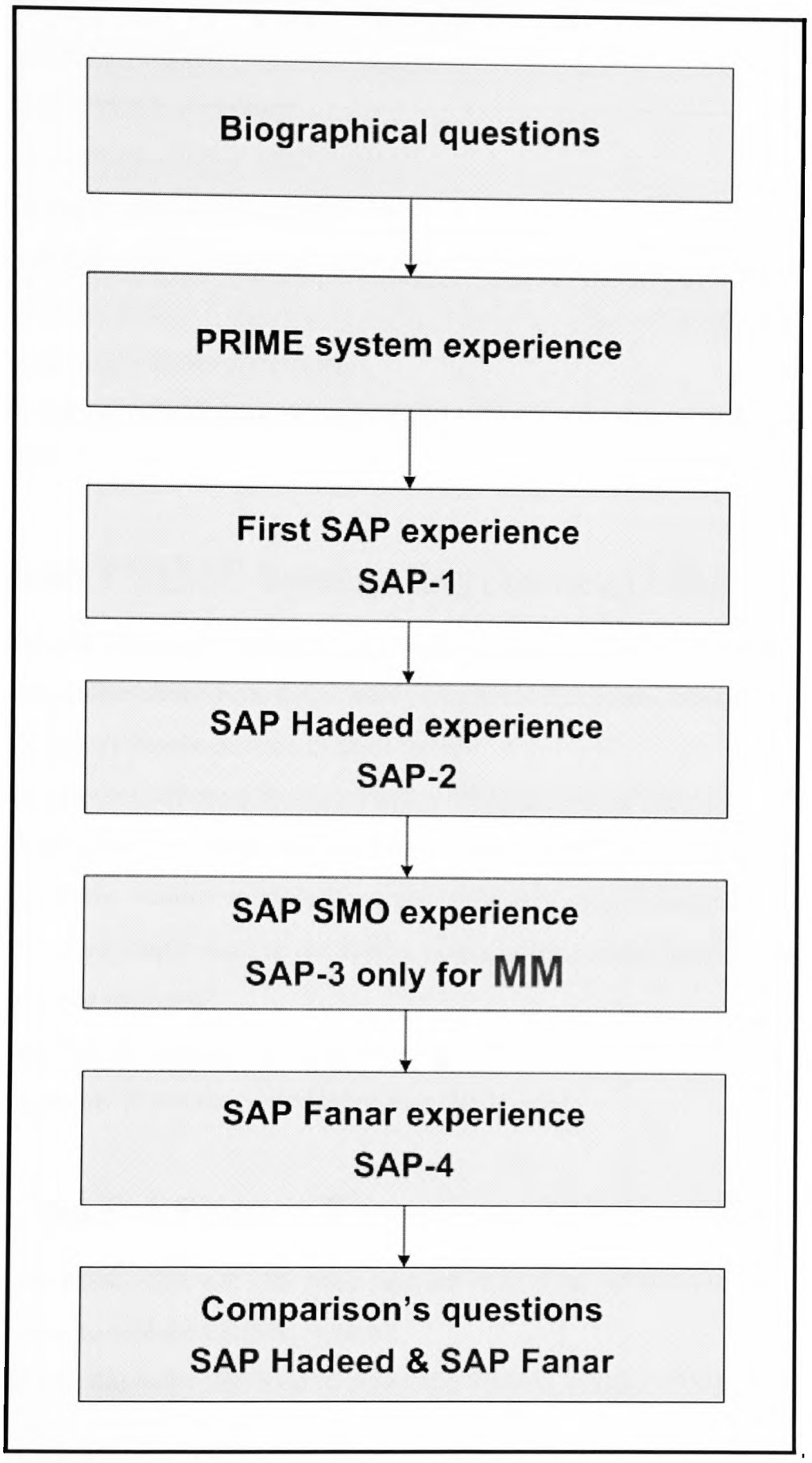
I agree to take part in this PhD research project as an interviewee. I have had the project explained to me and I have had a copy of this consent form, which I will keep for my records.

		Signature	
Interviewee	**********		25-Apr-07
Interviewer / Researcher	Majed A. Al-Braithen		

End of Participant's Code# [FI__12] Concent Form

Appendix-B

Sample of Interviews Questions


Biographical questions
PRIME system experience
First SAP experience
SAP-1
SAP Hadeed experience
SAP-2
SAP SMO experience
SAP-3 only for MM
SAP Fanar experience
SAP-4
Comparison's questions
SAP Hadeed & SAP Fanar

Biographical Questions

1 Interviewee's Name.

2 When did you join Hadeed?

3 What is your academic qualification?

4 What is your English language level?

5 Do you have any previous IT experience? If yes than what are they?

6 Did you have any IT training courses? If yes then what were they and when?

7 What is your current department?

8 With my appreciation, could you please tell me your current position and your main role?

Hadeed PRIME System Experience (1983 – 1998)

9 Could you please tell me about your experience with PRIME system?

10 During undertaking your daily tasks using PRIME system, how did you use PRIME system? Please explain in some detail?

11 Were their any obvious issues related to PRIME system? What were they?

12 Have you used any other applications in line with PRIME system and why?

13 What did the management do in regard to PRIME system issues?

14 If you faced major issue or limitation when during using PRIME system, how does that issue resolved?

15 Personally, did you advocate or even claim to replace PRIME system with another system? If yes than what were you looking for?

SAP-I Project Experience (1992-1995)

16 In your view, what were the main reasons behind the decision of the management to replace PRIME system?

17 What was the main objective of replacing PRIME system with particularly SAP system?

18 How did you hear about the intention of the management to implement SAP system? And when?

19 Were there any obvious and noticeable formal activities during the initial stages of the project?

20 Do you have any idea about why SAP system in particular has been chosen?

21 Who was the consultant during that project?

22 What were the first activities of that project and how were they?

23 How did you assess the selected project teams' members and the project manager selection?

24 What do you think about SAP system at that time?

25 Once different project teams' are developed, what were their roles?

26 Have you received any formal announcement pertain to the project? If yes, when?

27 Have you had any training pertain to SAP system and its related IT applications?

28 When was that training and who was in charge to undertake such trainings?

29 Was there a notable communications with end users during running the project? If yes, how?

SAP Hadeed Project (1996-2004)

30 How was the team development process?

31 What was you role during SAP Hadeed project?

32 Did Hadeed inform their employees that SAP system will be implemented in the company?

33 Was Hadeed the first company in the region that implemented SAP system during that time?

34 What was the implementation approach?

35 What was the implementation strategy?

36 Could you please tell me, what was your role in the project team during and after the project?

37 Before, you join the project, have you heard, received or even been invited to any thing in regard to SAP?

38 Was there any observable sort of awareness programs that were organized and undertaken by SAP Hadeed project team?

39 After go live, what was the role of key or power users?

40 Was there any formal training for end users, and when?

41 What about manuals, have you had any? What was their sort?

42 How do you assess that training?

43 Were there any qualified people available in IT to solve any technical or even business issues related to SAP system?

44 What were users' situations before and after SAP go live?

45 What was your role after SAP go-live when leaving the team back to you department?

46 If a user in your department faced a problem after SAP go-live, what is the actual procedure to solve such issue?

47 What other knowledge have you had in regard to SAP during your working with the team?

48 How can you explain and assess Hadeed experience in regard to SAP?

49 What is your opinion a bout SAP as a system according to your long SAP experience?

50 When did SAP Hadeed go live and for how long it continues running?

51 Were there any obvious problems with SAP Hadeed?

52 Let's talk about after go-live period, what was your role and what was your main responsibility?

53 What is your perception of SAP Hadeed project?

54 Do you think it was a successful project and why?

55 Were there any plans or even intentions to optimize and utilize the system particularly once it has been stabilised?

SAP SMO Project (1999-2001)

56 When did SSL start?

57 What were the issues of SSL?

58 Why SABIC decided to implement SAP SMO?

59 Do you have any idea about why SABIC selected SAP system in particular?

60 What business units have been involved in this project?

61 What was your role during that project?

62 Do you think SAP SMO project add any knowledge to you? Explain pleas?

SAP Fanar Project (2004-Present)

63 What was Hadeed objection against Fanar project?

64 What was your role during that project?

65 What was the implementation approach?

66 What was the implementation strategy?

67 Do you recommend any configuration or you prefer to adopt the system rather than adapt it?

68 Do you think SAP Hadeed facilitated and streamlined the transition to Fanar or not and why?

69 Was there any formal training for end users?

70 What about manuals, have you afford them manuals?

71 How SAP Hadeed benefited SAP Fanar?

72 When did SAP Fanar start?

73 Were there any obvious problems with SAP Hadeed?

74 What were the rationales behind SABIC decision to run SAP Fanar project?

75 What was the consequence of SABIC decision to implement only one system in SABIC and its different affiliates?

76 Were there any mistakes made by SABIC during SAP Fanar and what were they if any? project

77 Do you feel even for a moment that Hadeed users were over confidant during or even after implementing SAP Fanar?

78 Let's talk about after go-live period, what was your role and what was your main responsibility?

79 Ok let me ask you a question, if Hadeed moved directly from PRIME to Fanar, what do expect the situation will be?

80 What is your perception of SAP Fanar project?

81 What happened to you when you left Fanar team after SAP Fanar go-live?

82 Do you think it was a successful project and why?

SAP Hadeed and SAP Fanar Projects Comparison

83 How can you compare SAP Hadeed project with SAP Fanar project?

84 Are there any differences between Hadeed management attitudes during SAP Hadeed and SAP Fanar projects?

85 What were the obvious problems in both projects?

86 What were the strength aspects of each of them?

87 What are the important areas that should be considered during any SAP implementation endeavour?

88 What is your perception of SAP Hadeed particularly after going live with SAP Fanar, and why?

89 Do you think SAP Hadeed facilitated or hindered the implementation of SAP Fanar project? Please explain in more details?

90 If you have been asked to join new project, what will be your viewpoint and why?

91 Do you think Hadeed and SABIC showed a good appreciation to projects' members after completing any SAP project? Explain?

92 In other word, were there any management promises that have been given to teams' members? What were they?

93 Have Hadeed and SABIC managements committed to their promises?

94 Ok but in you view, what will be the implications of such management attitudes upon both teams' members and non-members?

95 Finally and generally, in few words, what is your perception of SAP Hadeed project and SAP Fanar project and why?

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