BPR Initiatives:

The Impacts of IT and Organisational Customs and Practices

A Thesis Presented

by

MANAL AHMED M. N. AL HASHDI

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ABSTRACT

This research is designed to investigate the relationship between IT and Organisational customs and practices in Business Process Reengineering (BPR) projects based on a research framework, which consists of organisational culture, IT and the outcome of BPR initiatives together with the inextricable interdependence between them. The focus is on developing a process oriented, context-based description and explanation of the BPR phenomenon in Arab Gulf Cooperation Council (AGCC) countries. The study strives to describe and explain the process of adopting and implementing BPR initiatives in petrochemical and utilities industries in AGCC countries in terms of interaction of contextual conditions, actions and consequences. The research methodology of this thesis focuses on the pragmatics of conducting case studies as a rigorous and effective method of research. The study emphasises on conducting positivist inquiry of three case studies' data to deductively test the researcher's understanding on BPR and her assumptions of 'Blueprints' for successful BPR in AGCC countries. Two of the case studies organisations are sister companies operating in the oil and gas industry, whereas the third case study organisation is a utility company operating in the field of water and electricity generation and supply.

This study resulted in a framework that could serve as a prescription to achieve a successful BPR initiative. It has identified a number of organisational elements that emphasised the necessity to pay attention to cultural and IT issues prior to undertaking BPR projects. These include the development of strategy and sound stimuli for the project, the availability of leadership, top management vision, availability of required skills and expertise and the maturity of the IT infrastructure. In addition, the study has empirically emphasised a number of BPR project implementation elements that should be in place to ensure successful implementation and management of the project including: the availability of an appropriately composed project team, continuous communication, users' involvement and usage of communication technologies.

Affectionately dedicated to my family:

My husband Dr. Mansoor, and my two lovely boys; Mohammed and Ali.

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<div align="right">**INTRODUCTION**</div>

1.1   Preface

In the business environment, business and market globalisation impose high pressure on the organisations to adopt new and evolutionary business practices to compete and provide services similar to their counterparts. In addition, the global interdependence, the changes in political and economical landscapes and the infusion of latest technology force organisations to continuously reassess their goals and strategies, review traditional business practices and deploy the ever-increasing capability of information technology (Senn, 1992).

Over the past years, several approaches to organisational change have been advocated to reduce costs, achieve manifold improvements in productivity and quality of service that can provide a basis for competitive advantage in the global market. One approach to organisational change is commonly referred to using different interchangeable terms such as Business Process Reengineering (BPR), Process Improvement, Business Process Redesign, Business Transformation, Process Innovation and Business Process Change (BPC). Throughout this thesis, the term Business Process Reengineering (BPR) will be consistently used to serve the broader concept of change and recognise the need for radical, incremental and continuous improvements through stewardship of processes. The global reach of BPR can be observed from the continuous inaugurals of conferences that have been attended by the researchers and practitioners across many countries. Yet, most of the existing research on BPR is based on Western organisations.

The primary objectives of BPR approach are to fulfil the organisation's strategy, to improve productivity and efficiency in completing the processes and to provide quality service. The BPR phenomenon is flourishing as a change management approach,

although some of its techniques have long been used as change initiatives in organisations. BPR is an example where organisational pathologies are attacked by focusing on an organisation's core processes, i.e. processes that provide an added value to the internal or external customer. BPR has helped companies to understand how different processes are interrelated.

BPR is still a crucial phenomenon in the global economy and holds the interest of academics and researchers (Willcocks & Currie, 1996; ProSci, 1999). Billions of dollars have been invested in the redesign of the organisational business processes. Some surveys show that nearly ninety- percent of dominant organisations are actively involved in change management projects (Bashein et al., 1994). For example, in the US many of the government sectors, such as military and police departments, universities and hospitals are engaged in some form of BPR (Meel, 1995).

There is some debate in the literature on defining BPR, the scope of organisational change, the success factors and the role of IT in BPR initiatives. BPR has been defined differently but commonly viewed as the redesign of "business processes to make them more efficient", differing in scope from process improvement to radical new process design (Kettinger et al., 1995). Many practitioners and experts advocate radical change "clean slate" approach (Hammer & Champy, 1993; Earl et al., 1996; Dixon et al., 1994; Lowenthal, 1994; Loh, 1997), whereas others emphasise the adoption of "business or process improvement" approach to be more effective than the revolutionary approach (Strassman, 1994; Harrington, 1991; Geisler, 1996; Peppard & Rowland, 1995). Davenport (1993) emphasises the need for corporations to adopt a continuous process improvement prior to initiating any radical change.

1.2 BPR and Organisational Performance

Since the 1990's many leading organisations have conducted BPR to achieve competitive advantages and productivity. Although there has been an ongoing debate on BPR effectiveness and ethics (Davenport, 1995; Biazzo, 1998), globally, many organisations are still adopting BPR to achieve breakthrough performances due to the continuous change in technology and world's politics. Some organisations aimed at redesigning processes that were too narrow and had little impact on the overall performance and,

therefore, results were not as expected. Other organisations, such as Citibank (Teng et al., 1994), adopted large-scale radial change and invested large sums. Some firms could not implement radical change due to cultural issues, however they succeeded in creating flat organisations in order to improve their performance and communication and reduce their costs.

Although there are many success stories of BPR, failure seems to be frequent. Many articles have suggested that BPR projects have a high failure rate (Hammer & Champy, 1993). According to Hammer and Champy (1993), the rate of failure is as high as 70%. For example, the CSC Index Survey (Information Week, September 1994) discussed the critical success factors for BPR initiatives of 600 senior managers, 40% of which were involved in BPR, in large European and US Corporations. Findings were that 16% of the senior managers were satisfied and the results were classified as excellent and 17% were classified as good. More than 40% were moderate to average and 25% were reported as failure. Another survey published by the CFO Journal (1995) found that only 16^oo of senior executives were fully satisfied with the results of the project, while nearly 68^oo encountered unanticipated problems. On the other hand, many companies such as AT&T, Pacific Bell, Cigna RE and Hallmark have succeeded in implementing BPR (Grover et al., 1995).

There are many reasons behind the failure of BPR projects. A primary reason behind the failure of BPR projects is the misinterpretation of the concept of BPR (Grover & Kettinger, 1995). Other reasons for BPR projects' failure include: mismanagement of human aspects, over-reliance on the inadequate management science techniques (Walsham, 1993) and the deficient consideration to the cultural, social and political issues (Belmonte & Murray, 1993; Buday, 1992; Grint & Willcock, 1995; Moad, 1993; Mumford, 1999).

Researchers have discussed many imperatives of BPR initiatives. Information technology is one of the most recognised potential and important enablers of BPR (Hammer & Champy, 1993; Venkatraman, 1994; Keen, 1991; Harrington, 1991). This is because companies cannot comprehend the complexities of the redesigned business processes without the use of IT, since IT can effectively support and serve all the stages of BPR. Many organisations are using the computer and telecommunications to integrate their

business processes across multiple geographical boundaries. Staff are provided with transparent information and they can access data to analyse and provide instant decision making to the offices globally.

Although, many companies are heavily investing in technology, the results are disappointing (Bradley et al., 1995). Nearly two-thirds of BPR projects fail because of the unclear role of IT (Bluestein & Hill, 1993). One of the reasons is because companies tend to use this technology to automate old ways of business practices and leave the existing processes intact. The use of IT is often inadequate for the situation and could constrain the BPR effort due to its limitations (Davenport, 1993). Sometimes the potential of IT is neglected during the design phase or the redesign builds on investment in the latest technology without fully exploiting the capabilities of existing IT infrastructure.

Clearly, the deployment of IT impacts the organisation and its participants. However, a thoughtful deployment of IT in BPR, wherein a careful consideration to the mechanisms of interrelating and aligning the culture and IT, holds much promise.

In addition to the role of IT, it is unusual to hold a meaningful discussion of organisational change without reference to its culture. The concept of culture continues to strike managers and researchers as a key factor in the success or failure of organisational change. An organisation's prevailing cultural characteristics can be an impediment to change (Hammer & Champy, 1993; Kilman et al., 1984; Fitzgerald, 1988). In this study, the term organisational culture is used liberally in its broader sociological and anthropological sense as a manifestation of symbols, meanings and values within the organisation that acts to consensually structure social relations, hence style of leadership, communication, politics and management (March & Olsen, 1989). However, a particular emphasis, as reflected in the thesis title, will be given to the organisation's customs and practices.

1.3   Gaps in the Existing Research

Since the introduction of BPR, many academic researches have been involved in investigating the BPR phenomenon. There is an extensive research and academic

investigation of the BPR phenomenon whereby a plethora of books, journal articles and reports were published (Davenport & Stoddart, 1994; Grover et al., 1995; Clemons et al., 1995; Hammer & Champy, 1993, Davenport, 1993). However due to the broad topic of BPR, much theory building in this area of research remains ambiguous (Saharia et al., 1994).

While a number of recent studies have sought to investigate BPR efforts, they suffer from a limited repertoire of constructs. These studies often isolate the scope of investigation to; the role of IT in BPR (Mc Donagh & Coghlan, 2000; Avgerou, 2000; Markus et al., 1994; Marteniz, 1995), social aspects of BPR (Belmiro et al., 2000; Cooper and Markus, 1995) and identification of strategies for BPR (Veasey, 2001; Cotoia & Johnson, 2001; Earl et al., 1995). It is crucial that further research is conducted to understand those constructs that associate to the efficacy of BPR to better understand the underlying principles, relationships of constructs and situational variables that will affect a certain BPR initiative. The lack of consolidation of constructs followed by systematic empirical research, has led management theorists, such as Daft and Lewin (1993), to recommend addressing this dearth of research by following new research agenda in pursuit of a theory for organisational change.

Moreover, existing studies were conducted on particular types of countries that the subject organisations are based in (i.e. industrial countries), which is not necessarily extendable to organisations in other countries such as the developing ones. This raise an interesting question. Are BPR initiatives in developing countries the same as in industrial countries? And how does the role of organisational culture and IT affect BPR initiatives in developing countries? Palvia et al. (1996) argue that fundamental differences exist between the key MIS issues of different countries. Advanced countries tend to be more driven by strategic motives, whereas developing countries by operational motives, and under-developed by infra-structural needs (Palvia et al., 1996). Whereas, in a study made by Watson et al. (1997) it was found that "too many US based managers assume that what works in the United States will work elsewhere". This indicates that there is no awareness to the role of organisational culture and IT in organizational change. Issues such as the culture, legal and political environment, economic development, language and

IT are all ignored. However, it is inauspicious not to consider the effect of organisational culture and IT constraints in developing countries.

This research is mainly focusing on BPR initiatives of petrochemical and utilities organisations in Arab Gulf Corporation Council (AGCC) countries as such studies in this area remain silent. To the researcher's knowledge, this is the first research that is directed in this area hoping that this would provide clear picture of organisations that have conducted BPR initiatives in AGCC countries, thereafter providing a guide and prescription for practice for organizations planning to undertake similar initiatives. This study can be further used as a basis for future investigations to compare BPR initiatives in industrial and developing countries to come up with a holistic approach to BPR that takes into consideration the individuality of organisational culture and IT of the organisations' countries.

1.4 Motivation of the Study

Due to the high percentage of BPR failure associated with the Revolutionary "clean slate" approach, there has been an ongoing disagreement and criticism regarding the efficacy of change using Revolutionary approach. Social and human aspects of BPR, which were crucial factors to the success of BPR, were disregarded when conducting Revolutionary change (Cooper & Markus, 1995; Davenport, 1995).

It is evident that IT can play a central role in the area of BPR as it is continuously used by companies to achieve remarkable success and to survive the pressures of competitions. Yet, research and articles show that many organisations that have conducted IT-enabled change failed to reach their expected level of performance (Orlikowski & Baroudi, 1991; Hammer & Champy, 1993). Hammer and Champy (1993) suggest that 75% of IT enabled change have failed.

In BPR, what really matters is how the organisations want to organise work today, given the demand of today's markets and the power of today's technologies. Currently, organisations appreciate the latest technology of networked environment such as Internet and Electronic Commerce because they perceive that an IT-enabled change would render their business processes more flexible and efficient. For example, applying

workflow management systems and workgroup computing systems give active support to the business processes. In a UK research, it was found that IT expenditure ranges between 33% and 36% of the total cost of BPR projects (Grint & Willcocks, 1995).

ProSci (1997) conducted a benchmark study in search of best practices in BPR. The result of their study found six areas that are critical to the success of BPR projects: build top-management sponsorship, ensure strategic alignment, choose a strong team, create a business case for change, use proven methodologies, and manage the change effectively. None of the above areas mention the importance of IT usage, although one half of the project teams expected improvements ranging between 10% and 30%. One of the reasons behind this result is the misuse of IT, which was not addressed by the project teams before and after implementing the projects. They were only concerned with change management in future projects. Conducting BPR projects without using IT effectively could only improve the performance slightly. Therefore, leveraging capability of IT to facilitate the change in a BPR projects would result in an optimal improvement.

BPR requires organisational changes in terms of corporate culture, configuration and co-ordination, and in the way the organisation congregates its human, technological and information resources (Marchand & Stanford, 1995). Some studies were focused on understanding the relationship of BPR with innovation and corporate strategy (Grover et al., 1993), identification of strategies for BPR (Earl et al., 1995) and implementation issues of BPR (Grover et al., 1995). Theorists and practitioners have conducted several studies attempting to acknowledge the human, social and cultural aspects of BPR (Marchand & Stanford, 1995; Bartlett & Ghoshal, 1995; Mumford, 1995; Cooper & Markus, 1997). While other practitioners and theorists concentrated upon technical issues, such as IS role in BPR through case studies (Markus et al., 1994; Martinez, 1995) and underestimate the social issues (Tinaikar et al, 1995). There are very few researches that explore the relationship between BPR and IT (Mitchell, 1993).

Although studies investigating BPR initiatives are continuous, those remain limited to theoretical guidance on change initiatives and studies, which are based on single organisations, where they segregate the scope of investigating IT from other essential issues. In addition, these studies suffer from contributing studies that construct necessary conditions about the mechanism of the interplay between organisational culture and

technology in BPR to ensure successful implementation. Hitherto, researches investigating relationship of IT and organisational culture in BPR in developing countries remain silent. Therefore, it is essential that further research is conducted to understand those constructs that associate to the efficacy of BPR that may allow the development of an integrated theory to best understand the underlying principles, relationships of constructs and situational variables that will affect a certain BPR initiative in developing countries. The development of such theory is significant, or at least adequately appealing to motivate this study.

1.5 Research Objectives

This thesis focuses on investigating facilitators and inhibitors of BPR towards developing an integrated theory of BPR implementation. This study gives a special focus on investigating the role of organisational culture and IT each in isolation and their interrelation for successful BPR initiatives. The question is formally stated as:

"How do organisational Culture and IT contribute to the outcomes of BPR initiatives?"

The purpose of this research is to further understand IT and organisational cultural constraints that need to be taken into consideration when designing BPR and understand what causes the success and failure of BPR in terms of organisational culture and IT.

In an editorial essay, Daft and Lewin (1993) urged the research community to pursue new avenues in search for theories for the new organisation forms. They believe that the new research should be directed towards understanding the wide variety of contingency factors that associate to the efficacy of organisational change from an emergent perspective, hence the development of theories to best understand the underlying principles, relationship of constructs and situational variables of organisational change.

The aim of this study is to address, at least in part, the need for an integral theory relating organisational change to culture and IT as briefly formulated by Daft and Lewin (1993). Therefore, this study focuses on developing a process-oriented, context-based description and explanation of the BPR phenomenon in petrochemical and utilities organisations in AGCC countries. In so doing, the study strives to develop an integrated

process theory to describe and explain the process of adopting and implementing BPR initiatives in AGCC countries in terms of interaction of contextual conditions, actions and consequences. The availability of such theory would contribute, at least modestly, in improving the success rate of organisational change initiatives by providing blueprints, prescriptions and principles for organisations planning to undertake such initiatives. The theoretical constructs that form the building blocks of this integral theory are extracted from previous research. This thesis empirically validates those constructs, in a particular context, and integrates those in a theory for BPR.

1.6   Research Methodology

After more than a decade in the research area of Reengineering, there is a continuous debate on the efficacy of BPR due to the reported failure rate, almost two thirds (Hammer & Champy, 1993), associated with such initiatives. Theorists and practitioners provide conflicting guidelines, which are sometimes based on single or fragmented case studies, on the success of BPR. This means that BPR practice remains problematic and lacks the unavailability of tested integral theory and this should make the case for a need for such type of BPR theory.

It is evident that there is a need to consider a more theory building mode using the process theory approach recommended by Markus and Robey (1988). A process theory approach is selected because it has a longitudinal perspective, whereas variance theory considers a particular point in time. Yet, change is a process that occurs over a period of time from its inception to its declared completion that is more appropriate to study with a longitudinal perspective. Moreover, process theories are stated in a more flexible form that is less restrictive and more aware to the complex relations in the social context. Thus, a process theory is a more useful and applicable type of theory for understanding changes in organisations.

The purpose of this study is to develop an integral theory related to IT and organisational culture in BPR based on the research framework, which consists of organisational culture, IT and the outcome of BPR initiatives. The study is based on describing and explaining the process of adopting and implementing BPR initiatives of three organisations in petrochemical and utilities industries in AGCC countries in terms of

interaction of contextual conditions, actions and consequences. The constructs that provide the building blocks of this integral theory, which are derived from existing theories, are empirically tested in a new context.

The research strategy of this thesis is to conduct qualitative inquiry and obtain required information of three case studies on organisations in the AGCC countries that have implemented BPR projects. Qualitative research is chosen because it is suitable for studying organisational, groups and individuals' behaviour (Strauss & Corbin, 1990). The qualitative methods of collecting data used in this research are associated with observations and face-to-face interviews techniques (Cavaye, 1996).

A case research approach is selected, which has its roots in business studies, because it provides a practical and real example that can be analysed to build upon or validate existing models or theories, through collection of data. In addition, this approach incorporates intervention carried out in a way that may be beneficial to the organisations participating in the research study. Typical instance is the on-site case research study which was performed in a large organisation by Alavi (1993). She assessed the staffs' utilisation of an electronic meeting system. Another instance is the interview-based research study performed by Trauth and O'Connor (1991) to analyse the effects of cultural, economic and political factors on the establishment and evolution of information technology firms in Ireland.

The case research approach is well used in the IS field. There are some case studies on BPR projects but very few researchers critically analyse and point-out in details or share the problems behind the failure of BPR projects from an IT perspective. Most of the problems discussed are from a theoretical perspective.

This research uses a case study approach with a structured and semi-structured protocol. The research methodology focuses on the pragmatics of conducting case studies as a rigorous and effective method of research. Two of the case studies organisations are sister companies operating in the oil and gas industry whereas the third case study organisation is a utility company operating in water and electricity generation and supply field.

The research methodology of this study is based on two steps. First the researcher analyses and reviews the existing literature of BPR, focusing on the three components and the identified salient dimensions of those components, and develops a number of constructs and related propositions which constitute the necessary conditions to ensure successful implementation of BPR. These propositions, which are based on the researcher's positivist understanding, are derived from existing theories, are deductively tested (either verified or falsified) by conducting empirical case studies testing. In addition, the researcher's interpretation from the case subject's view is taken into consideration to validate this level of understanding. The case study research within this perspective is designed and evaluated according to the criteria of the natural science research which involves controlled observation, controlled deductions, replicability and generalizability (Lee, 1991). Second, propositions that are deductively invalidated using empirical data from the subject case studies are reformulated using interpretative analysis of data from the same case studies, and a fresh interpretation of the cases' data is conducted. This involves revisiting the specific cases that caused the rejection of the propositions and seek to understand the disparity in the researcher's positivist understanding of BPR and the researcher's interpretation of the case subjects' understanding.

1.7   Thesis Outline

The structure of this thesis is as follows:

- *Chapter 2* provides a review and an understanding of literature of the BPR phenomenon focusing on success and failure, IT and organisational culture.

- *Chapter 3* describes the research methodology used and the research strategy of this study. The chapter starts by arguing the need for an integral theory of BPR. This involves discussions of the types of theories and the different perspectives of "causal agency" (Markus & Robey, 1988), wherein the rationale behind choosing to express results of this study as a process theory and the adoption of the emergent perspective are detailed. Then, the research methodology of this study is presented. The chapter proceeds by presenting the research framework followed by the research strategy. Then, a number of theoretical propositions related to the research framework are

postulated based on the commonly understood principles of BPR. The chapter concludes by detailing this thesis approach to test those propositions and addressing the requirements for methodological rigour of this study.

- *Chapter 4* provides detailed in-depth narratives of the BPR initiatives of three cases organisations. The chapter starts by detailing the approach followed in the presentations of the cases. Then, thick descriptions of the BPR initiatives in each of the three cases' organisations are presented.

- *Chapter 5* provides analysis of the three case studies of this thesis and tests the propositions derived in Chapter 3. The chapter starts by conducting an evaluation of the outcome of BPR initiatives' implementations of the three case studies. Then, the derived propositions are deductively tested in the context of those case studies. The chapter concludes by an attempt to reformulate propositions that are deductively invalidated using interpretive analysis of data from the same case studies.

- *Chapter 6* presents an evaluation of the quality of this study and implications of the findings for practice. The chapter discusses the validity, reliability, generalisability and rigour of this study. It also discusses the implications of the findings of this study for practice by presenting an operational BPR framework that serves as a prescription for achieving successful initiatives.

- *Chapter 7* concludes and discusses potential areas for further research. The chapter starts by providing a summary of the findings and a statement of contributions made during this study. Then, limitation and implications of this study are presented. The chapter concludes by outlining potential directions for future research.

LITERATURE REVIEW

2.1   Introduction

In the 1990's BPR has been a leading concept for organisational improvement and success. Many leading organisations around the globe have conducted an analysis and redesign of their business processes with the aid of IT (Davenport, 1995) to achieve improvements in performance and cost efficiency, to provide competitive advantages and productivity and increase customer focus; a practice that is commonly referred to as Business Process Reengineering (BPR). BPR is also known by many other terms, which are interchangeably used, including Process Improvement (PI), Business Transformation (BT), Core Process Redesign, Value Reengineering, Business Process Change (BPC) and Business Process Redesign.

This approach has been accepted by many businesses because many worldwide organisations have lost their competitiveness in the market and therefore needed to respond to the changing demand. Such organisations were forced to be more externally focused and fit with the environment that is surrounding them. This can be achieved by reassessing their goals and strategies, reviewing their business processes, deploying the latest technology and removing any inherited business barriers (Omrani, 1992). Some well known organisations have successfully redesigned their business processes claiming the achievement of 80 percent savings in time and costs (Tinnila, 1995). For example, Mercer Manager Consulting (1994) conducted a telephone survey covering 180 US and 100 European companies and found that 75% of these companies had engaged in significant reengineering efforts in the past 3 years (Jackson, 1996).

BPR literature reveals crucial factors (social and technical factors) that hinder the success of BPR initiatives. These include, but are not limited to, IT and IT infrastructure (Bhatt, 2000; Broadbent et al., 1999) mismanagement of human, and the limited understanding

of the social and political issues of the organisations (Brightman & Moran, 2001; Buday, 1992; Belmonte &Murray, 1993; Moad, 1993; Grint & Willcock, 1995). Here, as will be detailed later in the chapter, all these social factors will be categorised into the "organisational culture" since this thesis interprets human and social issues as integral part of organisation's culture.

A plethora of literature in the field of BPR exists, therefore this chapter will review only relevant literature that are directly related to the research area; i.e. the role of IT and organisational culture in BPR initiatives. This chapter provides a critical review of available literature on the topic. First, a general review of BPR, various definitions reasons for and success and failure of BPR efforts are discussed in Section 2.2. Second, an overview of the views of the practitioners and researchers in the field regarding the role of IT in BPR is given in Section 2.3. The section also addresses the opportunities and constraints of IT in BPR initiatives. The role of the organisational culture is addressed in Section 2.4. The Chapter provides a snapshot of directions of the current research on BPR at the time of finalising this thesis in Section 2.5. Finally, the importance of the context in BPR research is discussed in Section 2.6.

2.2   Business Process Reengineering

Initially, an influential academic and a consultant introduced the concept of reengineering. In 1990, Hammer, a professor of computer science at MIT, introduced the concept of "Don't Automate, Obliterate" in which he claims that most of the work being done does not add value to customers and, therefore, should be removed, not automated. Alike, Davenport, a consultant at Ernest & Young, wrote an article in the same year advocating similar idea (Davenport & Short, 1990). As ideas flourished and matured, Davenport (1993) published the "Process Innovation" book. Correspondingly, Hammer and Champy (1993) came with "Reengineering the Corporation" book.

Early in the 1990s, with the increase in global competitive pressure, US managers rapidly adopted the idea of reviewing the current business processes and advocated BPR as a new tool for attaining success in the dynamic world. This new change management approach has helped firms to understand how different processes are interrelated. The BPR message started spreading across Europe. During the following years, the BPR

topic was spread quickly through books, public lectures, journal articles and other publications. As soon as the results of BPR, conducted by the early adopters, became evident many management journals took the lead reporting the success of reengineering projects (Mumford & Hendricks, 1996), but none had experienced the failure of BPR. For example, in a survey of 400 US companies it was found that 81% have at least one project in progress (Information Week, June 1994). The same journal reported in September of the same year that 40% out of 600 senior managers in the US and Europe firms who were involved in reengineering describe the result of the effort as sub-optimal. Another 25° o describe the result of the effort as a failure. From then, articles and books began discussing the reasons behind the increase in failure percentage "over 50%" (see for example, Hammer & Champy, 1993; Nasierowski, 1997; Braganza & Myers, 1997).

Some researchers and practitioners consider BPR as a fad where consultants are benefiting from this new top to increase their revenues (Archer & Bowker, 1995). Other practitioners and academics who are against the concept of BPR, believe that reengineering is a fad that must be abandoned (see for example, Mumford & Beekman, 1994). They argue that large firms, wherein a long time is spent in building employees' commitment and teamwork, will lose their achievements by implementing BPR. Instead, they expect organisations to keep increasing the trust and commitment with everyone in the organisation. Some critics argue that BPR is little more than an excuse for the destruction of jobs and intensification of work (see for example, Willmott, 1994; Grey & Mitev, 1994). Mumford and Beekman (1994) add that BPR emphasises on technology and efficiency that uses less-caring and less-humanistic ideas such as ruthless obliteration, reduction of headcount, top-down imposition of change, macho-management style and instrumental reorganisation of process. They argue that a socio-technical design, wherein a match between social and technical systems is sought, is fundamental to the design and implementation of organisational change.

However, BPR is still a crucial phenomenon in the global economy and holds the interest of academics and researchers (Willcocks & Currie, 1996; ProSci, 1999). Some surveys show that nearly ninety- percent of dominant organisations are actively involved in change management projects (Bashein et al., 1994). However, despite the large number of firms that are conducting reengineering, the rate of failures in reengineered projects is over 50% (Hammer & Champy, 1993; Nasierowski, 1997).

In a research conducted by Grint and Willcocks (1995) they found that Information Technology (IT) expenditure ranges between 33% and 36% of the total cost of BPR projects. Yet, a primary factor that has contributed to, nearly, two-thirds of BPR projects' failure is the unclear role of IT (Bluestein & Hill, 1993). Therefore, leveraging the capability of IT to facilitate the change has become a critical part of BPR effort and if not used correctly it could add further risk or even lead to the failure of the project.

However, other researchers believe that organisational culture issues (social factors) contribute majorly in the big proportion of failures in BPR initiatives. Walsham (1993) argues that the high degree of failures in organisational change is due to an over-reliance on management science techniques, which are inadequate on their own. He asserts that these techniques emphasise content at the expense of process and context (i.e. culture and politics). Culture affects many aspects of the organisation (Lorsch, 1986). It influences the decision to be made regarding the organisation's relationship with its environment and its strategy and the way managers believe within the organisation (Lorsch, 1986). Likewise, organisational culture dictates the formal and informal channels of communication, which gets what information and whether or not information is a political weapon or a business asset (Marchand & Stanford, 1995).

In the following subsections, definitions, basics and reasons for the high rate of failures in BPR initiatives are identified and described.

2.2.1   What is BPR?

There has been an increase in the number of researchers and consultants since the inventiion of BPR, although the actual practice of BPR is not new (some suggest that BPR is merely a manifestation of total quality management TQM, see for example, Shonberger, 1994). BPR became an active research where mostly it has been consultant driven in practice. External consultants are believed to contribute to the success of BPR due to their skills and expertise that they bring to the BPR teams (Harrison & Pratt, 1993). The results of a questionnaire survey, which has been conducted by Archer and Bowker (1995) on the need of external consultants when approaching BPR, show that many organisations consider that external consultants are a necessity when approaching BPR. This is mainly due to the lack of skills, experience, and confidence and in order to break the internal barriers and overcome political issues. However, a study which has

been conducted by Shabana (1996) on the role of consultants in the success of 118 BPR initiatives resulted in that the role of consultants has little impact on the success of BPR efforts (in terms of its outcome and performance). This is due to the instability of services provided by consulting firms.

There is no standard definition of BPR. Practitioners and academics understand BPR differently then define it in their own way modifying others' understanding of the management concept with a slight different focus of its objectives. A questionnaire survey which have been conducted by Archer and Bowker (1995) to investigate how consultants define BPR, showed that "no two replies were identical". BPR is commonly viewed as the redesign of business processes to make them more efficient, differing in scope from process improvement to radical new process design (Grover & Kettinger, 1995).

For most of the writers, the term BPR has a strong "radical change", (see for example, Davenport, 1993; Dixon et al., 1993) and advocate the "clean slate" approach (Hammer & Champy, 1993). Others define it as an "incremental improvement" and consider this to be more effective than the revolutionary approach (Strassman, 1994; Harrington, 1991; Geisler, 1996), and few differ about the extent of change (see for example, Grover et al., 1993; Keen & Cummins, 1994).

To develop a shared understanding of BPR, the various aspects are investigated. Below are some of the commonly quoted definitions of Reengineering by originators of BPR.

Hammer and Champy (1993) define BPR as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed". They argue that BPR is a "clean-slate" approach. However, an empirical study conducted by Davenport and Stoddart (1994) shows that few organisations are capable to follow such approach.

Hammer and Champy (1993) believe that BPR is about "redesigning work to take advantage of demographic and technological changes that have merged since the avent of scientific management". They believe that although modern IT plays an important role, it should not be the only essential element in reengineering. They argue that

conducting BPR in organisations that have corporate culture that would resist change is not possible. Creating the right environment "will encourage, motivate, and liberate people to perform" and "shape people's attitude and feelings" (Hammer, 1996, page 105).

Although Hammer and Champy (1993) do not emphasise the importance of organisational culture in their definition, they however believe in creating the proper environment in which BPR could succeed. They provide an example of a CEO who "first created a new organisational structure that emphasised the autonomy of major business units and eliminated cross subsidies, installed a new senior management team, and carried-out a significant reduction in the workforce that slashed costs and signalled the end of a traditionally paternalistic culture" (Hammer & Champy, 1993, page 106). This emphasises the importance of breaking-down the cultural resistance to change rather than creating a positive climate for change. They also believe that a new culture is an expected outcome of a BPR effort. The initiative forces new attitudes, which will, in due course, change the culture and thus the characteristics of the organisation.

Davenport (1993) distinguishes between process innovation and process improvement. He describes process innovation as a radical change whereas process improvement involves lower level of change. It is also possible that process innovation results in only incremental benefit and in this case it would be considered as an improvement (Dewar & Dutton, 1986). Similarly, in rare cases a process improvement could result in radical benefits (Davenport, 1993). According to Davenport (1993), reengineering is only part of what is necessary in the radical change of processes. He suggests "process innovation" to encompass the envisioning of new work strategies, the actual process design, and the implementation of change in organisations involving employees, technology and other organisational dimensions. Although Davenport (1993) addressed the essential role of IT in BPR, he emphasises that IT alone is not sufficient to result in a process change. He states that process innovation can not be achieved without carefully considering both technical and human enablers. Despite his emphasis on technology and innovation, he clearly states that "organisational human resource issues are more central than technology issues to the behaviour changes that must occur within a process" (Davenport, 1993, page 17).

Grover and Kettinger (1995) describe BPR as "a strategy driven organisational initiative to (re) design of business processes to achieve competitive breakthroughs performance; differing in scope from process improvement to radical new process design, contingent upon the degree of socio-technical change required. In the same book, many chapters discuss the importance of IT and culture. For example, Marchand and Stanford (1995) state that there should be a healthy environment for a BPR effort to be successful. They argue that "if existing corporate attitudes and values run against reengineering attempts in all or parts of the firm, either the reengineering program or the culture have to change" (Marchand & Stanford, 1995, page 38). They believe that in order to implement change successfully, the three corporate dimensions (culture, configuration and co-ordination) and the key resources (people, information and technology) of BPR must be perceived as confusingly interdependent like the object on a mobile.

To summarise, while there are almost as many definitions of BPR as there are writers on the topic, those differ considerably even on basic issues such as the extent of change, the expected outcome of the BPR effort and the role of IT. Regarding the extent of change, many recent publications argue that a BPR initiative may involve either incremental or radical change (see for example, Kettinger, 1998; Stoddard & Jarvenpaa, 1995). Regarding the expected outcomes of a BPR effort, some authors believe that the performance improvements should be of order of magnitude for a change initiative to qualify as a BPR. Whereas, others argue that incremental benefits are acceptable due to the fact that organisations are sometimes satisfied to gain incremental benefits from their BPR initiatives.

2.2.2 Success and Failure of BPR Initiatives

Reengineering is not an easy task and its cost must be considered before deciding that it is the right strategy for an organisation. The alignment of technical and human elements leads to the success of BPR efforts (Dey, 1999). The failure of BPR seems to be frequent however the cost of failure is rarely reported (Drew, 1994). However, London Stock Exchange Taurus believes that the cost can be magnificent (Drew, 1994). The cost of reengineering involves training costs and technology and assessment investments. Practical experiences suggest that a successful reengineering project would involve a major organisational change and will come out with extraordinary results such as speed,

productivity and cost reduction. However, according to a survey, which was conducted in the UK between the beginning and mid of 1995, it was discovered that many organisations from both private and public sectors aim at incremental rather than radical change (Willcocks et al., 1997). This is because the radical approach puts the organisations at high risk and requires large expenses (Willcocks et al., 1997). Change for organisations with long history of tradition will be more difficult compared to newer companies.

There is some argument about the importance of certain factors, which contribute to the success of BPR initiatives. *Figure 2.1* shows the results of study, which has been conducted by Archer and Bowker (1995), on the importance of factors contributing to the success of BPR initiatives of companies based on the experiences of their consultants. The results of this study are similar to the results of Watkins et al. (1993) survey which was based on BPR efforts within UK financial services sector. In addition, other practitioners believe that the success of implementation is affected by certain factors such as team members, personnel, cultural issues (Detert, 2000) and proper implementation of IT and Infrastructure (McAdam & Donaghy, 1999). A successful project needs to follow and develop well-structured strategies throughout the implementation and if change is not approached wisely, the effort can create more harms than good.

There are some success stories of BPR such as IBM (Hammer & Champy, 1993), Ford (Hammer & Champy, 1993), Siemens, Federal Express (Candler et al., 1996), Phoenix (Omrani, 1992), CIGNA and AT&T (Grover et al., 1995). Ford is one of the first organisations to radically redesign their business processes and as a result Ford made a saving of 75%. Federal Express have succeeded in conducting BPR initiative by effectively utilising the latest technology to reengineer some of their important business processes (Candler et al., 1996). IT played a major role in the success of the initiative. Siemens is another example of employee empowerment where this organisation has managed to save 60% in elapsed time to place an order. In this case, the change in management contributed to the success of Siemens. In the case of Phoenix, this insurance company has radically redesigned its contract processing workflow. The outcome was a reduction in the time of processing a policy from 25 days to 24 hours (Omrani, 1992). Phoenix would not have succeeded without the change in culture.

Critical Success Factors of BPC
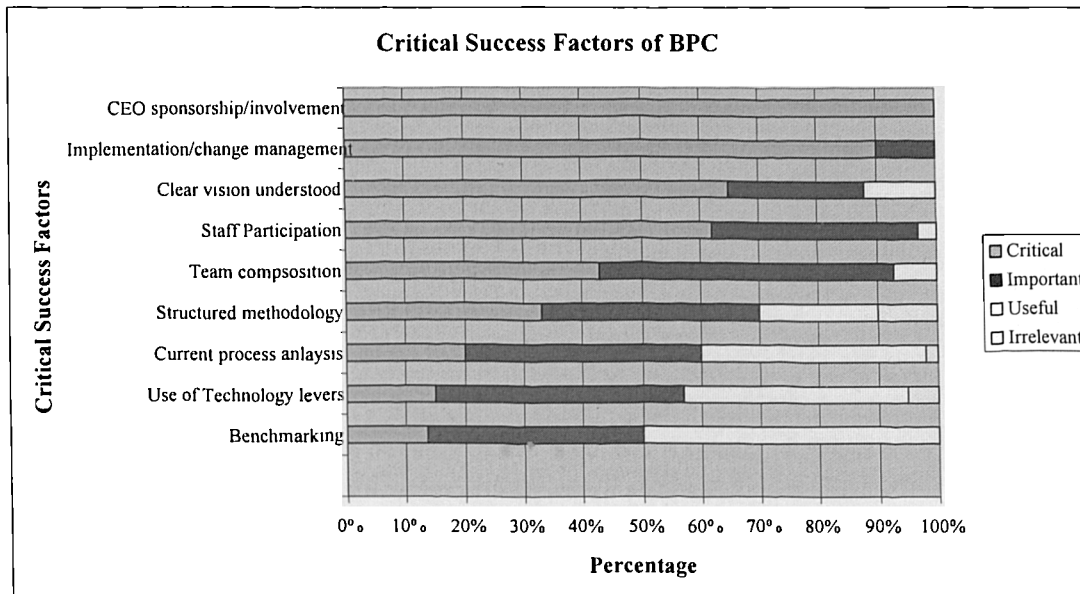
- Figure 2.1 Results of Archer & Bowker (1995) Survey on Critical Success Factors of BPR

Although the above are classic examples of successful stories of BPR initiatives, the literature report that the failure of BPR is very high. For example, a published report by CSC Index showed that 4 out of 5 BPR initiatives were not successful (CSC Index, 1995). There might be an internal investigation of the failure and their causes but few organisations would share and publicly discuss their failure experiences. This is because top management who supported the projects do not want their mistakes to be publicised and consultants who make a lot of money do not want to tarnish their reputations fearing of their future earnings (Aggarwal, 1997). Another reason for hiding any sign of failure is that few managers are willing to admit the expensive cost of failure due to the BPR project's high costs in terms of money, time and energy consumption.

The originators of reengineering, i.e. Hammer and Davenport, believe that there are many reasons for the failure of BPR. A primary reason behind the failure is the misinterpretation and confusion over its meaning. A result of a survey conducted by Forrester Research of 50 organisations claiming of implementing BPR, showed that only 30% of the organisations were truly involved in BPR initiatives, 42% were incremental changes while 28% were not engaged in conducting BPR (Carr & Johansson, 1995). Many firms have considered reengineering as downsizing; fire employees to reduce labour cost. Whereas, the originators of reengineering emphasise that they never

supported the concept of reengineering to save money by reducing the number of employees (Mumford & Hendricks, 1996). The aim of BPR is "to streamline or remove bureaucratic procedures and to make work processes more efficient" (Mumford & Hendricks, 1996). On the other hand, the Revolutionary "clean slate" approach, which has been criticised by some experts, has resulted in a high percentage of failure due to disregarding cultural issues of BPR (Cooper & Markus, 1995).

Some practitioners consider the main reason of the failure of BPR initiatives is the misuse of IT and others argue that the failure is because of the deficient consideration to the cultural, social and political issues (Braghtman & Moran, 2001; Buday, 1992; Belmonte & Murray, 1993; Moad, 1993; Grint & Willcock, 1995). Some organisations view IT as an obstacle to the success of BPR initiatives this could be attributed to many reasons such as to the poor performance of an IT Department, the unclear role and improper use of IT (Bluestein & Hill, 1993; Chan & Land, 1999). For example, according to Field (1997), 40% of IT application development projects are cancelled before completion, 35% of the remaining projects are "challenged" by cost/time overruns or changes in scope, and failed projects cost USA roughly $145 billion a year. Many of those defective IT projects, which include a growing number of change initiatives, fail due to the improper IT project management. Some poor management practices include not determining users' needs properly, not seeking tangible benefits and not defining a project's scope accurately.

Nevertheless, many cases of BPR fail because many organisations do not implement BPR in a strategic level nor understand the importance of considering the strategic perspectives (Tinnila, 1995). Moreover, many BPR that involves process redesign based on operational needs fail due to the difficulty of aligning those needs with the strategic objectives. In other cases, poor management practices failed to address the "soft side" of the human aspects, which are related to reengineering's impact on people and corporate culture, in order to overcome the fear of change (Marchand & Stanford, 1995; Bennett, 1998).

There are few published cases attributing the reasons of failure to the insufficient availability of resources or the unrealistic expectations (see for example, Drew, 1994; Mumford & Hendricks, 1996). A BPR proposal would be affected by a considerable

confrontation from the organisation's employees. Therefore, employees in different levels of the organisations, customers or suppliers may strongly resist change which causes delays and difficulty in implementing a BPR project because it causes a threat to an individual's job, career and security (Scott, 1995). This is due to the common understanding of BPR as a way of getting rid of people and hence there was a lot of resistance. Also, the long time it takes to study, implement and then evaluate the results of BPR projects may present unforeseen problems (Davenport, 1995).

Undesirable change leads to mistrust and pessimism and maybe accompanied by passive-aggressive types of behaviour, which make positive teamwork and group creativity impossible. Further, employees could be stressed due to an increase in work and therefore would not be able to cope with the technological change.

A key barrier to change is the lack of top management commitment (Bennett, 1998) and the resistance of middle managers (Hammer & Champy, 1993). They resist because they believe that the change reduces their authority and increases their workload. The lack of knowledge and skills is another barrier to make a BPR a success. This raises important concern for strategic planners because a radical improvement, which is a necessity for BPR, requires creativity and breakthrough thinking that are hard to dictate or develop through training programmes.

Another reason which has contributed to the failure of BPR initiatives is the conflict between the organisational culture and IT which may weaken the effort to bring about organisational change (Cooper, 1994). The experience of the modernisation of the air traffic control system of the Federal Aviation Administration (FAA) (Coleman, 1997) is an example of a publicly shared case of failure. In this case many processes that have been engineered, reengineered and optimised still failed because the culture was not changed in alignment with the technology and the redesigned processes. In a report on the FAA, the General Accounting Office stated that the organisational culture has been the underlying cause of the FAA acquisition problems. He argued that the FAA officials are resistant to making needed changes in their acquisition process because the FAA culture rewards conservatism and conformity that discourages innovation. The result of the effort is summarised in the executive report as follows; "Over the past 15 years, FAA's modernisation program has experienced substantial cost overruns, lengthy

schedule delays, and shortfalls in performance. The FAA's organisational culture has been an underlying cause of the agency's acquisition problems and processes".

Table 2.1 summarises examples of identified research into BPR failures.

Reason for BPR Failure	Source
Culture: Failure to manage politics and power	Willcocks & Smith (1994)
Lack of upper management support	Moad (1993)
Culture: failure to anticipate the power of biases and assumptions	Andrews & Stalick (1994)
Change Management failure	Belmonte & Murray (1993)
IT: fragmented, inflexible application software infrastructures	Best & Forman (1992)
Leadership: Led by IT people	Greene (1993)
Concept confusion: misinterpretation of BPR	Mumford & Hendricks(1996)
Unrealistic expectations, insufficient resources	Drew (1994)
Organizational resistance; middle managers, front line employees	Hammer (1993), Scott (1995)
Lack of leadership	Johansson et al. (1993)

- Table 2.1 Examples of research into reasons for BPR failures

2.3   The Role of Information Technology in BPR

Earlier than the 1980's, Information Technology (IT) had focused on computerising or automating existing processes in organisations to gain incremental improvement in speed and accuracy. Then in the mid of the 1980's, IT changed its focus from a supportive to a leading role and started to gain a status as a strategic asset. At the end of the 1980's, IT played a significant role in Europe, where organisations started to consider IT as "a strategic weapon critical to the survival and success" of an organisation (Tomlin, 1991). Since then many case studies shared their experiences in initiating projects and calling IT to lead organisational change. It is widely accepted now that IT and IS have evolved from its traditional administrative, back-office support orientation to a more strategic central role within the organisation (Venkatraman et al., 1993). However, to succeed in the implementation of IT, an organisation has to provide the appropriate cultural environment (Atre, 1995) where staff are skilled and well trained. For example, in 1988 British Airways succeeded "from being one of the least popular airlines, with a year-end

losses of 100 pound million to one of the busiest airlines with a profit of 320 million pounds" (Tomlin, 1991). This was due to the success of the implementation of IT in the right cultural environment where IT played a crucial role by empowering staff in the lower level of the organisation to make decisions using accurate information (Tomlin, 1991).

Currently, there is a general understanding of the importance of IT infrastructure to BPR and therefore many organisations are forced to adopt extensive IT networks not in automating business processes but in redesigning of those (Bhatt, 2000). Examples of organisations that used IT to reinforce organisational change include: Baxter's ASAP (Short & Venkatraman, 1992), American Airlines SABRE and United's APOLLO (Copeland & McKenney, 1988; Miller et al., 1993), Taco Bell (Hammer & Champy, 1993) and Ford Motor Company (Bradley, 1993).

In the early 1990s, several new management models of IT-enabled organisational change were used. Most of these models are based on theories of strategic management, industrial engineering, information management and organisational behaviour (see for example, Tapscott & Caston, 1993; Zuboff, 1988; Gould, 1996). Then a new approach that borrows from these techniques to increase organisational productivity, wherein IT plays an important role, is proposed and called BPR. BPR combines the power of IT-enabled change with ideas about empowerment and teamwork to "give a strong push forward" to the reengineered organisation. A survey carried out by Business Intelligence, showed that 60° o of BPR efforts surveyed confirmed that IT is a 'critical enabler' for their BPR initiatives (Harvey, 1995).

In the literature of BPR, there is a lot of disagreement about the role of IT and its importance to the success of BPR initiatives. The results of a questionnaire survey, which was conducted by Archer and Bowker (1995) of whether IT is critical to BPR efforts, were divided into 50/50. The strategic potential of IT in BPR cannot be undermined, whereas ad-hoc IT maybe an inhibitor of BPR (Bhatt, 2000). Many recognise IT as a fundamental enabler of BPR initiatives (see for example, Hammer & Champy, 1993; Davenport & Short, 1990; Jones, 1994). They believe that IT is an active agent of change and that without the correct use of IT, BPR would result in failure. Therefore, many of BPR efforts consider IT as one of its major contributors to success.

For example, Hammer and Champy (1993) argue that IT is no longer regarded as a mechanism for automating and supporting business processes of an organisation, they view "state of art IT as part of any reengineering effort". They argue that "a company that cannot change the way it thinks about IT cannot reengineer" (Hammer & Champy, 1993). Hammer (1990) considers IT as an "essential enabler" and calls it a "catalyst". Others believe that IT has been a crucial component for many successful BPR efforts (Teng et al., 1994; Guha et al., 1993).

Davenport and Short (1990) believe that IT plays a central role in BPR and argue that there is a recursive relationship between IT and BPR. However, the role of IT in BPR has not been investigated enough (Davenport, 1993). Davenport (1991) also considers that IT impacts the preparation, the process and the implementation of reengineering as well. Davenport (1993) has identified set areas where IT can play an important role for substantially changing the business processes.

The use of IT is often inadequate for the situation and could constrain the BPR effort due to its limitations (Davenport, 1993) or otherwise lead to unexpected results. Sometimes the potential of IT is neglected during the design phase or the redesign builds on investment in the latest technology without fully exploiting the capabilities of existing IT infrastructure. Therefore, to effectively use IT in BPR initiatives, its capabilities, constraints and behaviour need to be exhaustively understood (Al Mashari & Zairi, 2000).

On the other hand, some authors believe that BPR projects do not necessarily involve IT (Morris & Brandon, 1993), "not critical enabler" (Ahmed & Simintiras, 1996) and others have observed that IT is not central to the concept of BPR but nevertheless available in most projects (Dixon et al., 1991). However, authors like Boudreau & Robey (1996) believe that IT can disable BPR initiatives since the use of IT involves new structure and any future changes to the business processes would require reconstruction of the system.

In the following subsections, the concept of IT as a major enabler in BPR will be discussed. Technological advances and application areas of IT that are usually proposed in conjunction with BPR efforts will be briefly addressed. Then, the concept of IT as being a constraint in BPR efforts will be discussed.

2.3.1 IT as an Enabler

Conducting BPR initiatives with the use of the latest technology could result in tremendous benefits (Chan, 2000; Davenport & Nohria, 1994; Hammer & Champy, 1993; Linden, 1993; Venkatraman, 1993). IT provides innovative strategic choices for the organisations to be able to manage effectively their critical factors such as quality, cost, lead-time, customers' relation and allowing organisational learning (Venkatraman, 1994). Organisations that were successful deploying IT in BPR were able to streamline workflow or co-ordinate tasks across the business process (Davenport & Short, 1990). Employing IT effectively has the potential to: allow greater flexibility to bring about different types of outcome, result in more precise process control (Benson, 1991), give support to the administrative infrastructure, business processes, and operational skills of the staff, provide reduction in time and accuracy in information (Davenport & Short, 1990; Hesket et al., 1990; Alter, 1992). Therefore IT should be part of an organisation's strategy (Soliman & Youssef, 1998).

When conducting a BPR project, organisational change enablers must be identified at the beginning of the process of BPR so that the design process phase includes the capabilities of the enablers. A critical enabler such as IT needs to be analysed to ascertain its suitability to a BPR because without the appropriate use of IT, a BPR initiative would be difficult to conduct and the effort might fail (Soliman & Youssef, 1998). Also, IT should not only complement or support the process, but its capabilities should influence the redesign process phase. The enablers of BPR provide constraints and opportunities, and IT is not an exception. Therefore, to have an effective utilisation of IT, it requires the understanding and knowledge of their current and future capabilities and relevance should be studied.

Implementing IT creatively plays a crucial role in shaping and restructuring the organisation provided that the organisational culture issues such as structure and management processes are modified to utilise the benefits of the ever-increasing capabilities of IT (Soliman & Youssef, 1998). However, BPR efforts might be constrained by IT limitation wherein ineffective or inappropriate IT infrastructure exists. Due to constraints that IT might cause, there should be a serious commitment to develop an effective IT infrastructure to support the new redesigned business processes.

Organisations such as Detroit Edison (Teng et al., 1994), Citibank (Teng et al., 1994), IBM (Hammer & Champy, 1993), Fujitsu (Chan & Land, 1999) and Ford Motor (Hammer & Champy, 1993) are some of the few organisations that have successfully conducted BPR in which IT played a significant role. For example Ford Motor Corporation (Hammer & Champy, 1993; Bradley, 1993) has successfully reengineered its accounts payable process that resulted in a reduction in their workforce by 75%. Furthermore, the effective use of IT, in which a centrally located and cross functionally accessed database, has resulted in a reduction of fourteen days of the total cycle time of existing supplier payment process. Another example involves Detroit Edison (Teng et al., 1994), which has conducted BPR with the use of IT and which was considered as a critical success factor to the BPR initiative. The outcome of this effort was a reduction in time of particular activities by 75%. In the case of initiating a BPR effort with the aid of IT, Citibank had managed to increase recruitment of new businesses from 9% to 43% and increased its profit by over 75% over a period of two years (Teng et al., 1994).

IT provides an opportunity to use the latest technology to help improve business processes and provides an appropriate structure to a business-wide communication infrastructure (Al Mashari & Zairi, 2000). IT can be used to enable global business transactions and improve organisational effectiveness and efficiency by reducing delays, administrative intermediaries, redundant processing steps, and providing better access to information. There are several technological advances that could have strong impact on BPR efforts. These include: telecommunications, video conferencing, optical scanning, Electronic Data Interchange (EDI), email, wireless communication, laptop computers, networks and expert systems (see for example, Bhatt, 2001; Hammer & Champy, 1993; Tapscott & Caston, 1993). For example, EDI and Internet-based commerce provides a more efficient way of paying where funds previously took long time to transfer. Interactive videodisks replaced expensive face-to-face customer and buyer relationships, reducing time and money and at the same time increasing public awareness and presence.

Table 2.2 summarises areas where information technology can be used in BPR to break the rules that limit how business is conducted (Davenport, 1993; Hammer & Champy, 1993).

Impact	Explanation	Disruptive Technology
Automational	Automate process – no manual work	Robotics, workflow, EDI
Sequential	Changing process sequence or enabling parallelism	Workflow, GroupWare, networking
Analytical	Improving analysis of information and decision making	DSS, business intelligence, CRM
Integrative	Coordination between tasks and processes	Workflow, SCM, shared databases, GroupWare
Geographical	Breaking distance barriers	Networking, telecommunication
Tracking	Monitoring process status and objects	Workflow, automatic identification and tracking
Intellectual	Capturing and distributing intellectual assets	Expert systems, AI
Informational	Capturing process information for purposes of understanding	Shared databases, GroupWare, software agents
Disintermediating	Eliminating intermediaries from processes	Software agents, networking

- Table 2.2 Areas where IT can be used in BPR

2.3.2   IT as a Constraint

Aligning human and technological capabilities within and across processes and then tracking performance as process changes take hold was, and for many organisations still is, a nightmare (Johnson & Kaplan, 1987; Chase & Hayes, 1991). There should be a consideration for balance between the IT ingredients to the need of a successful BPR, rather than imposing IT blindly without considering other factors that should lead to having the BPR effort rotating around the technology and consequently limit the outcome. Hammer and Champy (1993) emphasise the need to reconfigure processes with IT rather than to adopt IT to processes. Moreover, IT can not succeed without the change and empowerment of staff which involves making the appropriate decisions (Markus & Benjamin, 1997).

IT is a very expensive fundamental enabler of BPR, but if not used insightfully it could lead to unexpected results. Hammer and Champy (1993) believe that 75% of IT-enabled organisational change using BPR failed. Many researchers had different reasons for the failure. Some of these reasons as stated in the case studies include: lack of top

management support (Davenport & Short, 1990), insufficient resources, employees working under constant pressures due to unrealistic timeframes for change (Davenport, 1995), wrong idea of putting technical professionals into a strategic role (Davenport et al., 1992) and the creation of technological biases (Benjamin & Levinson, 1993).

Those studies try to analyse reasons and evidences of the potential for the failure of BPR. But for most of these studies, a specific explanation for possible reasons that have caused the failure is not provided. Existing research has not explained how a certain mix of conditions and factors prevent change; instead there are few researchers who have discussed the factors hindering IT-enabled change. There have been very few attempts that systematically analyse and understand the limits and constraints of IT and clarifying other fundamental factors hindering the organisation change at the same time. Below are examples of two case studies that discuss other fundamental factors that are important to the success of a BPR effort.

In one case, Grudin (1989) reports a case about a group calendaring effort. In this case, secretaries maintaining their managers' electronic calendars became less enthusiastic with the technology because the benefit was not to those doing the work. This political dichotomy ultimately led to an eventual desertion of the technology. The study shows that the ultimate use of a technology depends on the specificity of the case, regardless of corporate command or the potential for collective gain. Unfortunately this study does not offer a theoretical framework from which to understand the influences shaping the use or non-use of an IT deployment.

In another case, Orlikowski (1993) describes how a system implementation disregarded the existing political ordering of an internally competitive organisation, which caused an IT deployment to be reconsidered. In this case, highly collaborative system architecture based on sharing information was imposed on workers who consider this information as intellectual property and believe that their professional progress depended upon unshared informational advantage. The conflict between workers' incentives and use of the system ultimately ruined the successful deployment of the original system.

These example studies highlight the importance of the social, political, and organisational influences shaping IT deployment. They present the difficulties encountered by

organisations trying to change through the deliberate redeployment of the IT infrastructure. However, findings from such studies are difficult to apply to comparable situations, either because they lack a theoretic grounding or provide only a descriptive recounting of a uniquely situated case. There is no substantive systematic guidance to be found in the research literature as to how and when IT can enable or constrain organisational change efforts.

2.4   The Role of Organisational Culture in BPR

Since the 1960s, the culture has been studied in relation to international business operations.   Many researchers consider the importance of corporate culture for effectively managing organisations (Revenaugh, 1994). Some studies discussed the role of organisational culture in shaping organisational structures (see for example, Handy, 1985; Quinn & McGrath, 1985; Harrison, 1970). These studies showed an interest in the organisational behaviour. Similarly, there has been an interest in the management research in the area of organisational culture change (see for example, Deal & Kennedy, 1985; Lawrence & Lorsch, 1967; Beckard & Harris, 1987). Changing the organisational culture is a complex process, difficult and could result in unexpected outcomes (Hill & McNulty, 1998). However, the effects in this area were misdirected because activities of the organisational culture change did not achieve their objectives (Buchanan, 1997).

Although the concept of organisational culture was overwhelmed by many assumptions, organisational culture still remains to be one of the obstacles in organisational change. The concept of 'organisational culture' has the problems of non-unified definition, meanings and analysis. In the following subsections, a clear description of what is meant by organisational culture in this study is provided. Then, the roles of organisational culture in organisations' change, and more specifically on BPR initiatives, are discussed.

2.4.1   What is Organisational Culture?

Similar to BPR, there is a great diversity of opinion concerning what 'organisational culture' refers to and hence there is no consensus on an appropriate definition (Detert, 2000). Existing definitions contain different elements, however they share a number of common attributes such as values, beliefs and assumptions (Schein, 1985; Sathe, 1985; Denison, 1990; Stacey, 1993; Pheysey, 1993). For example, Denison (1990) defines

organisation culture as the values, beliefs and principles that serves as a foundation for an organisation management system as well as the management practices and behaviours that both exemplify and reinforce those principles.

Surprisingly, there is a degree of consensus that three of the most important sources of organisational cultures (see for example, Sathe, 1985; Schein, 1985; Denison, 1990; Stacey, 1993) are:

1. **The societal (national) culture within which the organisation is physically situated.** The national culture creates the wider-ranging context in which organisations operate. It provides the complex social systems of laws, values and customs in which organisational behaviour occurs. According to social psychology, employee behaviour is a function of the interaction between the personal characteristics and the environment surrounding the person (Brown, 1995). Part of this environment is the social culture within which the individual lives and works that provides broad suggestions as to how an individual with a given background would behave.

2. **The vision, management style and personality of the organisation's founder or other dominant leader.** Organisations' founders tend to impose their beliefs and values about the world and organisations on other organisational participants (Schein, 1985). They determine what mission is to be pursued and in what business context, decide who to be recruited and what rules, procedures and systems will be instigated and have discretion powers over what constitutes acceptable patterns of behaviour in the workplace. Leadership, on the other hand, contributes toward integrating and monitoring various jobs' activities, controlling deviations from standards and co-ordinating communication between organisation's sub-units.

3. **The nature of the business environment of the organisation.** The operational requirements of manufacturing organisations are fundamentally different than those of service organisations. Large corporations have different 'climates' as compared to their counterparts, and organisations in the public sector are inclined to develop in a markedly different way to those in the private sector.

It is worth mentioning that in this thesis, the sources of the organisational culture, which include the three sources described, are interpreted as integral part of an organisation's culture, whereas some other authors consider those as shapers of organisational culture (Sathe, 1985; Schein, 1985). However, a particular emphasis, as reflected in the thesis title, will be given to the organisation's customs and practices.

2.4.2 Organisational Culture and Change

There has been considerable debate concerning whether organisational culture can be managed actively and much of the debate revolves around the extent to which a culture can be modified to a desirable state (see for example, Schein, 1985; Willie, 1989; Thompson & Luthans, 1990). This is due to the difficulty in achieving a cultural change in practice (Coleman et al., 1996). There are changes which are straight-forward to implement, whereas underlying values or implicit cultures are difficult to change. This kind of organisational culture requires a heavy investment in education and training in order to overcome this difficulty. However, effective management of organisational culture requires the ability to introduce change and maintain the status quo.

The concept of organisational culture is an important factor in the success and failure of BPR initiatives (Detert, 2000). Therefore, companies' dominating organisational cultural characteristics can hinder or ruin a BPR initiative before it begins (Detert, 2000). However, BPR originators (Hammer & Champy, 1993; Davenport, 1993) ostensibly address the role of organisational culture in reengineering efforts, neglecting most of the time to emphasise its significance. They believe that through vision, strong leadership, communication, team-working and related Human-Resources Management (HRM) type initiatives such as training and rewards, the management can transform organisations to a pre-stated ideal. This has led many organisations that were excited about change strategies to conduct BPR forgetting the organisational culture, which might be more rigid in different countries. Many organisations follow a systematic approach when conducting BPR effort to ensure the alignment of the BPR strategy with the company's strategy (Teng et al., 1994).

Many researchers believe in the crucial role of leadership in the success of BPR initiatives (Hammer & Stanton, 1995; Arendt et al., 1995; Cooper & Markus, 1995; Carr & Johansson, 1995; Abraham et al., 1999). Hammer and Champy (1993) emphasise the

role of leadership in establishing a BPR strategic vision, providing the right environment to conduct reengineering by involving and motivating staff, and making it clear to everyone that BPR involves a serious effort that will be seen through to its end. They believe that commitment, strong leadership and communication are key to removing conflicts, resistance to change and organisational politics (Hall et al., 1993). They provide the case of DRG organisation as an example, wherein the required leadership existed and made a radical change in its culture in order to reengineer its process for receiving insurance applications. Similarly, Covey (1997) believes that the "task of leaders is to create a culture that values integrity and empowerment".

Knights and McCabe (1998) add, "it seems politically naïve if not entirely unrealistic to assume that a leader can make employees want what he wants" as suggested by BPR originators. They emphasise that resistance to change can not be overcome simply by strong leadership, team-working, or communication. Individuals who have vested interests in perpetuation of a particular organisation structures and accompanying technologies would resist any move to change the current situation regardless whether a strong leadership existed to take up such a move or not. Moreover, rather than leaders having a dictatorial approach to managing change, they should be able to communicate and adopt a participative approach in an effective way and to create a culture that values integrity and empowerment (Abraham et al., 1999).

Effective communication through all the phases of the change process is another important tool in facilitating successful BPR initiatives (Hammer & Stanton, 1995; Carr & Johansson, 1995; Abraham et al., 1999; Marjanovic, 2000; Al Mashari & Zairi, 2000). Davenport (1993) emphasises the necessity for communication across all levels of the organisation, which should be based on sensitive issues and the importance of open and honest discussions in order to avoid any confusing messages. Communication is required to elucidate the future state and new vision that are essential for organisation participants (Abraham et al., 1999).

Similarly, Davenport (1993) accents that although IT has a central role in BPR, IT alone does not result in a success. He states follows that for an organisation to succeed, cultural constraints such as "strict hierarchical structures, cultures unreceptive to innovation, and general organisational rigidity or inability to accommodate change" must

be removed before or while conducting reengineering. Therefore, to succeed in IT there should be a change in organisational culture where staff are well skilled and trained and ready to take responsibilities.

Team-work is known as a crucial value of BPR (Johansson et al., 1993; Choudrie, 2000) and its success is affected by the way in which team members are selected. It constitutes of a collaborative and learning environment where team members from different backgrounds are encouraged to share knowledge, skills and expertise (Al Mashari & Zairi, 2000).

BPR results in changes in many aspects of an organisation including organisation's structure, job roles, power distribution and work strategy. Therefore, it would not be possible to implement such changes without addressing the collateral philosophical underpinnings, i.e. organisational culture, to provide a pre-stated ideal for those changes to succeed. Marchand and Staford (1995, page 38) emphasise that "if existing corporate attitudes and values run against reengineering attempts in all or parts of the firm, either the reengineering program or the culture will have to change". Lyytinen and Hirschheim (1987) attribute the failure of more than 50% of all of the IS to the poor "fit between technology and the organisational culture that it is implemented into".

At one extreme, some researchers (see for example, Andrew & Stalick, 1994; Johansson et al., 1993) view organisational culture as an enabler and an internal variable in the change program. They go as far as saying that organisational politics can be cast aside provided that management changes their role (Johansson et al., 1993).

On the other extreme, researchers who are sceptical regarding the revolutionary claims of BPR originators, believe that there are practical limitations facing organisations when introducing such radical changes (see for example, Grint & Willcocks, 1995; Grint & Case, 1995; Willmott, 1994). They believe that what the advocates of BPR prescribe for a radical change shows a limited understanding of organisations and organisational politics, or more generally human issues.

2.5   Where is BPR Research Now?

More than a decade has passed since the introduction of the terms BPR, BPC and process redesign. During this time, a dearth of academic research has been directed toward investigating BPR phenomenon. At the time of finalising this thesis, a plethora of academic investigations have been published in leading research journals. The key research issues at the moment can be grouped into three categories; frameworks and strategies, case studies, IT and cultural issues.

Many research focus upon the development of frameworks and strategies for conducting BPR tackling different perspectives such as: methodological framework (see for example, Towill, 2001; Hill & Collins, 2000a; Hill & Collins, 2000b), vision of BPR with IT (see for example, Koch, 2001; Sirigindi, 2000; Allen, 2000; Aouad et al., 1999), and analytical perspective of BPR (see for example, Belmiro, et al., 2000; Dougles, 1999; Cao et al., 2001; Al Mashari & Zairi, 2000). Similarly, numerous BPR case studies investigating important characteristics of the phenomenon were recently completed (see for example, Ebrahimpur & Jacob, 2001; Dey, 2001; Paper et al., 2001). These case studies provide important insights into the power of case study research method when investigating complex, context-based phenomenon such as BPR.

Other articles address different aspects of BPR such as: the role of organisational culture and management of cultural diversity (see for example, Fleury, 1999; Joiner, 2001; Kidd, 2001), studies on critical success factors (see for example, McAdam & Doughy, 1999) and studies on the conduct of BPR in specific sector or country (see for example, Kovacic, 2001; Al Mashari et al., 2001; Barins, 2001). However, academic research diverted towards theory-building in the BPR domain remain largely unanswered. To the researcher's knowledge, studies of BPR conduct in organisations in AGCC countries are absent.

2.6   The Importance of Context in BPR Research

BPR is a major issue in the US and recently recognised worldwide (Watson et al., 1997). It is a huge topic and its nature focuses on every element of the organisation and therefore there are still many areas of research that remain ambiguous (Saharia et al.,

1994). Much of the existing literature in this area is mainly based on organisations in industrial countries.

External environmental forces such as economic development, legal political issues and cultural issues (Dean et al., 1991; Watson et al., 1997) have major influences on organisational issues (Lawrence & Lorch, 1967). Therefore, it is clearly evident that conducting BPR initiatives is not easy, because each project has to be studied individually due to the different culture, work ethic and law. In an organisational change process, it is imperative for managers to understand current organisational culture (Kanter et al., 1992). This enables these managers to adapt change strategies that are appropriate for the organisational context (Kanter et al., 1992). An awareness of the nature of organisational culture provides a basis for explaining and assessing the appropriateness and outcomes of the change process. For example, an improved understanding of the organisational culture within the public sector provides a basis for developing appropriate strategies for attaining improved results in public sector.

It is not possible to ignore the legacy of organisational culture because it affects the behaviour and identity of human. A country's culture is difficult, yet important, for managers to handle in their organisations because it affects and influences the behaviour of the employees. National culture is deeply rooted in history, geography, religion, tradition, values, customs, language and education. Hofstede (1980) found out that national culture explains 50°o of the differences in employee attitudes. His pioneering study of IBM affiliates in fifty countries developed a questionnaire to illustrate culturally dependent work preferences and found that managers and employees vary on four dimensions of national culture. In many ways those dimensions describe organisational behaviour and how these behaviours differ across nations and cultures (Hofstede, 1980):

- Individualism (refers to a loosely knit social framework wherein people emphasise only the care of themselves and their families) versus collectivism (refers to a tight social framework wherein people in-groups look and protect each others). A comparative score for UK and Arab Gulf Co-operation Council (AGCC) countries along this dimension are 89 and 38 respectively (AGCC countries are chosen here because the cases' subjects of this thesis are organisations situated in those countries). This gives a clear indication that the UK is very individualistic compared to the

AGCC countries. AGCC countries' cultural identities are strongly represented in their religion, institutional framework of the government and the language. Appendix B provides further insights into the case studies' organisations' country culture, which is situated in one of the AGCC countries. The dominant religion is Islam, which governs the behaviour of the society to a far greater extent than the religion does in the west, penetrating into every aspect of daily life and promotes this collectivism behaviour and their official language is Arabic.

- Power distance (refers to the extent to which a society accepts that power in institutions is distributed unequally). A comparative score for UK and AGCC countries along this dimension are 35 and 80 respectively. This indicates that a UK national is more accustomed to relatively low power distance and confrontational culture compared to AGCC nationals (due, in part, to the institutional framework of the government).

- Uncertainty avoidance (refers to the extent to which a society feels threaten by uncertain and ambiguous situation and tries to avoid them). A comparative score for UK and AGCC countries along this dimension are 35 and 68 respectively. This implies that AGCC nationals tend to rely more upon rules and procedures to avoid uncertainties (due, in part, to the institutional framework of the government).

- Quantity of life (refers to the extent to which societal values are characterised by assertiveness and materialism) versus quality of life (refers to the extent to which societal values emphasise relationship and concern of others). A comparative score for UK and AGCC countries along this dimension are 66 and 53 respectively. This implies that AGCC nationals show more sensitivity and concern to the welfare of others and value relationships more, as compared to UK nationals.

Table 2.3 summarises the impact of Hofstede's cultural dimensions on management issues.

Power Distance	Small	Large
Organizational Structure	Relatively flat	Hierarchical pyramid
Status Symbols	Relatively unimportant	Very important
Importance of "Face"	Face saving less important	Face saving important
Participative Management	Possible	Not possible
Role of Manager	Facilitator	Expert
Uncertainty Avoidance	**Low**	**High**
Corporate Plans	Seen as guidelines	Seen as important to follow
Competition	Seen as advantageous	Seen as damaging
Budgeting Systems	Flexible	Inflexible
Control Systems	Loose	Tight
Risk	Take	Avoid
Individualism	**Collectivist**	**Individualist**
Decision Making	Group consensus	Individual
Reward Systems	Group based	Individual/Based on merit
Ethics/Values	Particularism	Universalism
Organizational Concern	Look after employees	Employees look after selves
Achievement	**Quality of Life**	**Quantity of life**
Valued Rewards	Quality of life	Money, performance
Networking	Important for relationships	Important for performance
Interpersonal Focus	Maintaining relationship	Getting the task done
Basis for Motivation	Service to others	Ambition – getting ahead

- Table 2.3 The impact of Hofstede's Cultural dimensions on management issues

2.7 Summary

The review of BPR literature shows that consultants, practitioners and researchers differ considerably even on basic issues of BPR such as the extent of change, the expected outcome of the initiative and the role of IT and organisational culture. Therefore, this study will leave judging whether an initiative qualifies as a BPR or not to the stakeholders of each case study. However, this study will focus on the role of organisational culture and IT in BPR initiatives.

The review indicates that there is a degree of consensus that the country's culture within which the organisation is physically situated is an integral part of the organisational culture and would greatly influence how change initiatives are perceived (or should be

conducted). Therefore, the cultural identity of the country of the thesis's case studies, i.e. AGCC countries, is briefly addressed.

The review also indicates that the social and technical systems, of an organisation, simultaneously influence one another. This implies that successful change initiatives require careful consideration to the context and the process of the change in addition to the content of the change.

RESEARCH METHODOLOGY

3.1 Introduction

Researchers and practitioners have discussed many critical success factors (CSF) of BPR initiatives. Those can be classified into two main categories: technological and cultural factors. Authors contributing to BPR literature can be divided into three groups regarding their assumptions of the relative importance of each factor in BPR success. IT received considerable attention and as much disagreement about its role in BPR. Some authors, adopting the technological perspective, believe that IT, in itself, has the power to change an organisation and they assume that all aspects of BPR revolve around it (see for example, Tapscott & Caston, 1993). Others adopt the socio-cultural perspective, which assumes that organisational change occurs not due to the technology but due to human motives and actions and thus focus on the role of organisational culture and social factors in BPR change (see for example, Bashein et al., 1994; Hammer & Stanton, 1995). The third perspective attempts to achieve a balance between the two views, i.e. technological and socio-cultural perspectives, by adopting an emergent perspective. Practitioners adopting this orientation focus on the inextricable interplay between actors, context and technology (see for example, Markus & Robey, 1988; Mumford, 1995).

This research study seeks answers to the query:

How do organisational culture and IT contribute to the outcomes of BPR initiatives?

This study is designed to investigate the relationship between IT and organisational culture in BPR projects. The focus here is on developing a process-oriented, context-based description and explanation of the BPR phenomenon in AGCC countries. The study strives to describe and explain the process of adopting and implementing BPR

initiatives in petrochemical and utilities industries in AGCC countries in terms of interaction of contextual conditions, actions and consequences. The purpose of this study is to address, at least in part, the need for an integral theory relating to organisational change and information technology as briefly formulated by Daft and Lewin (1993).

The researcher chose the structured and semi-structured method using case studies approach for conducting this thesis. The research methodology focuses on the pragmatics of conducting case studies as a rigorous and effective method of research.

The need for an integral theory of BPR is addressed in Section 3.2. The section also addresses the rationale behind choosing to express the results of the positivist inquiry as a process theory and the adoption of the emergent perspective are presented. Then, in Section 3.3 the research methodology of the study is presented. In Section 3.4, the research framework and the main constructs of this study are addressed. The research strategy of this study is detailed in Section 3.5. Then, a number of theoretical propositions related to the defined constructs are postulated based on a review of related literature and views of key informant of the subject. The methods used in this study are presented in Section 3.7. The thesis approach to test the propositions and their requirements are addressed in Section 3.8. The chapter concludes by addressing the methodological rigor of the study.

3.2   The Need for Theory

This study is an instance of the process of theorising. Weick (1995) suggests that there is a stage before theory which he calls theorising. He sees theory as a product whereas theorising is a process. Glaser and Strauss (1967) believe that theory is an ever-developing entity, not a perfected product, and emphasise on theory as a process.

In pursuit of the theory demanded by Daft and Lewin (1993), this study, is an initial step falling into the theorising classification, seeks to build this theory. However, purposeful studies conducted to seek new theories should address two principle questions. The first is to address the need for theory in the domain anyway, given that it may be covered by a grand theory in super domain, such as organisation studies. The second is to address

what is wrong with existing theory, if any available, and thus warranting the case for the need of theory.

As indicated by the surveys mentioned in Chapter 2, there has been an ongoing debate on the efficacy of BPR due to the reported failure rate, almost two thirds (Hammer & Champy, 1993), associated with such initiatives. In a CSC Index survey (InformationWeek, 1994), which included 600 senior managers in large US and European corporations, the critical success factors of BPR were discussed. The survey showed that the satisfaction with BPR results were diverse with 16% claiming excellent results, 17° o good results whereas more than 40% reported mediocre results and 25% reported that their projects had failed. Moreover, the survey had indicated that half of the respondents, who had not yet undertaken a BPR initiative, planned to initiate one before the end of the year. The high failure rate of BPR initiatives, and the wide adoption of this valuable methodology to improve corporate efficiency and transform legacy functional bureaucracies, should make the case for a need for an integral BPR theory. This theory would contribute, at least modestly, to improving the conduct of organisational change initiatives by providing blueprints, guidelines and ideas for organisations planning to undergo change program.

The approach to address the second question (i.e. What is wrong with existing theory, if any available?) is to make the case for a particular type of theory as being the one that best represents the domain of interest, i.e. organisation change, and thus all existing theories that are not of this type are deemed to be insufficient by definition. In addressing this, types of theories are discussed and thus the most applicable type of theory of organisation change is chosen.

Mohr (1982) classifies theories into "process" theory and "variance" theory. Variance theories usually consist of precursor variables that are the necessary and sufficient conditions for the outcome. Whenever these conditions are present in the context then a specified outcome is theorised to result. A critical pre-requisite to creating a defensible variance theory is the ability to identify the appropriate dependent and independent variables from the complex social phenomenon being studied and to study the relationships among the two groups of variables. Another difficulty associated with creating variance theories for a phenomenon in a social domain, such as BPR, is the

extreme difficulty in finding powerful explanatory relations of this kind in the social context.

A process theory, on the other hand, informs a little about how a certain outcome comes about. Instead it provides information on what happens within a phenomenon and gives a theoretical explanation of recurrent behaviour. Process theories have a longitudinal perspective, whereas variance theories consider a particular point in time. Yet, change is a process that occurs over a period of time from its inception to its declared completion that is more appropriate to study with a longitudinal perspective. Moreover, process theories are stated in a more flexible form that is less restrictive and more aware to the complex relations in the social context. Thus a process theory is a more useful and applicable type of theory for understanding changes in organisations.

Markus and Robey (1988) assert that one of the shortcomings in most research in the area of IT and organisational change is the over-reliance on variance models in theory. They suggest using the logic of process theory rather than an exclusive dependence on variance foundations.

Given the choice of process theory, one is confronted with further choices directly related to organisational changes and IT used by Markus and Robey (1988) in their development of the concept of "causal agency". They define "causal agency" as beliefs about the nature of causality. They describe the three conceptions of causal agency in organisational change as; the technological imperative, the organisational imperative and the emergent perspective. Technological imperative, regards technology as an exogenous force that constrains actions and forces organisations and people to behave in certain ways. The organisational imperative is based on Pfeffer's (1982) view of "rational actors" perspective wherein people and organisations have a free choice in deciding a course of action resulting from an evaluation of alternatives. This implies that motives and rational actions of humans are the cause of the organisational change whereas technology is dependent variable. In the context of BPR the analogy is that process designers act rationally and purposively to meet the needs of the organisation. In this perspective, the contextual variables are contingencies that must be handled by the initiative team and the managers. Contingency theory is the most prevalent in this category (see for example, Bashien et al., 1994).

In the emergent perspective, organisational change emerges from an unpredictable interaction between technology and humans. The nature of the emergent systems is that they are indeterminate, in that their behaviour can not be predicted a priori. Their behaviour emerges unpredictably as a result of the complex interactions between actors, individuals and organisations. Further, the interactions change over time as do meanings and their organisational contexts. With the emergent perspective, a greater complexity enters into the view of organisations with non-deterministic, unpredictable and unforeseen consequences. Thus, emergent perspective appears to be the most appropriate perspective to address the issues of BPR. However, there are few case studies that would critically analyse the BPR project from this perspective. Little research exists that informs about the mechanisms of the interplay between organisational culture and the technology in BPR initiatives, let alone researches dedicated to organisations in developing countries.

While a number of recent studies have sought to investigate BPR attempts, they suffer from a limited repertoire of constructs. These studies often segregate the scope of investigation to; the role of IT in BPR (Markus et al., 1994, Marteniz, 1995), social aspects of BPR (Cooper & Markus, 1995) and identification of strategies for BPR (Earl et al., 1995). While restricting the research domain of BPR in this manner is effective in directing research resources, it constrains the investigation of a phenomenon that has a wide variety of contingency factors. It is crucial that further research is conducted to understand those constructs that associate to the efficacy of BPR that may allow the development of an integral theory to best understand the underlying principles, relationships of constructs and situational variables that will affect a certain BPR initiative. This thesis integrates a large number of constructs, derived from existing theories, to form an integral process theory of BPC. These theoretical constructs are empirically tested in a new context.

3.3   Research Methodology

The philosophical roots of this research perspective are primarily based on the central tenets of a framework developed by Lee (1991) to integrate positivist and interpretivist research. The ontological assumptions of most social studies posit social reality as either subjective (applies interpretivist epistemology which posits social systems as result of

meaningful human behaviour) or objective (applies positivist epistemology) (Burrell & Morgan, 1979; Orlikowski & Baroudi, 1991). However, Lee's (1991) framework challenges this assumption of opposition and proposes an integrating theory that recognises both objective and subjective dimensions of social reality.

Giddens (1979, 1984) asserts that both subjectivism and objectivism are important to inform social theorising and empirical investigation and posits the existence of three levels of understanding:

- First level understanding referred to as "subjective understanding" that consists of the common-sense understanding held by human subjects experiencing the phenomenon.

- Second level understanding referred to as "interpretivist understanding" that consists of the understanding held by the researcher based on her interpretation of the subjects' understanding.

- Third level understanding referred to as "positivist understanding" that takes the form of testable formal propositions, usually using constructs developed by the researcher, and conducting empirical testing for verifying or disconfirming those propositions.

Lee's (1991) framework for integrating positivist and interpretivist research draws primarily on Giddens' (1984) structuration theory. Giddens' structuration theory has been adopted by a number of organisational researchers in their analysis of organisational processes (see for example, Pettigrew, 1985; Willmott, 1987; Manning, 1989). Lee asserts that his approach, which is in a way similar to this study approach, enables the "cumulative research" of positivist and interpretivist research, which would eventually lead to an extensive and well tested theory of organisational change.

In the context of Lee's framework Sarker (1997) presented a study integrating positivist and interpretivist approaches. The study tested a number of process propositions classified into three perspectives; technologically oriented, socially oriented and sociotechnical, to identify which of those perspectives is useful for managing a BPR initiatives.

The research methodology of this study proceeds as follows:

- First, the researcher expresses her positivist understanding on BPR, based on a review of related publications and views of key informants of the subject, in terms of process theory propositions. By reviewing a number of studies that seek to investigate BPR endeavours, although mostly focus is on the individual elements of BPR, the researcher infers a number of constructs and related proposition for: What really constitutes the necessary conditions to ensure successful adoption of BPR initiatives? These propositions, which constitute the researcher's positivist understanding, are either verified or falsified by conducting empirical case studies testing (deductive testing). To validate this level of understanding, the researcher takes into consideration her interpretation of case subjects' points of view (the subjective understanding) and validates that the postulated propositions are understandable to the case subjects in terms of their "common sense interpretation" (Lee, 1991, page 353).

Due to the thesis timeframe, a major part of this study is dedicated to verify this level of understanding. Hence, the study emphasises conducting positivist inquiry of the case studies data to deductively test the researcher's positivist understanding on BPR and her assumptions of " blueprints" for successful BPR in AGCC countries. Case study research within this perspective is designed and evaluated according to the criteria of the natural science research that involves controlled observation, controlled deductions, replicability and generalizability (Lee, 1991). Although manipulation of variables is not possible in case studies, the theoretical constructs can be defined and empirically evaluated and measured and naturally occurring controls can be identified (Cavaye, 1996). Literal and theoretical replication provide for generalizability of case study research findings (Lee, 1991).

- Second, when some of the propositions expressing the researcher's positivist understanding on BPR are found to be invalid or questionable, a fresh interpretation of the cases' data is conducted. This involves revisiting the specific cases that caused the rejection of the propositions and seek to understand the disparity in the researcher's positivist understanding and her interpretation of the case subjects' understanding.

3.4   Research Framework

According to the emergent perspective, BPR is visualised as a change leading to the joint optimisation of the technical and social factors. A successful redesign of business processes within the socio-technical perspective can be accomplished only with a proper understanding of the recursive relationship between information technology and the social system of the organisation (Davenport & Short, 1990; Markus & Robey, 1995).

The literature review of IT and BPR shows clearly that the deployment of new IT has some impact on the organisation and its individuals. On the other hand, the research literature suggest that the "decision to computerise" is influenced by social processes that takes place within the planning group as well as by the constraints and directions set outside the group. Yet, structuration theory (Giddens, 1984) asserts that human actions produces and reproduces structures of social relations and that groups act according to rules to achieve their goals and in doing so create structures that in-turn affect future action. Structuration theory furnishes this thesis' basic assumptions about the inextricable relationship between actors, context and technology in social systems (as per the emergent perspective). However, structuration theory is a "meta-theory" under which domain specific theory, in this case BPR, can be built (Morrow & Brown, 1994).

Ranson et al. (1980) regard IT as one of several contextual constraints that affirm some sort of organisational reaction. Thus, organisational resources, size and technology are considered as organisational characteristics impinging on structural choices in a way similar to how organisational environment affects the structure.

The reciprocal influence of IT and organisational culture on organisational change, as suggested by the emergent perspective, justifies the consideration of three components (macro-constructs) in the research framework as shown in Figure 3.1. These are: organisational culture, IT and the outcome of the BPR initiative together with the inextricable interdependence between them. The investigation of these relationships is to be conducted in petrochemical and utilities organisations in AGCC countries. This is reiterated because, according to Institutional Theory (March & Olsen, 1989), social, religious, political and governmental institutions act to consensually structure social relations.

By reviewing various studies of success and failure in BPR initiatives, focusing on the three components and the identified salient dimensions of those components "i.e. constructs", preliminary blueprints for effective BPR, in the form of propositions, are constructed. These propositions are deductively tested using the case study method, while a conscious effort to maximise deep understanding of the organisational context is central to this study. The aim here is to contribute to knowledge by describing and explaining the BPR phenomenon in its specific context and relate the findings of the investigation to the researcher's positivist understanding built from reviewing publications related to the subject area.
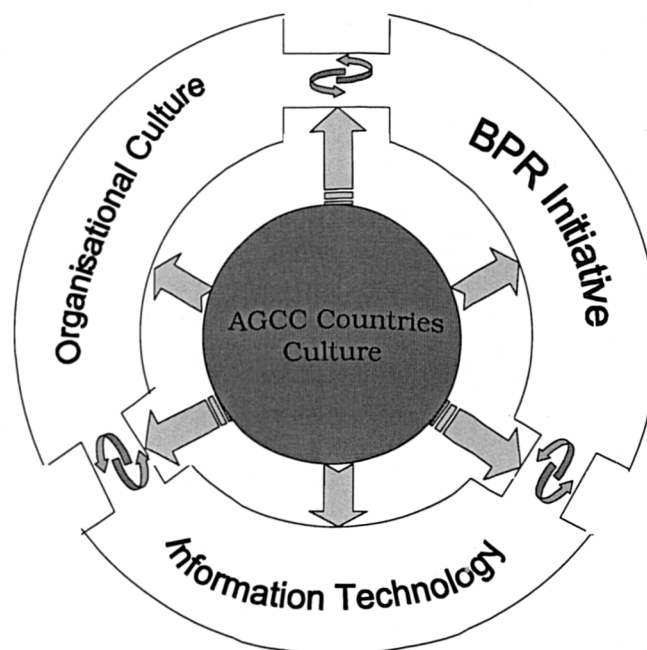
Figure 3.1 Research Framework

To validate this positivist understanding, a specification of theoretical propositions derived from existing theories and views related to the subject area will be provided. Then, the results of the case studies' data collection and analysis will be used to compare these findings with the expected outcomes predicted by the propositions (Benbasat et al., 1987). The theory is either validated or else found to be inadequate in some way in which the case is further refined based on the findings.

3.5   Research Strategy

The research strategy to address the core question of this thesis is to conduct qualitative inquiry of three case studies on petrochemical and utilities organisations in the AGCC countries that have implemented BPR projects.

Qualitative research is common among practitioners searching better understanding and gaining rich insights of human behaviour and functions. It is also suitable for studying organisational, groups, and individuals behaviour (Strauss & Corbin, 1990). A qualitative inquiry is primarily interested in deriving meanings and cognition of a phenomenon rather than measuring or quantification of a phenomenon (which is the primary focus of quantitative inquiry). Qualitative researchers consider that it is not possible to assign meanings to a phenomenon without describing the context and the position of the people who affect and are affected by the phenomenon (Cavaye, 1996). To achieve the contextual understanding, direct and in-depth knowledge of the research setting is necessary. Therefore, qualitative methods are associated with observations and face-to-face interviews with persons in the research setting (Cavaye, 1996).

In planning the study design of this thesis, the researcher considered several methodological alternatives including action research, field study, ethnographic research and case study.

In field study, the researcher enters the site as an observer to collect and record the data that relates to specific constructs or hypothesis that he has in his mind before entering the field (Stone, 1978). In action research, the research forsakes his role as observer of events and takes part with the subjects in the study situation (Cornford & Smithson, 1996). In ethnographic research, the researcher attempts to understand the meanings of a phenomenon from the participants' point of view by undergoing extended fieldwork over long periods (Sanders, 1982).

The three approaches were eliminated from the choices since entering the site as an observer participant or undergoing extending fieldwork over long periods were either impractical for the researcher (i.e. since it is not practical for a female to stay in field for a long period due to the traditions and customs of the country) or the research settings (i.e.

since all cases have completed their projects leaving little for observations or participants).

Case studies have become well-accepted research methods in organisational and IS research. Many publications discuss the advantages of case study research (see for example, Benbasat et al., 1987). Many researchers have conducted case studies and analysed the cases interpretively to gain insights about the case subjects view and interpretation of the phenomenon under study (see for example, Hirschheim & Newman, 1991). On the other hand, Lee (1989), for example, discussed how a case study might be used to deductively test theories in accordance with the principles of logical positivism. Therefore, the choice of case study strategy in this study is to provide an in-depth understanding of the context of BPR phenomenon (interpretivist) and its use to deductively test theories (positivist) has been shown to be effective.

Case study research enables the capturing of 'reality' and detail by investigating people and groups' experiences and knowledge related to BPR implementation in the richness of its natural context. Case study research is valuable in developing concepts appropriate for theory building or refining concepts for further studies. Furthermore, multiple case studies enable the researcher to relate differences in context to constants in process and outcome.

The deductive use of case study strategy represents a non-traditional way for testing a theory. The fact that the case study has not traditionally been used for theory testing does not make the strategy less appropriate for the purpose (Cavaye, 1996). Since deductive logic can be used in case study research, the appropriateness of employing a case research strategy to confirm or dis-confirm existing theory is unquestionable.

Following Yin's (1994) recommendation for the choice of appropriate research strategy, the choice of case study method meets the three conditions used to conclude appropriate strategy. First, the type of the research question "how type" seeks explanation and exploration of contemporary phenomenon that is more suitable for case studies. Second, the phenomenon is investigated in its natural settings in which explicit control or manipulation of variables and behavioural events is neither required nor desirable. Third, the use of qualitative tools and techniques for data collection and analysis to allow for a

large number of variables and different aspects of the phenomenon to be investigated is more appropriate in case study approach. This allows the linking of multiple levels of analysis to overcome the shortcoming of failing to distinguish among individuals, groups and organisations as levels of analysis facing many researchers.

In the following section, the theoretical propositions to be verified by the conducted case studies are given.

3.6   Theoretical Propositions

The specifications for the process theory that are used in this study are based on Lee's (1991) approach for specifying process theories. First, the propositions are stated in a necessary, but not sufficient, condition form. Second, stated propositions satisfy all requirements for positivist theories as shown later in Section 3.8.

The approach for specifying process theory used in this study is to provide a number of testable propositions that would provide a bound to how the proceedings of BPR process is theorised. The specificity and the structure of each proposition determines how precisely BPR has been predicated. The bounds created by the propositions represents the theoretical explanation of the possible ways in which the process and the outcome of BPR emerges. Therefore, the more specific the propositions and the closer the relationships among the propositions, the less is the probability of unexplained turn of events and, hence, would result in a sufficient understanding of BPR phenomenon.

In the following subsections, a number of theoretical propositions related to the relationships between each of the three defined macro-constructs are postulated and based on the findings of related publications and case studies. First, the relationship between the IT role in BPR and the organisational culture is reviewed and a set of key constructs and related propositions are presented. Second a set of primary constructs and related propositions about the relationship between the organisational culture and the success of BPR are presented in light of the given argumentation. Third, the relationship between the IT role in BPR and the success of the BPR project is addressed and a set of key constructs and related propositions are presented.

3.6.1 The Role of Organisational Culture in the Outcome of BPR Initiatives

As indicated earlier in Chapter 2, the importance of organisational culture is best understood in terms of cultural beliefs, value systems and norms (Schein, 1984). Organisational culture influences the organisation's ability to learn, share information and make decisions and, hence, facilitates (or inhibits) the change initiative (Kilman et al., 1986). Value systems relate behaviours across units and levels of organisations and, because of their common nature, often disclose a propensity to resist change (Fitzgerlad, 1988). Organisational norms are the implicit and socially transmitted guides to behaviour. Norms include: level of openness and communication, extend of risk taking propensity, degree of trust and respect, level of expectation for actions and competition level (O'Reilly, 1989).

The following are some of the key "Organisational Culture" constructs for BPR.

Leadership:

Many authors see leadership as a key figure in successful organisational change (see for example, Robbins & Finley, 1996; Hammer & Champy, 1993). Leadership and change agents that may influence the organisational cultural readiness to change should be a prerequisite for BPR (Tushman & Nadler, 1986). Although management positions come with some degree of formally designated authority, this does not assure that managers will be able to lead effectively. An effective leader may have little position power, but instead have charisma and powers of personality, commitment, integrity and consideration that can provide great leverage to change ideas. Organisational behaviour literature frequently refer to two styles of leadership; transactional and transformational (Bass, 1985). Transformational leadership is more effective style for leading radical organisational changes (Bass, 1985). Transactional leadership focuses attention on vision and draws on emotional and spiritual resources to energise and motivate the people in the organisation. "Visionary leadership" is an informal change approach whereby a single leader with a vision gets the locus of the organisation's focus for change (Mintzberg & Westley, 1992).

Many authors see that engaging top management to play a leadership role is a critical factor for the success of BPR initiative (see for example, Davenport, 1993; Johansson et al., 1993; Hammer & Champy, 1993). The most important contributions from executive leadership include:

- Demonstrate commitment and support for the project,

- Authorise and motivate the overall BPR,

- Provide the needed resources to the project team,

- Provide adequate funding,

- Articulate the vision and communicate the business reasons for change, and

- Responsible for shaking the barrier and removing the stumbling blocks set within the organisation by people resisting the change process.

The above argumentation leads to considering 'leadership" (probed by the presence/ absence of BPR "champions" or "czars" to lead the organisation and break norms) as one of the key constructs of organisational culture for BPR. The importance of effective leadership in BPR projects is stated by the following proposition:

Proposition 1. *The existence of effective executive leadership to lead the BPR project and continually seeks support of all levels in the organisation will have a positive impact on the level of success of the project.*

Open Communication:

A number of authors see communication issues as a central in organisational change (see, for example, McAdam & Donaghy, 1999; Al Mashari & Zairi, 2000; Hammer & Stanton, 1995; Carr & Johnsson, 1995). There is a need for managers to sustain a culture of mutual trust and support for open communication and multiple input within the organisation (Davenport, 1993; Saffold, 1969). Communication must be a priority for everyone involved in change program. Consistent and clear communication among various stakeholders is necessary. Workshops, presentations and informal collaboration are essential to avoid the hazards of misunderstanding, insecurity and disengagement

from the program. The most effective communication provides a consistent message that is simple to understand at all levels of the organisation and yet enthusiastic in explaining how the environment will be better after the change.

For communicating the case for change and vision, the communication must come from the top and emphasise why change is necessary, what the change will be, how the change will happen and the inevitability of the effect. The communication must also include status updates with open discussions of issues, concerns and problems (Coleman et al., 1996).

The above discussion leads to considering "communication" (probed by the extent of open communication) as another key organisational culture construct for BPR. The importance of effective communication in BPR projects is stated in the following proposition:

Proposition 2. *The existence of effective and open communication among the various stakeholders of the BPR initiative will have a positive impact on the BPR implementation success.*

Strategy led:

Another critical success factor for a reengineering project, which executive leadership need to understand, is that strategy must drive reengineering. Top management has a role in identifying the rationale for the change initiative and setting directions. They should provide a business strategy that is sound, well described and feasible in order to provide a context for core process definitions and to allow the creation of processes being aligned with the business objectives and performance requirements. Andersen Consulting's (Andersen Consulting, 1998) reengineering approach starts with a "shared vision" initial setup phase that is concerned with the identification and definition of the change initiative, based on a value assessment and the positioning of the organisation. This is usually conducted by executive management and major stakeholders and involves:

- Define stakeholders values

- Define core competencies

- Develop shared vision

- Determine strategies and priorities

- Develop operational vision

It is crucial that senior management articulate a clear vision of the business strategy as it relates to a BPR implementation initiative to achieve that strategy (Kotter, 1995; Digman, 1990). BPR projects that have no strategic linkage tend to focus on more sub-optimal exploit and may not receive the required attention and resources to be successful. Therefore, it is imperative to understand whether a BPR project had been linked to the corporate strategy from the onset or not. In benchmarking report by ProSci (ProSci, 1999), with 248 companies participated in a study on BPR, some of the biggest mistakes made by executive leadership as listed by project teams were: changing the project direction mid-stream and not setting clear boundaries and objectives for the project.

The above argumentation leads to considering "strategy led" (probed by the onset BPR linkage to plan and strategy) as one key construct for BPR. The importance of a strategy to drive the reengineering projects is given by the following proposition.

Proposition 3. *The existence of a compelling vision tied with a sound, well-described and feasible strategy to drive the BPR project will have a positive impact on the success of the project.*

Team based:

To improve the outcome of BPR, process management methods are used that combines methodological approaches with human resources management (Anderson et al., 1994; Grover et al., 1995; Choudrie, 2000). Process management is a set of concepts and practices aimed at better servant of business processes (Davenport, 1995). This involves human resources design and employee practices such as team-based management, decision making and remuneration (Katzenbach & Smith, 1995).

Choudrie's (2000) study investigating reengineering teams in the context of BPR found that teams are imperative for BPR and formed a new theory covering selected human

and organisational aspects emphasising the role of the teams as change agents and team selection criteria.

A BPR initiative should involve members from the affected functions of the business process. The use of team based management techniques is critical in order to identify process change opportunities and also to seek soft issues in the new organisational structures that maybe recommended in the course of the BPR. The selection of the team should be carefully made to include members with experience in strategic visioning, change management and team improvements initiatives (Carr & Johansson, 1995). Cross-functional representation of the BPR team is critical to obtain a variety of perspectives and to avoid resistance from different functional areas (Davenport, 1993).

The project team has three major roles (Ancona & Nadler, 1989; Davenport, 1993):

- Work management – managing how the team makes decision, coordinates activities and shares information.

- Relationship management – managing issues pertaining to degree of openness and cohesiveness, methods of conflict resolution and level of trust.

- External boundary management – managing relationship between customers, suppliers and/ or channel partners.

Research into BPR failures has suggested that leading the project by IT people could be a reason for the failure (Greene, 1993). The scale of change at the fundamental level will have deep repercussions and needs the authority to enforce the new values and new ways of working. The IT department members should be cast in the role of IT consultants in which they play a supportive rather than leading role. They will continue to provide the specialist design and development skills for IT selection or building.

The above leads to consider "team based" (probed by the availability and appropriate composition of a team to lead the BPR) as another key construct for BPR. This discussion also leads to the following two related formal propositions that recognise necessary but not sufficient condition for effective BPR.

Proposition 4. *The existence of an appropriately composed team to manage the BPR project will have a positive impact on the BPR implementation success.*

Proposition 5. *The availability of representatives from the IT department in the composed BPR project team, but not assigned the project's leadership role, will have a positive impact on the BPR implementation success.*

Organisational Politics:

Significant insights into the BPR phenomenon can be obtained by analysing the level of surface and deep structural power and politics within the organisation (Knights and McCabe, 1998). From an organisational politics perspective, there are two basic activities of organisation. First, are the contests among independent actors operating from different perspectives of reference and motivated by different self-interests and preferences to control resources, to determine the means of doing organisational work (Baldridge, 1971; Uttal, 1985). Second, there are the struggles for collaboration among actors in the performance of a given task when the means for getting it done are unclear or subject to dispute (Pfeffer, 1981; Wilkinson, 1983). Few case studies demonstrate how critical power and politics are in determining the eventual success or a failure of a change (see for example, Pinchott, 1985; Nayak & Ketteringham, 1986).

Cao et al. (1999) suggest a classification of four types of organisational change: processual, structural, cultural and political change. A political view sees change in terms of power and potency to influence the flow of events. Political influence can also serve functional roles in organisations (Mintzberg, 1998). For example, political influence can ensure that the most powerful members of an organisation become leaders, or that issues of concern are fully debated (Cao et al., 2001). An appreciation of the political nature of organisations, where different interests do exist and often conflict, helps in exploring who are the powerful, and the ways in which that power is exercised.

Buchanan (1997) and Bevan (1997) discuss issues raised by the implementation of a BPR project in a politicised hospital context. One of the case study's findings is that the lack of the precision surrounding the focus and methodology of BPR gives politically motivated actors considerable influence with respect to defining the terms of reference in ways which will shape potential outcomes in their favour.

The above argumentation leads to the following proposition regarding the political behaviour in BPR projects.

Proposition 6. *In a politicised organisation, the alignment of the motives of the actors, who have the power and potency to influence the flow of events of the BPR project, to the organisational vision will have a positive impact on the BPR implementation success.*

The Sector of the Organisation:

The sector of the organisation, i.e. private or public, has been suggested to influence the possible level of change in the organisation and hence the type of BPR, i.e. incremental or radical (Champy, 1995; Hodgson, 1994). Research on organisational culture indicates that culture is central to the change process and to attainment of strategic objectives (Bluedorn & Lundgren, 1993). Concerns have been raised that organisational strategies designed to achieve new forms of public management need to be developed with an awareness of existing organisational culture within public sector organisations (Kanter et al., 1992). This enables developing change strategies that are appropriate for the organisational context.

Koch and McQueen (1996) describe an attempt to reengineer a large public sector organisation in Brazil. One of their key findings is that no radical changes in the organisation's business processes had resulted. They argue that there were four main reasons for the failure of the reengineering attempt (they consider any change other than radical as a failure). The first reason was the effect of political environment on the organisation's CEO in attaining objective goals. The second was the gradual shift of the focus of the reengineering team from core business process redesign to problem solving and automation of existing processes. The third reason was the hiding of failure signs. The fourth was that radical changes in core processes in public sector organisation are not feasible without either changes in law or privatisation.

The main finding of the study shows that the only possible change in public sector organisations is incremental. However, this thesis investigates the applicability of these findings despite the differences in the country culture and political environment.

Similarly, several cases investigating IT projects implementation conclude that public IT projects continue to be over budget, behind schedule and producing fewer benefits than expected (Laudon & Laudon, 1991; Cats-Baril & Thompson, 1995).

The above leads to considering "the sector of the organisation" (i.e. private or public) as another construct for BPR. A formal proposition related to this construct is:

Proposition 7. *Due to the particulars of public sector organisations, incremental change is the most feasible change in public sector organisations.*

3.6.2   The Relationship between Organisational Culture and IT in BPR

The relationship between IT and organisation has been of major interest among IS researchers. Swanson (1987) distinguishes between research which identifies determining factors for IS usage and research which identifies the effect of IS usage. He further argues that research on determinants of IS usage received more attention. Many researchers have investigated the reciprocal relationship between IT and social environment and the recursive relationship of nature and impact of IT on the change in the user's work (Blomberg, 1988; Orlikowski & Robey, 1991). Structuration Theory (Giddens, 1981) suggests that social action is capable of reproducing existing social structures and also producing new structures. This implies that not only the way people act changes their norms and values (structures) but also those structures influence the activities. This recursive dynamic has important consequences on social actions such as team-working and communication.

The following are some of the key constructs related to the inextricable relationship between "IT and Culture" for BPR.

IT-Culture Fit:

For an IT-enabled BPR change to succeed, the proposed IT change must be acceptable to the organisation as a whole. To meet the organisation's acceptability requirement, the new IT should be able to support the planned organisational objectives and also achieve an acceptable "match" with the organisation's custom and practice so that it does not disturb the overall ability of the organisation to function in its environment (Eason,

1988). For example, in organisations that practice collective decision-making wherein management espouse participative, consultative conviction, the choice of introducing rigid system control endangers the match between the technical system and the values of the organisation.

Weizenbaum (1976) gives many examples of the way IT systems can shape or distort human values rather than human values determining IT choice. BPR practitioners should be able to recognise when a specific IT system is in danger of producing a mismatch with the culture and values of the organisation. In most cases, however, practitioners are inclined to choose a set of packaged solutions based on benchmarking, or the observation of, exemplary organisations, failing to recognise that those may be inappropriate in their own particular situation (Hsiao & Ormerod, 1998).

The above discussion leads to considering "IT-Culture fit" (probed by the extent of match between technical and social system) as another key construct for BPR. The importance of "considering the cultural constraints on IT selection" for successful BPR is given in the following formal proposition.

Proposition 8. *In IT-enabled BPR change, ensuring that the to be selected IT will not endanger the match between the technical system and the customs and values espoused by the organisation will have a positive impact on the BPR implementation success.*

IT expertise and end-user skills:

Many researchers have discussed critical organisation roles necessary for innovation, including idea generators, champions, mentors (sponsors) and Gatekeepers. (Tushman & Nadler, 1986; Frost & Agri, 1991). In contrast to the champions who search for creative ideas, the gatekeepers acquire, translate and distribute knowledge to others. The gatekeepers, whether individuals or team, receive and translate information and knowledge and distribute it effectively to others (Howell & Higgins, 1990). The organisation's ability to recognise the value and apply knowledge is a function of both the gatekeeper's expertise and individuals who are supposed to receive this knowledge (Cohen & Levinthal, 1990). Technology gatekeepers usually play significant roles in increasing the organisation's BPR propensity and facilitating its implementation effectiveness (Nelson, 1990).

Kaplan (1996) mentions that most organisations adopt technology without acquiring the skills and establishing the operating procedures to ensure the proper implementation of it. From the human resources aspect, BPR practitioners need to make sure the availability of IT expertise required by the new system and that end-users receive training required to feel comfortable when using the new system.

The importance of "addressing the need of IT expertise and end user training" for successful BPR is given in the following formal proposition.

Proposition 9. *In IT-enabled BPR change, the availability of IT expertise and sufficient end users skills to support the selected IT will have a positive impact on the BPR implementation success.*

3.6.3   The Role of IT in the Outcome of BPR

Communication Technology:

Underlying most BPR initiatives are technologies such as groupware, workflow, EDI, imaging, Expert Systems (ES), LANs, Decision Support Systems (DSS) and Client-Server architecture. The importance of new communication technology to enable knowledge sharing has been emphasised in the literature (Huber, 1990; Teng et al., 1994; Keen, 1991; Melone & Rockert, 1991). Huber (1986, 1990) describes how changes in environment cause changes in the organisation's decision making, intelligence and design capabilities. He further describes how communication technologies affect this adaptation. As the ability to share knowledge and transparent data access empowers individuals and reinforces expertise, an organisation's propensity to change is enhanced by using those technologies (Charan, 1991).

The above discussion leads to considering the "use of communication technologies" (probed by the utilisation of telecommunication technologies for knowledge sharing) as one of the key "IT" constructs for BPR. The importance of utilising communication technologies to enable knowledge sharing is stated in the following proposition.

Proposition 10. *Exploiting the potential of communication technologies to enable knowledge sharing will have a positive impact on the BPR implementation success.*

Maturity of IT Infrastructure:

Many authors recognise the significance of IT infrastructure to BPR (Brancheau et al., 1996; Wastell et al., 1994). An inappropriate or inflexible IT infrastructure can constrain the BPR effort (Grover et al., 1993). The IT infrastructure encompasses the applications, data, organisational skills and experience, methods and practices, and communication technologies. IT infrastructure can be a constraint where existing systems are not compatible or where inconsistent data structures have been used in different divisions of the organisation (Broadbent et al., 1999). Proprietary, independently developed applications may need to be redesigned to enable BPR integration requirements.

The above discussion leads to the considering of "maturity of IT Infrastructure" (probed by level of maturity) as another key "IT" construct for BPR. Related necessary but not a sufficient condition regarding the importance of having appropriate IT infrastructure prior to BPR initiatives in given by the following proposition.

Proposition 11. *The existence of a well-established IT infrastructure within the organisation will have a positive impact on the BPR implementation success.*

3.7   Research Method

This research uses multiple case studies design. This allows the cross case analysis and comparison, and the investigation of the phenomenon in diverse setting. The evidence of similar results (literal replication) from multiple cases is considered more compelling and the overall study is, therefore, regarded as being more robust (Yin, 1994). Multiple cases may also be selected to produce contrasting results for predictable reasons (theoretical replication) (Yin, 1994).

3.7.1   Site Selection

Sites selection is always subject to a certain amount of serendipity (Markus, 1989). In this study, the process of sites selection, due to the culture of the AGCC countries, had to be done within serious site availability constraints. The basic criterion for site selection was that the organisations should have undergone IT-enabled BPR initiative that has resulted in some type of change (whether incremental or radical). Pettigrew (1989) also suggests choosing research sites with a high experience level of the phenomenon under study.

The fact that an organisation has undergone a change provides evidence of high experience.

Since the researcher has carried related studies during the master's studies that could be considered as pilot cases for this thesis and due to the time constraints, it was decided that the study of three organisations is appropriate. The selection of the organisations was made in such away that cross case patterns become more prominently visible (Eisenhardt, 1989).

The researcher contacted various people known to her in the home country to solicit possible candidates. After a numerous false starts (some organisations did not meet the criteria for selection while others refused to share their experience), two oil/gas companies in the AGCC countries were approached and accordingly two appointments were arranged in September 1998. To get the support and commitment from all members of the case studies' organisations, top management was approached first to endorse the study. An Appointment was organised with the Deputy General Manager of company "GCO" and another appointment was arranged with the General Manager of company "PCO". The aim and the scope of the study were explained to both managers. Both of them sanctioned verbally, but for formalities a letter was sent which contained the purpose of the research and the type of information sought. The letter assured the managers that a strict confidentiality would be taken into consideration. Also, the method of taking the information, which is by tape-recording, was included. A confirmation by fax was received from "PCO" and a confirmation by phone from "GCO".

A preparatory list of questions was compiled to give the interviewees an idea about the expected type of questions [See Appendix B for the list of questions]. Then, two letters were sent to both "GCO" and "PCO" requesting suggestions for initial interviewee candidates together with "rules of engagement". One criterion for interviewee selection was that candidates should have a good insight into what transpired during the change. The other criterion was that candidates had to have been part of the organisation before the BPR started and to have been part of the change process in one or more capacities up until the study date. As interviewing progressed, interviewees also suggested other possible interview candidates, a snowball approach.

Later in year 2000, another round of search for more organisations as possible candidates was conducted. The researcher felt that at least one more case study would be beneficial for the cross case patterns matching and to address the requirement for replicability of findings. However, by this time the government adopted a strategy to privatise a number of public sector bodies. This was done mainly in order to comply with the requirements of the General Agreement for Traffic and Trade (GATT) on a global level by World Trade Organisation (WTO). Those agreements, enforced by international organisations and bodies, have opened new opportunities for foreign competitor entrants while increasing pressure on the government to ease regulations protecting local companies from this competition. Therefore, the researcher decided to study one of the early entrants into those privatisation programs. After many false starts, the researcher got in contact with the General Manager of the Water and Electricity Authority "WEA" which was a public ministry and then made into a private authority. An Appointment was organised with the General Manager to further detail the aim and the scope of the study. Then, the researcher received a letter of approval for the study with an initial list of candidate interviewees. Interviews progressed with the same conditions and criteria made during the other two case studies.

It is worth noting that all three case study organisations are from a single country that is a member of the AGCC. However, anonymising the country is necessary to protect the identity of the case study organisations, since revealing the country would automatically disclose the organisation. Nevertheless, the culture of all AGCC countries is identical; analogous to different states in a single country.

3.7.2 Data Collection and Triangulation

Four sources of the case study evidence have been identified: documents, interviews, archival records and direct observations (Yin, 1994). The case study protocol of this research demands for data collection via all the above sources. First, documents such as reports, brochures, memos and forms, administrative materials, and procedures of the business processes were reviewed to understand the case environment and see the results of the project. Second, interviews with the key players and functional associates were conducted using semi-structured and focused formats. This type of source represents the elementary source of information regarding the organisational culture and IT; and

quandaries. Finally, archival records such as personnel backgrounds, organisational records and history of the organisation were examined to obtain information related to the companies and their employees. This triangulation across various techniques of data collection is particularly beneficial in theory building because it provides multiple perspectives on an issue, allows for cross-checking, provides more information on emerging concepts and yields stronger substantiation of constructs (Glaser & Strauss, 1967; Eisenhardt, 1989).

Consistent with the spirit of contextualism (Walsham, 1992), the data collection effort paid special attention to the context in which the BPR initiatives were undertaken and the organisational aspects such as culture and reward system while focusing on the content and process of the BPR related organisational changes.

Although the conducted interviews provided the primary source of information, the researcher recognises that the subjective perceptions of the interviewees may not always reflect the truthful outcome of the cases. Interviews should be considered as verbal reports only (Richardson, 1996). As such, they are subject to the problems of bias, inaccurate articulation and poor recall. Therefore, triangulation via other sources was used to corroborate interview data with information from those sources. Moreover, to eliminate any bias of a single respondent, an attempt was made to ensure triangulation of data from multiple sources in the organisation. Every effort was made to validate respondents' perceptions and responses through multiple sources and also interviewing multiple members at different levels of the organisation for cross validation. Thus, the following profiles were interviewed:

- Executive management, BPR champions or team leaders to discuss strategy, process implementation and corporate culture.

- Functional associates to discuss customs and practices, change process and expectation gaps.

- Implementation team members for insights into obstacles, facilitations and the change process.

Similarly, member validation was used in an attempt to gain fuller understanding of the initiative, rather than an attempt to get at any absolute truth, by including multiple viewpoints. Member validation involved taking the analysis of responses back to the members to enable them to check or comment upon the interpretations. Section 6.2.1 describes in details the strategies used in this research to improve the construct validity. Those include the use of multiple sources of evidence (Yin, 1989; Flick, 1992), having members of the subjects organisations being studied review the case study report and corroborate the reconstruction of facts (Yin, 1989; Trauth, 1997; Erlandson et al., 1993) and establishing a chain of evidence by presenting cases' information in a smoothly traceable manner (Yin, 1989).

The researcher relied on triangulation, or the use of several kinds of methods or data, as a heuristic tool to corroborate and articulate evidence from other sources. Denzin (1989) identifies four types of triangulation:

- Data triangulation: The use of variety of data sources in the study.

- Investigator triangulation: The use of several different investigators.

- Theory triangulation: The use of multiple perspectives to interpret a single set of data.

- Methodological triangulation: The use of multiple methods to study a single problem.

In this thesis, many publications, provided by the three case studies organisations, such as management reports, internal memos and organisation charts, administrative materials, policies and procedures documents, business process documentations, internal published articles and financial reports were used to triangulate evidence from other sources. Similarly, preliminary performance results and external sources of information such as internal published articles and financial reports were heavily used to authenticate the acclaimed achievements as detailed by the interviewees. Moreover, by making a field visit to the case studies organisations, the researcher had the opportunity for direct observation. Since the phenomenon under study, i.e. BPR, have not been purely

historical, some relevant behaviour and environmental conditions were available for observation and served as yet another source of evidence in the case studies.

3.7.3 Literature Review

The start of this research contained an in-depth search in the area of Business Reengineering, Organisational Change, Organisational Culture and Information Technology. The first source of data was several libraries wherein related books and journals were searched using a computerised catalogue. The second source was the use of the Internet, which provides a huge information including previous research in the area, journals and articles. After an extensive literature review a list of questions were prepared for the interviewees and for guiding the researcher. The questions were compared with the research objectives. In order to obtain a full picture of each case study, different type of questions were generated to keep track and to remind the researcher of the information that is required to be collected. Then, the questions were examined for thoroughness and correctness.

3.7.4 Interviews

Interview is a technique, which was used in all the case studies because it provides an in-depth exploration of the topic. Another advantage is that any misunderstanding between interviewer and interviewee can be clarified and the process of questioning can be adjusted depending on the interviewees' responses (Cornford & Smithson, 1996).

There are three types of interviews, structured (survey research), unstructured and semi-structured interview. The structured and unstructured interviews have their uses and dangers in terms of lack of completeness or failing to reap the benefits of the personal interview (Cornford & Smithson, 1996). Therefore, this research used the semi-structured interview where the interviewer works from a number of prepared questions allowing the control of the direction of the interview.

In this research, interviews were based on interviewing some of the key players (from different levels and divisions) in the activities of the project and those who could compare the company before and after implementing the project. In addition, functional associates who were affected by the change and were not part of the project were interviewed. The interviews ranged from 40 to 130 minutes. Some were tape-recorded

and some were based on notes taking; the obeying interviewees' wishes. All interviews took place in the interviewee's office, all with prior appointments. Most of the interviews were formal and sometimes an informal conversation would take place after the interview is over. Some of the interviews, towards the end of each case study, were also conducted over the telephone. Important statements from informal conversations and telephone calls were immediately noted down.

It is worth noting that this research had not structured any aspect of the study to the effects of the researcher's gender on the research proceedings. However, this research in organisations in the AGCC countries has been undoubtedly affected by the social institutions of sexual segregations as would be clearly understood from the case studies narratives. Due to the culture of country in which the case studies organisations are situated, those organisations are men dominated. The mere fact that all interviewees, but one, were men illustrates this.

Although many young researchers and in particular female find it difficult to conduct fieldwork due to the criticism and unseriousness that they might face from the interviewees(Whitehead & Conaway, 1986), the researcher did not find major difficulties. In all three case studies organisations, the majority of the interviewees were cooperative and helpful in providing all the necessary information required with no restriction to any data because the researcher was a national (had it not been the case, certain information would not be provided). Those organisations have mandate to support national researchers because there are very few national researchers and the country want to encourage and motivate nationals.

However, being a female researcher studying organisations in extremely conservative country imposes certain restrictions on both parties such as settings and timings of the interviews and the liberal choice of expressions that would not respect the culture of segregation.

3.7.5 Duration of Interviews

The interviews at "GCO" took place in October 1998 for six months while the interviews at "PCO" took place in January 1999 for another six months. Interviews for the third case at "WEA" took place during the period of February 2000 to September

2000. Tables 3.1 –3.3 provide statistics regarding the data collection effort through interviewing at GCO, PCO and WEA.

After an analysis of the collected interview data, there was a follow up with all cases companies to clarify some points and to ask questions that were more focused. This approach was used to improve the final research output.

Interviewee	Number and duration of formal interview	Type and number of informal interviews
Deputy General Manager	-	One conversation
IT Manager	One interview, 80 minutes	Four telephone calls, Two conversation
Finance Manager	One interview, 50 minutes	One conversation
Materials and Contracts Manager	One interview, 40 minutes	One telephone call
Head of sales, revenue and expenditure	One interview, 90 minutes	One conversation
Head of systems and procedures	One interview, 90 minutes	One telephone call
Procurement superintendent	One interview, 70 minutes	-
IT team leader	One interview,120 minutes	Five telephone calls, several emails, one conversation
Senior IT network engineer	One interview, 60 minutes	-
Senior IT application developer	One interview, 45 minutes	-
Head of maintenance and planning	One interview,40 minutes	-
Inventory control supervisor	One interview, 45 minutes	-
Materials system coordinator	One interview, 50 minutes	-
Maintenance systems engineer	One interview, 60 minutes	-

Table 3.1 GCO Interviews statistics

Interviewee	Number and duration of formal interview	Type and number of informal interviews
Deputy General Manager	-	One Conversation
Quality Management Advisor	One interview, 80 minutes	One telephone call
Senior Advisor – Organisational Development	One interview, 90 minutes	Two telephone calls
Head of Organisational Development	One interview, 50 minutes	-
General Services Manager	Two interviews,90 minutes each	One conversation
Public Affairs Superintendent	One interview, 50 minutes	-
Head of Development & Training	One interview, 120 minutes	Two conversations, Two telephone calls

Senior Training Assistant	Three interviews, 30 minutes each	Three telephone calls
Head of Personnel Relations	One interview, 60 minutes	Retired
Head of Information Systems & Technology	One interview, 120 minutes	Three telephone calls
Senior application developer	One interview, 90 minutes	-
Compensation Officer	One interview, 60 minutes	-
Systems Analyst	One interview, 90 minutes	-
Consultant	One interview, 120 minutes	Two conversations, Two telephone calls
Senior Network Engineer	One interview, 60 minutes	-
Head of Onshore Operations	One interview, 100 minutes	One telephone call

Table 3.2 PCO Interviews statistics

Interviewee	Number and duration of formal interview	Type and number of informal interviews
Chairman	-	One conversation
Deputy Managing Director	One interview, 50 minutes	Two telephone calls
Cooperate Development Policies & Procures Advisor	One interview, 180 minutes	One conversation, two telephone calls
IT Training	One interview, 60 minutes	-
IT Director	One interview, 90 minutes	One telephone conversation
Director of Sales	Two interviews, 60 minutes then 30 minutes	One conversation
Billing Supervisor	One interview, 50 minutes	-
IT Support	One interview, 40 minutes	-
Procurement Manager	Two interviews, 60 minutes then 30	One telephone call
Group Head – Procurement	One interview, 60 minutes	Two telephone calls
Co-ordinator Assistant Leader	Two interviews, 60 minutes then 30	-
Human Resources Manager	One interview, 40 minutes	One conversation, one telephone call
Personnel Assistant	One interview, 30 minutes	One telephone call
Legal Consultant	One interview, 90 minutes	-
Head of Systems Applications	One interview, 60 minutes	One telephone call

Table 3.3 WEA Interviews statistics

3.7.6 Post Interview

The researcher transcribed the tapes from the recorded sessions. After collecting all the contextual data and the transcripts from the tapes, a descriptive report was written in a

format relevant for the research. Towards the end of the study it was obvious that certain areas lack some information and some points need further clarifications. However, since the researcher returned to the university, which is in a different country from where the case companies are situated, several faxes were sent with all the questions required to clarify some points. Also, there were many follow-ups using the email. Then, the additional information was combined to the existing report and sent to the cases companies according to their request for comments and approval before publishing it.

3.8   Deductive Testing

Deductive reasoning and inquiry begins with a theory or some form of theoretical framework (Lee, 1989). Statements that serve as testable generalisations are abstracted from the theory. Propositions may be posed relative to each generalisation. These propositions clearly identify those variables and their relationships to be investigated. Observations are systematically collected on those variables and their relationships. Those observations are analysed and interpreted in the light of the original propositions.

This thesis deductive testing involves the testing of propositions representing the positivist understanding on BPR. The propositions to be tested using case studies must satisfy the falsifiability, logical consistency, survival on empirical testing and greater predictive power than other theories (Lee, 1991). Examination of the propositions stated earlier shows that these requirements have been met. Each proposition has been stated in a way that may be falsified by empirical testing. Any proposition that has been verified in the light of the case data is not to be accepted as a generalisable truth statement.

Since manipulation of variables is not possible in case study research, naturally occurring controls and treatments already in place or likely to occur need to be identified to derive the predictions (Cavaye, 1996). It is generally accepted that deductive logic can be used in case study research and that the appropriateness of employing a case research strategy to test a theory is unquestionable (Lee, 1991). Testing the theories in multiple case studies that will have different set of initial conditions and hence result in different predictions that can be empirically tested satisfies the requirement for replicability of findings. The requirement of generalisability is satisfied to the same extent as any

experiment designed according to positivist guidelines, since no theory concerning Management of Information Systems (MIS) would be generalisable based on the findings of three case studies (Lee, 1989).

3.9   Methodological Rigour

Since the deductive testing of this study is carried out based on the epistemological assumptions of positivism, it is important to demonstrate how the conducted case studies meet satisfactorily the positivist requirement for rigour. Yin (1989) recommends a number of guidelines and procedures for conducting rigorous case study research. The recommended procedures to following positivist criteria for rigour are:

- Construct validity: refers to the degree to which a measure actually assesses the underlying theoretical construct it is supposed to assess. Three strategies can be used to improve construct validity: using multiple sources of evidence, having a key informants to review case study report and establishing a chain of evidence (Yin, 1989).

- Internal validity: refers to the validity with which we "infer that a relationship between two variables is causal or that the absence of a relationship implies the absence of the cause" (Cook & Campbell; 1979, p.37). Three strategies can be used to improve internal validity: pattern matching, explanation building and time series building (Yin, 1989).

- Reliability: refers to the degree to which the process of the study is consistent, reasonably stable over time and across methods and researchers. Two strategies can be used to ensure reliability of the study; the design of case study protocol and the implementation of case study database (Yin, 1989).

- External validity: refers to the generalisability of the findings.

Chapter 6 will discuss how the study satisfies the positivist criteria for rigour by following the recommended procedures.

3.10   Summary

Table 3.4 provides summary of the derived proposition to be tested by this research. The next chapter provides "thick descriptions" of the BPR initiatives of the three case-subjects organisations.

Construct	Proposition	Source
Organisational Culture		
- Leadership	*1) The existence of effective executive leadership to lead the BPR project and continually seeks support of all levels in the organisation will have a positive impact on the level of success of the project.*	*Davenport, 1992; Tushman & Nadler, 1986; Hammer & Champy, 1993*
- Communication	*2) The existence of effective and open communication among the various stakeholders of the BPR initiative will have a positive impact on the BPR implementation success.*	*McAdam & Donaghy, 1999; Hammer & Stanton, 1995; Carr & Johansson, 1995; Saffold, 1989*
- Strategy led	*3) The existence of a compelling vision tied with a sound, well-described and feasible strategy to drive the BPR project will have a positive impact on the success of the project.*	*Kotter, 1995; Anderson Consulting, 1998; Digman, 1990; ProSci, 1999*
- Team Based	*4) The existence of an appropriately composed team to manage the BPR project will have a positive impact on the BPR implementation success.* *5) The availability of representatives from the IT department in the composed BPR project team, but not assigned the project's leadership role, will have a positive impact on the BPR implementation success.*	*Katzenbach & Smith, 1995; Davenport, 1993; Carr & Johansson, 1995 Ancona & Nadler, 1989; Greene, 1993*
- Politics	*6) In a politicised organisation, the alignment of the motives of the actors, who have the power and potency to influence the flow of events of the BPR project, to the organisational vision will have a positive impact on the BPR implementation success.*	*Pinchott, 1985; Nayak & Ketteringham, 1986; Pfeffer, 1981; Buchanan 1997*
- Sector	*7) Due to the particulars of public sector organisations, incremental change is the most feasible change in public sector organisations.*	*Champy, 1995; Hodgson, 1994; McQueen, 1996*

IT and Organisational Culture		
- IT-Culture fit	8) In IT-enabled BPR change, ensuring that the to be selected IT will not endanger the match between the technical system and the customs and values espoused by the organisation will have a positive impact on the BPR implementation success.	Eason 1988; Waizenbaum 1976; Hsiao & Ormerod, 1998
- IT expertise and end-user skills	9) In IT-enabled BPR change, the availability of IT expertise and sufficient end users skills to support the selected IT will have a positive impact on the BPR implementation success.	Kaplan, 1996; Cohen & Levinthal, 1990; Nelson, 1990
IT		
- Communication Technology	10) Exploiting the potential of communication technologies to enable knowledge sharing will have a positive impact on the BPR implementation success.	Huber, 1990; Teng et al. 1994; Keen, 1991; Melone & Rockert, 1991
- IT Infrastructure	11) The existence of a well-established IT infrastructure within the organisation will have a positive impact on the BPR implementation success.	Brancheau et al., 1996; Wastell et al., 1994; Grover et al., 1993

Table 3.4 Summary of derived propositions to be tested in this thesis

CASE STUDIES

4.1   Introduction

This chapter presents three case studies of organisations in one of the AGCC that had undergone business process change initiative. *Appendix C provides a description of the country, in which the case studies organisations are based.* The cases used in this research are for three large organisations. The first case is a Liquefied Natural Gas (LNG) producing Company, hence the acronym 'GCO', which is the second source of country's income. The second case is an oil producing company, hence the acronym 'PCO', which is the backbone of the country's economy. These organisations are analogies in terms of; ownership (semi-private with a major share for a government owned Mother Company and the remaining is distributed among a number of foreign shareholders), structural, cultural and political similarity.

Although these companies are constrained by the rigid rules and policies enforced by the mother company, other foreign companies shareholders (mainly Western) have managed somehow to introduce Western management practices and penetrated into many of their daily practices including the usage of English as the official technical language. However, being semiprivate companies create a mixed environment where in social and political issues exist similar to those in the public sector organisations. Therefore, these oil companies have a mixed environment which adopt Western Management practices in some areas and constrained by the customs and practices traditionally espoused by the local governmental bodies.

The third case is Water and Electricity Department, hence the acronym 'WED', which is a public sector organisation. *WED is the name given to the Water and Electricity Department*

before conducting the project, and WEA is the name of the Water and Electricity Authority after the implementation of the project. This organisation has mainly been influenced by the country's culture which is shown in their daily practices and their policies, procedures an organisational structure which are full of bureaucracy. This case is different than the other two, hence allowing the investigation of the change process in a diverse setting and facilitating the cross case analysis and comparison.

All three organisations have recently completed the BPR initiatives, thus furnishing the advantage of investigating a fresh experience and obtaining finer details of the approach. However, the disadvantage is that the outcome, whether success or failure, would require more time in order to make an informed assessment.

4.2 Presentation of the Cases

An effort was made to present the case studies in a story telling style. Conscious endeavour was made to describe the events of the cases in a chronological order whereby timing of activities within the project is crosschecked using the triangulation method. It is worth mentioning that since some of the interviewees did not feel comfortable to speak in English, some interviews were conducted and recorded in Arabic. Then, those were transcripted and translated to English. Similarly, some of the statements given by the interviewees were badly expressed to the degree that those would not be understandable if quoted as spoken. In such cases, the interviewer was repeating to the interviewee what she understood in a representable form, to get the interviewee consent that this is what he intended to say. In all cases, all quoted speeches were shown to the interviewee to confirm that those statements were indeed theirs.

Regarding the interview arrangements, it is worth noting that although relationships (of the researcher) played an important role to facilitate and reduce time interval between one interview and the next one, interviews with the Chairmen and top Management were very difficult to arrange. However, since this was necessary for investigating objectives, visions and leadership, the researcher, with persistence, managed to arrange meetings.

Regarding interviews' proceedings, in each interview, the interviewer started by describing the objectives of her research and then the interviewee began describing the

approach of the project in a story form. The interviewer sometimes interrupted the interviewee whenever detailed insights were required. After the interview, the researcher transcripted it and wrote the first draft of the case study. In each subsequent interview, the same procedure was followed, however some of the given details in previous interviews were cross-checked for accuracy and/or second opinion. Similarly, after each interview, the previous draft of the case study was reviewed to include more details. Therefore, the final write-up of each case study went through several iterations for thoroughness and accuracy.

4.3   Case one: "GCO"

4.3.1   Introduction

GCO, a profit making company established in 1973, to turn gas, extracted from city's offshore field crude oil into a new source of marketable energy. This company owns and operates the first Liquefied Natural Gas (LNG) plant in the Middle East. In addition to LNG as the main product, GCO produces other products such as LPG, Pentane and Sulphur. Since GCO's establishment, numerous developments have taken place and the company has been ascertained as a highly successful and reliable in both local and international markets. The aim of this organisation is to utilise and process the gas in order to produce a clean and reliable energy that could be sold to the international market as an additional source of wealth for the country.

Currently, GCO is the pioneer in the Arabian Gulf in producing and utilizing natural gas, providing a clean source of energy and protecting and preserving the environment of the region. GCO is based in the capital city of one of the Arab Gulf Co-operation Council (AGCC) countries employing around 1000. The company is semi private with government (represented by the Mother Company) share capital of 70% and the other shares are divided among shareholders as follows; 15⁰ o for Mitsue, 10% for BP and 5% for Total. Previously, the government had 51% and 49% distributed among the shareholders Mitsue, BP and Total. When the company was chartered in 1973, the Mother Company's share capital was only 20%.

The Mother Company since its establishment has steadily broadened its activities through its subsidiaries creating an integrated oil and gas industry in the capital city, thus the establishment of GCO. Today, this government owns Mother Company manages and oversees oil production of more than 2 millions barrels of oil a day, which ranks it among the top ten oil and gas companies world-wide. Moreover, it became one of the world's leading oil companies, with substantial upstream and downstream business in transportation, shipping, marketing and distribution. The Mother Company and its groups companies comprise of 18 organisations. Three of them operate in exploration

and production of oil and gas *(one of them is PCO)*, five companies provide support services to the oil and gas industry, four joint ventures for oil and gas processing *(one of them is GCO)*, two chemical and petrochemical companies, two maritime transport companies for crude oil, refined products and natural gas, and one refined products distribution company. In the last two years, three additional companies were established to invest in new oil, gas and petrochemical quality programs. "M1" Gas Company is investing in Gas processing activities, "M2" Oil Refining Company supervises the refineries, and "M3" company has been established to be a powerful new force in polymers.

GCO was established in 1973 in one of the big Islands 'X', which was the logical location for the new gas liquefaction plant, planned as the most complex and largest of its kind in the world. In late 1976, the plant came on stream and the continuous flaring of associated gas came to an end. Since the commissioning of the Island 'X' LNG facilities, numerous developments have taken place and GCO has established itself, locally and internationally successfully. This was possible due to the employment of advanced planning techniques that enabled the company to execute its operations to the highest standards of efficiency, while complying with the top international standards in health, safety and environment protection.

The plant of GCO had to be huge, advanced, efficient and have effective control system to help facilitate its smooth functioning throughout various stages of the liquefaction process. Therefore, GCO developed the control system already in use at the plant, and in 1990 changed over to a distributed control system (DCS), based on highly sophisticated computerised technology. This large new control system provides access to information from the LNG Plant via highways, outstations, and optical fibre transmission by means of Visual Display Units, known as Universal Stations and located in the control room. More than 7000 control loops/information points are available to the operator through a "Touch Screen" facility on the Universal stations in order to operate and control the LNG facilities in the most efficient mode.

The environment of GCO has a mixture of staff coming from many different countries where they are provided with continuous training to perform their specialised tasks reliably and efficiently. GCO aim to recruit skilled nationals whereby a special

development program for national graduates is provided. Therefore the number of nationals has increased steadily from 16 in 1977, 3% of the work force, to 247 by 1996, nearly 25% of the work force. Moreover, in line with GCO's five years Nationalisation plan, this number is expected to increase. The significant increase in the number of nationals is inline with government directives. Priority is given to the employment of nationals for whom personalised career development programmes are prepared and implemented in coordination with their respective line managers.

GCO exports the products of its LNG to the international gas market, always making sure that their clients' specifications are met, that its sales policies are flexible to ensure a fair share of the market, and that its relations with customers are maintained and consolidated.

In addition, GCO exports LPG, Pentane plus Sulphur under contracts with some of the world's major companies. The validity of such contracts ranges from one year to three years. Moreover, one customer signed an agreement with GCO to double its production as from year 1994 and to purchase an additional capacity for a further contract period of 25 years (2019). Having increased the production of LNG and LPG to exceed the contractual selling, its surplus production, since 1995, to some of the world's major companies in Europe and the USA, and it is planning to start exporting to some clients in the Far East in the near future.

As a result of the new sales and purchase agreements, GCO witnessed major changes and expansions including refurbishment and improvement of its plant, construction of a third train, which is the largest of its kind in the world, renewal and expansion of its LNG tanker fleet which transports the liquefied and continuous modernisation of its technological infrastructure. This led to an increase in the total production from around 3 million tons of liquefied natural gas a year to a total annual production of 5.8 million tons of LNG or around 8 million after adding LPG, Pentane plus and Sulphur.

GCO has a surplus of 3 million tons of LNG which they have to sell. Therefore, they have to compete against new projects and new competitors coming from other AGCC countries, Yemen and Far East like Indonesia. These competitors might sell the product cheaper than GCO.

4.3.2 Diagnosis

Although GCO monopolises the local market, it is operating in a competitive international market. Previously, GCO was dominating the market, stable in the market and had guaranteed customers due to the long-term contracts. However, in the past few years, the demand for the product of its LNG has decreased. The recession and the emergence of new competitors in the market are two main reasons for the reduced demand. Some of the rapidly emerging competitors include two companies from the same gulf region and others from the Far East such as Indonesia.

GCO's executive management and shareholders were aware of the changes in the competitive market landscape and were coerced to do something in order to maintain their competitiveness in the market. The Finance Manager expressed the competitive challenges facing the company:

> "[GCO] has to really compete with the new projects that are coming from [other GCC countries]. These competitors will probably be selling their products cheaper than [GCO]. The only advantage, so far, is that [GCO] have had been in the market for 22 years. So the coming few years will be a challenging period for this company. Currently, we have a surplus of products. [TEPPCO] takes only 5 million tons LNG in total and now we need to sell the other 3 million tons"

GCO's Deputy General Manager had serious aspirations of remaining competitive in the industry and he felt that an innovative form of quality improvement could be the answer. To envision areas of possible improvements and establish tangible measures of key performance indicators, he formed a committee involving the top management of several departments. The objective of the committee was to provide a critical assessment of GCO's performance and thereafter provide a plan for improving the identified shortcomings in performance. In the first brainstorming session, the committee settled that providing better service, quality product, efficiency and lower cost are essential to remain competitive in the market. The IT Manager summarised these findings:

> "Because there are many new competitors in the market and because the shipping cost is a big problem due to the location, we have to provide a competitive selling price, efficient better service and quality product on time".

In subsequent sessions, the committee realised that GCO needed to significantly reinforce its information technology infrastructure and redesign some of its incompetent organisational processes. The IT Manager exploited this realisation to his avail to convince the committee that starting with changes in IT alone would provide many opportunities to change ways in which GCO did business. He emphasised the importance of information span and availability:

> "Value chain to deliver such service has to go across the organisation and the old system did not provide this. I believe that information is an asset which you can make decision on, therefore we needed a system which would provide us with the necessary information across the organisation".

However, to ensure that the suggestion of renovating GCO's IT infrastructure would not become one of those stereotyped and much criticised technology centred initiatives, the IT Manager proposed to hire a business consulting company to conduct a study of the organisation. The study was to seek a quick and comprehensive analysis of the company's future direction and business needs to frame IT strategy in alignment with those needs. The aim of this study as stated by the IT Manager was:

> "[GCO] was driven towards an IS strategy which should be based on business strategy. Therefore, in order to reach the company's mission, we have to implement a project with the aim of change in the IT (integrated system) and business processes based on alignment with the business needs. This should result in achieving the company's objectives.. Our objective from this study was to design an IS Strategy that is driven by the business information needs and identify the critical units of functionality required. The study was to relate preliminarily identified key business indicators to measure the benefits expected."

Organisational Culture Prior to Project Initiation

Similar to all other oil and gas companies in the country, GCO inherits its policies and procedures from a Mother Company that governs them. Those companies are constrained by the rigid rules and policies enforced by the Mother Company. Those policies can not be changed except by a prior approval from the CEO of the Mother Company and this usually takes a long time, if at all. Moreover, those companies are semi-private (i.e. a mixture of private and public sector) and this creates similar political problems available in public sector organisations.

GCO's management understands the constraints imposed by the Mother Company and that it would by very difficult to go through major changes without getting the support of the Mother Company. The IT Team Leader connoted this challenge as:

> "The top management knew the situation that they are in and knew that there are certain policies that applied to group of companies and in order to go through major changes we have to go back to Mother Company and this takes a very long time.   This is because the top management has limited authority in the organisation and this applies for the other oil companies".

Moreover, according to the regulation of the Mother Company, the General Manager of GCO should be replaced every four years. The Finance Manager described this policy as frustrating:

> "The General Manager can not follow any changes that would be done or any initiative that takes place. This makes the GM lazy to invoke his creativity and become initiative, because he knows that someone else is going to come after four years and take his place and benefit from any improvements that took place. As a result, middle managers, like us, get frustrated of the continuous top management change especially if we are in the mid of an important project."

Middle management, in particular expatriates, feel unsecured and, therefore, is fearful of the unknown or the possibility of losing their jobs. The Senior IT Application Developer elegantly expressed this issue:

> "Non-nationals tend to follow a procedure of building boundaries among their lower employees so that they will not take over their place. Therefore, there was no change of cross-functional co-operation. The business consulting company when it was invited at the beginning to provide us with a study pointed to the fragmented and sensitive environment created by the managers; there was no trust between a non-national manager and a national employee who is reporting to him. All these issues are mainly due to the government policy of replacing the expatriates by the nationals".

The IT Team Leader emphasised the resistance to change:

> "We had faced a lot of resistance to change from many people in the company and especially non-nationals".

The Finance Manager described the paradox created by government's nationalisation policy:

> "Nationals are only a minority so there is sort of job security for them, and if you have got expatriates and nationals, there will be a problem of replacement. So there will be an inverse relationship where you have experienced expatriate being replaced by nationals with no experience. So you are eliminating the expertise and it will take some time to sort of gradually rise to the level of building up that again. It is a phenomenon which is not available anywhere else in the world. It is a situation where people have to be careful because the quality of work that you will do will be affected".

IT Infrastructure Prior to Project Initiation

GCO had serious concerns regarding the IT infrastructure due to many reasons. The first is due to the year 2000 problem that many companies were apprehensive about. The second is due to problems faced while integrating the different existing legacy systems. The Senior IT Network Engineer explained the situation of the IT infrastructure prior to project initiation:

> "We had many different small systems for each department, which cost a lot of money to maintain. Therefore, there were data redundancy, no communication among departments and no integration. This resulted in a redundant paper work in this company. We needed an integrated system among the departments to share information and communicate electronically."

The old infrastructure was mainly terminals and standalone PCs for word processing. Most departments had their own in-house developed systems such as Plant Maintenance, Material's Management, Personnel/Payroll and Financial systems; there was no integration among them and were difficult to maintain *[See figure 4.3.1 for GCO's old IS infrastructure]*. For example, in Plant Maintenance and Material's Management systems there was a lot of work done between them and hence a lot of interdependent information that was exchanged manually.

Although there were a number of small LAN to WAN connections that existed between the central HQ location and the islands where the plants are located, information exchange was limited. Some of the problems that existed in the old information system,

because of the slow manual procedures, were apparent in, for example, the Financial,

Material's Management and Maintenance Systems.
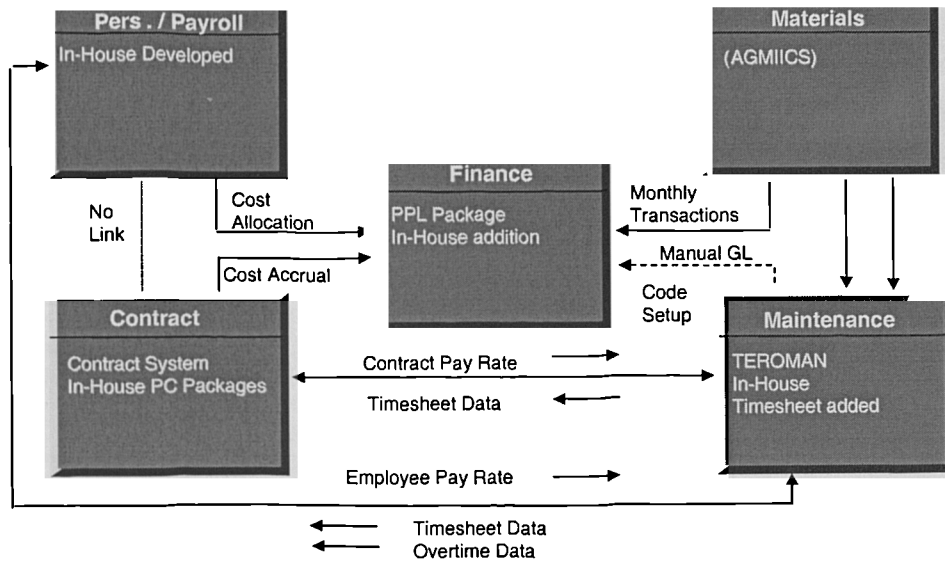
Figure: 4.3.1: GCO's old IS Infrastructure

The Head of Sales, Revenues and Expenditure reported the following points as the

greatest problems that existed in the old Financial System:

> To enter data into the General Ledger, we first had to wait along time to receive
> the invoices. This resulted in over 30,000 accounts, which was difficult to control
> and maintain.

> The billing system was not efficient and consisted of a lot of paper work between
> suppliers and the company, which caused delays in paying the suppliers. [See
> Figure 4.3.2 for the old supplier invoice processing process].

> There was no integration or sharing of information among sections so decisions
> were difficult to make.

> The procedure of updating budgetary control system from Purchase Requisitions
> (PR) and Service Orders (SO) was done manually.

Closing the accounts was done on the 20th of each month and the reports where produced to the shareholders by the 20th of the following month and this lengthy time was creating frustration.

Another important process is the plant maintenance. The process starts with raising a work service order that is entered into the system together with the corresponding requirements of spare parts or manpower. Then a printed sheet of information is taken to the materials department, wherein the department inputs the data into their system to check for its availability and accordingly takes action such as raising a Purchase Requisition (PR) to purchase a certain item. So, it was difficult therefore to anticipate the number of spare parts that were required, and sometimes things get expired. The Maintenance System Engineer described the problems existing in the old plant maintenance system:

"With the previous system it was difficult to take decision because there was no availability of information. There was a need for a better system that facilitates information access and availability to be able to measure the requirement better and optimise the resources and spare parts. This would result in saving on the stock value and lead to cost reduction."

Similarly, the old system used by the Materials Department (Material Inventory Control System) was an independent system with no integration with other departments' systems. The Procurement Supervisor described the problems that existed with the old material's system:

"There was no link to other systems and we could not produce necessary reports. With regards to the system, it was not possible to produce online reports and hence it was done manually. It was not possible to see the number of purchase requisition order and what was the stock and purchase order, which was raised. Frequently, end-users could not access the system. The process of Purchase Requisition (PR) to the Purchase Order (PO) material was mainly manual and takes 95 days. It involved a lot of paper work, time consuming, paper flow and no integration".
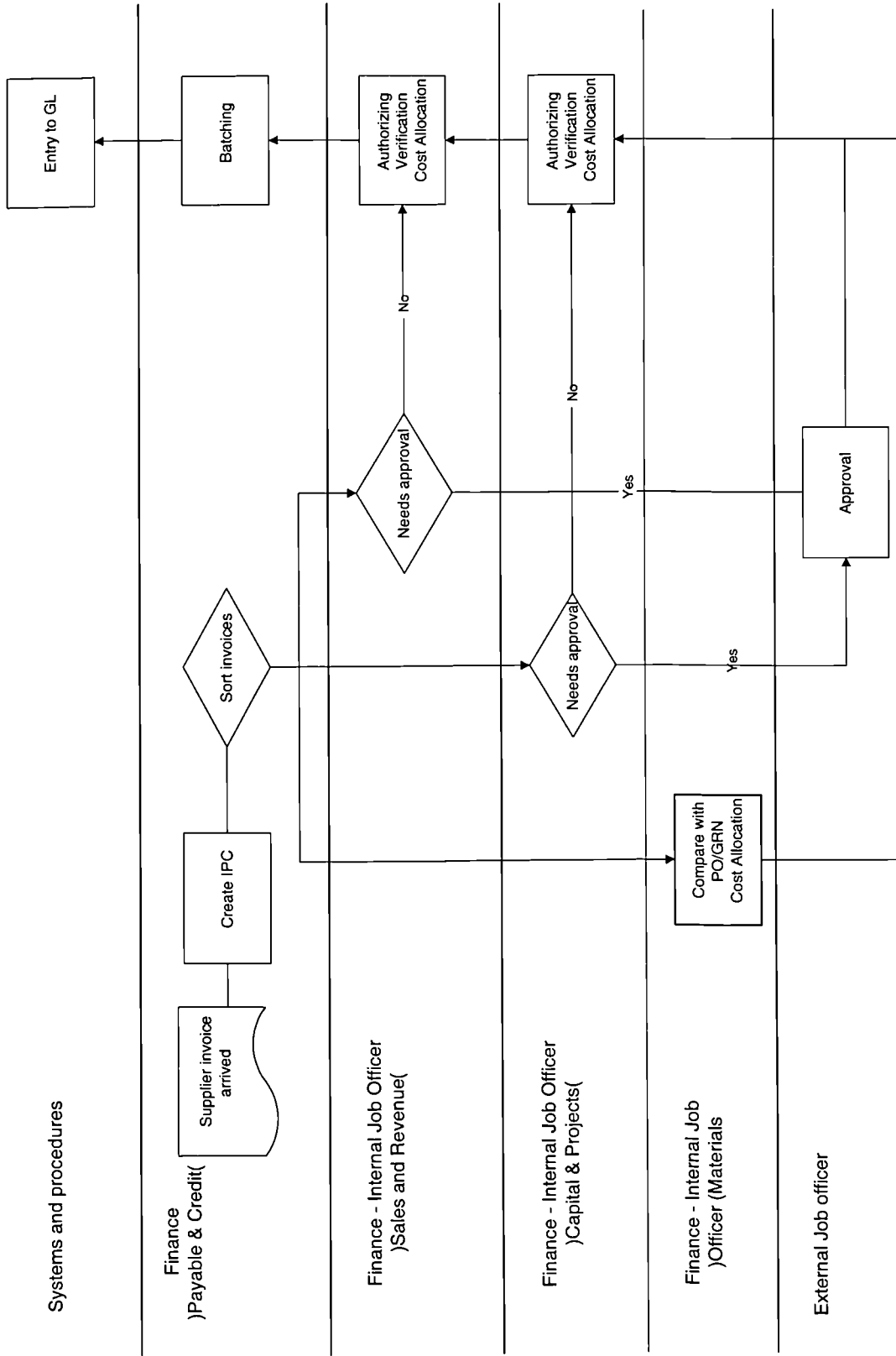
Figure: 4.3.2 GCO's Old Supplier Invoice Processing Process

There was a large amount of paper such as invoices; documents used among the departments, which slowed down the entire process. IT people were aware that reports which were generated using the old system usually do not have up-to-date relevant data as a result of poor system and technological infrastructure. The IT Manager described the critical situation of GCO:

> "For [GCO] to succeed in the global market, it was essential to have the right integrated system with the right infrastructure. Therefore, it was also required to go through an organisation change to eliminate the existing problems faced in communications, lack of data integration, paper work inefficiency in Business Processes and especially in producing reports to top management, reduction in time and cost, and elimination of data redundancy. Without introducing IT and changing our Business Processes, it would be difficult for [GCO] to remain competitive in the market for the coming years".

4.3.3 Project Initiation

The committee agreed to engage a consulting company to conduct the review study. To start immediately with the study, one of the top-consulting firms was chosen to conduct the study based on recommendations. This was done to avoid the conventional lengthy process of tendering the study, receiving the offers, conducting a techno-commercial evaluation and finally awarding the contract to the best bidder.

The consulting company undertook an Information System Strategic Planning (ISSP) study in the first quarter of 1994. The major outcome of this study was the identification of the critical information needed in each unit of the company, the ownership and source of this information, and the integration requirements among the different business divisions and functions. The study also provided two options for the development of IS; strategic and non-strategic options. In the strategic option, which was recommended by the consultants, the main part of the existing system was to be replaced over a period of four years with an enterprise package that has a greater integration between the application and a more suitable technical architecture based on open system principles. The second declined option was to make the least possible change to the existed system portfolio. This option still requires the replacement of the existed materials system, which was withdrawn from the market, and hence has no support, and the financial systems, which became unmaintainable. Moreover, the proprietary technology architecture was to remain.

The committee acceded to the recommendation of the consultants to adopt the strategic option given the small additional investment required. However, executive management and the shareholders requested more assurance on the relative costs and the benefits of the two options before granting authorisation to proceed. Then, the consulting company took a further detailed study to establish the costs and benefits of the two options. The consultants developed a benefits case and provided a comparison of two system models; 'Best of Breed' and 'integrated system' model. The 'Best of Breed' system model consists of multiple platforms/ applications that are functionally oriented and requires the development of interfaces to link them. The 'integrated system' model is process oriented single platform/application that has a built in integration.

IT Infrastructure

Based on the consultants' recommendation, a technical committee was established in 1995 to evaluate available packages with the first priority for Finance, Materials Management and Plant Maintenance. After studying their requirements, several vendors were invited to make presentations regarding the features of their product. The short list included products covering both best of breed and integrated packages such as SAP R3, PeopleSoft, MAXIMO (for Materials Maintenance and Plant Management), HR Access (for Human Resources Management), J.D. Edwards, Oracle Financials and Indus Passport packages. The IT Manager listed the major evaluation criteria:

> "Functionality, technology, integration, Y2K compliance, flexibility, vendor reliance and customer base...".

The committee concluded that an integrated system is more valuable and cost effective to the business, as long as there is no compromise in the core functionality. They believed that integration is not easy to build if it is not already built in.

The decision of selecting a specific package was perplexing, nevertheless with careful study and after a comparison with their requirements, SAP was chosen. SAP was found to be a highly integrated suite of business application software. This total solution package is built upon Client/Server technology with key features of integration, openness and Graphical User Interface (GUI). It provides extensive reporting facilities, secure

product, automated transactions and processes. The IT Manager summarised the committee's recommendation:

> "To acquire core ERP system on a solid product that is recognised world-wide and has proved to be rich in functionality, reliable and cost effective. SAP was selected because it met all the criteria for selection. Moreover, SAP is used by many oil companies such as TOTAL and SHELL".

The IT Division's staff and the project team were satisfied and enthusiastic of the recommendation because they believed that it would be a challenging experience for them to implement the SAP package and there would be a lot to learn which will improve their skills and qualifications.

In September 1995, the proposal and the recommendations were presented to the project committee. The Finance Manager had some concerns about SAP so he asked, based on recommendation from his personnel, for a very small benchmark before ratifying the recommendations. The Head of Systems and Procedures of Finance Division recalled:

> "Because we felt that we were going to be dragged in without knowing anything, I and another two from finance were told by Finance Manager to go and look and study other companies that are using SAP. We visited two companies, one of them is TOTAL. We have learned a lot from TOTAL. We sat with people who implemented SAP and discussed their problems. We learned a lot because we also spoke to users and shared their experience, problems, benefits, and changes and looked at their accounting structure. They were very honest and frank. So we were satisfied with SAP and we wrote a report explaining the situation to Finance Manager".

After the sanction of SAP by all concerned in the project committee, the proposal was presented to the top management. The Deputy General Manager was satisfied with the conclusion but had some worries about this project. He recapitulated his concern:

> "We knew that the implementation of an ERP system is not an easy project and many organisations throughout the world are struggling and many projects fail. Therefore, it needs a serious work from the team members". Then he added with pride, "we are the first Oil Company in this country to go for such a system so it was a big responsibility".

In January 1994, the GM forwarded the recommendations to the shareholders for endorsement. The shareholders granted the authorisation for expenditure and expressed their satisfaction and commitment to the plan.

SAP Implementation

In November 1995, a new "project team" was set up by the top management to lead the project. It consisted of about 20 staff from diverse areas of the business; combined group of IT and business with different experience *[See Figure 4.3.3 for the project organisation chart]*. IT Team Leader summarised the core focus of the project team:

> "The initial stage of the implementation of SAP focused on three main areas. The core areas were Finance, Material Management and Plant Maintenance. The rational behind the team selection was to have roughly members breakdown of 60% with wide and deep business sense, 20% with wide business sense, and wide IT sense, and 20% with wide business sense and wide and deep IT sense".

To increase the level of awareness and technical knowledge, the team was provided with intensive seminars, conferences and courses related to organisational change and change management techniques. However, the team was fully dedicated to their day to day work in addition to being members of the project team.

The team has requested tendering for SAP implementation to the top five consulting companies. Then, based on a techno-commercial evaluation, the implementation was contracted out to one of those companies. The contractual agreement stated that the consulting company is to provide highly qualified consultants to guide and help the internal resources of the company to set up the system. This means that the internal resources of the company will be doing most of the implementation work and the consultants' role is to guide and help in solving complex issues. The IT Manager explained the rationale behind choosing the guided internal resources approach:

> "We chose this approach because we wanted to build an internal experience to support the system and further enhance it. Moreover, it is less expensive for us because this way we require only small number of costly consultants. The disadvantage here was that this approach takes longer time because our internal resources had to pass through a sharp increase in their learning curve".

The contractor consulting company presented their renowned implementation methodology, which claims that business transformation will be achieved through an accelerated approach that aligns people, process, technology, and strategy.

The implementation methodology consisted of three phases; assessment and planning phase, business design and prototype phase, and implementation and delivery phase *[see Figure 4.3.4 for the project life cycle]*. Each phase had its activities, deliverables, key elements and a specific time to complete, which the team had to follow.

The first phase involved the "as is" business description interfaces summary and high level SAP mapping assessment. It also involved the planning for a work program for implementation strategy, communication strategy and change management approach. This phase consisted of a number of activities and deliverables that were carried out by the project team "GCO internal resources" that were seeking the guidance of the consultants.

The major activities involved were:

◁   The definition of the business case and the identification of tangible performance metrics to avoid spending time in non-benefit areas.

◁   The definition of the operating vision of the "to be" environment that was used in setting the direction for many of the activities in the subsequent phases.

◁   The assessment of GCO's readiness to change and the initiation of the buy-in process to reduce resistance to change. This activity involved a series of workshop-driven exercises spanning the targeted departments to enable and then agree on the SAP vision for GCO which were then reflected within the project plans in terms of; project scope and objectives, business justification, enterprise processes impact, organisational impact, and master implementation plan.

◁   The development of a "going in" implementation plan and rollout strategy based on the assessment exercises.
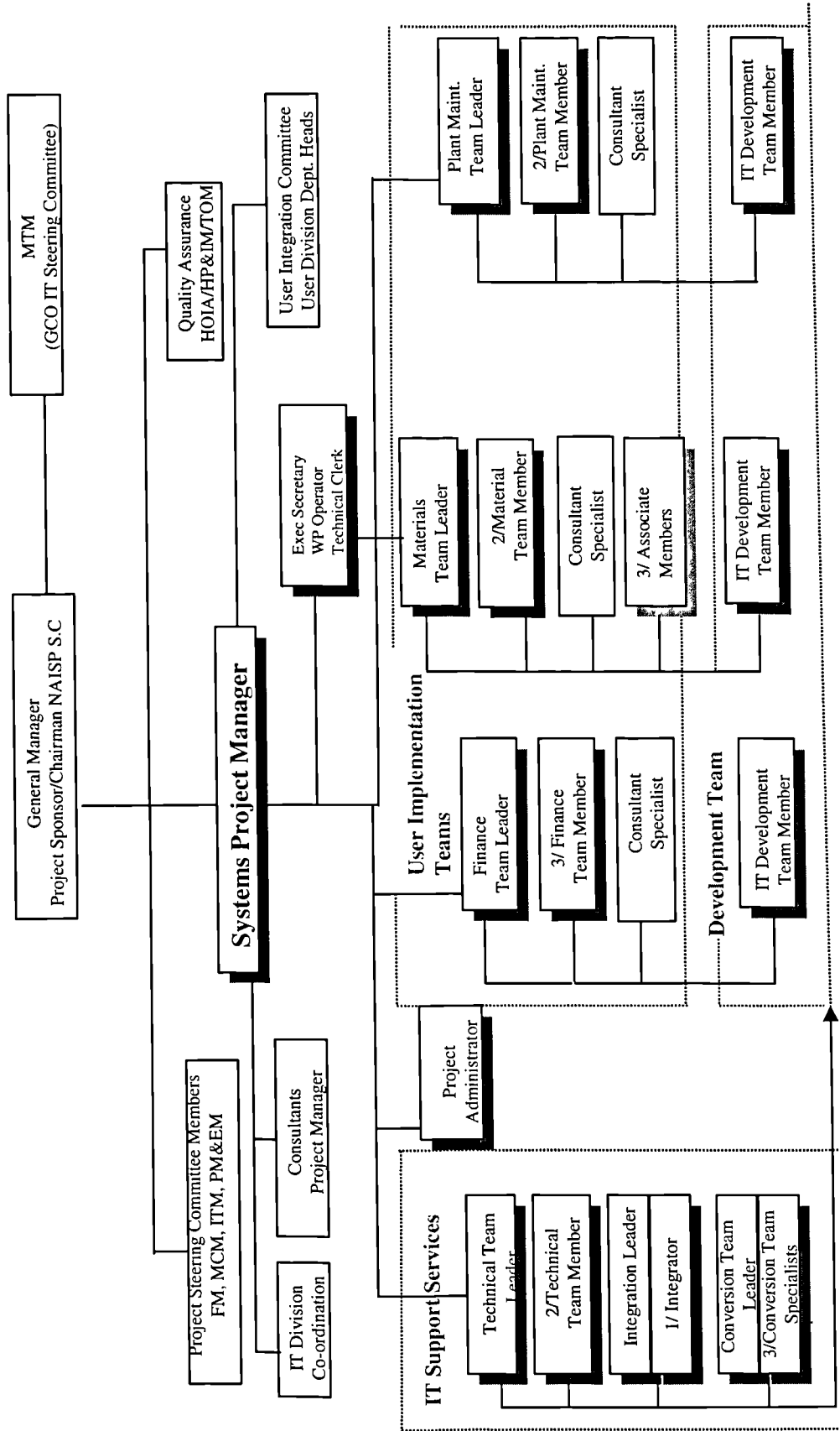
Figure: 4.3.3 GCO's Project Organisation Chart

◁   The development of a proactive change management strategy to accelerate the implementation.

◁   The concurrent training of the core team members whilst developing the project charter and the assessments of how the project will be measured.

The main deliverables of this phase were; a business case, an implementation plan, change management plan, and "to be" operating model.

During the conduct of the first phase, GCO realised that the contractor consulting company that was suppose to be guiding the implementation supplied different consultants from the one's presented initially (prior to securing the contract). Those consultants were short of business knowledge and in-depth SAP experience. The Head of Sales, Revenue and Expenditure described in-length the consultants with frustration:

"What we have discovered was that the consulting companies lacked knowledge and experience. They were here for training and they could not explain a lot of things. We found out that those consultants were brought for training. So the consulting company [X] brought many people to learn and few experts. They were learning as we were learning. The only one step ahead, they learned about processes and they knew better in typing and database and few other things. This was with regards to consulting company that was supposed to assist us in the implementation. Regarding SAP support themselves, we would give them zero in everything. SAP, as a company, would only be able to sell you the package but does not expect any support afterwards. The consulting companies in general; they bring for us the lousy people and to their western environment the good ones. At the end we pushed them out." He recalled, " When I asked a consultant how to do this and why, he answered this is the only way. Another said we do not have material accounting in Europe at all so you have to get rid of it. Those people were not helpful; they have a problem of understanding and appreciation. They did not even try to see how it can work".

In order to rectify this situation to rescue the project, GCO had to find an alternative that came through the contact with other shareholders, who were at the same time SAP customers, who advised GCO with some of the high calibre SAP consultants they have worked with. Then, GCO had a direct short-term contract with recommended high calibre consultants. The IT Manager denoted the importance of this step:

"The directly hired consultants, based on those recommendations, were the key success factor for the project with remarkable efforts exerted by the internal implementation team."
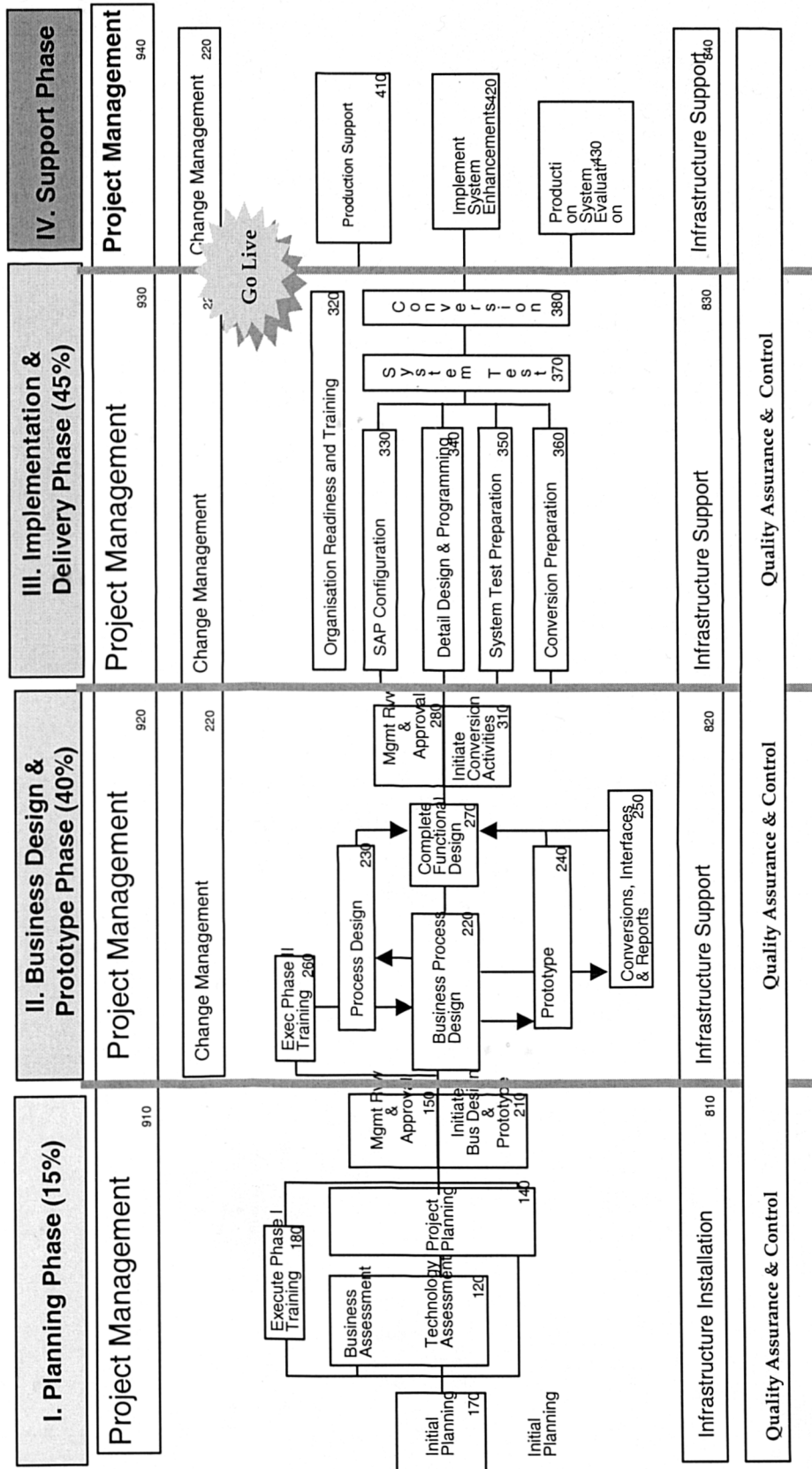
Figure 4.3.4 GCO's Project Life Cycle.

Business Design

The problems with the consultants had prolonged the planned timeframe of the first phase for an additional six months. Then the design and prototype phase was started. This phase involved sets of activities to: finalise the 'to be' design, prototype business scenarios, organisational redesign and change management, and the complete design of SAP.

An overview requirements analysis preceded the specific functional /sub process (business area) requirements analysis to ensure the integration of design and scope setting within the design that has overlaps, not gaps, between the teams' scope. The Senior IT Application Developer described the role of the project team in this phase:

> "In order to drill-down the operating vision into 'to be' process scenarios that improve the quality of the business solution, we identified the processes, functions and business event and the corresponding detailed SAP mapping. We also developed 'to be' process scenarios, which were mapped to SAP transactions and then validated those against industry best practices."

This activity was carried out in several steps as follows:

◁   Team members who were distributed for each division, started by studying, analysing, evaluating and documenting the "as is" business processes of their division.

◁   The team studied and evaluated what SAP supports in terms of business processes and its functionality to be mapped into "to be" business processes.

◁   The two models were compared and gaps were analysed. Then, discussions of changes of business process models were done in workshops where key players and end-users evaluated the different options and evaluated the benefits of each option and different scenarios. The IT Manager described the users community involvement:

> "Users at all levels were involved.. feedback to and from the user community was incorporated at every step of the project".

◁   Redesign of the business processes and the definition of start, end, the triggering events and functions of each business process and who is performing the different activities, were defined in the database. This activity revealed the customisation requirements of SAP so as to fit the 'to be' business processes within SAP.

The business process redesign exercise was running in parallel with the SAP requirements' analysis and SAP process design and prototype. The change management focused upon the design of the future organisation, the impact upon the user population, policies, standards, authorisations and controls. A number of deliverables were produced from this exercise that included a design of the organisation change, design of the end-users training and definitions of job descriptions.

To prototype the business scenarios, the hardware and SAP software were installed. Then a number of business scenarios were defined, executed and the results were documented and reviewed. This activity was conducted so as to configure the software to fit the "to be" model that meets the business requirements. The IT Manager denoted the importance of this activity:

> "There were frequent meetings with the user community to discuss the change in business processes and how the new system would impact the way they do business...Prototyping using SAP was an important step which occurred several times because end-users were able to see how everything will be working and give feedback and then agree on something and implement it."

The SAP application design wrapped up the design activities with the production of the user design report for both SAP and interfaces. This involved the SAP usage design, the data conversion plan, the interface conceptual design and the SAP extensions. The activity provided an inventory of software extensions, workarounds and interfaces requirements.

Implementation Phase

The delivery and implementation phase started in September 1996 and ended in December 1997. Go live took place in January 1998. This phase consisted of a number of activities to build conversions, interfaces and reports, rollout organisational change, comprehensive test of the system and "Go Live".

The implementation phase consisted of the organisational change and the physical implementation of the new system. After the team members finalised the SAP configurations, process designs and organisation designs, they designed and developed the software extensions, legacy interfaces and conversion programs. Then the team tested and produced technical operating environments and the training scenarios followed. During the process of conducing training, key users were involved with the implementation team to help in the training for the end-users and supports. Users were trained on the new processes and system to maximise benefits. Data conversion and training were conducted concurrently to allow users to aid data conversion effort. Moreover, the new GCO vision was communicated by executive management to provide business structure within which SAP training was conducted.

People in the organisation were under constant pressure because the task was demanding. The training courses were given to each employee according to their new job role. The training period of end-users was full time for about two weeks wherein half of the employees of a division went for the training and the other half did the work and vice versa. Training and building up the skills of the end-users was very important because SAP requires certain levels of skills from end-users. This involved learning a totally new environment, system, business processes and techniques. In addition, it was important to enhance the skills of the end-users to analyse the information to start getting more value of information out of the system. The training was followed according to the business process documentation database, as described by the IT Team Leader:

"We had a database which identified the business processes. It keeps track of what is the business process, from where it starts to where it ends, what are the triggering events within the business process, what functions within that business process and who is performing the different activities within each business process. From this information, we built the training courses. Those training courses were centred around the interconnected business process that has formed some logical major function".

After the training was completed, the IT people provided self-learning workshops for each division. The workshop room was fully equipped with PCs and there was someone available at certain times to help and mentor the trainees. The purpose of these workshops was to provide an easy access and tranquil test environment after working hours so that employees can get adjusted and explore the new system without the work-

time pressure where each person has his routine work to be performed. The Maintenance Systems Engineer described the advantage of the test environment:

> "This test environment helped a lot in giving employees confidence of using the new system without fear of doing mistakes."

Then, software integration and acceptance testing was performed. The acceptance test was conducted in a controlled environment for the testing of all the elements that make up the "to be" user environment (i.e. SAP system, converted data, procedures and controls, and training). Finally, the old processes and system were converted to the new SAP system and processes. Process and organisation design was integrated with the new software to provide a well-rounded business solution.

After the completion of the implementation of SAP and the "GO Live", the workforce reorganisation took place. The first priority for the team was to reposition the staff according to their skills rather than downsizing. The IT Manager elaborated:

> "The managers first tried their best to find another post that suits the staff's skills before they were terminated. After exhausting all means of trying to replace those in other divisions, terminated staff were given four months notice period".

On the other hand, due to the new systems requirements new jobs were created as part of the enhanced functionality of SAP such as Plant Maintenance Planners.

Organisational Culture through the Project

During the process of the project, from the planning phase to the actual implementation, the team members were aware of the difficulty of the project, the sensitivity of the culture, and the likely of encountering resistance to change in GCO. Therefore, they opted for a gradual 'evolutionary' change so as to minimise the risk of resistance. The Maintenance System Engineer manifests the choice of "evolutionary change":

> "During the implementation, middle management were reluctant to introduce big changes to their environments before settling down with the system".

The IT Team Leader supported the decision to proceed with evolutionary changes:

> "We did not face a situation where critical decisions had to be taken, simply due to the fact that we decided to go for a progressive business change with time rather than revolutionary changes".

The time constraint, to address the year 2000 problem, as elaborated by the Finance Manager, was another major factor that forced GCO to undergo a limited change.

> "The general strategy was to get the system up and running with the only necessary business changes. Although, the initially claimed primary objectives to undergo such a project were mainly business-driven, during the project undertaking priorities were tremendously reorganised. So the project was mostly seen, at the time, as a replacement of old systems which were not year 2000 complaint with a new integrated system. The picture is different now especially by the new management of [GCO] who see the potential of the new system and would like to maximise the benefits by introducing continuous business improvements utilising the system's rich functionality".

During the whole stages of the project, top management was steering the project through regular follow-ups. The management was involved through regular meetings and sign offs of all the stages of the project. Deliverables of each phase were presented to top management and implications were highlighted. Although the presence of top management was declared, there was no focus on the objectives stated prior to the project initiation. As a result, some of the team members had different visions of the objectives of the project. The IT Team Leader described the case:

> "During the implementation phase the General Manager did not check the alignment between the implementation and the strategic vision; he did not make sure that the top management understand the strategic priorities in a very concrete way. The General Manager involvement was more toward linking management controls and incentives toward the project success. There was no real involvement in terms of outlining organisation's objectives from the project."

However, this shortcoming was balanced by the heavy presence of the business team in the project, as claimed by the Finance Manager:

> "Top Management was not involved in putting down their expectations out of the system but due to the heavy presence of the business team in this project, we

believe we were able to deliver a system that supported the business and laid down the ground for an evolutionary Business Process Improvement scheme".

The IT Manager remarks seemed to indicate similar beliefs:

"The project has a very strong business presence (out of 20 people functional teams, only 5 people were from IT). It is true that there was a strategic objective at the beginning but during the actual implementation the business objective was not there in front of top management, but there was a general agreement of what areas are of potential sources of benefits and this is what the group team was targeting".

The IT Team Leader added:

"We are implementers... As far as I know, there was no strategic objectives in a way, but there was a common consensus that integration will bring many efficiencies with it".

With regards to leadership, roles and responsibilities, there was no clear description of peoples' roles and responsibilities and there was no one to lead and manage the project in terms of introducing improvements and measuring the benefits. As a result, when it came to changing some of the business processes some of the end-users refused to accept the change because it could lead to jobs elimination.

Yet, the need to establish clear guidelines or rules for the different levels of the organisation's team members was overlooked. The Head of Systems and Procedures indicated to problems that GCO faced because there were no clear rules or guidelines:

"Unfortunately there was no rules or guidelines so that we can understand how and where our skills will be utilised and what issues we should resolve and what issues we need to raise to the next level of management. This caused some problems. But because we ended up with no strategic decisions the problems were not huge. As a result, any decision making process was done by the business team in the case of main areas where a forced change is needed".

During the implementation, the IT people played an important role. They were heavily involved in analysing and designing the business processes of GCO. The IT Team Leader described his department's role:

"We played an important part in the implementation and there was no segregation. To implement certain business areas and introduce improvements, for example in materials and finance division, there was a major role for IT in enhancing the business environment. We participated in deciding, for example, what type of activities to be eliminated what things should be enhanced, how things should be done eventually, and what changes should take effect in the system. We complimented the team because of our IT knowledge and at the same time, most of us took responsibilities within the business environment".

The other role of the IT Division was to provide support to end-users and to provide environmental control and security. This was required by the Internal Auditing Department to make sure that nothing was being changed without the appropriate authority. Yet, the major role IT people played was in providing the required technical support to set up the SAP system.

4.3.4   Problems Encountered

GCO encountered several problems during the project's implementation phase. Those problems can be categorised in terms of resistance to change, consultants' availability, project management and politics.

There was resistance from staff to change, as they were insisting that they wanted to keep the same old processes. This is due to different reasons. The first reason is because there was no powerful person to force the required change. For example, during the implementation, there was no leader or decision-maker so some employees were not following what they were told to do by the implementation team. The Head of Maintenance and Planning described this challenge:

"The IT people took the role but they could not make final decisions or be able to force the necessary change. The absence of a leader to enforce the changes suggested by the IT people caused many problems that were eventually overcame."

The second reason was that some other staff were resisting change because they were afraid to lose the power of the data they were possessing and they believed that this is an intellectual property which they must not relinquish to others. The Inventory Control Supervisor elaborated on this problem:

"A major problem we have faced during our recording of the 'as is' processes was that some people were trying to show that what they are doing is very complicated and can not be easily described. They repeated that they have acquired the experience over a long number of years and this would be difficult to automate. It was obvious that some of the expatriates were afraid of loosing their jobs so they resisted any effort to change. Moreover, some of the line managers were resisting change because they had the impression that the change would lead into layoffs of some of their employees with whom they were passionate."

During the implementation, there was no proper management of the project. Although top management was aware of the complexity of the project and expressed their commitment to the success of the project at the initiation stage, through the implementation it was noted that the strong leadership needed to introduce the required changes and enforce the new procedures and that was absent. The IT Team Leader described this problem:

"There was no powerful person or one to lead and manage the project in terms of introducing improvements and measuring the benefits. As a result when it came to changing some of the business processes some of the staff refused to accept the change that would lead to eliminating some people because there was no one to force change." He added, "Another problem was in terms of procedural issues, there was no clear role who is responsible for what, and who is supposed to do this and that. Is it my responsibility or your responsibility? There was no rules or guidelines for team members. These things were there and we could not avoid them".

The IT Manager denoted that the requirement for a "matrix of responsibly" was overlooked:

"We faced some problems initially, they were more of a procedural issues where, for example, there were certain areas not clear about who is going to do what, should this person do it or that, and after doing it...what should the person do with it, to whom he should forward it to. It took a month to clean up these small problems...streamlining".

As described earlier, GCO faced many problems with the consultant they hired for the implementation. The Head of Sales, Revenue and Expenditures complained about the consultants:

"The consulting company has sent us the lousy people, these people lacked knowledge and experience. For example, we faced problems with SAP in supporting the three dimensional reporting and with the budget control, and the consulting people did not have a clue how to solve those".

The importance of measuring and evaluating the results of the project was also missed. The Head of Maintenance and Planning described GCO's failure to measure those achievements as another problem:

"Our problem, which most companies face, was that after the implementation there was no one to evaluate the achievements. The top management became aware of the problem and immediately initiated a new task by placing a group who will study the expectation of the project and compare it with the benefits achieved after the implementation".

At the end of the project, some of the key team members resigned and GCO had to have a quick replacement for them. The IT Manager said:

"At the end of the project when all staff were trained, some of the key team members resigned because they got better offers because they had experience in SAP...Now we realise that we should capitalise on our national workforce and train them rather than training the expatriates who usually leave after acquiring the experience required to raise their value in the market".

4.3.5 Results and Achievements

The total external costs of the project (this phase focused on financial, plants' maintenance, and materials management) were USD 4.8M. The project resulted in incremental changes. The changes were limited to certain areas but some indeed reflected quite strongly on the overall performance. Changes in the organisational structure have taken place in certain areas, small units were eliminated while some other units have undergone reassignment of responsibilities. The Finance Manager described the gradual presentation of results:

"The benefits were shown within few months. The first month was difficult, the second was trying to catch up and the third was in control and results appeared."

Each division has gained some tangible and intangible benefits. SAP as an enabling tool, its integration reflected automatically on certain changes. There have been some savings in cost and time. Currently, most of the divisions systems are integrated and have online reports and approvals are done electronically. All information are available online and everyone is required to respond on time.

Achievements in Finance Division

The finance people are extremely happy with the results of the project, although they are facing few problems in adopting their way of doing work into the system. Those few problems are expected to be surmount very soon. One of the major changes that have taken place is the structure of the accounting Department, which has completely changed. The Finance Manager was impressed with the results of the project and said:

> "The benefits of this project in our division can be summarised as follows: manpower optimisation, timely reporting (ease of decision making process for management & shareholders), efficiency (less human interference with fully integrated system), and flexibility (less time needed to prepare sensitivity analysis)".

Some of the realised benefits after the implementation of the project in the finance department include the reduction in the general ledger from 30,000 accounts to 600 only. The Finance Manager denoted the benefit of this reduction:

> "Currently, the Finance people can easily maintain and control the general ledger (chart of account). These are small changes where they have great impact in terms of maintainability and support".

The Head of Systems and Procedures described the benefit of transparency provided by the system:

> "Transparency is one of the tangible benefits. It is now possible to trace the status of each employee and how they are proceeding with their work. Previously, employees would keep and delay the documents from being processed. Currently, each person's work is monitored and controlled and it is easy to trace the status of any document being held especially with outstanding invoices".

The Inventory Control Supervisor elaborated on the advantage of automatic budgetary control and commitments update that is provided by SAP:

> "This has eliminated the manual procedure for updating budgetary control system from purchase requisitions and service orders. Also the automatic invoice verification process with purchase orders has eliminated the old manual procedure and has speeded up the processing of invoices dramatically. As a result, suppliers are happy with the efficiency of [GCO] because they are paid faster."

Figure 4.3.5 shows the new business process for the supplier invoice process. Although the change was not dramatic but the improvements were huge. The project also resulted in manpower reduction. The Finance Manager stated the reduction size:

> "There has been a reduction of manpower by 9 people out of 45 and there is more to come".

The project has resulted in a substantial improvement in the required time for periodic financial closing of accounts. Previously, the Finance people used to do their periodic financial closing accounts on the 20th of each month and produce report to share holders by the 20th of the following month. Currently, it takes only five working days and by the 6th of the following month, they produce the reports to the shareholders. The Head of Sales, Revenue and Expenditure proudly stated:

> "[GCO] proved that they are the best Oil Company in the country in closing".

The Finance Manager summarised the result of the project:

> "I think it was a success with all the hiccups".

Achievements in Materials and Contracts Division

The project resulted in a dramatic reduction in inventory value. The Material System Co-ordinator detailed the realised financial benefits:

" The inventory value was reduced by USD 4.4 million by identifying excess stock, non-moving stock and slow items. This should improve with time as SAP builds its own history of time movements. Moreover, the procurement cost is reduced by USD 600,000 through identifying more efficient purchasing methods."

The project has also resulted in a reduction in purchasing process cycle time by at least 15%. The Procurement Supervisor said:

"We are happy with the achievements, the cycle time for the purchase requisition to purchase order and material delivered used to take 95 days while now it takes 80 days. Also we realised a major reduction in paper work and timesaving for buyers to do more productive work such as evaluation of bids, combining requests for quotations, and splitting purchase requisitions".

The Material and Contracts Manager summarised the achievements of the project in his division:

"The project did achieve its objectives with regards to materials and contracts division and most of our requirements were met. It resulted in saving time and money. The project has also resulted in reduction of the manpower of the division and eventuated in a more efficient paperless work."

Achievements in Plant Maintenance Division

The biggest advantage of the implemented SAP system as identified and recognised by the plant maintenance users is the integration with the other modules (Materials Management and Financial). This has contributed in reducing the time for searching and ordering Materials. Management reports now show more up-to-date and correct budget and expenditure figures.

The project has resulted in a reduction of the daily maintenance processing time, such as work orders cycle, decentralisation of some of the business processes, relocating the order cycle elements ownership to the end-users, and reducing the amount of reports print-out with SAP on-line reporting facilities. The Head of Maintenance and Planning summarised the benefits of the system:

> "Having implemented and used the system for a period of one and half year now, we are pleased to state that the system meets our business requirements and has significantly improved work practices with high performance and reliability."

4.3.6 Organisational Culture and Structure After The Project Implementation

The project has resulted in a minor change in the organisational structure and manpower reduction. The change of the organisation structure was in terms of some sections that were eliminated. For example, the Finance Division was one of the divisions, which faced an organisational change in its structure [See Appendix D for the organisation chart of Finance Division and its subdivisions before and after the implementation]. Although the project resulted in manpower reduction, this issue created a lot of sensitivity and therefore many who were made redundant during this change were relocated somewhere else in the company. The IT Team Leader explained:

> "Most changes would usually aim at cost reduction and sometimes lead to manpower reduction. However, due to the culture, traditions and religion and because the majority of employees are Muslims these issues are more sensitive so we do not want to be behind firing people because their work is the place where they make money for living".

Top Management were aware that such a project would bring minor cultural and structural changes due to several reasons. Therefore that was not expected due to the nature of the company and all the policies and rules that have to be followed from the Mother Company. So any major cultural or structural change would be difficult to embark. The Finance Manager said:

> "...such a change would require a deep and significant change in the attitude and behaviour of all employees at all levels which was obvious that the organisation was not ready for such a change...Also us as Arabs and managers we do not like to give a lot of power to the staff below".
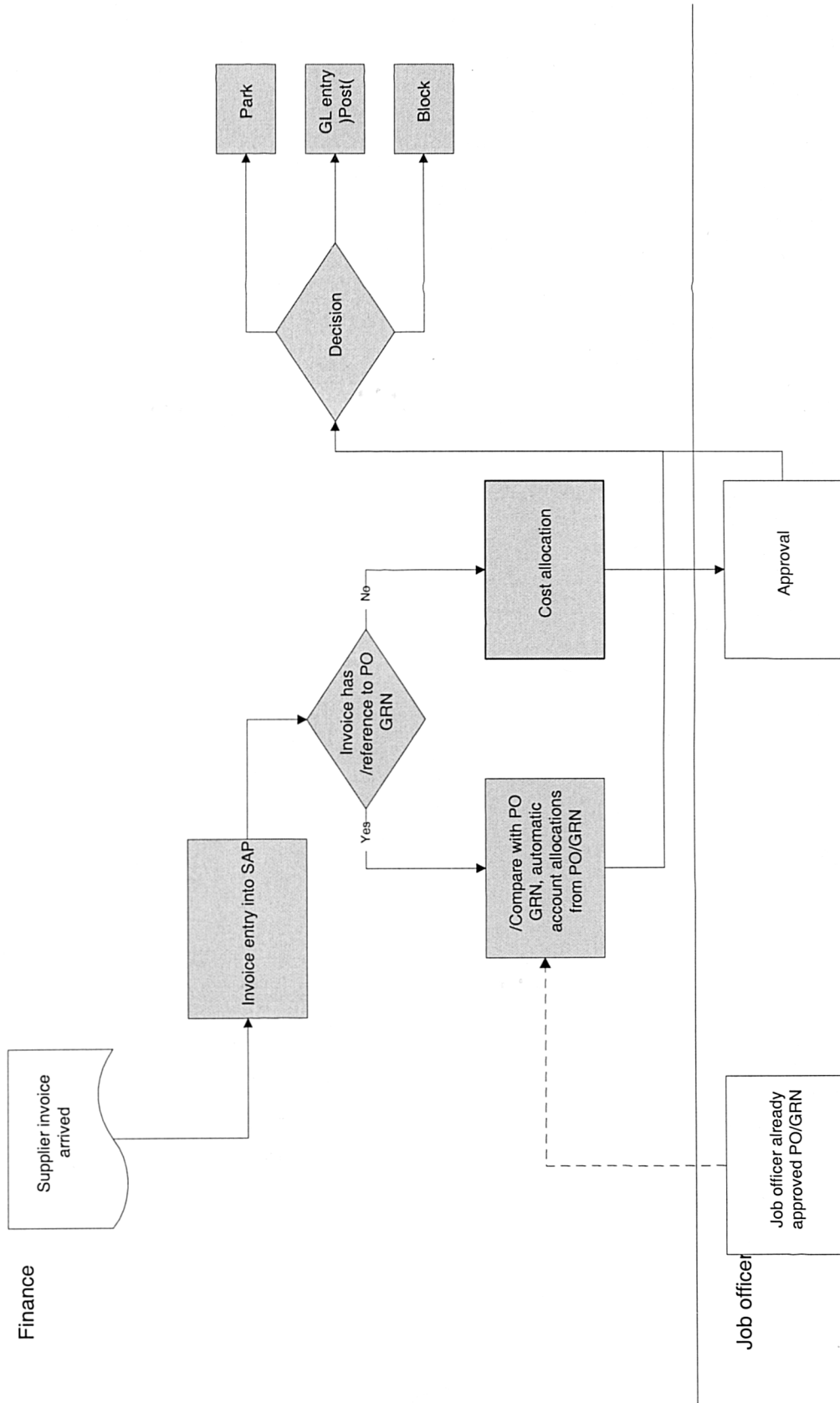
Figure 4.3.5 GCO's New Supplier Invoice Processing Process

Although the project resulted in some kind of empowerment due to the nature of SAP, top management observed the difficulty of providing full empowerment to staff due to the structure and politics of the organisation. In addition to provide full empowerment there should be a radical structural change in the organisation and staff should be provided with enough training to be responsible and reliable for making decisions. The IT Leader explained:

> "Because SAP is an integrated system, for example in the Finance Division some staff were empowered...They can generate reports and make decisions upon these reports".

In addition, the implementation of the project resulted in a collaborative environment which many expatriates staff would refuse to work in. This is due to the SAP integrated system where a lot of information is shared among staff.

4.3.7   IT Infrastructure After The Project Implementation

The choice of going with SAP necessitated kernel changes in the previous IT infrastructure. The new infrastructure is a modern INTEL-based server farm platform with client-server architecture running over fast Ethernet for Local Area Network traffic and Asynchronous Transfer Mode (ATM) for the Wide Area Network Traffic (WAN). SAP software provides easy access, a window base (user friendly) interface, saving in performance transactions time, better communications across the organisation, a single database shared by many users, decentralisation, user empowerment with more responsibilities, and speed in reports issuance.

Integration is a major feature of SAP that had a great impact from the end-users point of view *[Figure 4.3.4 shows the integration provided by SAP]*. The IT Manager reported the following points as the greatest realised benefits of the integration provided by SAP:

- The streamlining of many business processes that used to take longer time because of non-availability of information.

- The centralisation of data repository and the elimination of data redundancy. Because SAP is integrated, then all data is centralised, and there is no duplicate data existing that can cause misleading or conflicting information.

- The avoidance of duplicate entry of data in many different systems, since there is only a single entry point which makes the information available to everyone.
- The elimination of the lengthy reconciling process that used to take place when having multiple different systems, as a result of the integrity of the in-built controls of the system.

- The availability of real-time information to all concerned parties, thus introducing a cross-functional organisation around processes and results in more organisational efficiencies.

- The flexibility and powerfulness of the online reporting functionality in SAP helped end-users in making decisions and reduced their dependency on paper based reports, because SAP provides up-to-date information with a drill-down facility to track the individual transactions. This also resulted in great reduction of paper usage.

- System's ease of use; with SAP WINDOWS based interface its unified and standard user interface that makes navigation and performing the tasks for end users more easy. In fact, some of the users had no previous computer knowledge and they found it easy to perform their tasks within couple of days of training. Also, end-users did not need to learn more than one interface to perform their tasks in different modules of SAP.

- Integration of MS Office enabled the production of excellent output and link with available external MS Office Applications.

- Internet, Workflow, and Executive Information System functionality existing in SAP allows for future advanced enhancements to the way business is run in GCO.
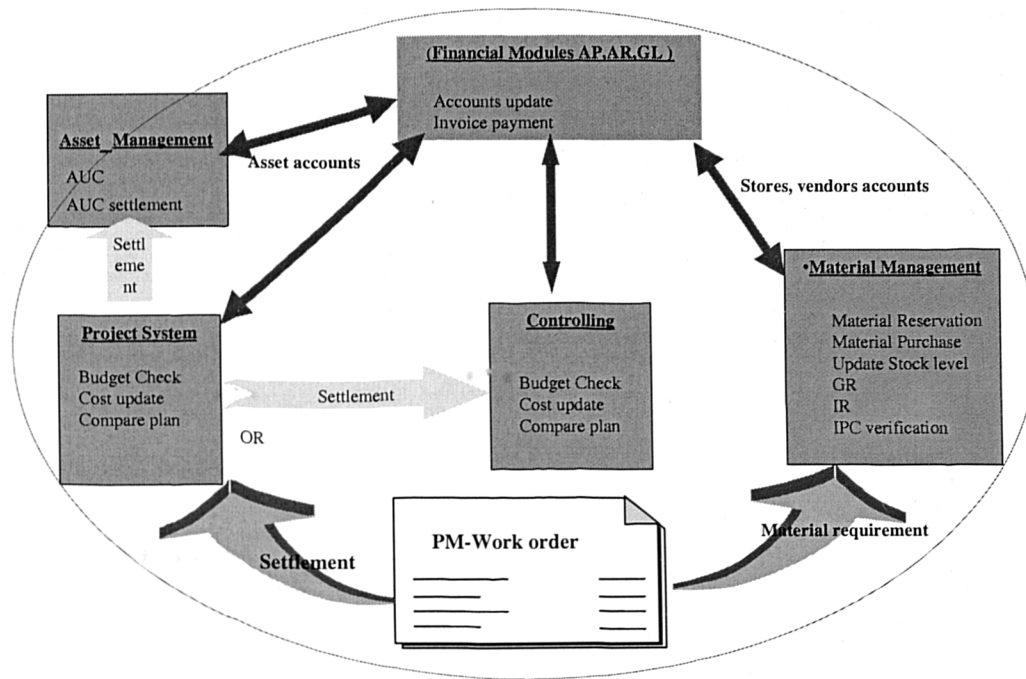
Figure 4.3.4 Overview of the Integration Cycle provided by SAP

The role of IT people has changed smoothly and naturally since the time of implementing the project. It is no longer considered as it used to be sometime back. Previously, they were considered programmers and systems analysts for developing scripts and programmes. Now, the IT people are more business-oriented. The IT people's role is to help and assist the business unit, see opportunities and benefits and provide requirements in the business by utilising the latest technology. Moreover, they became more initiative in terms that they wanted to improve and enhance their business.

There is a change in IT division in terms of recognition of the different role of IT. One of the changes that they succeeded in getting the management acceptance is the introduction of "business analyst" post. So initially they were systems analyst in one level and analyst programmer and team leader. Now, they have analyst/programmer as an entry level. The availability of a business analyst at a higher level is to reflect that this person has reached a stage where he can assess the business processes of end-users, recommend changes, enhancement and improvements in terms of business processes. So the role is more towards the business rather than only technical.

4.3.8   Second Phase

With the first phase of the project effort showing signs of success, GCO decided to proceed with launching a second phase to complement this achievement. The second phase was envisioned to aggregate the following requirements:

◁   To implement the system in the remaining departments. The second phase will cover the implementation of Human Resources, Cross Application Time Sheet and Services Management.

◁   To introduce workflow, Intranet front-end for the system, document management system across the company in order to get rid of paper and have work approved within the system, since SAP provides these features.

◁   After seeing the results of the project, now the Finance and Materials Divisions were told by top management to reduce the number of employees by the end of year 1999.

◁   To proceed with a new strategy, which is to introduce a continuous improvement program by the business support division (named organisation review).

In the year 1999, a management change has taken place. The GM has been replaced. This is a policy which takes place every four years. The new top management studied the organisational change that has taken place and sees a different picture now. The IT Manager elaborated:

> "The picture is different now especially by the new management of GCO which see the potential of the new system and would like to maximise the benefits by introducing continuous business improvements utilising the system's rich functionality".

GCO hired an international management consulting company to provide them with a study in order to establish a continuous improvement culture. The aim is to support them in how to build mechanics of these continuous improvements. This is in terms of how to build key performance indicators, how to build benchmarking levels for different divisions and how to measure performance.

4.4   Case two: "PCO"

4.4.1   Introduction

PCO is an oil producing company established in 1978 which operates onshore in the shallow coasted water of the capital city. Although the original concession agreement was made with Petroleum Development (Trucial Coast) Ltd. on 11th January 1939, geological work did not start until after the Second World War. Exploratory drilling began in the city in Feburary 1950. The first commercial discovery was made at 'B' Field in 1958, and exports began from the 'JD' terminal on 14 December 1963 and the company was known as the 'Petroleum LTD Company'. Production of crude from second field 'BH' had been added to that of first field in 1965, and the following years were devoted to developing the field. In the same year, another field 'AS' was discovered. Then, in 1966 a fourth field 'SH' was discovered. As production increased substantially year by year, 127,857 billion barrels in 1964 to 255,287 billion barrels in 1966, so it was accomplished by a rolling programmes of exploration and test drilling. Crude oil revenues rose drastically in 1965. In 1967, the fifth 'SA' commercial onshore oil field discovery was announced.

Currently, PCO operates and produces oil mainly from five fields. These fields are linked to the storage and shipping facilities located to one area 'JD', where tankers load crude oil for export to markets in various parts of the world. Oil production comes also from four other oil fields. A sixth field 'JY' came on stream late in 1993 and its production is transported to the refinery for treatment. An early production system for the other North East fields was commissioned during 1994. In 'A', 'B', 'BH' and 'SA' fields, water injection is used to maintain reservoir pressure and optimise oil recovery. Gas injection systems are used in 'B' and 'BH' fields. Full 'B' field oil development project was completed in 1993 and that of 'S' field during 1998. The 1998 exploration programme continued to place emphasis on evaluation of hydrocarbon potential of frontier areas, delineation of the proven discoveries and assessing the potential of deep reservoirs. During the year 1998, PCO increased operating land rigs to twelve, which were owned by the drilling company. These were engaged in exploration and development drilling and in workover operations.

In 1999, the 'A' Gas Gathering and Injection Project encompassed many other related activities with it, such as the 'A' Infrastructure Facilities, Additional Power Generation and Transmission. These elements have demonstrated how the mother group of companies can share services and certain infrastructure.

The company is semi private with government (represented by the same Mother Company described in GCO case) share capital of 60% and the remaining is divided among shareholders as follows; BP, Shell and CFP 9.5 % each, Mobil and Exxon 4.75% each and Partex 2%. In the early days, the government acquired a 25% interest which was increased to $60^o o$ held by the mother company. As PCO moved towards the fourth decade of operations following the historic 1963 shipment from the first field operation, all production and management systems were at a peak of efficiency and the company was more than meeting the expectations of both its shareholders and the government. During these first three decades, total oil output has exceeded 7 billion barrels.

PCO's staff are from different cultural backgrounds. PCO is following the same nationalisation program as GCO. This program aims at recruiting nationals in order to increase the percentage of nationals at PCO annually. This was approached by attracting high-calibre nationals, a team representing the Operations, Technical and Administration Divisions periodically conduct recruitment campaign for expected graduate national students explaining the career opportunities offered by PCO. As a result, the number of nationals recruited has increased dramatically through the years.

PCO HR strategy is to continuously assess and update the company's human resources strategy and the associated processes and programmes. The importance of further alignment and integration of these underlying programmes (recuirtment, entry point absorption, career development and professional ladders) with the long term business plan and employee attrition forecasts is ciritical to PCO's ability to deliver business performance.

This organisation which employs around 3,000 (excluding contractors and staff in the fields), is the largest oil producer company in the country and located in the capital city. PCO is also the third largest oil producer in the Arab Gulf Co-operation Council

(AGCC) countries. PCO has also played a critical contribution to the creation of modern country.

4.4.2 Diagnosis

PCO is an oil producing company operating in the upstream business (exploration and production) that is disguised from the direct touch with the competitive market. Marketing the produced crude oil, i.e. downstream business or refining it, is the responsibility of the Mother Company (a company owned by the government that holds all the shares of the oil, gas and chemicals industries in the country). Traditionally, all PCO's requirements are met without considering the financial entanglements, due to the inconsiderable production cost as compared to the selling price. However, PCO had other internal worries and problems inside many divisions that were becoming apparent and would eventually impede the smooth operations of the company. This case study investigates the change undertaken to rectify the problems in one of those divisions, which is the Human Resources Division (HRD). The rationale behind choosing to focus on one division only is to explore all issues pertinent to the initiative and hence a thoroughly informed analysis can be made.

HRD consists of three functional departments; Recruitment Department, Training and Development Department and Administration Department. The processes of those departments were centred on administrative convenience rather than being customer centric. In 1990, in a periodic meeting of PCO's Management, the Management of several divisions expressed their concern pertaining to the delays in cycle times of HRD's processes such as Recruitment, Course Administration and Salary Administration *[Figure 4.4.1 shows HRD's Processes]*. They emphasised the necessity to address those issues and to tackle the problems experienced in those processes. However, the HRD Manager ascribed the deficiencies, inefficiencies and problems that were existent in those processes to the existed Interactive Personnel and Payroll System (IPPS). The previous Head of Development and Training Department recalled:

> "During the past few years, many things have changed and evolved; the day to day activities and the policies of the company have changed, and we wanted a more responsive system to all those changes.... We insisted for a long time that we wanted a system, which would automate many of our processes. For

> example, we want a system that can run from remote areas so that not everything needs to come to HR Division... We believed that a powerful system with automation and workflow features would be the solution to most of those inconveniences and delays."

During the same period, the Information Systems and Technology Division (IS&TD) was finalising a plan to change PCO's IT infrastructure towards a Client-Server environment. HRD exploited this opportunity to convince IS&TD to include a new HR System in their plan. As a result, IS&TD staff committed themselves to provide an in-house system that would cater for all the identified HRD's requirements. The development of the in-house system took one year and a half utilising IS&TD's internal resources. The system was operational in mid 1993. However, the developed system was utterly disappointing as elaborated by the previous Head of Development and Training Department:

> "The IT people presented the same package with minor modification. Our reply was, if this is the new system then we would rather stick to our old system ...Our main objectives of getting a new system was to cater for deficiencies in the old system and to automate some of the manual processes that add delays. Unfortunately this was not done... We raised the case to top management explaining exactly what happened".

HRD articulated their dissatisfaction with the work done by IS&TD to the top management. The GM called for a joint meeting with both divisional managers to have a clear understanding of the problem. After several meetings, the General Manager (GM) concluded that in order to resolve this issue, HRD needs to reassess their processes and consequently consider an appropriate system. The GM informed HRD to disregard the system provided by IS&TD and to focus vigorously at enhancing the existing HR processes aimed at increasing customers' satisfaction, anticipating that this would be translated into the system's requirement. The GM said:

> "During those meetings, I told the HR Manager to look into all their current Business Processes in each department and study whether this is what they want. If the Business Processes are not according to what they want and are not efficient then they should conduct a BPR study before introducing any IT system and then present their findings to the IT to find a suitable package for their requirements. Yet, if the HR Division is happy about its current Business Processes, it still has to ask its customers whether they are happy or not".

HRD was reluctant to assume the responsibility of the project due to the lack of experience and knowledge in process improvements techniques. The previous Head of Development and Training Department elaborated:

> "The HRD staff knew from the beginning that there should be a kind of change but they did not know how to go about it. For them, the concept of reengineering and process documentation was new and vague. Moreover, HR Division had no experience in package evaluation and selection techniques... HR Division staff felt that it was necessary to hire a consulting company but the top management did not support it as this project will only involve the HRD and not the whole organisation."

The GM instructed the previous Head of Training and Development Department to form a team to lead the project and to provide them with necessary training and seminars prior to the conduct of the project.

Organisational Culture and Structure Prior to Project Initiation

PCO's culture, similar to other oil and gas companies in the country; is constrained by the rigid rules and policies of the Mother Company. Similarly, the organisational culture and political issues of PCO are identical to GCO in almost all aspects. Moreover, the same applied regulation by the shareholders to replace the General Manager every four years creates an instability of PCO's top management.

The heterogeneous mixture of nationalities in PCO's staff also creates an environment of fear, wherein expatriates, in an act of self-protection, tend to hold on to their information and not share it with other employees. One of the HRD's staff said:

> "The problem here is like any organisation in the country; companies tend to recruit many different nationalities due to their expertise... Since one of the aims of the government is to recruit nationals, the expatriates are scared to share or teach the new recruited national because they feel that those nationals are here to take their places. This has created an environment of fear, which is difficult to deal with".

The strategy of recruiting and promoting staff at PCO is very similar to government organisations, most of the times irrational and inconsistent. PCO provides training and development programs mainly for the nationals wherein most of them are fresh

graduates. Irrespective of their competency and accountability, once they complete the predetermined training period they are automatically promoted. This gives nationals the opportunity to be always promoted while expatriates rarely get this chance. However, there are other programmes and workshops provided for both expatriates and nationals to update their skills and knowledge.

PCO has a number of oilfield sites, which are remotely scattered, from the central head office. The employees, especially the ones working in remote areas, are frequently complaining about the lack of communication, long delays, inefficiency and the inferior services provided by HRD.

IT Infrastructure Prior to Project Initiation

The frequent changes of the Manager of IS&TD during the past ten years have created instability in the Division. The strategy and vision of IS&TD was changing according to the directions of the current manager. Therefore, there was a serious concern about the maturity of the IT Infrastructure in the company and the level of support that can be provided by them.

Until 1993, PCO's IT infrastructure was based on IBM ES/9000 mainframe with mostly IBM 3270 terminals and some Token Ring connected PCs for powerful end-users. Most divisions had their own in-house developed mainframe applications such as the HR. With the next change in management, Client-Server computing was touted as the extrapolation of inflexible mainframe-based application. The manager decided to move from the mainframe-based application to Client-Server applications to exploit flexibility and reconfigurability to support their regionalization and customisation business strategy. The network structure remained as Token-Ring based TCP/IP infrastructure. During the third change in the management, the manager decided to toss the recent investment in the network infrastructure and was determined to install ATM network to the desktop.
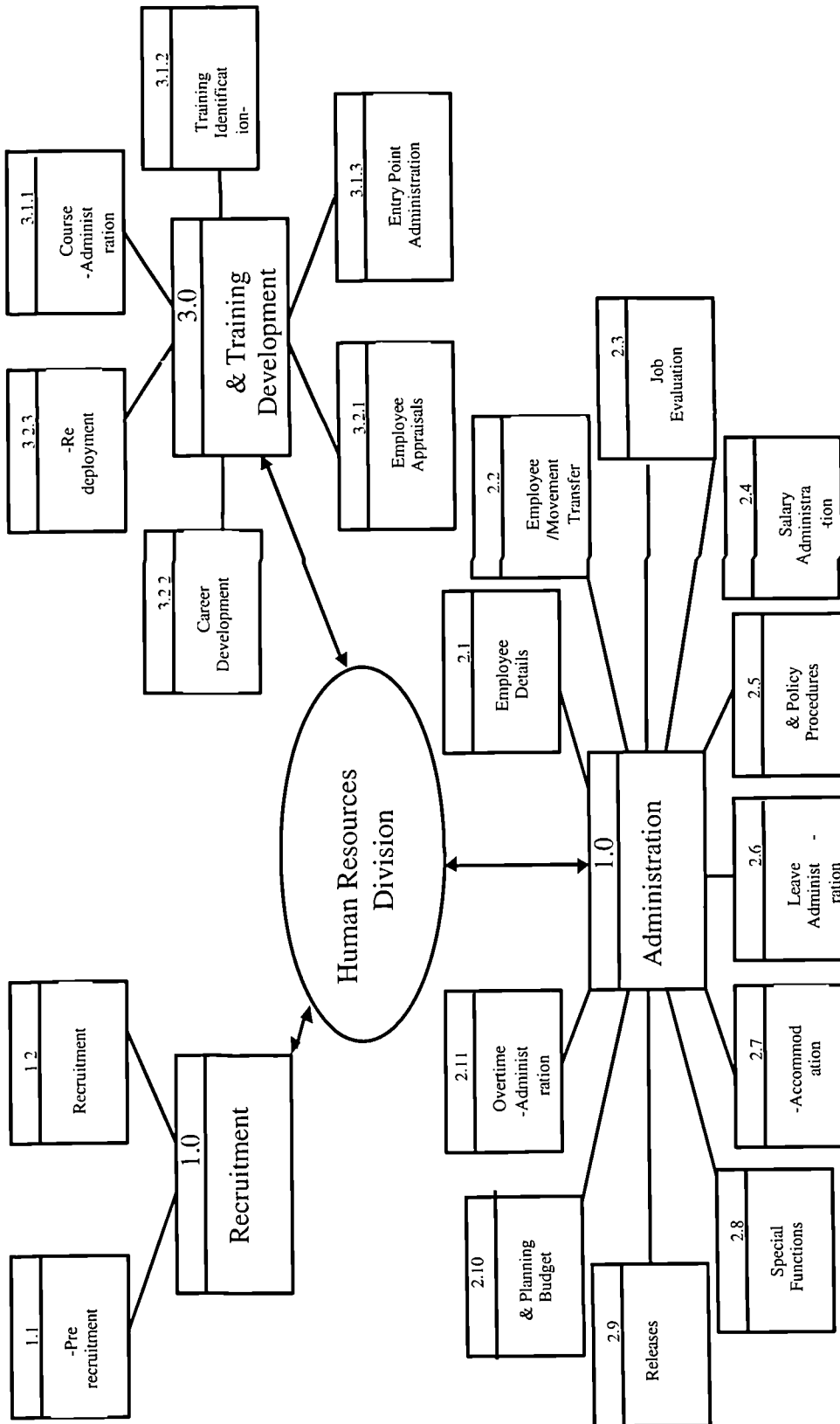
Figure 4.4.1 PCO's Human Resources Division Processes

Prior to 1993, PCO's application portfolio consisted of a hodgepodge of applications developed/purchased during the past 15 years or so that required some form of life support to exist. During the transition from the mainframe to the Client-Server architecture, there was a thought to have an integrated system to replace this mixture of home-grown and purchased existing systems. However, the management at that time rejected this option because they were worried that this would take a long time to implement and be very expensive to support.

For all major business applications in PCO, IS&TD decided to implement "best of breed" ready-made packages solutions without making any customisation. The IS&TD Manager elaborated on this choice and the obstacles they have faced:

> "Our idea was not to go for process analysis exercise, instead to adopt the 'best practices' already implemented in the 'best of breed' packages. Therefore, we would not need to do any customisation to those 'best of breed' packages. However, our aim was not fully supported by top management. Initially they have agreed, but when it came to implementation, the users wanted to stick to their own way of doing things.... Buying ready-made packages never gives you what you need. If it gives 70% then it is perfect. Senior Management can not impose ideas such as adopting best practices. For example, the HR policies are driven by Mother Company, so any changes has to be done by the Mother Company first. If such a change is going to take place then it has to affect all other oil companies. Therefore, in reality at the end we have to do some customisation in all ready-made packages but in the HR the percentage of customisation was high. The Finance system, for example, is more of an international standard but HR has its own rules within the company, governed by the Mother Company, governed by the government".

The change in IT strategy, i.e. from mainframe to Client-Server and from in-house to off-the-shelf solution, necessitated restructuring programs to align IT to the strategy and the business and to tailor the organisation chart according to this plan. Because of the reduced requirements for in-house development, the number of systems analysts and designers was reduced drastically. Moreover, a business relation section has been introduced. It is a separate section that interacts between IS&TD and end-users. To better understand users' requirements, the IS&TD Manager is considering employing individuals with hybrid, business and IT, knowledge to be within this section. IS&TD Manager said:

> "Previously, IT people were leading the development of projects and the results were that projects were thrown in the trash bin. This was because they would build the system according to their requirements and understanding. As a result, the end-users would blame IS&T Division for not providing them a system that matches their requirements and it ends up in the bin just like what happened previously with the modification of the HR system".

Regarding HRD, they had an old system, Interactive Payroll and Personnel System (IPPS), which was a mainframe-based COBOL system purchased in 1984. It was a small package for Personnel and Payroll only. It was fully customised to the special conditions and needs of the company. The previous Head of Development and Training Department elaborated:

> "IPPS is an IBM system running on mainframe. IS&T Division made many customisations to the system, roughly 90% of the system was customised, to cater for [PCO's] special needs. They added many databases for allowances, accommodation and training and many fields, for example, for religion and country of birth... The reasons for those customisations, for example for the allowances, were due to the uniqueness of our culture. For example, if an employee is a national then he/she gets allowances, which the expatriate does not. All the different allowances were introduced in that old system".

For the period between 1984 and 1992, many changes were introduced in the old system to reflect changes in the compensation and rewards policies. However, those ad hoc changes were not documented properly, which created difficulties in system maintenance and updates. So by these changes, the original package had become different from the last one. Hence, the several requests made by HRD for IS&TD's staff to migrate to the newer version were not fulfilled. One of the IS&TD staff said:

> "We could not replace the old system with a new version because the existing version was completely different from the original one. Moreover, to migrate then customise the system would be very costly and time consuming".

4.4.3 Project Initiation

Although HRD's staff were reluctant to assume the project's responsibility, because they had no experience in process redesign approaches and they did not have external consultancy guidance, it was apparent that the GM wanted HRD to be involved in the business requirements definition and the strategic choice-making. The HRD Manager

realised that it would be an opportunity to introduce tangible change in the division. So, it was decided that such a change should take place with the aim of restructuring and streamlining the business processes, reducing cycle time of the processes, and eliminating the bureaucratic procedures.

A small group of nine members was formed with mostly business professionals headed by a member from HRD. Two of them were full time members and the rest were part time members. The breakdown was 7 with wide and deep business skills (from HRD and Finance Division) and 2 with wide and deep IT sense (from IS&TD). The distribution was made to skew the discussions towards business models and processes rather than IT enabled models and processes. The project Manager (the previous Head of Training and Development Department) explained:

> "This was a business, not an IT, event. I was chosen by the top management to lead the project, because they did not want the project to be IT driven."

The team members were assumed the responsibility of the project ownership in addition to their day to day activities, which eventuated in added encumbrance and demoted the dedication and accountability.

Initially, during the exploration and learning stage, the team contacted few universities, such as Harvard Business School, Stanford University, and Bradford University, for guidance. Then they agreed with one of the universities to provide them with business process analysis and redesign workshops. After completing the workshops, they felt that they would still need to refer to books and "best practices" references and learn while they are reviewing their processes. They also felt the need for a consulting company to help them through the process of reengineering, however they decided against this engagement.

There was no previous plan for a standard methodology to follow but with regular meetings, discussions, frequent reading and sharing knowledge, they decided on the rudimentary and liberal approach of studying the current business processes, redesigning and then implementing the improved processes. Moreover, the set of required

deliverables for each stage was not specifically addressed; all what was in their mind was to provide a regular executive progress report for the top management.

Processes Redesign

The project team members started by analysing HRD's business processes and the cross-functional activities that would directly impact the performance of those processes. Being a service division, the processes are linked with so many departments including medical service and governmental bodies. The previous Head of Development and Training Department rehearsed the key performance indicators for the project:

> "The aim of the first phase was to improve and streamline HR Processes. Our initial targets were to reduce the intolerable delays in recruitment process and introduce savings in terms of time, money and manpower of Administration and Development Processes".

The project team was aware from the beginning, of the threats and risks that would evolve from employees' resistance and the unqualified culture for such change. Employees would always have the fear of losing their job, and such undertaking would add more certainty to this fear. Therefore, the team knew that if they did not get the support and co-operation of employees, the project would fail. The team decided to adopt open and transparent communication strategy, whereby the scope of the project was presented and assurances that there would not be size reductions was given to the concerned staff through several presentations.

After preparing the employees and the environment for such a change, the Project Manager organised the team into smaller groups and prepared each group in the form of briefings and materials that provided guidance about what is expected from them to do during the redesign stage. Then, each group visited the departments they were responsible to review and proceeded with interviewing key staff to document the activities involved within those processes. The Head of Personnel Department said:

> "We went through two types of interviews. First, we interviewed the key staff of HRD to document the procedures they follow in each process we were studying. Second, we interviewed key customers of those processes to take their opinions and to identify deficiencies. This needed a lot of hard work and was time

consuming, because we had to visit the remote sites and interview the line managers as well".

Then in October 1993, the team documented and mapped the current business processes using flowcharting method. The mapping consisted of identifying the links, activities and external factors. The previous Head of Development and Training Department described the difficulties faced in documenting the current processes:

"One of the difficulties we found was that some of the groups realised that many were describing the processes they wish to have and not what they actually do. So we were afraid that we would be led to the wrong direction and wasting time".

Another member said:

"When we were mapping the processes we found that some of the staff were mixing some of their activities and responsibilities". He added, " To finalise our documentation process, we had to go back to those people requesting them to confirm that the documentation indeed reflected the existing current processes. Several modification were made at this stage."

After this documentation stage, the team did not, nevertheless, had the confidence to embark on the redesigning stage of the identified processes. Therefore, they decided to mime the 'best practices' of other sister companies. To do so, the team conducted a benchmark study of three sister companies. Two team members visited those companies to learn and document their business practices. One of the team members summarised the findings of the study:

"The benchmark study was disappointing... We realised that the local companies, which we thought initially could be an example for us to follow, were suffering from unspoken inefficiencies and bureaucracies in their business practices. Regarding the foreign shareholder-company, their HR processes are simple and streamlined. However, we could not copy their processes because we realised that we have totally different environment. Add to this, the policy and guidelines from the Mother Company that can not be changed to adopt the shareholder-company processes..." He added, " This does not mean that all of our effort was a total waste of time, during this study we learned and gained practical experience in process documentation and analysis and the different ways of redesigning business processes."

In February 1994, the team started the redesign stage by analysing the documented 'as is' business practices to discover existing process-pathologies and eliminate inefficiencies. The previous Head of Development and Training Department offered insights of PCO's process redesign approach:

> " We did not take a 'clean sheet of paper' approach and started from scratch to build process vision. We analysed each process by looking at the benefits of each activity and accordingly see whether it adds value. It was discovered that 40-50 % of the activities were redundant and they were not adding value. Also we realised that some processes and activities were not in the correct place so those were moved to other divisions... While we were getting deeper in redesigning the business processes, it was clear that we can achieve our objectives and there will be an impact on the manpower, cost, efficiency and reduction in cycle time but that will not show until the completion of the IT implementation."

The current Head of Development and Training Department offered further details of the redesign stage:

> "To some degree we were successful moving away from the current business processes wherein few were radically changed. This led to getting rid of some of employees, which was not our aim. Because of the radical changes we wanted to introduce in some processes, we knew that the top management and Mother Company would not easily accept. To overcome this, we decided to get the management support by involving them, through regular briefings and presentations, and requested their feedback and guidance...This was a successful strategy to gain the support of the top management to introduce such changes."

The team members rendered the redesign of the cross-functional activities taking place between HRD and other divisions within a process. Further, job descriptions were prepared for the modified jobs for each of the identified 'to be' processes. Then in May 1994, the requirements specification for IT determination and selection was prepared.

Finally, a recommendation report containing a list of the existing business processes and the 'to be' processes and the benefits were prepared and presented to the senior management. The previous Head of Development and Training Department recalled the decision of the management based on the presentation:

> "Because the proposed changes were going to be tremendous, which includes interdepartmental activities and affect more than one entity, the senior

management decided to stick to changes in only the HR Division... The managers of other departments were pushing towards this option, because they did not want to review their practices... The team was cornered to reduce the scope of the redesign to be limited to activities within HR Division only... The team members sat with their HR Division Manager to revise the scope of change based on management's order".

Choosing Appropriate IT Package

The project team started the final-round of the envisioning stage of the business processes in HRD, staying within the guidelines and the approved head-counts for each department by top management. Job descriptions were written in details for every position required within HRD. The team also prepared a detailed implementation plan for recruitment for new positions, layoffs, nationalisation plan and training requirements.

Thereafter, all the work that has been done for each process was compiled into the 'HRD processes and procedures binder' which includes the description of the new processes and their key activities and characteristics, HRD structure and job descriptions. Then, the binder was handed to IS&TD to deliver a suitable system that will fit the new processes requirements. IS&TD Manager voiced his irritation due to the late engagement of IS&TD:

"After redesigning the business processes and now involving us! It was not the right way nor time of involving us. We should be involved from the beginning of the project. The IT had been an after thought in the whole project and then consulting us what is the appropriate package to these problems? Unfortunately they did not realise this problem".

During this period, a change in HRD's Management took place whereby the Manager of Training and Development Department was relocated to another division. A new manager was appointed who carried over the Project Management responsibility.

IS&TD, reluctantly, requested the formation of 'package-selection team' to be led by HR Team Leader and members from IS&TD, HRD and Finance Division. The team consisted of 10 members from IS&TD, who knew the previous system and its functionality, and the end-users from the HR, Personnel and Payroll, who knew exactly what the existing system was doing and its shortcomings. The team started by exploiting available options for the system delivery; in-house development or off-the-shelf package.

However, team members from the HRD immediately rejected the in-house development option and demanded the search for a suitable off-the-shelf package. They referred to the 'bad experience' they have had with the previous system provided by IS&TD.

The team investigated the option of acquiring an off-the-shelf package, however due to the uniqueness/specificity of the HR business processes and because team members from IS&TD voted against any customisation to be made in the to be selected package, choices were limited. The current Head of Development and Training Department elaborated:

> "Basically we had two main selection criteria. The first that was imposed by the top management which is the potential cost of such acquisition. The second was imposed by IS&T Division. The IT people rejected the option of acquiring a system then tailoring it to our needs. They believed that those to be made customisations would cause problems for future upgrades plans... Unfortunately, this was very restrictive. For example, we have 42 nationalities to deal with, we have different work cycle because some employees work in the field and certain regulations apply to them. For example, [PCO] have employees on a permanent contract, temporary contracts, secondees from Mother Company and employees from industrial shareholders. All of these [PCO's] specifics have to be considered in the new system.... There are many requirements that are [PCO's] specific which you will never find in a ready made packages".

Then, the team, in coordination with IS&TD, surveyed the market for potential candidate packages. The team went on evaluation trips to several vendors' reference sites to see the demonstration of products. A short list of three packages was produced:

Oracle: Although the package is rich in functionality, PCO's requirement for an integrated system between HR and Payroll could not be met. Moreover, Oracle did not provide the Payroll or the workflow functionality.

SAP R/3: Although this integrated package provides the required functionality, the potential cost of implementing the system was prohibitive. The team tried to sell the idea of acquiring the system for all of the operating companies, under the umbrella of the Mother Company, and share the cost of the package. The board rejected the idea.

Smart Stream: The system is rich in functionality with, reasonable acquisition cost and has the required workflow and payroll functionality. Further, it is claimed that customisations to be made in one version can be carried-over to newer versions.

The recommendation was forwarded to the IS&TD Manager who in-turn approached the GM for endorsement and in 1996 Smart Stream was brought. The previous Head of Development and Training recalled:

> "Unfortunately this was a confidence approval. IS&T Division Manager accepted the choice being made without making sure that his Division has the capability to support such package. Yet, building a qualified support team, after the project hand-over, was not seriously looked into".

System Implementation

After the purchase of Smart Stream, a new implementation team was set-up which included people from IS&TD and key users called "super users" from various departments that will be using the system. Some of the members were part of the previously formed "package selection team".

After the installation of the new system, in an isolated Network test environment, the team was provided with the required Vendor's training. In late 1996, the team started working on the "gap analysis" by comparing the system's functionality with the work of PCO and data type requirements that were not provided by Smart Stream. The System Analyst elaborated:

> "The process of comparing Smart Stream's functionality was against what we do in [PCO]. We were not comparing it with the previous system but from the previous system we knew exactly what information we require. ... For example, we knew that whichever software we choose, we are going to find a lot of gaps. ... That is what the comparison led to from the gap analysis, because there are a lot of additional information that are required here especially about expatriates. We also looked at the data and all the windows like personal information, employee information, name and address, history; each on a separate column, and input screen. So we looked at each of those in turn to see what data of elements we require and which are missing".

The analysis showed complete gaps in some areas, such as employee accommodation, and in other areas there was a slight gap such as employee personal data because it did not have fields like religion and Country of Birth.

In the beginning of 1997, the team started with the implementation of HRD's business processes that match processes provided by the system. However, in most instances, this

was not possible and hence the team had to adapt the system to accommodate PCO's own style of business practices because many line managers rejected some of the Business Process Changes that were recommended. As a result, the team had to go for major customisation to accommodate the business requirements that has not been envisaged previously, which is a continuous process until today.

Then, the customisation process started which involved three types of customisation. The first type of customisation was the non-technical change, which involved replacing unnecessary fields that exist in the system by fields that are required but did not exist in the system. This type involved utilising the data items in the Smart Stream that PCO's did not require. For example, religion was required and was not available, and eye colour existed which was not required, so the religion field was replaced by the eye colour. The next type of customisation involved adding additional fields to the original package such as the addition of a field for the employee salary range (minimum and maximum). The third type of customisation, which took a long time to develop, was technical changes. It involved technically changing many objects and adding new objects specific to PCO including adding new tables to the Smart Stream database to accommodate the data and then writing the procedures to maintain the tables. An example of this is employee accommodation.

Since IS&TD had no technical experience in the package, an external consultant was hired to do those customisations. The System Analyst said:

> "When it came to modifying the system; adding and developing the new activities, we frankly said that we have no expertise to do so. This is an object-oriented programming and essentially power builder and also using a product that comes along with Smart Stream called Smart Stream builder that we do not know about and were not trained. Therefore, we had to go for consultancy to do most of the work ... We must admit it was a mistake."

The consultant was hired to do the programming and the analysis, whereas requirement specification was done by IS&TD's people. Due to the time constraints PCO had to hire more analysts to do the analysis part. The results of hiring analysts were not satisfactory because a lot of PCO's developed activities were not meeting the business requirement. The Systems Analyst said:

"This is another mistake that we have to admit because you cannot bring an outsider who can at best only spell out PCO and that is about it and expect him to understand all the requirements as well... So although we ended up with the bulk of customisation complete by late 1997 we were aware at the time that we will have to go back and do some changes which we have been doing since we went live".

After the completion of application customisation, the team was struggling with the payroll functionality. Smart Stream's Payroll functionality was designed to run standard monthly or weekly payroll, where everybody is paid automatically not through transaction input. However, PCO's requirement is to run Payroll daily. So the team ended up having a lot of problems adapting Smart Stream's Payroll functionality to PCO's requirements. The Systems Analyst said:

"With regards to the Payroll, we did not have to customise from a technical point of view but we had to set it up to accommodate all the different ways where all employees get paid, which was a complex task to do."

By April 1998, PCO started the parallel run stage. At this stage, PCO hired a consultant from the Vendor to work solely on migrating production data from the old system to the test server. The Smart Stream System was made available across the network to the key users in the main departments, in parallel with the old system. After completing three months of parallel run, a complete switch over to the new system took place and the old system was phased out.

4.4.4 Problems Encountered

During the project's implementation, several problems cropped up, however many were expected. The main obstacle, that the team was aware of, is the constraining policy as provided by the Mother Company. The other stumbling blocks that the team had to conquer during the course of this project include; the identification and agreement of project's objectives, leadership style and power requirements, composition of project team members and its stability.

There was no consent among the project team members with regard to the objectives and aims of the project. Moreover, the several changes in the team members and, above

all, the leadership change created serious disturbance and delays in the project. The project Manager was moved to another a division midst the project and another person was appointed in his place. As a result, there was confusion and discouragement among the team. The previous Head of Training and Development Department elaborated:

> "We were told by top management that these kind of projects should not be led by IT people but we should co-ordinate with them because previous projects failed because IT people managed and led the projects. But unfortunately during the phase of redesigning, at the middle of the project, (this is where I think it went wrong), I was transferred to the General Service Division. So another Head took my place and continued leading the project. This happened at the time when we were supposed to give the redesigned business processes to IS&TD where a team was initiated led again by the new Head of Training and Development Department. But I think there was no interest and commitment from the HR people during that phase and therefore the IT people, virtually, led the project because they had to finish the project anyway".

Another obstacle was due to the lack of co-ordination and communication between IS&TD and HRD since the start of the project. Although, there was a representative from IS&TD as a member in the project team, IS&TD was not given a constructive role in the redesign stage. IS&T Division Manager said:

> "There was no kind of co-ordination between IS&T Division and HR Division. We were physically involved during the purchase of the new package. But I think this project was a waste of time for many reasons. One is because I think the HR is not a core area to the company because our business is to produce oil, not recruit people. Two, and this is a very important point, the project was not led by a person who has a power and this created a problem in terms of the kind of change which resulted in improvements that was not radical".

The rudimentary approach of the process redesign adopted by the project team yielded diffused, sometimes conflicting, views of the scope and the aim of the redesign. For example, some of the team members believed that this exercise would inevitably address manpower sizing and hence would result in layoffs. The review of the workforce requirements created an environmental disturbance due to the hidden agenda and the resulting conflict of interest of some of the involved people. To overcome this conflict, the intervention of the top management was sought to decide on the objective of the redesign and the reduction size, if any, of workforce. The Head of Personnel elaborated on the management's decision:

"The management decision was that, regardless of the need of reduction, it is the right time to implement a succession plan by replacing many expatriates with new national graduates... This has added further turbulence, fear and resistance."

4.4.5   Results and Achievements

Late 1998, after the project's completion, the Project Manager presented the results and achievements of the project to top management. They can be summarised as follows:

◁   Increased productivity and turn-around time due to process streamlining. For example, the pre-recruitment cycle time was reduced from 6 to 4 days. Recruitment cycle time for expatriates was reduced from 209 to 87 days. *[See Appendix E for the previous and new business process and cycle time of recruiting expatriates]* Processing of salary adjustments cycle time was reduced from 15 to 5 days.

◁   Increased productivity enabling staff to emphasise on more value added work. For example, the man-days requirement for pre recruitment was reduced from 4 days per annum to zero. For salary adjustments, it was reduced from 75 to 25 man-days per annum.

◁   Financial savings by replacement of Application software to Smart Stream that performs more efficiently, more effectively and with reduced maintenance cost. The old IPPS was leased for USD 93,000 yearly and required a person to maintain it who costs USD 100,000 per annum. The acquisition and implementation cost of Smart Stream was USD 350,000.

The GM disappointedly, yet sensibly, epitomised the outcome of the project:

"We should name things rightly; what kind of achievement is this? This was a total failure. The project took almost ten years to complete and cost us a huge amount of money which extremely outweighs those acclaimed achievements. Have we had left everything as it was without this project, a natural evolution and improvements should yield better results. Would you imagine that we went through all of this to make the cycle time to recruit a person 110 days! Regarding the financial savings, a fair comparison should consider how much did they spend on consultants, their own cost, extra".

The previous Head of Training and Development Department regrettably said:

"When we handed the project to the IT and then a team was initiated from IS&T Division and HR Division to select a suitable package. They worked on it for one year and regrettably they choose the worst package, which was Smart Stream... Smart Stream is a powerful package but it was never tested and one of the main problems is the support. I believe that if they had purchased all the modules that compliments the package and implemented all, then there will be a drastic improvement because it is a good and powerful system... So unfortunately this group, I cannot say misled. I do not know what happened".

Regarding the implemented system, Smart Stream, the end-users expressed their dissatisfaction regarding the implementation. One of the end-users said:

"This system is not providing us with the same information as the previous one".

Another end-user said:

"Smart Stream, in terms of practicality, is less than IPPS, however is powerful. But the IT people say that this is the beginning and that we need to adapt to this and they would train us to utilise the powerful features that comes with the system. They also said that they would keep customising the system to our needs as we go along, then we are going to see different results. So we are waiting".

4.4.6 Organisational Culture and Structure after the Project Implementation

There was no salient change transpired in the organisational culture. Recently, however, the management recruited an external consultant to review and recommend a better organisation structure for HRD and corresponding manpower sizing. The GM requested an external verification of the acclaimed achievements by HRD and hence commanded the engagement of external consultants for this purpose.

After a review of HRD's organisational structure the consultant proposed a flatter structure and 10° o manpower reduction. The proposed HRD's organisation structure was implemented in 1999 *[see Appendix E for the previous and new HRD's organisation structure]*.

Some of the business processes were transferred to other divisions that most suited those, such as Special Religious Functions, different types of leave processing, training budgeting and duty visit budgeting. The Head of Personnel, for example, said:

> "To get an escort leave, it used to go to the General Manager to get an approval. This escort leave is given to an employee who accompanies his/her relative abroad. An HR employee would prepare the proposal and then give it to the HR manager. Then, the paper would go to the functional manager of the employee who had applied. Then, it would go again to the general manager for approval. Later, it would go back to the HR employee and finally given to the person who has requested. But currently, when some one requests an escort leave it goes to the HR employee and then to the HR manager for signature. Later the paper will be returned to the HR employee and back to the employee who requested the leave."

4.4.7   IT Infrastructure After the Project Implementation

The current IT Infrastructure is a modern Intel-based Client-Server environment for the major business applications (HR, Finance, Materials Maintenance and Management). There are a number of multi-processor supercomputers for reservoir simulation and seismic testing used for E&P (Exploration and Production). A modern ATM network connects all the users' workstations and PCs (both locally and remotely) to the central environment.

Although a state of art hardware infrastructure was put in place, the strategy for selecting and implementing software applications is problematic. The decision to opt for best of breed software selection and to adopt the best practices provided by those packages, was never adhered to. Customisation was made to all selected packages (HR, Finance and Material Maintenance and Management). Further, recently there is a serious talk to replace the recently implemented Smart Stream with Oracle HR. This was considered to provide a tight integration with the existing Oracle Financial package.

4.5   Case three: "WED"

4.5.1   Introduction

WED (Water and Electricity Department) is a public government sector established in the early 1960's, located in the capital city of one of the AGCC countries, to provide safe and reliable supplies of water and electricity. The Department carried a multinational compliment of technical and support staff of more than 5,000 employees distributed within a number of branches/ stations that operate in the areas of production, transmission and distribution of water and electricity. WED owns fifteen stations, 9 of which are stations for electricity and 6 for water.

The main vital objective for the Department is to provide the country with water and electricity due to its importance and direct effect to the life of humans and the progressive development of the nation in terms of its economy and civilisation.

The first systematic consumption of electricity in the city was in the year 1966 where a diesel station was established consisting of three machines and each one contained 1088 Kilo Watts. The request for electric energy has increased through the previous years where then individual units were established and connected with energy pipes from the major cities. Until the year 1983, the network was developed from individual networks into an amalgamated network of 132 Kilo Volts.

The first water desalination unit from the sea started its production in the year 1970 with a daily capacity of two million gallons of water. During that period the water supply was from the wells in one of the cities. Today it is still used for the far areas by enhancing them with a modern pump system. In addition, most of the far places and villages were added with ornamented seawater units and these units also supply water to the capital and other cities. This desalinated water is pumped from the stations through the latest network and installation of new machines and equipment, and then distributed to major cities.

The statistics shows a yearly increase in the production and consumption of water and electricity due to the expansion that the city is witnessing. Over the years, WED extended its reach invariably with geographically distributed operations and maintenance

activities all over the country. Currently, WED is involved in a number of expansion projects, with a long-term objective to export power to Turkey, Southern Europe and North Africa.

Over the years, WED had gone through tremendous change trying to satisfy customers' needs. In early 1997 WED had introduced the facility of allowing consumers to pay their water and electricity bills through the bank. In the same year the Department established a training centre in order to develop technical training and to nationalise the jobs in order for the Department to be able to expand in terms of production and services which needs high calibre and trained staff. However, the changes that have occurred through the years were limited due to being a government department which has its own rigid policies and procedures.

By 1996, the WED had grown to an installed capacity 3000MW and 200 million gallons of desalinated water per day to reach consumers' demands. Demands Forecasts were predicting future shortfalls in the supply of electricity, thereby requiring further investment by the government for capacity expansion. These forecasts when coupled with the ever-increasing costs for operations and maintenance activities prompted the government to look for alternatives to further investment in the industry.

4.5.2 Diagnosis

Similar to other traditional governmental departments, WED's policies, procedures and organisational structure were plentiful of bureaucracy and control. The department had extensible dealings with three major governmental departments: Finance Department (for budget allocation and control), Purchasing Department (for governmental purchases) and Civil Services Department (for planning of expansions and growth). All of the communication between those departments had to be directed through appropriate channels and protocol that respects hierarchy, which introduces additional factors of delays and inefficiencies. The system was so rigid and the implemented policies and procedures by each department further impeded streamlining even the day to day activities. Moreover, WED's workforce included a large number of unskilled and incompetent labour that contributed to the poor services provided and the unsatisfactory

performance. Also, there were overwhelming evidences of administrative corruption, authority abuse and unethical deals conducted in the department.

All of these obstacles and difficulties are inherent pathologies that are common in public sector departments that were known for years and accepted as constraints. However, what initiated the change in WED is the change in top management. The newly appointed Chairman, who is a member of the ruling family, did not accept this situation as a reality and was not satisfied with the performance of WED:

> "[WED] is supposed to be profit making department not a cost centre for the government to support. I believed that we could do a lot better in terms of fighting corruption and providing better and faster services to the customers".

In 1997, the Chairman recruited a number of management consultants and advisors to form a review committee to provide recommendations for improvements. The Advisor of the Corporate Development of Policies and Procedures recalled:

> "When I asked the Sheikh, what is it that you want with your Department? What are you looking for?... The sheikh replied: Whatever it takes, including firing people, to bring about a modern organisation that functions smoothly, effectively and efficiently".

The top management committee, which included a number of Western nationals who had an extensive experience in change management, was enthusiastic and optimistic to be able to introduce the required change with the backing and the power of the Chairman. However, this fanaticism faded gradually due to several reasons. One main reason was that a major number of the overall business processes that needed streamlining were cross departmental processes (such as the Procurement and Financial Processes) and hence recommendations for improvements can only address activities within the department but not beyond. For example, the Maintenance, Repair and Operations (MRO) procurement for the desalination plants and power stations which is necessary for the continuity of the business can not tolerate the long cycle time interjected by the Purchasing Department. Another major reason was that employees who had vested interest in maintaining the same approach of business conduct were resisting any change that could recall some of their authorities or reveal the corruption.

After six months of studies, the committee concluded that the only way to introduce the required improvements is via privatisation. The objective of this privatisation program is to introduce radical change in the Department, in addition to relieving heavy finanical burdens from the government budget, enhance the standard of services provided for the customers, promote the economical capabilities providing work opportunities for the nationals and enhance the private sector to contribute to this productive activities.

They considered privatisation in terms of operation and maintenance activities but not in terms of assets' ownership. The government decision to retain the ownership of the Department was due to the critical nature of the business and the overall social and economical developments in the country. The Advisor of the Corporate Development of Policies and Procedures explained the recommendation to privatise:

> "The motivation for change within [WED] was not there. The only avenue for realising these goals and objectives was through privatisation, which was the top management committee's main argument; that was the main thrust of their argument and I will have to say in the end that they were correct. Nobody was motivated to pursue the change, therefore implementations of these recommendations for the restructuring and reorganising of [WED] never got about. There was a lot of resistance within the organisation, it was just going to die and would never happen and I think, when looking at it as an outsider, they were right. Because the resistance and reluctance of people to put these recommendations into play was so great. As a result, ultimately privatisation was the answer. Maybe it did not have to be, but in the case of [WED] it was such a large organisation and there was so many functions within [WED] that I think privatisation as a first step was certainly the answer".

Organisational Culture and Structure Prior to Project Initiation

WED had a very rigid system and implementing any kind of change was extremely difficult. The organisational chart was a traditional vertical structure. The Sales Manager of one of the distribution companies (B) recalled:

> "The Department had a mixed of functional and geographic structure that never really worked. It means that one person can have two bosses and this had to be changed".

External departments such as Purchasing, Finance and Personnel controlled all of the major business processes in WED. For example, WED did not have a purchasing

function but had a clerical duty that processes papers through the Purchasing Department, which is a separate governmental department.

The country's culture had played a major role in forming and influencing WED's culture. The indulgence of nationals and the exceptional facilities provided by the government to them contributed in creating a lax environment that was overwhelmed by administrative corruption. The Sales Manager of one of the distribution companies (A) said:

> "There were issues such as corruption and difficulties that were not tackled for years involving debts with local families, who did not pay for the services for many years, and those were only shelved and hidden".

The skill-level of the workforce was strikingly poor which led to inferior work quality. WED was staffed with a large number of incompetent labour who were appointed based on relationships and contacts with influential people, this includes nationals who were high school graduates. Yet, it is extremely difficult, if not impossible, to fire nationals even if they do not have the required skills. The Sales Manager of one of the distribution companies (A) added:

> "The staff, whether they were nationals or expatriates, believe that the work ethic here was not strict and were lazy about finishing their work because they were working in a governmental body. Yet, amazingly there were many nationals who were listed in the payroll but did not show up in the work for years".

Business Processes Prior to Project Initiation

All the business processes were time consuming and many activities involved layered approvals from several managers. Those processes were bureaucratic, which were controlled by the outside Departments. This case study presents, as an example, the Procurement Process, which extended across a number of functional areas. This example involves activities, which were controlled by outsider Departments such as Purchasing Department and the Finance Department. The cycle-time of urgent Purchase Orders (PO) took at least two weeks and the other POs took between 45 days to three months. The whole process was laborious and manual. *Figure 4.5.1* shows the flow of information within the Procurement Process of WED.

The annual budget of the WED consisted of two parts that has to be approved by the Finance Department each year. The first part, which was operating budget, contains employees' salaries, expenses of official missions and conferences, consumables and assets' maintenance costs. The second part, which was the capital expenditures, contains budgets for major expansion and improvements projects in addition to acquisitions plans for items such as furniture, cars and spare-parts. The capital expenditure was financially controlled and authorised by the Finance Department. The Purchasing Department played an important role in both operating and capital expenditures because all purchases were done through them. Moreover, the Procurement Process depended on both the amount and the classification of the material/ service to be procured (i.e. whether an operating or capital expenditure).

The activities involved in the acquisition of materials or services were classified into pre-commitment and post-commitment activities. The pre-commitment starts with the issue of a Requisition Order Form (ROF) by the materials or services requester. If the items requested are materials, then the form is sent to the Store Section within that station to check the availability of the items requested. If the item is available, then the Store delivers the required items to the requester. If it is not available, then the ROF is returned indicating that the items are not available and at the same time the SS informs the Purchasing Section to initiate a Purchase Order (PO) for those items. This PO has to be signed by three Sections. If the amount of the PO is less than or equal to $ 14,000 then the PO is presented to the Urgent Purchasing Committee (UPC) for approval. The committee consists of Finance Manager, Store Manager and Purchasing Manager. Once the PO is approved, they issue an Enquiry and send it to the Finance Division for cost authorisation and verification. Then the Enquiry is returned to the PS in order to prepare the Request for Quotation (RFQ), who post it on the bulletin-board at the reception of the WED for interested vendors to quote.

Then interested suppliers record the RFQ number and accordingly submit a sealed bid offer indicating the company name, the items, quantity and prices together with the full technical description. After the closing date, the UPC opens the offers and prepares a list of offers. Then, all documents along-with the list-of-offers are sent to the requesting Department. The requester studies the list, price and its technical description, prepares a

technical report and approves it by his/her manager. The technical report is about selecting a company, the reason for choosing such a company, and if the price of such items is more expensive than the other companies then the requestor needs to justify his selection. Once the technical report has been approved, it is sent to the PS for approval.

The post-commitment activities start with the issuance of a PO for the selected supplier by the Purchasing Section. Once the items have been delivered, the examining and receiving committee consisting of the requester and a technical person examine the items to determine if it is according to the specifications indicated in the PO. If it is according to the specification then the Store Section issue a Final Receipt Voucher (FRV) otherwise they issue a Rejected Material (RM). The FRV is taken to the Finance Division wherein the payment voucher is prepared.

In the cases where the PO is greater than $14,000 then the PO is sent to the Finance Department for cost authorisation and verification. Once the PO has been authorised then the PO is sent to the Purchasing Department head office where they are responsible for preparing the RFQ, gathering and preparing the list of offers. The list is sent to the Purchase Section of the WED wherein the information is checked and forwarded to the requesting department for analysis. The rest of the steps are the same as the previous one. But when it comes to the payment procedures it changes slightly. The internal Finance Division prepares the payment voucher and then sends it to the Finance Department where they are responsible for payment.
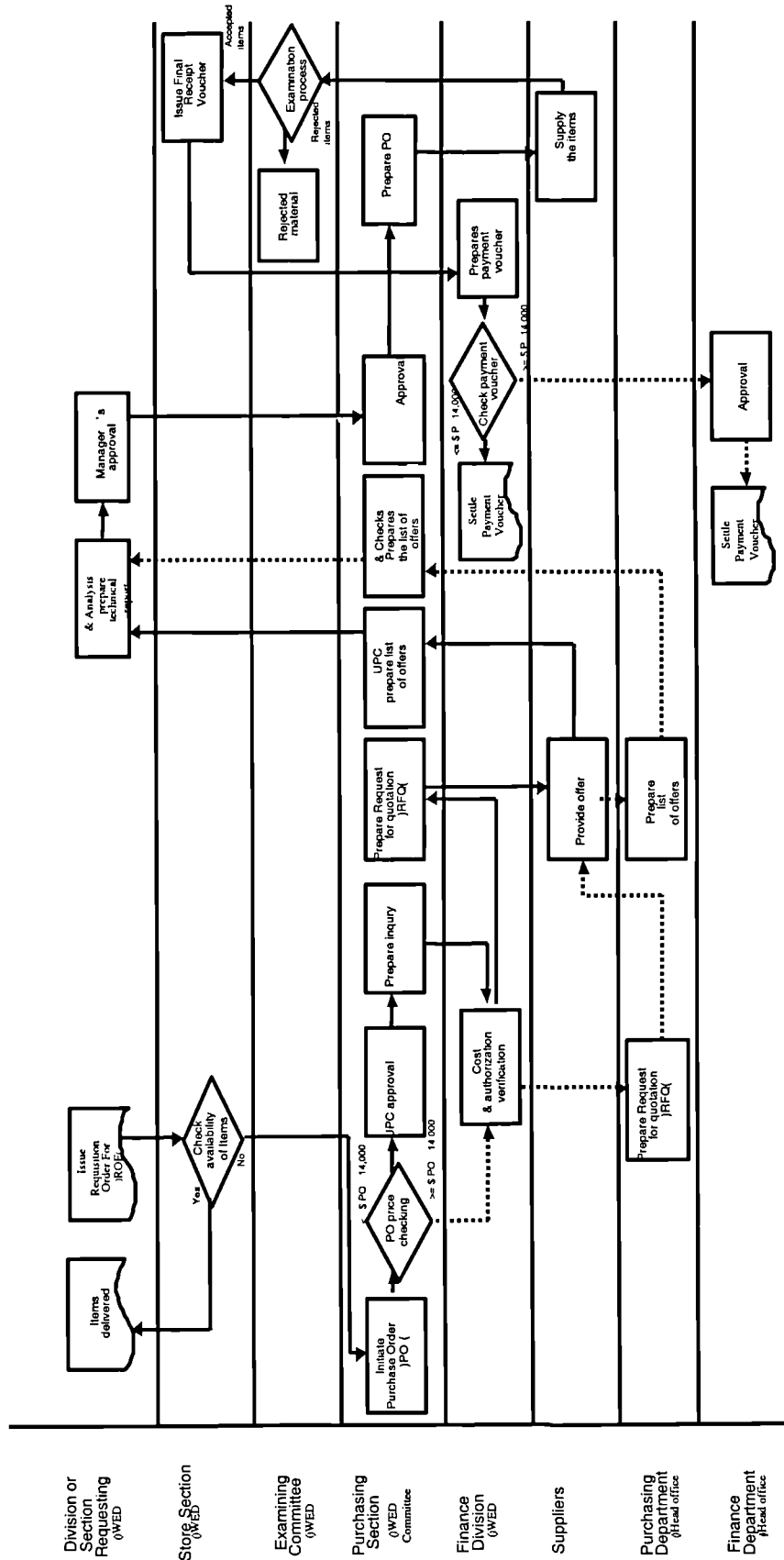
Figure 4.5.1 Procurement Process of WED

IT Infrastructure Prior to Project Initiation

WED's IT Section was a small unit with limited scope and role under the Administration and Finance Division. The IT infrastructure was primitive consisting of a number of basic disintegrated Information Systems distributed over a number of isolated LANs. The hardware infrastructure consisted of several Unix and NT Servers running Oracle Databases and applications in client/server environments. There were a large number of standalone PCs that were utilised for simple MS office applications. The Advisor of the Corporate Development of Policies and Procedures recalled:

> "I remember in 1994, I asked for, what I thought is, a standard report. It took them two months and a half to produce it. They had all the needed information in separate systems and to assemble it into meaningful information was very difficult"

He added,

> "There was a lot of money spent on purchasing PCs but with no strategy or even plans to train end-users. In fact, almost no one knew how to use the PCs and users did not want to figure-out how to use it. It was immaterial! They figured automation was just playing and having PCs on their tables. They came long since these days and we are not talking very long ago. It is not far back".

IT Section's staff were cynical due to the negligence of their potential role and the low representation in the organisation hierarchy. One of the IT staff said:

> "We tried to push hard to convince the top management of the important role of IT and the necessity for the IT to be a Division reporting directly to top management just like other divisions. However, it was not possible due to policies in the government sector which almost all departments are facing, and because top management does not appreciate the potential of IT in enhancing the efficiency and effectiveness of the department's operation".

Although the major processes in WED were cross-boundary processes that required a huge amount of information exchanges with external departments, such as Finance, Personnel and Purchasing Departments, this communication was manual, lengthy and paper driven. This has also resulted in frequent losses of information and documents. Add to this that most of the Divisions within the WED had no systems and hence the work was done manually. One of the Finance Division's staff said:

> "Our accounting systems in [WED] were manual systems and a manner of clerks. Most of the payments were not made at [WED] but were paid by the Finance Department. It was just processing paper but it was not a double entry book keeping system that they were following. It was just ledgers and single entries. Regarding information, we had little to work with. We had no personnel system, no material supply system, and no inventory system".

The few systems that were available, such as the billing system, were basic, old fashioned, full of bugs and very expensive to maintain. One of the IT staff said:

> "Before the privatisation took place, when I became aware that we spend about $ 120,000 yearly on maintaining the computerised billing system, I was puzzled. The system functionality was very basic to the extent that you can buy better functionality off-the-shelf system for half of the yearly maintenance cost".

The Sales Manager of one of the distribution companies (A) described the old billing system:

> "The old billing system was so old fashioned, bureaucratic, very dependent on paper and people".

4.5.3 Project Initiation

The top management committee presented their recommendation for improvements of WED to the Chairman. The submitted report discussed the imperative of introducing revolutionary changes in WED's existing business practices to bring about the requisite improvements. They further argued that for this revolutionary "clean sheet of paper" approach to succeed, WED needs to consider privatisation.

The idea of privatisation, with the Chairman's patronage, was presented to the government wherein a green light was obtained. In early 1996, the government issued a decree stated the intention to privatise the Water and Electricity Sector. The decree that called for the immediate establishment of a Privatisation Committee to study and provide recommendations on the pertinent approach.

To provide the required thrust and credibility for the Privatisation Committee, the decree was followed by a decision to establish Water and Electricity Authority (WEA) as a

public organisation, wholly owned by the government, to replace and carry out the duties of WED, maintaining full independent powers and eligibility qualifying WEA to carry out financial and managerial transactions. The Chairman of the Privatisation Committee managed the Authority. The decision also addressed the independence requirement:

> "The Authority shall have a separate personality and shall have the capacity to act as such in accordance with the Law and shall have financial and administrative independence in carrying out its affairs".

The Privatisation Committee consisted of 9 members: six nationals and three from Western Countries. The Committee hired a consulting company to assist in conducting some studies needed for a thoroughly cognisant recommendation. The consulting company provided the business case and recommendations on how to proceed with timeframes and tentative milestones for change activities that the organisation needs to go through. In addition, the consulting company presented a number of benchmark studies to help the Committee to conceive the steps involved in the implementation phase. The studies were based on countries such as Australia and other Western Countries. The committee felt that these studies were brought from places that had little resemblance to the real scenario at hand. The Advisor of the Corporate Development of Policies and Procedures described the benchmarks:

> "...This was a special situation, we have an economy, environment and culture which are different from many places in the world. [The consulting company] tried to give us a cross section, Australia and other places to look at and said this is how they do it there and then made recommendations based on these studies. We felt, as a committee, from our experience that the benchmark study is important for our situation but we wanted it to be based on neighbouring countries in the Arabian Gulf. I think we could have learned a lot and seen many benefits from neighbouring companies. Also, companies, such as ARAMCO, we could have learned a lot in terms of BPR and best practices functions. I do not know why they did not do so. Most probably, there were some political drives behind their selection of foreign companies".

Business Redesign

After studying the recommendations of the consultants, the Privatisation Committee started the organisational change phase to effectuate the Authority. This included review of the organisation structure and business processes. They started by splitting the

Authority into a number of companies based on functionality. The idea was to establish a mother holding company "i.e. the Authority" and group companies wholly owned by the Authority. The common requirements of all companies, such as IT, HR and Finance, are to be served by a Shared Services Directorate within the Authority. The aim is to centralise those functions that are not in the core business of those companies and hence could be out-sourced at later stages. Moreover, WEA is to own the shares of group companies, which operate in the areas of production, transmission and distribution of water and electricity, and has the legal right to sell part or all of the shares of those companies. The Committee decided to split WED into 10 companies, four distribution companies, four power generation companies, one transmission and dispatch company, one company for central services, one company for remote area services *(Appendices F provides a description on each company)*.

The Privatisation Committee established the business functions with the aid of external consultants. They prepared the business policies & procedures, business practices and quality assurance measures. The Advisor of the Corporate Development of Policies and Procedures said:

> "To start the business, a basic management, personnel, policies and procedures were developed and a basic accounting system was put in place because there was no IT role at that stage".

Implementation Phase

In March 1998, WEA was established and managed by a nine member's board of Management chaired by his Excellency. Once the Privatisation Committee announced the incorporation of WEA, the authority embarked in the unbundling and transferring the assets possessed by the former (WED) into more than ten separate entities specialised in the fields of production, transmission, distribution and supporting services. The assets, including the staff and property rights, were distributed among those companies including the Authority.

The Privatisation Committee established teams, consisting of ten to twelve members, representing each of the group companies to study and recommend a suitable

organisation structure and business practices that should be in alignment with the overall directions and objectives of the Committee.

After a careful review of the recommendations provided by those teams, the Privatisation Committee agreed on a unified basic organisation structure that they believed would serve the needs of those companies. The Advisor of the Corporate Development of Policies and Procedures explained:

> "Our feedback to the small teams of the companies was that we wanted to have all operating companies' structure to look alike, in particular for the power stations and we had four power distribution companies. There are two distribution companies and one transmission company and a couple of companies that were central services companies, but they all needed Finance, Administration, Material and Supply and IT. Also we made sure that we have identified all the functional responsibilities that the companies had and made their recommendations first with our basic organisational structure".

He added:

> "There was a lot of resistance when the teams received the feedback but at the end they had to accept it because everything they wanted was included but we planned it in a more efficient and effective way. They wanted to have big organisations. That was the first time that we stepped on their toes, but we did not step too hard, and eventually they got a point that they accepted".

Based on the Privatisation Committee's approved organisation structure for the group companies, each team of those companies started to re-evaluate the key positions, prepared job descriptions of positions required and changed business descriptions to match the new business procedures.

The teams started by a major review and assessment of the skills and qualifications of the existed staff to match the redefined roles and responsibilities. However, this activity was very complicated and delicate, which revealed major shortcomings. Some of the staff do not speak or write English, others were computer illiterate, and some others, for example, who are supposed to be accountants but bad failed to pass the accounting test. Only few staff were found to be satisfactory in the performance appraisal reviews. As a result there was a major subsequent activity of staff relocation, retooling and training, retirements

and terminations. Many staff were scared of this process especially those who were in over-resourced divisions. One of the IT training staff recalled:

> "This was a critical situation to everyone, but the committee tried their best to keep their old staff. So they tried first to train them for the new jobs and then it was discovered that many were hopeless cases and were not qualified even after the training as a result they were fired. We mainly lacked qualified staff in accounting and computer background".

The Sales Manager of one of the distribution companies "A" added:

> "We tried our best to help the staff before terminating them. If it did not work then we terminated them. Then we were very sympathetic about their situation. So if the staff had a family and they were going to school then we gave them a notice that the contract is going to be terminated until the end of the property or end of the schooling".

Afterwards, the recruitment phase for the vacant posts started. The Privatisation Committee started by employing the executives for the established group companies. This involved an international recruiting campaign. The Advisor of the Corporate Development of Policies and Procedures said:

> "We started a recruitment campaign in UK for Managers of established companies... We had a hard time to find good candidates to fill out roles such as Finance and IT. Until today recruitment is an ongoing process but on a minor scale".

IT Infrastructure After the Project Implementation

After the establishment of the required systems and procedures of the Authority and its group companies, the Privatisation Committee started to consider IT requirements to support the established business strategy. However, since the Privatisation Committee did not have the experience in IT, they hired a consulting company to study and recommend suitable Information Systems. The Committee decided that the priority was for a Financial System. Therefore, the consulting company developed the criteria for the Financial System. The Advisor of the Corporate Development of Policies and Procedures said:

> "The IT consulting company did their best to develop the criteria for the Financial System. They provided the basic bare bones for the Financial System because they did not have a user. There was no body who was going to use the system and certainly there was no body in [WEA] who had the knowledge of sophisticated Financial packages".

The consulting company also provided recommendations to hire an IT Manager together with the job description and skills' requirements for the post. The newly appointed IT Manager described the new role of his division:

> " ...It took a lot of energy and effort to convince the Management and get them to accept the importance of IT. As a result IT became a division in the Authority providing service for the whole authority and the group companies. We are responsible for the IT requirements of all group companies that have small IT Sections doing the coordination work".

According to the study provided by the consulting company, the IT Division started from scratch wherein Oracle Financials was implemented under a Client-Server and Unix environment. The Purchasing, Billing and Payroll modules were implemented based on the provided recommendations.

WEA's IT Division also evaluated a number of systems for HR and chose and implemented Oracle as well. Similarly, they implemented MAXIMO for the Materials Maintenance and Management System. The IT Division Manager explained the selection criteria:

> " ...My preference was for SAP as a single Integrated ERP system. However since the choice of Oracle for the Financial System was made prior to my appointment in the post, we were left with no other choice other than Best of Bread packages selection... The selection of Oracle HR was to provide the integration with the Financial System provided by the same vendor... When we came to the decision for Materials Management and Maintenance System, we were compelled to change our strategy. We found that we can not simply select a system from Oracle that would not provide the required functionality and features. We found that PSDI is the most experienced Vendor in the MRO and would better understand our requirement. We selected their praised system Maximo for this purpose. A number of local Oil Companies are using Maximo for the same".

Business Processes After The Project Implementation

Many changes have been introduced in the business processes to streamline and reconcile efficient and effective business practices. To maintain the flow of this case and to be able to visualise those changes, the same process, i.e. Procurement Process, that was described before project implementation is described after project's implementation.

The old Procurement Process is changed to introduce more empowerment. The involved activities are more efficient and does not require to dealing with the Finance Department or the Purchasing Department. The Manager of the Procurement and Contracts Department said:

> "The purchasing procedures at [WEA] have improved tremendously, in terms of efficiency and time. The cycle time has been reduced by at least 60%".

WEA has decided to adopt the business processes as provided by the implemented system, i.e. Maximo, without any customisation. The IT Manager managed to convince the top management that the best practices provided by the system can be adopted without any modifications. His argument was that those industry standard best practices are applicable for WEA and therefore no customisation would be required for the system, which would lead to a smoother implementation and with maximum utilisation of the system.

Currently, most of the activities involved in the Procurement Process are automated. The cycle time of the urgent POs are completed within a maximum of two days and the other POs takes between seven to ten days. *Figure 4.5.2* shows the flow chart of the Purchasing Cycle at WEA.

The PCD Director according to the type of item assigns a Buyer in the system. Then, the buyer checks those requirements and accordingly selects a bidder list from the system. The system provides a list of companies that are specialising in supplying such items. Then the buyer chooses three or four suppliers and approves it from the Director. Once it has been approved the buyer prepares the Request for Quotation (RFQ) and sends a fax to the suppliers to come and collect it. The suppliers are requested to provide two

offers, both technical and commercial offers. Once the suppliers send the two offers within the period requested, the technical offers are given to the requester for evaluation.

The Procurement Cycle starts with the issuance of MRF in the system by the requesting company. The process proceeds according to the delegation of authority. If the amount of this request is more than $ 30,000 then the Procurement and Contracts Department (PCD) in the Authority handles the process, otherwise it is handled internally.

The requester studies the offers and assesses whether the offers are according to specification or not. Then, the technical report is sent to the buyer at PCD. Then, the buyer opens the commercial offers and compares the technical report with the prices and then prepares a recommendation report. The recommendation report is presented to a tender-board committee, which consists of the Chairman of the Authority, the PCD Director and Finance Director. Once it has been approved the PCD accordingly initiates a Purchase Order (PO) and sends it to the supplier. Upon delivery, the requester inspects the materials. If it is accepted then the requester issues a Goods Received Form (GRF) in the system for the Finance Department to proceed with the payment.

4.5.4 Problems Encountered

During the implementation of the organisational change, the Privatisation Committee encountered several difficulties that they did not anticipate. This has slowed down the implementation pace in some instances. The process of restructuring, for instance, was a major stumbling block that required ample time for dialogues, convincing, forcing some staff to accept the new reality while getting others to adapt to the new reporting procedures.

Other problems that were faced during the transition process were in terms of the implementation of new IT, political barriers, lack of qualified staff, cultural and management issues.
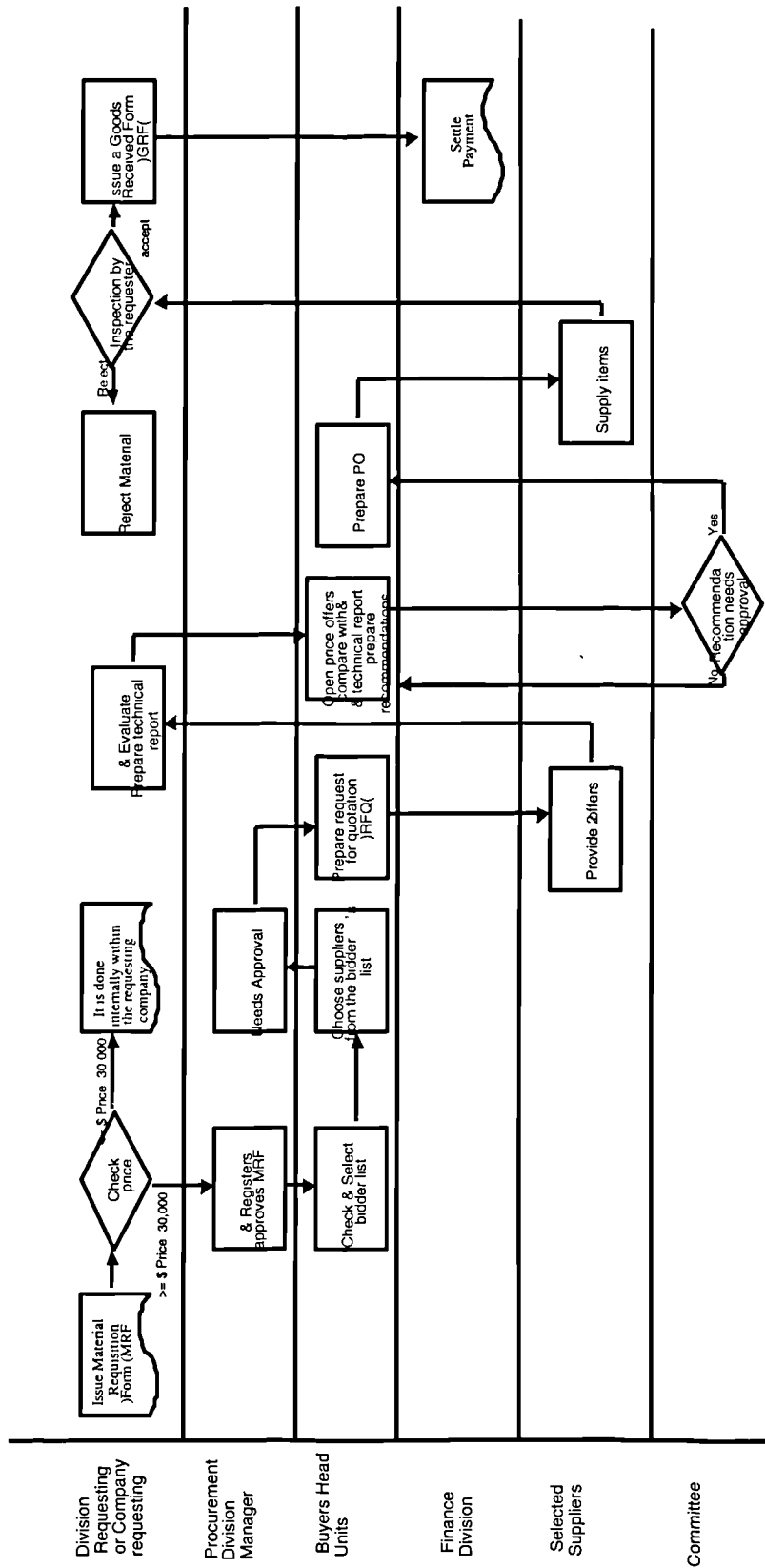
Figure 4.5.2 Procurement Process of WEA

The change was drastic which affected not only expatriates but nationals as well. WED had an environment of mixed culture with staff from different countries and with different level of qualifications and lingual skills. So all staff were struggling to know what will be their situation and what they should do in order to keep their posts. The Manager of the IT Division said:

> "The expatriates community were mostly resisting change...I think they see it with some scepticism because there was a lot of fear whether they will still have their jobs. I think when we talked about office automation, this was the simple largest threat to their job security because many of them knew nothing about PCs and there were many rushing out to take lessons to learn how to turn on a PC and learn about Microsoft packages".

The newly revamped IT Division was under a great pressure to demonstrate the capabilities and potential value that the Division can add to the business. They had to concurrently perform several activities to make up for the late involvement of IT in the project. They were evaluating, selecting, monitoring and sometimes participating in the implementation of the new systems. Concurrently, they had to train their staff, who were sometimes difficult to train due to their low skills and aptitude, and they were also recruiting new staff, which was also perplexing due to the difficulty of finding IT experts.

The implementation of new systems was a complicated undertaking and the success of this was, in some cases, problematic. For example, the newly implemented billing system did not meet the expectation of the users as they thought that this system is a copy of the old one in functionality, however the integration with other modules is implicit. The Sales Manager of one of the distribution companies "B" elaborated:

> "I think it was a big mistake from the beginning because the IT Division asked the same company that provided the Financial System to add a module for the Billing System. They were asked to copy the old system, which was a huge disappointment to me because we missed the opportunity to say our recommendations... The selection was made and then we were given a deadline of the 30th of December 1999 to implement the system. There was no documents, no contracts, no system specifications, no user specification of the new system".

She added:

"I was doing the procedures work afterwards which would not normally be done this way. Normally we would analyse the Business Processes then do a user specification and then go out to the market and see what is available and select a system. Then get an implementation team to implement the system. This case was different; they selected a vendor who can by default provide the integration then asked them to provide a system that mimics the functionality the existing system".

There was a lack of planning that was discovered during the transition period. The Sales Manager of one of the distribution companies "A" described the pressure that the group companies were undergoing due to the operating nature of those companies and the change mandate. He said:

"When I was employed I did not have time to look at the previous and current ways of doing work and look at new ways of improving it. Usually, we should have analysed what was the existing situation, give it to someone to study it, provide a proposal of improvement, then agree on it and on the cost and finally implement it...Such an exercise could take up-to one year to do it. However, I think it was a unique situation here. We have an operating company and customers who can not wait for until we improve the system. We need to continually service those people and at the same time asked to be extremely involved in this organisational change program. So we had to quickly concentrate on the high priority issues like implementing a new billing system and getting billing process correct. We had set a project team to do that which involved a mixture of sales, IT and Finance staff and just concentrated on improving and implementing the new system".

In addition there was a lack of communication among the small companies and top management, where some companies had continuously to go back to the top management for getting approvals and guidance. The Sales Manager of Distribution Company "A" added:

"We had to work twice as much to reach our objectives.... There was no strategic change team for setting up the mechanism for the authority and the individual companies to change, support and help them in the decision making process. We would have appreciated if there was a team on top of us who would be reporting directly to the Sheikh and at the same time responsible for the change process".

The role and period of the consultants' involvement was disputed among the committee members. The consulting company provided the study and the recommendations but were not involved in the implementation phase. The project teams had to implement those recommendations that were in some cases widely open. The teams had to rely on

their experience to come up with feasible ways to implement those recommendations. The IT Manager described the involvement of the consultants in the project:

> "Consultants come and do the easy work which is generating recommendation reports and get well paid. Then, they do not stick around to do the hard work, which is to implement those recommendations...Basically those reports are never implemented thoroughly, since important details were missed out...Unfortunately, the approach we have taken was not coordinated and we had to implement our own interpretation of those recommendations".

The act of self-protection by some of the staff was troublesome and difficult to overcome. Some staff were controlling information because they were afraid that they could be fired. It was very difficult for many staff to accept the change in terms of business functions and organisational structure since it would lead to a huge number of manpower reductions. The Finance Manager elaborated:

> "The change process, regardless what kind it is, is very difficult and privatisation is more difficult, but once privatisation is implemented then any changes that follow it would be easy to conduct. I think people in nature resist change regardless of the country but the difference here, which makes it more difficult, is the cultural aspects, which make the resistance difficult to overcome. This country still has a lot of old values, traditions they are reluctant to let go of and this is understandable. Another major problem on top of this is that people here are from other different cultures and they are large groups who have interest and are being threatened by the change...This group protection phenomena was clear when we started the reorganisation effort. Many were protecting their posts by hiding information and trying to blow up their roles in the organisation. ".

The Sales Manager of one of the distribution companies "B" said:

> "We tend to fire less people here than in the UK although here the staff skills we had were hopelessly low! For example, we were having meter readers who cannot drive and we were employing drivers to drive them who can read and write; why not have the driver read the meter? ...Those were employed based on relations and we faced a lot of resistance when we decided to get rid of them... Up-to date we have fired more than 5000 and I believe there should be a lot more to come".

The unawareness, of some of the newly appointed Foreign Managers, to the cultural constraints and country's tradition has created confusion and, in some cases, caused delays in change's execution. This was clearly indicated by the Sales Manager of one of the distribution companies "B":

"We employed a number of ladies and men as cashiers and were provided with induction training. We trained them on data entry for the new billing system, which was not yet implemented. So that once the system is ready then they will move into their jobs as cashiers. Many of the ladies did not like serving men because their families were not happy that they were facing men face to face. Although they have been employed as cashiers and their terms and conditions state so, they want to go back to data entry in the back office where there will be a room for ladies and not have any interaction with men".

4.5.5 Results and Achievements

The major achievement that WEA has accomplished via privatisation is seizing the independence from other governmental bodies. This independence alone has dramatically reduced the correspondence and decision cycle-times.   The Advisor of the Corporate Development of Policies and Procedures explained:

"I think it is a bit early to start asking for the performance measures, although the performance measures are certainly something we are looking at in all these various functions. But obviously it is just to say that initially at least through the privatisation process we made considerable improvements. The cycle-time for making a decision has reduced tangibly. We no longer need to include Finance or Civil Services or Purchasing Departments in our affairs... The cost of capacity has been reduced significantly and that we can measure.   We can do that by taking that into the bank in terms of significant saving being passed along to the customers...We are not there fully but it is getting close to being able to do it".

The preliminary assessment of the objective of providing quality service to customers, both internal and external, is encouraging. There has been a big change in the policies and procedures of the business conduct to streamline the business processes by empowerment and automation. The Manager of the Procurement and Contracts Department explained:

"Our day to day activities has become more productive and efficient. We managed to reduce the cycle time for the Purchasing Process by at least 60% by appropriately delegating authorities and using the Maximo system".

Moreover, there has been a reduction in cost due to manpower reduction. The number of staff has been reduced from 15,000 to 10,000 and the number is to be further reduced. The Human Resources Manager explained:

> "5,000 staff were terminated and it is possible that there will be more. This termination has revealed many pending problems that were hidden for years and then resolved by the replacement staff... We are still over staffed in my opinion...In Europe, I visited a company last year, they had 3,400 MW of installed capacity, it was combined with cycle gas treble and a steam by product and they need to produce steam commercially...It is similar to here. However, they are running their company with 850 people, and we have about 10,000 people. I am not saying we should be 850 but I am saying there is a big gap between 10,000 and 850 and I think we should fit in some where. I think we could do more with less".

The Finance Manager presented his assessment of the project:

> "Due to the use of Western Management processes and procedures, and business practices there has been a cost reduction in the construction which means that we will guarantee to deliver electricity and water and saving reliable quantities at prices about half what it used to cost. In addition, the income has increased and the debts continues to be reduced due to the controlled and supervised environment".

4.5.6 Organisational Culture and Structure After Project Implementation

In 1999, WEA opened the ownership to foreign investors to buy shares in the authority. The Authority was established, as 60% owned by the government and 40% private. The board of the authority sets the overall policies and guidelines to Water and Electricity Sector including the production, distribution, transmission and marketing of its supplies. Also, the board approves the annual budget of WEA and its Group companies, ratifies contracts and agreements concluded between WEA and other parties, reviews and follows-up the execution of the policies and guidelines, fixes tariffs, fees, charges and penalties related to electricity and water. In addition, the board issues rules, regulations and by law organises the structure and functions of WEA and its group companies.

The Sales Manager of one of the distribution companies "B" described the relationship between the Board of Authority and the group companies' teams:

> "The decision making, to my surprise, was better than expected. I had a great deal of support from the Authority where we had sensitive issues like a poor performing national or a national that we had a problem with or a customer that we had a problem with. We get advises from the Authority. I have been hearted and sometimes surprised by the support we had, because there are some managers

that were working here before who did not tackle many of the difficulties that we have especially some of the historical cases involving debts with national families. They were shelved and hidden not tackled and we have been gradually finding and taken them out of the cupboard and going through them".

Regarding the changes in WEA's environment due to staff termination, recruitment and relocation, this has contrived a positive impact and created a much healthier environment. The managers who were involved in the corruption were firedand staff who were incompetent, desperate of improvements even after retraining, were terminated.

As a result of the radical change process, the organisation's structure changed from the old traditional structure to a more flat and horizontal units in order to have a better communication among other divisions and top management. [*See Appendix F for organisation Chart of WEA and its group of companies*].

4.5.7   IT Infrastructure After The Project Implementation

The new IT Infrastructure is based on a Client-Server and NT environment for major standardised Oracle business applications (HR, Finance, Procurement). The integration of systems provides data centralisation, easy access of data, better performance and communication across the organisation.

The role of IT has completely changed due to the radical change in the organisation and its rigid policies and procedures, and the huge effort made by an IT Manager for Top Management to appreciate the potential role of IT in enhancing the efficiency and effectiveness of WEA. WEA's IT Division is a large Division, which reports directly to Top Management and plays a crucial role in providing technical support and service to WEA and its companies. In addition, WEA co-ordinates with IT Sections of all companies to provide service. The IT Division have skilled and staff with good knowledge, and recently they are considering Intranet project and Web Pages Payment to provide better customer service.

4.6 Comparison of the three case studies

Table 4.1 provides a comparison of the three case studies.

Description of the organisation	GCO	PCO	WED
Type of organisation	Gas Company & Semi-Private	Oil producing Company (upstream business) & Semi-Private	Water & Electricity Department & Government Sector
Establishment of company	1973	1978	Early 1960s
Reason for the project	To maintain their competitiveness in the market.	To overcome the internal worries and problems which would eventually impede the smooth operations of the company.	To overcome the poor service, unsatisfactory performance, bureaucracy, and relief of financial burden from the government.
No. of staff	1,000	3,000	15,000
Size of the project	Finance, Materials Maintenance & Plant Maintenance Divisions.	Human Resources Division	The whole Department
Project's outcome based on stakeholders' view	Success	Failure	Success
Role of Management Consultant	Techno-commercial consultant was engaged in conducting a ISSP study.	Management Consultant was hired after the failure of the project to solve the problems.	Consulting company provided study and recommendations but no physical involvement.
Problems faced during the project	No assigned leader to force change. People resisted change. No proper management of project.	Team was not united in terms of objectives. Leader not powerful so change was minimal.	Hiding information as an act of self-protection was difficult to overcome. Staff difficult to accept change. Unawareness from foreign managers of the cultural constrains and tradition. Lack of planning during the transition period.

IT	GCO	PCO	WED
Previous IT Infrastructure	Terminals, standalone PCs, most systems are in-house developed. Small number of LAN to WAN connections existed between HQ and the islands.	IBM ES/9000 mainframe with mostly IBM 3270 terminals and some token Ring connected PCs. Most applications were in-house developed	A number of disintegrated IS distributed over a number of isolated LANs. Hardware consisted of several Unix and NT servers running Oracle and applications in client/server environment and standalone PCs.
Problems with IT (Before)	Problem with solving the Y2K, problems with integrating the different legacy systems, difficult to maintain them, slow manual procedures no communication among divisions and data redundancy.	Instability in the Division due to the frequent change in the IT Manager.	No strategy or plans for training end-users. No important role for IT. They are neglected. Many systems are depending on papers. A lot of information is lost, communication is manual, lengthy and paper driven.
IT expertise/ endusers' skills	Well skilled staff. The majority of the users have a good base of knowledge.	IT staffs and end users had little skills due to the lack knowledge and training.	No vital role for IT, previous IT staff lacked knowledge and skills.
Role of IT people during the project	IT played an important role. They were involved through all the phases of the project, in terms of providing support to end users, provide technical support to set up the system and involved in the business process redesign.	IT people were involved in the project but they were not physically role. IT involved in the purchase of system.	IT staff are under pressure because of late involvement. IT Manager took a lot of effort to convince the Management of the important role of IT, then IT became as a Division to provide service for the Authority and companies.
New IT Infrastructure	SAP software with Modern INTEL-based server farm platform with client-server architecture running over fast Ethernet for LAN traffic ATM for WAN traffic.	Client Server applications and a network structure remained as Token Ring based TCP/IP infrastructure. Implement ready made packages solutions.	Started from scratch with Oracle Financials, Oracle for HR and MAXIMO for Material and Maintenance under Unix Client/Server for integration.
Tackling problems of IS during the project	IT people handled minor problems.	IT people could not solve the problems faced nor do any customisation with Smart Stream because of no technical experience.	Billing system was problematic and it is taking some time for new IT Division to solve it.
Role of IT Consultants	Consultants were hired to help team during implementation-lacked knowledge and experience.	Consultants were hired later to do some customisation.	IT consultant company was hired to study and recommend suitable systems.

Organisational Culture & Structure	GCO	PCO	WED
Structure of the organisation (after)	No major change to the structure. Only Finance Division has witnessed a change in its structure.	Structure of HR Division is flattened.	A radical change in the organisation structure.
Previous organisation culture	Constrained by rigid rules and policies enforced by Mother Company. GCO faced political problems as in public sector due to its nature. Replacing the GM every 4 years creates instability of Top Management. An environment of fear and self-protection due to mixture of different nationalities.	PCO culture is the same as GCO.	Policies, procedures and organisational culture were full of bureaucracy and control. Rigid system, delay of daily activities, administrative corruption, authority abuse, unethical deals poor staff performance and poor service.
Current organisation culture	No change in terms of rules, policies and political problems.	Minor change in policies but no change in terms of rules and political problems.	Semi-private company with their own policies and rules. Quality service to customers, productive, efficient daily activities.
Environment during the project	People were under pressure and feeling unsecured. Staff happy about test environment and self-training workshops.	Problems, turbulence and no motivation towards the end due to change of leader.	Newly appointed managers were pressured and no time to study the situation. Lack of qualified resources.
Environment after the project.	Staff are better skilled and efficient, work in a collaborative environment and better performance.	Work as a team and no more reporting to supervisor.	Healthier environment, skilled and knowledged staff, good performance and better communication among Divisions.
Manpower reduction	Finance Division witnessed manpower reductions, some were terminated and others were relocated.	No manpower reduction	A drastic manpower reduction.
Empowerment	Little empowerment due	Many staff were empowered due to	Empowerment among all levels of staff

	to SAP features.	the change in the structure and some policies.	
Communication	Good communication among stakeholders, users at all levels had interactive feedback, which shows a good communication among team members and users.	Lack of communication and co-ordination between IT and HR. The team adopted an open and transparent communication strategy with users.	Lack of communication and co-ordination between newly managerial staff and previous staff due to difference in culture, language and between small companies and top management.
Leadership during the project	No assigned leader so IT took the lead towards the end.	The team leader changed, IT took the lead and completed the rest of the project.	Supportive and handled sensitive issues well.
Top Management role	Supportive, involved in regular meetings and sign offs but during the implementation no focus in terms of objectives.	Supportive but no physical role.	Committed and supportive throughout all the stages.

Table 4.1 Comparisons of the three case studies

4.7 Summary

The chapter presented longitudinal narratives of three case studies of organisations in one of the AGCC countries. The cases described were for three large organisations. Two of those organisations are analogies in terms of ownership (semi-private), field of operation (petrochemical), structural, cultural and political similarity. The third case (utility organisation) is polar to the other two, hence allowed the investigation of the change in a diverse setting and facilitated the cross case analysis and comparisons. All three cases are organisations that have recently completed the BPR initiatives, thus furnished the advantage of investigating a fresh experience and obtaining finer details of the approach.

The following chapter provides an analysis of the case studies and tests the propositions presented in chapter 3 in the context of these case studies.

CASES ANALYSIS AND PROPOSITIONS TESTING

5.1   Introduction

To test the propositions, derived in Chapter 3, in the context of the BPR initiatives at the three subject case studies described in Chapter 4, an analysis of the outcome of BPR implementation at the three organisations must be conducted first. Therefore, an evaluation of the outcome of the BPR implementation initiatives at GCO, PCO and WED is presented in Section 5.2. Then in Section 5.3, the derived propositions are deductively tested in the context of those case studies. Finally in Section 5.4, propositions that are deductively invalidated using empirical data from the subject case studies are reformulated using interpretive analysis of data from the same case studies.

5.2   An Analysis of The Outcome of BPR Implementation at GCO, PCO and WED

There has been a plethora of research in the area of organisational performance measurement (see for example, Zmud & Armenakis, 1978). The effectiveness and performance of BPR initiative can be measured at various levels. These can basically be classified as measurements for hard dollar savings and soft dollar process improvements. However, most organisations would typically justify this type of project with a specific hard dollar savings opportunity. This requires rigorous methods for process performance measurement such as cycle time, costs, quality and ultimately customer satisfaction (Hammer & Champy, 1993; Davenport, 1993). Moreover, the outcome of a successful BPR project should result in improvements in employee "Quality of Work Life" and, therefore, should be systematically measured as an expected outcome of the initiative (Grover & Kettinger, 1995). Different methods such as Activity Based Costing (ABC) and Balanced Scorecard in conjunction with Total Cost of Ownership (TCO) and

Return On Investment (ROI) calculations are used for the purpose of assessing the financial dimension. Similarly, process metrics and quality techniques are used to quantify the process value and goal expectations. Once the effectiveness and performance of a BPR initiative are measured, these can be benchmarked against expectations and goals of the initiative (Expectation Gap) to determine the outcome of the project (i.e. degree of the success or failure).

Measuring the "Expectation Gap" to determine the outcome of the initiative presumes that those goals and objectives were stated in advance prior to the project initiation. However, for the case studies of this thesis there were no explicit and precise goals that were defined a priori that can be used as a baseline measure. Moreover, as indicated earlier in Chapter 4, since all three cases' organisations have recently completed the BPR initiatives, an informed assessment of the performance and effectiveness of the BPR initiatives would require more time.

Techniques traditionally used for evaluating IS implementation can be adopted to assess the outcome of IT enabled BPR initiatives. The notion of "Expectation Failure" was proposed to evaluate systems implementation (Lyytinen & Hirschheim, 1987). The "expectation failure" approach realizes the existence of multiple stakeholders of a system having different interests, values, levels of knowledge and power and, therefore, different expectations. Within this perception, failure is recognised as an embodiment of a perceived situation and, hence, a system that fails to meet the expectation of any of the stakeholders is perceived as a failure. Therefore, the importance of understanding how various stakeholders perceive and comment on the value of the implemented system is paramount and stressed in this approach. Most of the conducted surveys related to BPR that analysed the success and failure rates are based primarily on the questionnaire method to solicit stakeholders' perception on the outcome of their initiative (see for example, Deliotte and Touche study (Grover et al., 1995) and CSC Index survey (Information Week, 1994)).

In this study, drawing on the concept of "expectation failure", interviews of the various stakeholders are used to derive primary information on the results of each project. However since the researcher recognises that the subjective perceptions of the stakeholders may not always reflect the truthful outcome of the initiative, preliminary

performance results and external sources of information such as internal published articles and financial reports that were made available were used to authenticate those perceptions.

5.2.1 GCO

All the various stakeholders at different levels in the organisation denoted the initiative as successful. The General Manager in a published interview stated clearly that he saw the implementation of the project as successful. He said:

> "The implementation of SAP was hugely successful in that it greatly impacted the performance of [GCO]... In the year 2000, [GCO] achieved excellent performance in all areas of business ...The first and most important factor contributing to our success is the dedication and high sense of responsibility of all our employees in the discharge of their duties in an atmosphere of total co-operation and co-ordination on all operational and administrative levels".

The Finance Manager was emphatic about the success of the project, even though there were few adaptations problems:

> "I think it was a success with all the hiccups... The benefits of this project in our division can be summarised as follows: manpower optimisation, timely reporting (ease of decision making process for management & shareholders), efficiency (less human interference with fully integrated system), and flexibility (less time needed to prepare sensitivity analysis)".

The IT Manager was also noticeably delighted with the results of the project, even though there have been some difficulties during the implementation and delays in the completion of the project:

> "... Although Consultancy was an initial major problem, which delayed the implementation phase for six months, but the quick decision of finding another alternative through the contact of other shareholders (SAP customers) was one of the key success factors of the project... In sum, the project is considered as one of stereotyped success stories that we are proud of".

The Material and Contracts Manager attested the success and summarised the achievements' of the project in his division:

> "The project did achieve its objectives with regards to materials and contracts division and most of our requirements were met. It resulted in saving time and money. The project has also resulted in reduction of the manpower of the division and eventuated in a more efficient paperless work."

From the above testimonials and perceptions of the various stakeholders, which were verified by the preliminary performance results shown in Section 4.3.5, it can be concluded that GCO's project is considered as successful.

5.2.2 PCO

Although GCO and PCO are sister companies with similar organisational culture and structure, unfortunately PCO faced many problems in their BPR effort that ultimately led to the failure of the project. Some phases were seen as successful whereas other phases were seen as failure by many of the stakeholders interviewed. The toughest testimony of failure came from the General Manager who upsettingly epitomised the outcome of the project:

> "We should name things rightly. What kind of achievement is this? This was a total failure. The project took almost ten years to complete and cost us a huge amount of money which extremely outweighs those acclaimed achievements. Have we had left everything as it was without this project, a natural evolution and improvements should yield better results. Would you imagine that we went through all of this to make the cycle time to recruit a person 110 days! Regarding the financial savings, a fair comparison should consider how much did they spend on consultants, their own cost, extra."

A Team Leader, who was the previous Head of Development and Training, was interviewed. He was only involved at the first two phases of the project and then moved to another department. He was one of the members who was happy at the onset of the project and he expected failure once he left the department:

> "From the beginning I was aware of the threats and risks that were going to arise from the resistance of staff and the organisation's culture. So then we worked hard to overcome such issues by preparing the employees and the environment for such a change. When I left the department I handed in the project half way. The new Team Leader was not aware of these issues, therefore I expected that the next phases would be difficult and lead to the failure of the project...And now when I look back I was correct".

The new Head of Training and Development Department described the project as a failure impugning, in turn, IS&T Division for the fiasco due to wrong package selection:

> "To some degree we were successful moving away from the current business processes wherein few were radically changed. This led to getting rid of some of employees, which was not our aim. Because of the radical changes we wanted to introduce in some processes, we knew that the top management and Mother Company would not easily accept it. To overcome this, we decided to get the management support by involving them, through regular briefings and presentations, and requested their feedback and guidance...This was a successful strategy to gain the support of the top management to introduce such changes.... When we handed the project to the IT and then a team was initiated from IS&T Division and HR Division to select a suitable package. They worked on it for one year and regrettably they choose the worst package, which was Smart Stream... They have rendered the whole project as failure wasting all the effort we have made earlier".

Similarly, the IS&T Manager stated clearly that this project is a failure blaming the HRD for the outcome:

> "I think the project went wrong because we were not involved from the beginning of the project. Yes, there were few IT staff involved at the beginning but no real role for them".

The new business consultant who was recruited to solve the problems of the project said:

> "I think there are several reasons to the failure of this project: One, is because Workflow was the main reason why they choose Smart Stream but the implementation cost a lot of money which made them eventually cut the Workflow out of the implementation. Then, they were restricted with what the new system provided. So as a result the system was not as powerful as they expected because it did not give them the results they wanted. In addition, poor system training to the staff that made them not realise the benefits of the project. Two, they tried to implement the old processes and tried to implement what the old IPPS system provided because they were running out of time and they just wanted to complete the project".

From the above, it can be concluded that the implementation of BPR in PCO was seen as a failure by most of the stakeholders.

5.2.3 WED

All the interviewed stakeholders indicated that BPR in WED had been successfully implemented. The primary drivers behind undertaking this project involved the recognition of territorial walls, rigid system and bureaucracy in the department. The way to dismantle those is through changes in its traditional hierarchy structure and culture and the only way to introduce such change is via privatisation. The Top Management Committee realised from the study that the main reason behind the territorial walls and their impact on the bureaucratic business processes, which were controlled by the outside Departments, was due to the nature of the Department. Therefore the Committee decided not only to privatise the Department but also to replace many of the unskilled staff who were causing the administrative corruption and poor services.

The chairman was satisfied with the radical change in WED's structure and culture and described privatisation as the primary secret of the success of the initiative:

"The success of restructuring [WEA] would have been impossible without privatisation".

The Manager of the Procurement and Contracts Department evaluated the project from his department perspective:

"The privatisation was a definite success... Our day-to-day activities have become more productive and efficient. We managed to reduce the cycle time for the Purchasing Process by at least 60% by appropriately delegating authorities and using the Maximo system".

Similarly, the Finance Manager evaluated the project from the financial dimension:

"The positive financial impact of this project was obvious and welcomed by everybody... In addition, the income has increased and the debts continues to be reduced due to the controlled and supervised environment".

The Human Resources Manager also stated that he considers the project as successful, however he believes that there is a scope for further improvements specially in manpower size:

"5,000 staff were terminated and it is possible that there will be more. This termination has revealed many pending problems that were hidden for years and then resolved by the replacement staff... We are still over staffed in my opinion... I think we could do more with less".

From the above testimonials, which were verified by the preliminary performance results shown in Section 4.5.5, it can be concluded that the various stakeholders perceive WED's project as successful.

5.3 Deductive Testing of the Propositions

To test the derived propositions in the context of the BPR initiatives at the subject case studies, this section uses deductive logic through pattern matching and probing the presence or absence of indicators of the related constructs.

Proposition 1. *The existence of effective executive leadership to lead the BPR project and continually seeks support of all levels in the organisation will have a positive impact on the level of success of the project.*

The researcher uses the notion "executive leadership" to refer to a single leader from the top management who gets the organisation's focus on the change. In GCO case, the changes in the market landscape stimulated the executive management and shareholders to proactively look for BPR opportunities to improve operational efficiencies and, hence, maintain industry leadership. The Deputy GM formed a committee involving top management to assess GCO's performance and provide a plan for improving any identified shortcomings. The top management committee realised a need to significantly reinforce GCO's information technology infrastructure and redesign some of its incompetent processes.

Then, the top management committee hired a consulting company to conduct the review study. Based on the consultant's recommendation the top management committee established a technical committee to recommend a suitable IS package. Once SAP was selected, the proposal was presented to top management committee for authorisation.

Then, a project team was set up by top management committee to lead the project with the help of a consulting company. The team was given independent authority for developing and implementing their process visions, however the committee was steering the project through regular follow-up meetings and sign offs of all the stages of the project. The Deputy General Manager said:

> "We gave the team the authority to manage the project and they would inform us of their progress... We choose this approach because we appreciate the skills and knowledge of our staff and second because the team was conducting the project with the support and help of the consulting company".

The IT Manager said:

> "The top management were part of the committee who believed in the idea of organisational change and it success. Therefore, they initiated the project and were committed to it... They were steering the project but with no physical role in the actual process of change".

The IT Team Leader clearly stated that the lack of strong leadership needed to introduce the required changes and enforce the new procedures was one of the major problems encountered during the project:

> "There was no powerful person or one to lead and manage the project in terms of introducing improvements and measuring the benefits. As a result when it came to changing some of the business processes some of the staff refused to accept the change that would lead to eliminating some people because there was no one to force change." He added, "Another problem was in terms of procedural issues, there was no clear role who is responsible for this and who is supposed to do this and that. Is it my responsibility or your responsibility? There was no rules or guidelines for team members. These things were there and we could not avoid them".

Clearly, from the above, GCO's executive leaders merely provided the broad objectives of the project and some constraints in terms of project budget, systems' customisation and headcount reductions that had to be observed by the project team.

In PCO's case, the BPR project was a reactive initiative. The primary stimuli for initiating the project was, as stated by one of PCO's managers, "...the intolerable delays in cycle times of HRD's processes".

The GM was approached in order to solve the problems faced in the HR Division. As a result the GM requested the HRD Head to form a team to lead a project, which is business driven and not IT driven. The aim of this project was to reassess their processes by enhancing the existing HR processes, aiming at increasing customers' satisfaction and consequently consider an appropriate system to replace the one provided by the IS&T Division. Then, throughout the project, the role of the GM was limited to attending the regular monthly progress meetings.

Initially, the Head of Training and Development Department led the project. However, a midst the project, a new head was appointed who also assumed the project management responsibility.

Clearly, from the above, there was no single person from top management who can be identified as being the leader of the initiative. The GM merely served as an arbitrator between HRD and IS&TD, whereas the project leadership role was changed from one person to another a midst the project.

In the case of WED, the BPR project was a strategically reactive initiative. The primary stimuli to undertake BPR were clearly stated by the Chairman:

> "[WED] is supposed to be profit making department not a cost centre for the government to support. I believed that we could do a lot better in terms of fighting corruption and providing better and faster services to the customers."

The Chairman recruited a number of management consultants and advisors to form a review committee to provide recommendations for improvements. The General Manager of the Planning and Coordination Bureau explained the Chairman's role:

> "Although the Chairman recruited a number of consultants to provide us with recommendations, he closely monitored the change process. This is because his Excellency knew the difficulty of this exercise due to its nature and culture and the staff or consultants alone would not be able to achieve such a radical change and a huge improvement performance without his power and support".

The Advisor of the Corporate Development of Policies and Procedures described the Chairman's involvement in the project as imperative for its success:

"...The first phase of organisational change effort involved the privatisation and the second stage involved restructuring the whole organisation and making a tremendous cultural change. The Chairman closely supervised and supported the two phases... It would have been very difficult if not impossible to privatise [WED] without the patronage of the Chairman".

Clearly, from the above, that the leadership of WED's Chairman was imperative for the success of the BPR initiative.

To conclude, based on the evidence presented above and considering that the BPR initiative at both GCO and WED was seen as successful, it could be construed that only WED's case was consistent with what is hypothesised in the proposition. Whereas, GCO's case is not consistent with what is hypothesised in the proposition, since the BPR initiative was successful despite the absence of the proposed necessary condition of "the existence of a single leader from top management who gets the organisation's focus on change". For PCO's, although it was not consistent with what is hypothesised, nothing can be deduced since the initiative was seen as a failure. This leads us to rejecting, the proposition being tested. In Section 6.4 an attempt is made to reformulate this proposition using empirical data from the GCO and WED cases using interpretive analysis of data from the same case studies.

Proposition 2. *The existence of effective and open communication among the various stakeholders of the BPR initiative will have a positive impact on the BPR implementation success.*

To verify this proposition, the cases data is to be probed for indicators for the availability of open and honest communication throughout the initiative. In GCO's case, the project team highly believed in full disclosure and open communication and the importance of continuous information communication of the BPR effort in project success. It was clearly stated that the inception of the project involved a major activity to assess GCO's readiness to change and the initiation of the buy-in process to reduce resistance to change. This activity involved a series of workshop-driven exercises spanning the targeted departments to enable and then agree on the SAP vision for GCO which were then reflected within the project plans in terms of: project scope and objectives, business justification, enterprise processes impact, organisational impact, and master implementation plan.

Moreover, the selection of the "project team" members by senior management stressed on cross-functional representation assembly to openly discuss the process tasks, identify none value-adding activities and recommend areas of improvements. The top management steered the project through regular follow-ups. Deliverables of each phase was presented to top management and implications were highlighted.

Several workshops were conducted to discuss models of business process changes wherein key players and end-users evaluated the different options and evaluated the benefit of each option. The IT Manager described the users' community involvement:

> "Users at all levels were involved...feedback to and from the user community was incorporated at every step of the project".

Clearly. from the above, GCO in general valued the role of open communication and continuous information disclosure of the BPR effort as key for successful initiative.

In the case of PCO, the project team was aware of the importance and, hence, decided to adopt an open and transparent communication strategy whereby the scope of the project was presented and assurances that there would not be size reductions was given to the concerned staff through several presentations. However, this approach was only followed within the HR Division. For example, the lack of communication and coordination between HRD and IS&TD, who are the two primary stakeholders, was clearly evident throughout the project. The IS&TD Manager stated that they were not involved at the beginning of the project:

> "After redesigning the business processes and now involving us! It was not the right way nor time of involving us. We should be involved from the beginning of the project. The IT had been an after thought in the whole project and then consulting us what is the appropriate package to these problems? Unfortunately they did not realise this problem".

Similarly, the previous Head of Development and Training indicated to this lack of communication:

> "Unfortunately this was a confidence approval. IS&T Division Manager accepted the choice being made without making sure that his Division has the capability to

support such package. Yet, building a qualified support team, after the project hand-over, was not seriously looked into".

Clearly, in PCO case, the lack of communication and coordination among the various stakeholders was one of the primary reasons for the failure of the initiative.

In the earlier stages of the change effort, WED, similar to all public sector organisations, had a traditional and hierarchical management structure and was feeble in open communication. Initially, the committee established to provide recommendations for improvement in WED conducted several audits and studies wherein the views and advises of senior and middle management were solicited. Then, the committee presented their findings in a confidence to the Chairman. The Chairman, in turn, presented the idea of WED's privatisation to the government wherein a green light was obtained. The government then publicly announced in a decree the intention to privatise the Water and Electricity Sector. After, the public announcement and the establishment of the Privatisation Committee, the level of open communication improved considerably.

The Privatisation Committee established several teams, each consisting of ten to twelve members from various cross-functional areas, representing each of the group companies to study and recommend a suitable organisation structure and business processes. The teams' members participated in "town hall' type meetings soliciting inputs as well as providing directions and visions. Moreover, a number of information sessions and seminars were conducted to explain "the idea behind privatisation, the impact of the initiative, what does it entail and expectations for the staff and related issues".

Clearly, from the above, that WED's awareness of the mandate of communication in the initiative and hence the adoption of an open communication throughout the project implementation duration was key for successful implementation.

To summarise, both GCO and WED cases were consistent with what is hypothesised in the proposition. In the case of PCO, the failure of the BPR effort can be partly attributed to the absence of coordination and open communication among the stakeholders of the initiative. Thus, proposition 2 cannot be invalidated.

Proposition 3. *The existence of a compelling vision tied with a sound, well-described and feasible strategy to drive the BPR project will have a positive impact on the success of the project.*

To verify this proposition, the cases data is to be probed for indicators for the onset BPR linkage to plan and strategy. In GCO case, GCO wanted to maintain industry leadership and started its BPR project as a strategically proactive initiative with innovative IT solutions. The organisation was looking for BPR opportunities to improve operational efficiencies and strengthen its market position. The BPR began as an IT overhaul effort based on senior management's realisation for a need to significantly reinforce GCO's information technology infrastructure and redesign some of its incompetent processes. GCO's initiative started off with appreciation of the value of a business-focus linkage to IT change and provided a grand scheme to redesign their IT infrastructure to improve organisational performance. GCO avoided the launch of a major revolutionary effort due to cultural and structural constraints. Instead, the company focused on incremental improvements to achieve several feasible successes. It is worth noting that the involvement of consulting companies to provide strategies and plans to guide the project was one of the key imperatives for the success of the BPR effort.

The BPR effort, in the case of PCO, was a reactive initiative. The primary stimuli for initiating the project, as repeatedly expressed by several managers, was the intolerable delays in cycle times of HRD's processes. However, the proceeding of the project was not based on a rigorous plan. There was no clear vision or strategic linkage to the business strategy to derive the project. Instead, the project began with a request by HRD, based on their understanding of the source of the delays and problems in HRD's processes, to provide a new HR system. After the failure of the newly deployed HR system to meet HRD's expectation, the project direction changed. The GM intervened, as an arbitrator between HRD and IS&TD, and as a result requested the HRD Head to form a team to review the current processes of HRD. The GM said:

> "HR had to look into all their current Business Processes in each department and study whether this is what they want. If the Business Processes are not according to what they want and are not efficient then they should conduct a BPR study before introducing any IT system and then present their findings to the IT to find a suitable package for their requirements..."

Furthermore, it was clearly indicated by one of the team members, that there was no consent among the project team members with regards to the objectives and aims of the project.

Clearly, from the above, PCO's reactive initiative was rudimentary and was not linked to a well-thought plan or strategy.

In WED case, the BPR project was strategically reactive initiative. The Chairman's vision to " ...bring about a modern organisation that functions smoothly, effectively and efficiently" was the primary stimuli to undertake the BPR initiative. The Chairman recruited a number of management consultants and advisors to form a committee to come up with a feasible and sound strategy that articulates his vision. The strategy was based on introducing a revolutionary change in the organisation via privatisation. This strategy was presented to the government and, thereafter, approved. Moreover, the Privatisation Committee, which was established based on the privatisation decree, hired a consulting company to assist in conducting some studies needed for a thoroughly cognisant recommendation. The consulting company provided the business case and recommendations on how to proceed with timeframes and tentative milestones for change activities that the organisation needs to go through. In addition, the consulting company presented a number of benchmark studies to help the Committee to conceive the steps involved in the implementation phase.

Clearly, from the above, WED formulated and kept a strategy of revolutionary change from the onset of the project.

To summarise, GCO opted for a gradual evolutionary change and was strategy led and WED embarked upon revolutionary change and formulated and kept a strategy from the onset. On the other hand, PCO's BPR effort was rudimentary with no formulated plan or strategy. Recalling that both GCO and WED change initiatives were seen as successful whereas PCO's as failure, thus, proposition 3, cannot be rejected.

Proposition 4. *The existence of an appropriately composed team to manage the BPR project will have a positive impact on the BPR implementation success.*

To verify this proposition, the cases data is to be probed for indicators for the availability and appropriate composition of a team to lead the BPR. In GCO, initially a technical committee was established based on the technical experiences, to evaluate the available packages in the market. Then, another team was set up by the top management to lead the project. The project team consisted of 20 staff from diverse functional areas, combined group of IT and business with different experience. The team selection was based on their ability to work constructively as a group, and their ability to represent their areas of speciality. The IT Team Leader elegantly stated the rational behind the team composition:

> "The rational behind the team selection was to have roughly members breakdown of 60% with wide and deep business sense, 20% with wide business sense, and wide IT sense, and 20% with wide business sense and wide and deep IT sense".

Clearly, the composition of GCO's project team was rational and based on industry recommended best practice for project team selection.

In the case of PCO, a project team was established, as instructed by the GM, to be led by the Head of Training and Development. The team consisted of nine members with a majority from the business functions. The breakdown was 7 with wide and deep business skills (from HRD and Finance Division) and 2 with wide and deep IT sense (from IS&TD). The distribution was made to skew the discussions towards business models and processes rather than IT-enabled models and processes. The Project Manager indicated the rational behind the team composition and leadership:

> "This was a business, not an IT, event. I was chosen by the top management to lead the project, because they did not want the project to be IT driven."

However, the representation of IS&TD in the project team, as complained by the IS&TD Manager, was physical with no actual role:

> "There was no kind of co-ordination between IS&T Division and HR Division. We were physically involved during the purchase of the new package..."

Moreover, when the time came to select an appropriate IT package, a new 'package-selection team' was formed and led by the new Head of Training and Development. The team composed of end-users from different departments who knew exactly what the existing system was doing and its shortcomings. Then, a third team was set-up for the implementation which included people from IS&TD and key users from various departments who will be using the system. Some of the members were part of the previously formed 'package selection team'.

Clearly, the several changes in the team members and the replacement of the team leader in the middle of the project created serious disturbance, confusion, disagreement and delays in the project.

In WED, the Privatisation Committee established several teams, each consisting of ten to twelve members from various cross-functional areas, representing each of the group companies to study and recommend a suitable organisation structure and business processes. Deficiency of skills' representation in specific areas, such as IT, was catered for by hiring consulting companies to solicit advises for the purpose.

To summarise, both GCO and WED cases were consistent with what is hypothesised in the proposition. In the case of PCO, the failure of the BPR effort can be partly attributed to the several changes in the team members and the replacement of the team leader in the middle of the project. Thus, proposition 4 cannot be rejected.

Proposition 5. *The availability of representatives from the IT department in the composed BPR project team, but not assigned the project's leadership role, will have a positive impact on the BPR implementation success.*

To verify this proposition, the cases data is to be probed for indicators of the availability and IT Department representation and role in the project team of the BPR. In GCO, as clearly stated by the IT Team Leader, 20^0 o of the project team members were IT staff *"with wide business sense and wide and deep IT sense"*. During the implementation, the IS&T Division played a crucial role and were heavily involved in analysing and designing the business processes. In addition, they provided training, environmental control and security and support to end-users. The IT Team Leader indicated that a project team,

but not a single person, who led the initiative. He described IT Department's participation in the project:

> "We played an important part in the implementation and there was no segregation. To implement certain business areas and introduce improvements, for example in materials and finance division, there was a major role for IT in enhancing the business environment. We participated in deciding, for example, what type of activities to be eliminated what things should be enhanced, how things should be done eventually, and what changes should take effect in the system. We complimented the team because of our IT knowledge and, at the same time, most of us took responsibilities within the business environment".

Obviously, GCO's IS&T Division was rationally represented in the project team, yet it was not assigned the sole project management leadership role.

In PCO, the several teams at different stages of the project were all led by a staff from HRD. Two, out of nine, of the initial team members were representing IS&T Division. Thus, PCO's case was consistent with what is hypothesised in proposition 5.

In the case of WED, throughout the organisational change the privatisation committee, that was established by the Chairman, led the project. However, due to the nature of the project, the first priority for the committee was to come up with a duly organisation structure and business practices to be in alignment with the objectives of privatisation. For this, the committee established teams consisting of ten to twelve members from various cross-functional areas, representing each of the group companies to study and recommend a suitable organisation structure and business processes. After the establishment of the required systems, procedures, structures and business practices, the committee started to consider the IT requirements to support the established strategy. However, since neither the Privatisation Committee nor the Authority had the required IT skills to solicit views and advises, the committee hired a consulting company to study and recommend a suitable Information System for the Authority. Thus adequately covering main functional areas with required knowledge and skills.

To conclude, all three, GCO, PCO and WED, cases were consistent with what is hypothesised in proposition 5. Thus, proposition 5 cannot be rejected.

Proposition 6. *In a politicised organisation, the alignment of the motives of the actors, who have the power and potency to influence the flow of events of the BPR project, to the organisational vision will have a positive impact on the BPR implementation success.*

This proposition will be tested in WED only since, unfortunately, related data was not available for evaluation in the contexts of both GCO and PCO. In WED, one of the drives for the initiative was to combat the overwhelming evidences of administrative corruption, authority abuse and unethical deals conduct in the department were part of the motives for the initiative. The Sales Manager of one of the distribution companies (A) described the working environment and culture of the organisation prior to privatisation:

> "There were issues such as corruption and difficulties that were not tackled for years involving debts with local families, who did not pay for the services for many years, and those were only shelved and hidden... The staff, whether nationals or expatriates, believe that the work ethic here was not strict and were lazy about finishing their work because they were working in a governmental body. Yet, amazingly there were many nationals who were listed in the payroll but did not show up in the work for years".

The Advisor of the Corporate Development of Policies and Procedures elegantly stated that politics was endemic in the initiative:

> "...Obviously since many people have a great vested interest in the organisation, politics are entirely expected. There was variety of motivations for many staff to maintain the same way WED was carrying out its business... Many of the managers were resistant to previous change ideas put forward... I think their resistance was more to do with loss of control."

The Advisor of the Corporate Development of Policies and Procedures further explained that the established teams' reacted to the restructuring, as part of the initiative, by displaying animosity:

> "There was a lot of resistance when the teams received the feedback but at the end they had to accept it because everything they wanted was included but we planned it in a more efficient and effective way. They wanted to have big organisations. That was the first time that we stepped on their toes, but we did not step too hard, and eventually they got a point that they accepted".

Resistance was at all levels in WED. The change was drastic which affected not only expatriates but nationals as well. So all staff were struggling to know what will be their situation and what they should do in order to keep their posts. The Manager of the IT Division explained that:

> "The expatriates community were mostly resisting change...I think they see it with some scepticism because there was a lot of fear whether they will still have their jobs. I think when we talked about office automation, this was a simple largest threat to their job security because many of them knew nothing about PCs and there were many rushing out to take lessons to learn how to turn on a PC and learn about Microsoft packages".

The Advisor of the Corporate Development of Policies and Procedures answer to the question "What was done to eradicate this resistance?" was:

> " ... Do not forget that we had the backing of the Chairman...He himself had his own interest in bringing about a modern organisation. I strongly believe that the powerful, committed and aggressive leadership was pivotal in this achievement... Add to this, the communication strategy we have adopted. We kept all our plans as secret, until privatisation was approved and announced by the government. Hence, everybody understood that privatisation is a given fact since government decision can not be reverted "

To summarise, WED's case was consistent with what is hypothesised in proposition 6. As a result, proposition 6 cannot be invalidated.

Proposition 7. *Due to the particulars of public sector organisations, incremental change is the most feasible change in public sector organisations.*

This proposition cannot be tested in GCO and PCO cases, since both are semi-private sector organisation. Therefore, the proposition is to be verified using WED as a single case.

In WED, initially the Chairman recruited a number of management consultants and advisors to form a review committee to provide recommendations for improvements. The committee was enthusiastic and optimistic to be able to introduce the required change with the backing and the power of the Chairman. However, this fanaticism faded gradually due to several reasons. One main reason was that a major number of the

overall business processes that needed streamlining were cross-departmental processes and hence recommendations for improvements can only address activities within the department but not beyond. Another major reason was that employees who had vested interest in maintaining the same approach of business conduct were resisting any change that could recall some of their authorities or reveal the corruption.

After six months of studies, the committee concluded that the only way to introduce the required improvements is via privatisation. The objective of this privatisation program is to introduce radical change in the Department. The Advisor of the Corporate Development of Policies and Procedures explained the recommendation to privatise:

> "The motivation for change within [WED] was not there. The only avenue for realising these goals and objectives was through privatisation, which was the top management committee's main argument; that was the main thrust of their argument and I will have to say in the end that they were correct. Nobody was motivated to pursue the change, therefore implementations of these recommendations for the restructuring and reorganising of [WED] never got about. There was a lot of resistance within the organisation, it was just going to die and would never happen and I think, when looking at it as an outsider, they were right. Because the resistance and reluctance of people to put these recommendations into play was so great. As a result, ultimately privatisation was the answer. Maybe it did not have to be, but in the case of [WED] it was such a large organisation and there was so many functions within [WED] that I think privatisation as a first step was certainly the answer".

Clearly, from the above, the committee, which consisted of management consultants and advisors, realised that a BPR effort in WED without privatisation would at best result in incremental improvements. Hence, they had to privatise first in order to be able to introduce a radical change in the organisation.

To summarise, WED's case was consistent with what is hypothesised in proposition 7. As a result, proposition 7 cannot be invalidated.

Proposition 8. *In IT-enabled BPR change, ensuring that the to be selected IT will not endanger the match between the technical system and the customs and values espoused by the organisation will have a positive impact on the BPR implementation success.*

To verify this proposition, the cases data is to be probed for indicators for extent of match between technical and social system. In GCO, the technical committee that was

established to evaluate the available packages in the market with the priority for Finance, Materials Management and Plant Maintenance, studied carefully the requirements of the three Divisions. The IT Manager listed the major evaluation criteria:

> "...Functionality, technology, integration, Y2K compliance, flexibility, vendor reliance and customer base."

The choice of a SAP system was based on those criteria. During the business design stage, as clearly described in the case, several activities were taken to reveal the customisation requirements of SAP so as to fit the 'to be' business processes within SAP. To prototype the business scenarios, a number of business scenarios were defined, executed and the results were documented and reviewed. This activity was conducted so as to configure the software to fit the "to be" model that meets the business requirements. The IT Manager denoted the importance of this activity:

> "There were frequent meetings with the user community to discuss the change in business processes and how the new system would impact the way they do business...Prototyping using SAP was an important step which occurred several times because end-users were able to see how everything will be working and give feedback and then agree on something and implement it."

Clearly, from the above, GCO was aware of the need of a convergence between the selected system and the business requirements that encompasses the customs and values espoused by the organisation. This was done in some cases by making customisation to the package, whereas in other cases by adopting the default business processes of the system.

In PCO's case, a 'package selection team' was formed to be led by HR team leader and with member from HRD, IS&TD and Finance Division. The team investigated the option of acquiring off-the-shelf package, however due to the specificity of the HR business processes and because team members from IS&TD voted against any customisation to be made in the to be selected package, choices were limited. The current Head of Development and Training Department elaborated:

"Basically we had two main selection criteria. The first was imposed by the top management which is the potential cost of such acquisition. The second was imposed by IS&T Division. The IT people rejected the option of acquiring a system then tailoring it to our needs. They believed that those to be made customisations would cause problems for future upgrades plans... Unfortunately, this was very restrictive. For example, we have 42 nationalities to deal with, we have different work cycle because some employees work in the field and certain regulations apply to them. For example, [PCO] have employees on a permanent contract, temporary contracts, secondees from Mother Company and employees from industrial shareholders. All of these [PCO's] specifics have to be considered in the new system.... There are many requirements that are [PCO's] specific which you will never find in a ready made packages".

After the selection of SmartStream, the implementation team started to work on the "Gap Analysis". The analysis showed complete gaps in some areas, such as the unavailability of employee accommodation, and in other areas there was a slight gap such as the unavailability of fields like religion and Country of Birth in employee personal data. Then, the team started with the implementation of HRD's business processes that match processes provided by the system. However, in most instances, this was not possible and hence the team had to adapt the system to accommodate PCO's own style of business practices because many line managers rejected some of the Business Process Changes that were recommended. As a result, the team had to go for major customisation to accommodate the business requirements that has not been envisaged previously, which is a continuous process until today.

Clearly, from the above, that one of the main selection criteria which is to avoid any customisation, as imposed by IS&TD, was not fulfilled. To the contrary, customisation was the norm. During the implementation, major customisation requirements cropped up to fit the business requirements within the system. Specific customs and values espoused by the organisation, which were found as non-standard requirements, had to be catered for by the selected system and hence caused unforeseen delays.

In WED's case, specification of the IT requirements was made after the establishment of the required systems and procedures of the Authority. The Privatisation Committee hired a consulting company to study and recommend suitable Information Systems. The Committee decided that the priority was for a Financial System. Therefore, the consulting company developed the criteria for the Financial System. The Advisor of the

Corporate Development of Policies and Procedures indicated that there was no issue of

adaptation since there was not existing users or system:

> "The IT consulting company did their best to develop the criteria for the Financial
> System. They provided the basic bare bones for the Financial System because
> they did not have a user. There was no body who was going to use the system
> and certainly there was no body in [WEA] who had the knowledge of sophisticated
> Financial packages".

Moreover, the IT Manager explained the selection criteria for the remaining systems

indicating that the selection of a Materials Maintenance and Management System was

influenced by the wide usage of the system in the country and hence its tailor-ability to

the culture:

> " ...My preference was for SAP as a single Integrated ERP system. However since
> the choice of Oracle for the Financial System was made prior to my appointment in
> the post, we were left with no other choice other than Best of Bread packages
> selection... The selection of Oracle HR was to provide the integration with the
> Financial System provided by the same vendor... When we came to the decision
> for Materials Management and Maintenance System, we were compelled to
> change our strategy. We found that we can not simply select a system from Oracle
> that would not provide the required functionality and features. We found that PSDI
> is the most experienced Vendor in the MRO and would better understand our
> requirement. We selected their praised system Maximo for this purpose. A number
> of local Oil Companies are using Maximo for the same".

To summarise, both GCO and WED cases were consistent with what is hypothesised in

proposition 8. On the other hand, the frequent customisation requirements of the

selected package by PCO, suggest that the selection was made without considering the

requirement of a match between the selected system and the organisation's values.

Recalling that both GCO and WED change initiatives were seen as successful whereas

PCO's as failure, thus, proposition 8, cannot be invalidated.

Proposition 9. *In IT-enabled BPR change, the availability of IT expertise and sufficient end users*
skills to support the selected IT will have a positive impact on the BPR implementation success.

To verify this proposition, the cases data is to be probed for indicators for the awareness

to the requirement for expertise availability. In GCO case, the committee was aware of

the difficulty of implementing SAP and the scarcity of skills in the field. This awareness

was translated into a rigorous strategy to minimise the risk of failure. First, a consulting company was contracted to provide a highly qualified consultants to guide and help the internal resources of GCO to implement SAP. The IT Manager explained the rationale behind choosing the guided internal resources approach:

"We chose this approach because we wanted to build an internal experience to support the system and further enhance it. Moreover, it is less expensive for us because this way we require only small number of costly consultants. The disadvantage here was that this approach takes longer time because our internal resources had to pass through a sharp increase in their learning curve".

Furthermore, those internal resources were provided with intensive workshops and training related to organisational change, change management techniques and SAP implementation courses prior to the implementation phase. Second, GCO provided a solid business structure with which SAP training for end-users was conducted. The training courses were given to each employee according to their new job role. The training period of end users was full time for about two weeks wherein half of the employees of a division went for the training and the other half did the work and vice versa. The training was followed according to the business process documentation database, as described by the IT Team Leader:

"We had a database which identified the business processes. It keeps track of what is the business process, from where it starts to where it ends, what are the triggering events within the business process, what functions within that business process and who is performing the different activities within each business process. From this information, we built the training courses. Those training courses were centred around the interconnected business process that has formed some logical major function".

After the training was completed, the IT people provided self-learning workshops for each division. The workshop room was fully equipped with PCs and there was someone available in certain times to help and mentor the trainees. The purpose of these workshops was to provide an easy access and tranquil test environment after working hours so that employees can get adjusted and explore the new system without the work-time pressure where each person has his routine work to be performed. The Maintenance Systems Engineer described the advantage of the test environment:

"This test environment helped a lot in giving employees confidence of using the new system without fear of doing mistakes."

Clearly from the above, GCO was fully aware of the importance of the availability of IT expertise and sufficient end users skills for successful project, hence a rigorous strategy was adopted by investing extensively on training their IT staff and end-users.

In PCO's case, there are several testimonials indicating that the requirement for IT expertise was overlooked. For example, the Head of Training and Development commented on the selection of Smart Stream's selection:

"Unfortunately this was a confidence approval. IS&T Division Manager accepted the choice being made without making sure that his Division has the capability to support the package. Yet, building a qualified support team, after the project hand-over, was not seriously looked into".

Strikingly, this was clearly supported by one of IS&TD staff:

"We made a big mistake and we must admit it. The team chose a package where there was no technical experience so when it came to modifying the system, adding and developing new activities we failed to do so".

The newly recruited Management Consultant added:

"The end-users were happy with IPPS more than Smart Stream because they do not feel comfortable when using the new system. It had to do with a lot of things such as the perceptions of people, the level of training, the skills of end users and therefore they were not prepared well for it".

The lack of IT expertise forced PCO to totally depend on external consultants to support and carry out major customisations required in the system.

In WED's case, one of the factors that contributed to the poor services provided and the unsatisfactory performance of the organisation was the workforce, which included a large number of unskilled and incompetent staff. Therefore, the privatisation committee requested the teams of each company to do a major review and assessment of the skills and qualifications of the existed staff to match the redefined roles and responsibilities.

This resulted in a major subsequent activity of staff relocation, retooling and training, retirements and terminations. One of the IT training staff said:

> "This was a critical situation to everyone, but the committee tried their best to keep their old staff. So they tried first to train them for the new jobs and then it was discovered that they were not qualified even after the training as a result they were fired. We mainly lacked qualified staff in accounting and computer background".

Then, the Privatisation Committee hired an IT consulting company to study and recommend the suitable information systems. The consulting company provided also recommendations to hire an IT Manager together with the job description and skills' requirements for the post. According to the study provided by the consulting company, the IT Division started from scratch wherein Oracle Financials was implemented under Client Server and Unix environment. Purchasing, Billing and Payroll modules were implemented based on the provided recommendations. WEA's IT Division also evaluated a number of systems for HR and chose and implemented Oracle as well. Similarly, they have implemented MAXIMO for the Materials Maintenance and Management System.

Clearly, from the above, that the IT Division started from scratch whereby any crucial skills' requirements were recruited as and when needed.

To summarise, both GCO and WED cases were consistent with what is hypothesised in proposition 9. On the other hand, the lack of IT expertise which forced PCO to totally depend on external consultants to support and carry out major customisations required in the system, suggests that the selection was made without ensuring the availability of IT expertise within the organisation. Recalling that both GCO and WED change initiatives were seen as successful whereas PCO's as failure, thus, proposition 9, cannot be falsified.

Proposition 10. *Exploiting the potential of communication technologies to enable knowledge sharing will have a positive impact on the BPR implementation success.*

To verify this proposition, the cases data is to be probed for indicators for the utilisation of telecommunication technologies, such as groupware, workflow, EDI, imaging, Expert Systems (ES), LANs, Decision Support Systems (DSS) and Client-Server architecture,

for knowledge sharing by the initiative. In GCO's case, kernel changes in the previous IT infrastructure were made as a result of the BPR effort. The new infrastructure is a modern INTEL based server farm platform with Client-Server architecture running over fast Ethernet for Local Area Network (LAN) traffic and Asynchronous Transfer Mode (ATM) for the Wide Area Network Traffic (WAN). Moreover, SAP software provides better communications across the organisation, single database shared by many users, decentralisation, users' empowerment with more responsibilities, speed in reports issuance and, above all, default integration that had a great impact from end-users point of view.

It is evident, from the above, that several of communication technologies, including Client Server, LAN, WAN and systems integration, were implemented in GCO's initiative.

In PCO's case, the deployed HR system is based on Client-Server architecture. Moreover, a modern ATM network connects all the users' workstations and PCs (both locally and remotely to the central environment. Clearly, communication technologies, i.e. Client Server and LAN WAN, were utilised within PCO's initiative.

In WED's case, the new IT Infrastructure is based on Client-Server and NT environment for major standardised Oracle business applications (HR and Finance) and Procurement. The integration of systems provides data centralisation, easy access of data, better performance and communication across the organisation. Moreover, WED is currently considering Intranet project and Web Pages Payment to provide better customer service.

It is evident, from the above, that several of communication technologies, including Client Server, LAN, WAN and systems integration, were implemented in WED's initiative.

To summarise, all three, GCO, PCO and WED, cases were consistent with what is hypothesised in proposition 10. Thus, proposition 10 cannot be rejected.

Proposition 11. *The existence of a well-established IT infrastructure within the organisation will have a positive impact on the BPR implementation success.*

To verify this proposition, the cases' data is to be probed for the organisation's existing investment in different information technologies required to implement the BPR vision. In the case of GCO, the hardware infrastructure was mainly terminals and standalone PCs for word processing. Although there were a number of small LAN to WAN connections that existed between the central HQ location and the islands where the plants are located, information exchange was limited. Regarding software, most departments had their own in-house developed systems such as Plant Maintenance, Material's Management, Personnel/Payroll and Financial systems; there was no integration among them and were difficult to maintain. The existed IT infrastructure was insufficient for implementing the BPR vision. The changes required in the IT infrastructure as part of the initiative as described by the IT Manager were radical:

> "...We had to introduce kernel changes in the previous IT infrastructure. The Mainframe computing had to be replaced by an INTEL-based platform with client-server architecture running. All terminals and standalone PCs had to be replaced with networked PCs with fast Ethernet for LAN. Remote sites are connected via ATM network."

The IT Manager, further, argued that some delays in the project implementation were partly attributed to the insufficient IT Infrastructure:

> "...Obviously, have we had the appropriate Hardware and networking infrastructure, many of the delays that occurred due to infrastructural issues would have been avoided."

Clearly, in case of GCO, it can be maintained that improving the IT infrastructure would enhance the extent of the success of the BPR implementation.

PCO's IT infrastructure, similar to GCO's, was based on IBM ES/9000 mainframe with mostly IBM 3270 terminals and some Token Ring connected PCs for powerful end-users. Most divisions had their own in-house developed mainframe applications such as the HR. With several changes in IT management, different strategies and, hence, changes in infrastructure had taken place. First, Client-Server computing was touted as the extrapolation of inflexible mainframe-based application, hence, the new manager decided to move from the mainframe-based application to Client-Server applications to exploit flexibility and reconfigurability to support the business strategy. Second, the next

manager decided to toss the recent investment in the Token-Ring based TCP/IP network infrastructure and was determined to install ATM network connect all the users' workstations and PCs (both locally and remotely) to the central environment. Moreover, PCO's application portfolio consisted of a hodgepodge of applications developed/purchased during the past 15 years or so that required some form of life support to exist. During the transition from the mainframe to the Client-Server architecture, management planned to replace this mixture of home-grown with standard packages. One of the IT staff explained the effect of those changes in the IT infrastructure on the project:

> "...During this period [i.e. project] our department was involved in a number of concurrent projects. We were replacing the mainframe, the networking and the applications. Our resources were stretched thin... We had to prioritise the activities and distribute resources accordingly... Definitely, this introduced delays."

Clearly, in PCO, it can be argued that some delays in the project implementation were partly attributed to the lack of sufficient IT Infrastructure.

WED's IT infrastructure was primitive consisting of a number of basic disintegrated Information Systems distributed over a number of isolated LANs. The hardware infrastructure consisted of several Unix and NT Servers running Oracle Databases and applications in client/server environments. Yet, there were a large number of standalone PCs that were utilised for simple MS office applications. The lack of sufficient IT Infrastructure and the late involvement of the IT in the project, delayed the implementation but did not endanger the outcome of the initiative. The initiative mandated changes to the IT infrastructure wherein the new infrastructure is based on Client-Server and NT environment for major standardised Oracle business applications (HR and Finance) and Procurement. LANs to LANs connectivities were achieved via WANs connections. The Advisor of the Corporate Development of Policies and Procedures explained the effect of those changes in the IT infrastructure on the project:

> "...Things that we could not implement with the existed IT infrastructure were delayed. This has consequently prolonged our initially planned timeframe for completing the project."

To summarise, it is evident from all three cases that the availability of appropriate IT infrastructure would reduce the risk of delays and enhance the extent of the success of the BPR implementation. Thus, proposition 11 cannot be rejected.

5.4   Proposition Reformulation Using Interpretive Analysis

In this section, an attempt is made to reformulate proposition 1, which was rejected through deductive testing, using empirical data from GCO and WED cases using interpretive analysis of data from the same case studies. This proposition states that the "Existence of effective leadership to lead the BPR project and continually seeks support of all levels in the organisation will have a positive impact on the level of success of the project".

Recalling that GCO experience was not consistent with the proposition, while WED experience was consistent, it would be useful to use the discipline of hermeneutics to resolve this breakdown in understanding of this proposition. To perform the interpretation using validation hermeneutics, the guidelines offered by Hirsch (1967) for assessing the quality of an interpretation of human behaviour is respected, as follows:

> A good interpretation resolves any apparent anomaly or irrationality. A good interpretation, however, need not be final and conclusive because, at least in principle, improvements in the interpretation will always be pursuable.

The interpretation involves several iterations around the subject data, with each iteration ending with a different understanding and a different enigma, thus bringing additional data to the researcher's focus (Davis et al., 1992).

In the first iteration, the starting point for the researchers interpretation of the importance of existence of effective executive leadership to lead the BPR initiative was based on the assumption that the most important contributions of the leadership (as indicated in Chapter 3) that need to be carefully addressed in the initiative are:

1. Demonstrate commitment and support for the project,

2. Authorise and motivate the overall BPR,

3. Provide the needed resources to the project team,

4. Provide adequate funding,

5. Articulate the vision and communicate the business reasons for change, and

6. Responsible for shaking the barrier and removing the stumbling blocks set within the organisation by people resisting the change process.

In attempt to resolve the breakdown posed by the experience of GCO with respect to the leadership existence, the apparent contradiction in GCO and WED experience can be resolved by analysing each of the expected roles of the leadership and identifying data to support the existence or absence of those roles within both initiatives. Both GCO and WED data provide evidence that the cases' were consistent with the first 5 main contributions of leadership listed above. However, those roles were assumed by a single "champion" in the case of WED whereas by several people in the case of GCO. The discrepancy found was that the requirement for shaking barriers and addressing people's resistance to change was consistent in WED's case while absent in GCO's case. This would suggest questioning the initial assumption that shaking barriers and addressing people's resistance to change is critical for successful BPR. This would imply that shaking barriers might not be a mandatory role of leadership.

In the second iteration, the researcher's interpretation that shaking barriers and addressing people's resistance to change is not critical for successful BPR is seen as counter-intuitive in the light of plethora of evidences in the related literature and case studies regarding its importance, thus presenting anomaly that had to be explored further. GCO's IT Team Leader reflection on the change strategy adopted by the organisation provided a way to resolve this breakdown:

"We did not face a situation where critical decisions had to be taken, simply due to the fact that we decided to go for a progressive business change with time rather than revolutionary changes".

This suggests that the leadership role and scope of involvement is dependent on whether revolutionary or evolutionary change is undertaken. This observation is coherent with WED's case that undergone a revolutionary change program and was consistent with the proposition.

Related research examining leaders characteristics and behaviour is reviewed for evidence to support the researcher's interpretations. There have been a number of theories that explore the effectiveness of leadership styles and behaviour. Most leadership behaviour theories adopted a contingency approach (Flamholtz, 1990; Filley et al., 1976; Fiedler, 1967; Rice, 1978; Vroom & Yelton, 1973). Under this approach, there is no single leadership behaviour that works in all situations.

Flamholtz (1990) has developed a framework on the behaviour of leaders when change is the goal. This framework links relevant situational factors to the leadership style employed for performing the leadership tasks. The findings were that successful BPR leaders use leadership styles that fit the situation better and they have a better balance between the two leaderships' task orientation: management of BPR members and tasks.

Most surprisingly is the findings of Bass (1985), who identify 'change' as another variable to be part of the contingency approach. He distinguishes between different levels of change and recommends different styles of leaderships. Transactional leadership is effective for first order change, whereas transformational leadership is needed for higher-order change.

5.5   Summary

Table 5.1 provides a summary of the outcome of the propositions testing in the context of the case studies' data.

Construct	Proposition	Deductive Test Outcome
- Leadership	*1) The existence of effective executive leadership to lead the BPR project and continually seeks support of all levels in the organisation will have a positive impact on the level of success of the project.*	Rejected Interpretively reformulated as follows: *The existence of effective executive leadership to lead the BPR project and continually seeks support of all levels in the organisation will have a positive impact on the level of success of the project. However, required leadership style and tasks is dependent on the required level of change.*
- Communication	*2) The existence of effective and open communication among the various stakeholders of the BPR initiative will have a positive impact on the BPR implementation success..*	Valid
- Strategy led	*3) The existence of a compelling vision tied with a sound, well-described and feasible strategy to drive the BPR project will have a positive impact on the success of the project.*	Valid
- Team Based	*4) The existence of an appropriately composed team to manage the BPR project will have a positive impact on the BPR implementation success*	Valid
	5) The availability of representatives from the IT department in the composed BPR project team, but not assigned the project's leadership role, will have a positive impact on the BPR implementation success.	Valid
- Politics	*6) The availability of representatives from the IT department in the composed BPR project team, but not assigned the project's leadership role, will have a positive impact on the BPR implementation success.*	Valid
- Sector	*7) Due to the particulars of public sector organisations, incremental change is the most feasible change in public sector organisations.*	Valid
- IT-Culture fit	*8) In IT-enabled BPR change, ensuring that the to be selected IT will not endanger the match between the technical system and the customs and values espoused by the organisation will have a positive impact on the BPR implementation success.*	Valid
- IT expertise and end-user skills	*9) In IT-enabled BPR change, the availability of IT expertise and sufficient end users skills to support the selected IT will have a positive impact on the BPR implementation success.*	Valid
- Communication	*10) Exploiting the potential of communication technologies to enable*	Valid

Technology	*knowledge sharing will have a positive impact on the BPR implementation success.*	
- IT Infrastructure	*11) The existence of a well-established IT infrastructure within the organisation will have a positive impact on the BPR implementation success.*	Valid

Table 5.1 Summary of the outcome of prepositional testing in the context of the case studies

QUALITY AND IMPLICATIONS OF THE STUDY

6.1   Introduction

The objective of this chapter is to evaluate this study in order to assess its quality and rigour and demonstrate the relevance and value of the research by imparting "operational" BPR framework.

The quality of this study is evaluated in Section 6.2. Then, in Section 6.3, the implications of the findings of this study are discussed by presenting an operational BPR framework.

6.2   Quality of the Study

Due to differences in the underpinning ontological and epistemological assumptions of positivism and interpretivism (such as the posit of social reality as either objective or subjective), the demand on establishing rigour fluctuates based on the methodological base of the study. Interpretive studies in IS are less demanding in terms of establishing rigour for an interpretation and are infrequently subjected to evaluation criteria. Thus, the limited interpretation made in this study, which was based on validation hermeneutics, is not evaluated in this section. The quality of the positivist part of this study is investigated for adherence to guidelines for rigour both during the research process and "post hoc" after the study has been conducted.

Yin (1994) provided the methodological guidelines for case studies by analysing those from the philosophical perspective of positivism. He recommends a number of methods to assess the reliability and validity of the qualitative research, as discussed earlier in Section 3.9, that would contribute to the overall quality of the research.

The procedures followed in this study to address the validity concerns as recommended by Yin (1989) are addressed in the following subsections.

6.2.1 Construct Validity

This study used three strategies to improve construct validity as suggested by Yin (1989): using multiple sources of evidence, having members of the subject organisations being studied review the case study report and corroborate the reconstruction of the facts, and establishing a chain of evidence by presenting cases' information in an smoothly traceable manner.

- The use of multiple sources of evidence:

Case study researchers propose triangulation of data sources as one way to achieve rigour (Yin, 1989; Flick, 1992). The combination of multiple perspectives and data sources adds rigour, breadth and depth to any investigation (Yin, 1989). In this study triangulation was used in many instances by drawing upon data available from different resource including interviews, archival records, documents, physical artifacts and observations. As discussed earlier, the primary sources of information for this research's three in-depth case studies was the "official" interviews carried with many members of the subject organisations. In addition, in many instances the researcher was given access to a number of documents and external sources of information such as companies' profiles, newsletters, progress reports, internal published articles, financial reports, informal conversations, and projects' documentation. This helped ensuring a high degree of validity by providing a multiple measures of the same inquiry. For instance, while evaluating the achievements of the organisations under study due to the BPR initiative, the researcher recognised that the interviewees' subjective perception of the achievements may not reflect the truthful outcome of the initiative. Therefore, preliminary performance results, financial reports, progress reports and other external sources of information, which were accessible, were used to validate those acclaimed achievements.

- Having members from the subject organisations review the cases' report:

Case study researchers also recommend "members checking", wherein members of the organisation being studied review the case study report, to confirm facts presented in the case (Yin, 1989; Trauth, 1997; Erlandson et al., 1993). This procedure should help

reducing the likelihood of falsely reporting an event, hence enhancing the accuracy and increasing the construct validity (Yin, 1984).

In this study, the entire case study narratives for both GCO and WED were reviewed and commented upon by one member from each respective organisation. For GCO, the IT Manager reviewed the draft case study report and indicated that the report presented a thorough and accurate depiction of GCO's BPR effort. Similarly, for WED, the Advisor of the Corporate Development of Policies and Procedures has reviewed the draft case study report and conveyed that the report portrayed WED's case correctly.

In the case of PCO, arrangements could not be made to have members at the organisation to read and comment upon the draft case study report. The main reason was that the case study narrative is revealing a failure and describing some negative aspects of the members that could be perceived by some members as detrimental for the organisation and the professionalism and competency of its members. In such cases, a request to review the case report could possibly lead to the member's contest to the stated facts or the withdrawal from the study.

Other ways to carry out "member checking" were followed as recommended by Erlandson et al. 1993 to further increase the accuracy in the cases and offset by not having a member from PCO reviewing the case. First, as described earlier in Section 4.2, one procedure that was strictly adhered to in all interviews with members from all three case studies organisations was to summarise important points made by the interviewee at the end of each interview, thus allowing him to correct any misunderstanding or challenge interpretations. Moreover, to achieve ultimate honesty and accuracy in conveying opinion, all interviewees were given the chance to review their own statements that are quoted in the case report to ratify that those speeches are indeed theirs.

Second, the semi structured proceeding of the interviews that was followed in this study facilitated the natural conduct of members checking in the interviews by verifying interpretations and data gathered in earlier interviews (Erlandson et al., 1993). As described in the earlier Section 4.2, the researcher started each interview by describing the objectives of the study and invoking the interviewee "storytelling" by requesting him to describe the project in story form by asking broad questions that serves the purpose.

The researcher sometimes interrupted the interviewee whenever detailed insights were required. After each interview, the researcher transcribed the interview and refined the previously drafted case study. In each subsequent interview, the same procedure was followed, however some of the given details and interpretations in previous interviews were cross-checked for accuracy and/ or second opinion, hence enabling member checking through a dynamic form of triangulation. Therefore, the final write-up of the case studies passed through several iterations for thoroughness and accuracy.

- Establishing a chain of evidence:

Yin (1989) recommends that the construction and presentation of the information in the case studies should be in a manner whereby the reader would be able to trace the sequence of events from conclusions back to initial research questions and vice versa.

In this study, this was achieved by presenting a detailed in-depth narrative of the three case studies in Chapter 4 prior to testing propositions in Chapter 5. The idea behind providing detailed descriptions in Chapter 4 was to present the sequence of events that occurred in the organisation augmented by clearly cross-referenced methodological procedures (i.e. data source and method) and resulting evidence, thus enabling the reader to trace the steps in either direction. This presents one of the major strength of case study approach wherein the depth to which the exploration is conducted and descriptions are written result in sufficient details for the reader to grasp the peculiarities of the situation. In order to ensure high reliability and validity, the researcher has explicitly provided cross-references between the methodological procedures and resulting evidences in both the descriptions, in Chapter 4, and the analysis, in Chapter 5, of the cases.

6.2.2 Internal Validity

In this study, pattern-matching technique was used for enhancing the internal validity (Yin, 1984). Basically, this technique involves the development of rival operationalised theoretical propositions as patterns to be matched with the empirical data of the case studies. The successful matching of the pattern to one of the rival explanations would be evidence to conclude that the matching explanation is the correct one (Yin 1984).

In this study, the derived rival theoretical explanations are based on the emergent perspective that recognises the organisational change as the emergence of an unpredictable interaction between technology and humans. Those explanations were articulated in operational terms consistent with Lee's (1991) guidelines for specifying process theories as detailed in Section 3.6. The pattern matching involved logical comparisons of the empirical data from the case studies with the patterns predicted by the propositions as detailed in Chapter 5.

6.2.3 Reliability

Yin (1989) recommends the development of a standard protocol and database for the case study to ensure reliability of the study. The case study protocol of this study includes the following:

- Description of the study objectives, scope and related literature. This was provided in Chapters 1, 2 and 3.

- Details of the process and criteria for sites selection, data collection and analysis methods. This was detailed in chapter 3.

- Discussion of the research questions, derivation of rival theoretical propositions and description of the research method. This was discussed in Chapter 3.

- Development of a set of questions to guide the researcher in the interviews. Appendix A provides a list of questions that were used to guide the interviewee.

Similarly, this study maintained a central repository of the cases' data to allow independent researchers to review directly the study's evidences. This database includes: interviews transcripts and notes, interview questionnaire, case studies' documents and narratives, and many tabular material and flowcharts obtained/ created by the researcher. This clearly contributes to the reliability of this study.

6.2.4 Generalisability

A common criticism of case the study method questions the value of its dependence on one or few cases that does not satisfy the "sampling logic", which is believed to make it

incapable of generalising conclusions (Yin, 1984; Lee, 1989). However, case study researchers vigorously argue that although qualitative studies are not generalisable in traditional terms, they have other redeeming qualities that make every single case highly valuable (Lee, 1991; Hamel et al., 1993; Adelman et al., 1980). They further argue that, while the aggregation of few case studies allow theory building through hypotheses testing, the generalisation produced are not less justifiable when about small sample size of studies. For instance, Stake (1980) claims that case studies could be the preferred research method, especially in fields such as education and social science, suggesting that such methods may be in conceptual harmony with the reader's experience and thus be a natural basis for generalisation.

Yin (1989) argues that case study researches should seek analytical generalisations rather than statistical generalisations. To achieve this, he suggests the use of multiple cases selected in such a way that would satisfy "theoretical sampling" logic rather than "statistical sampling".

In this study, as detailed in Section 3.7.1, the selection of the three cases organisations was made in a manner that cross-case pattern becomes more prominently visible, hence facilitate the implementation of the "replication logic". Two of the case study organisations, i.e. GCO and PCO, are sister companies and resemble each other to a great extent in terms of structure, industry, culture, environmental pressure, etc., thus helping to largely reduce the uncertainties and the number of variables that comes into play hence making cross-case patterns more visible. This facilitates making controlled observations by using natural controls, wherein a number of factors are held constant to ensure that potentially confounded influences are accounted for, then treating the situation external to those factors (Markus, 1983; Lee, 1989). The third organisation, i.e. WED, is "polar" to the other two, differing considerably in size, structure, industry, culture, environmental constraints, etc., thus fulfilling the requirements of theoretical replication (Yin, 1989; Orlikowski, 1994). The use of three different cases, of which two are similar and one is polar, helped in making more visible pattern matching and enhances the probability of maintaining the trueness of the empirically invalidated propositions for a wide spectrum of organisations. By observing the distinctiveness of each case study in terms of organisational context, stimuli and nature of the BPR project that results in different chain of events and different outcome, the notion of "theoretical

replication" enabled the testing of the same propositions in the subject organisations. The same logic can be broadened to other organisational contexts, thereby demonstrating the replicability of this study. From another angle, the detailed description of how the study was conducted (such as case study database and protocol, questionnaires, interview guides, references, etc.) makes the study more reliable and easily replicable by an independent researcher.

Clearly, this research did not and cannot claim the generalisability of the findings. The title of this thesis suggests that this study would limit the investigation of the BPR initiatives to petrochemical and utilities industries. Moreover, it was mentioned in Chapter 2 that Hofstede's (1980) work insinuate to the cultural factors as a major issues in organisational change. Therefore, organisational context was emphasised wherein characteristics of the base country of the case studies' organisations, i.e. one of the AGCC Countries, was addressed.

The three case studies of this research provide consistent evidence to support Hofstede's (1980) work and the researcher's reasoning for Hofstede's findings as presented in Chapter 2 (Section 2.6). Concordant with Hofstede's findings on the AGCC countries' score along the four cultural dimensions, the case studies narratives contain several quotations of interviewed organisations' members that allude to the organisations' inclination to "collectivism behaviour" and "quality of life". For example, in GCO the IT Manager described the process of termination:

> "The managers first tried their best to find another post that suits the staff's skills before they were terminated. After exhausting all means of trying to replace those in other divisions, terminated staff were given four months notice period".

GCO's IT Team Leader statement supported that country's religion governs the behaviour of the society to a great extent, penetrating into the every aspect of the daily life:

> "Most changes would usually aim at cost reduction and sometimes lead to manpower reduction. However, due to the religion and because the majority of employees are Muslims these issues are more sensitive so we do not want to be behind firing people because their work is the place where they make money for living".

Similarly, WED's Sales Manager of one of the Distribution companies "A" described the process of termination:

> "We tried our best to help the staff before terminating them, if it did not work then we terminated them. Then we were very sympathetic about their situation. So if the staff had a family and they were going to school then we gave them a notice that the contract is going to be terminated until the end of the property or end of the schooling".

In addition, the case studies narratives contain several quotations of interviewed organisations' members that allude to the organisations' inclination to "risk aversity behaviour". Albeit many reasons were attributed to the "cautious" and "pragmatic" approaches that were followed to rationalise the need for change and introduce it, nevertheless the cases indicate that the culture is conducive to taking more cautious and "calculated risk" approach. For example, GCO's IT Team Leader believes that there are many constraints imposed by the Mother Company, hence it would by very difficult to go through major changes:

> "The top management knew the situation that they are in and knew that there are certain policies that applied to group of companies and in order to go through major changes we have to go back to Mother Company and this takes a very long time. This is because the top management has limited authority in the organisation and this applies for the other oil companies".

However, GCO's Maintenance System Engineer manifested that the choice of "evolutionary change" was influenced internally:

> "During the implementation, middle management were reluctant to introduce big changes to their environments before settling down with the system".

Similarly, in GCO, the Finance Manager confirmed the choice of a "cautious" calculated risk approach and indicated that the culture is conducive of high "power distance"

> "...such a change would require a deep and significant change in the attitude and behaviour of all employees at all levels which was obvious that the organisation was not ready for such a change...Also us as Arabs and managers we do not like to give a lot of power to the staff below".

PCO's previous Head of Development and Training Department described management reaction to a proposal that involved dramatic changes:

> "Because the proposed changes were going to be tremendous, which includes interdepartmental activities and affect more than one entity, the senior management decided to stick to changes in only the HR Division... The managers of other departments were pushing towards this option, because they did not want to review their practices... The team was cornered to reduce the scope of the redesign to be limited to activities within HR Division only... The team members sat with their HR Division Manager to revise the scope of change based on management's order".

The above suggests that radical changes with a plan for "dramatic layoffs to take place" or "taking aggressive risk" are unlikely to be acceptable in organisations in such countries.

6.3   Prescription for Practice – Operational BPR Framework

This section discusses the implications of the findings of this study for practice. In this study, the researcher based on a review of related studies, started by identifying constructs for the BPR elements. Those identified constructs were cast in theoretical propositions aggregating the common beliefs and principles on the impact of those constructs on the outcome of the BPR effort. The primary objective of this was to investigate, in natural settings where all factors simultaneously come into play, the validity of those propositions.

As described in Section 3.4, according to the emergent perspective, the study uses a conceptual BPR framework by considering three high level components of BPR. These are organisational culture, IT and the outcome of the BPR initiative together with the inextricable interdependence between them. Then, through an extensive review of researches that have prescribed factors and salient dimensions of those components "i.e. constructs" that would impact the outcome of a BPR initiative, those components were operationalised into multiple relevant constructs and indicators. The principles of the effect of those constructs and their indicators on the outcome of the BPR were given in a number of propositions. This operationalised model was tested with three real BPR cases using the case study method.

Table 6.1 provides a summary of the findings for each element and its constructs from the three case studies that constitute the operational BPR framework. This framework serves as a prescription for achieving successful BPR initiative. The framework elements can be classified into facilitators and inhibitors wherein companies implementing BPR initiatives should ensure the availability of those elements that are requisites and avoid inhibiting ones. Facilitators and inhibitors can be further categorised into organisational readiness elements, which are necessary factors that an organisation needs to possess a priori to engagement in BPR project, and BPR project implementation elements, which are necessary factors that an organisation has to have during the BPR implementation.

This study has identified a number of organisational readiness elements that must be in place prior to undertaking BPR project including: the development of a strategy and sound stimuli for the project, the availability of leadership, top management vision, availability of required skills and expertise and the maturity of the IT infrastructure. Similarly, this study has identified a number of BPR project implementation elements that be in place to ensure successful implementation and management of the project including: availability of an appropriately composed project team, continuous communication, users' involvement and usage of communication technologies for knowledge sharing.

Elements	Indicators	Findings
Organisational Culture constructs		
- Leadership	Leadership availability and style Leadership roles and scope of involvement	1) The existence of effective executive leadership to lead the BPR project and continually seeks support of all levels in the organisation will have a positive impact on the level of success of the project. However, required leadership style and tasks is dependent on the required level of change.
- Communication	Level of communication; high – low extent of communication; depth in the organisation	2) The existence of effective and open communication among the various stakeholders of the BPR initiative will have a positive impact on the BPR implementation success
- Strategy led	Stimuli; proactive – reactive Scope; incremental – revolutionary Strategy timing; onset, midst, never there	3) The existence of a compelling vision tied with a sound, well-described and feasible strategy to drive the BPR project will have a positive impact on the success of the project.
- Team Based	Availability of team; yes –no Composition of the team; breadth and depth of knowledge of the team members IT dominance; IT department led – conservative IT department	4) The existence of an appropriately composed team to manage the BPR project will have a positive impact on the BPR implementation success. 5) The availability of representatives from the IT department in the composed BPR project team, but not assigned the project's leadership role, will have a positive impact on the BPR implementation success.
- Politics	Level of power and politics Decision making style; autocratic, bureaucratic Resistance to change	6) In a politicised organisation, the alignment of the motives of the actors, who have the power and potency to influence the flow of events of the BPR project, to the organisational vision will have a positive impact on the BPR implementation success.
- Sector	Organisation sector; public, private, semi private	7) Due to the particulars of public sector organisations, incremental change is the most feasible change in public sector organisations.
Relationship of Organisational Culture and IT		
- IT-Culture fit	match – mismatch	8) In IT-enabled BPR change, ensuring that the to be selected IT will not endanger the match between the technical system and the customs and values espoused by the organisation will have a positive impact on the BPR implementation success.
- IT expertise and end-user skills	Availability of expertise; yes – no Outsourcing Role of consultants	9) In IT-enabled BPR change, the availability of IT expertise and sufficient end users skills to support the selected IT will have a positive impact on the BPR implementation success.

IT constructs		
- Communication Technology	Used - Not used ☐ Type of technology used	*10) Exploiting the potential of communication technologies to enable knowledge sharing will have a positive impact on the BPR implementation success.*
- IT Infrastructure	Level of IT infrastructure maturity; sufficient – not sufficient	*11) The existence of a well-established IT infrastructure within the organisation will have a positive impact on the BPR implementation success.*

Table 6.1 Elements and Constructs of Operational BPR Framework

As a prescription for practice, this framework urges organisations planning to undergo BPR to:

- Position BPR as a strategic initiative with sound stimuli to derive the project. Strategic initiatives typically involve visioning, planning, committing, endorsement and enabling from executive management. Strategic plan is a unified, comprehensive and integrated scheme designed to secure the achievement of the basic goals of the organisation. A BPR strategy could be in reaction to a need, such as inefficiencies and poor performance, or a proactive push to grasp potential gains (Earl, 1994).

- Provide leadership with a compelling vision of organisational change. Leadership and change agents that would enhance the cultural potency for change are of a paramount importance. In generic terms, leaders create the vision for the change process, encourage the pursuit of change, provide great leverage to change ideas and make them tangible, and motivate the entire organisation toward achievement of change goals.

- Foster a culture that advocates open communication. Communication must be a priority for everyone involved in the BPR program. The case for the change and vision must be effectively communicated at all levels of the organisation and emphasises why to undergo the change, what the change will be, how the change will happen and the inevitability of the effect. The communication strategy must also include status updates, informal collaborations and workshops to avoid the pitfalls of misunderstandings, feel of insecurity and disengagement from the program.

- Compose an appropriate team to lead the BPR project. The selection of the team should be made carefully to include members with experience in strategic visioning, change management and team improvements initiatives (Carr and Johansson, 1995). Cross-functional representation of the BPR team is critical to obtain a variety of perspective and to avoid resistance from different functional areas (Davenport, 1993). Commonly, the team composition had roughly members breakdown of 60% with wide and deep business sense, 20% with wide business sense, and wide IT sense, and 20% with wide business sense and wide and deep IT sense. Although the presence of IT skills in the team is mandatory, project management responsibility should not be with the IT people.

- Leverage the capabilities of IT to help obliterating existing processes. BPR practitioners need to ensure that the selected technology would be capable of supporting the planned organisational objectives and that it would achieve an acceptable "match" with organisation's customs and values. They need also to ensure the acquisition of required skills and establishment of operating procedures for proper implementation of the technology to be adopted. In addition, they are urged to exploit the potential of communication technologies to enable knowledge sharing.

Conclusion and Directions for Future Research

7.1   Introduction

To conclude this work, this chapter summarises the findings of this study, discusses the implications and limitation of this research and provides directions for future research. The chapter starts by presenting a statement of contributions made during this study. Then, in Section 7.3, the theoretical implications of this study are represented to complement the implications for practice presented in Chapter 6. Then, limitations of this study are discussed. Finally, the thesis concludes by outlining some ideas for further research.

7.2   Statement of Contributions

The individual elements of the contributions made by this work stem from different components in this thesis. From the contextual information provided in Chapters 1, 2 and 3, to the ingress of the research methodology reported in Chapter 3, through the design and the conduct of the case study research reported in Chapters 3, 4 and 6, and finally the empirical analysis of the cases and the development of operationalised BPR framework presented in Chapters 5 and 6.

The following is a review of what is sustained to be the main contributions of this thesis.

First contribution: The most significant contribution of this thesis is the empirical investigation of existing theoretical constructs in a new context and the aggregation of those into an integral process theory of BPR.

Glaser and Strauss (1967) believe that theory is an ever-developing entity, not a perfected product, and emphasise on theory as a process. Thus, as described, earlier in Section 3.2, this research was an instance of the process of theorising. The approach for specifying process theory used in this study was to provide a number of testable propositions that provide a bound to how the proceedings of BPR process is theorised. The specificity and the structure of each proposition determines how precisely BPR has been predicated. The bounds created by the propositions represent the theoretical explanation of the possible ways in which the process and the outcome of BPR emerges. Therefore, the more specific the propositions and the closer the relationships among the propositions, the less is the probability of unexplained turn of events and, hence, should result in a better understanding of BPR phenomenon.

The empirical verification of existing theoretical constructs, derived from literature, in a new context, leads to the development of an integral process theory espousing those theoretical underpinnings of BPR, which can be stated as:

*"To achieve successful BPR initiatives, executive management are urged to provide a compelling vision tied with a **sound, well-described and feasible strategy** to drive the project. In the **public sector** organisations, change strategy should opt for incremental change approaches. Also developing an organisational environment that promotes **open communication** and adopts best practices of change management including **leadership** and **team management** techniques would have a significant impact on the success of the initiative. BPR leaders are urged to pay attention to the **political realities** of the organisation. They are also urged to exploit the potential of IT as enabler by carefully **selecting IT ensuring that it would not endanger the match** between the technical system and the customs and values espoused by the organisation and to ensure the availability of **IT expertise and end users' skills** to support the system. Also, the **availability of appropriate IT infrastructure** and the **exploit of the potential of communication technologies** to enable knowledge sharing will have a positive impact on the outcome of the initiative."*

This aggregation of theoretical constructs provides an answer to the principle question of this thesis and stems from different components in the thesis, as follows:

In Chapter 1, gaps in existing research were presented wherein the need for an integral theory of BPR was touched upon. It was argued that the lack of studies seeking to

investigate BPR efforts with adequate repertoire of constructs, has led management theorists to recommend addressing this dearth of research by following a new research agenda in pursuit of an integral theory of organisational change.

In Chapter 3, as stimuli for this study, a plea for an integral theory of BPR was elaborated. In light of the high failure rate of BPR efforts, it was argued that the availability of a theory aggregating verified principles and proved guidelines of BPR would contribute, at least modestly, in improving the conduct of such initiatives. It was explained that since this study is seeking to aggregate an integral BPR theory, it falls into the theorising categorisation. It was also emphasised that theory is not a perfected product but perpetually evolving entity (Glaser and Strauss, 1976). Then, the case was made that a "process theory" with "emergent perspective" would be the best type to represent the domain of interest, i.e. organisational change. Subsequently, the approach for specifying a process theory was discussed. Then, a number of propositions were postulated based on review of the prevalent principles and beliefs of BPR to provide the building block of the theory to be developed. It was shown that the form in which those propositions are stated satisfy all requirements for specifying positivist process theories. It was further explained how deductive reasoning would be used to test those propositions. It was argued that postulated propositions, which are to be tested using case studies, satisfy the requirements of falsifiability, logical consistency, survival on empirical testing and provide greater predictive power than other theories.

In Chapter 5, the propositions derived in chapter 3 were empirically tested in the context of the BPR initiatives at the three subject case studies narrated in Chapter 4. The chapter started by an analysis of the outcome of the BPR implementations in the subject organisations, i.e. whether success or failure. It was argued that since "expectation gap" (i.e. the actual measurement of the outcome of the effectiveness and performance of the BPR initiative benchmarked against expectations and goals of the initiative) cannot be used to determine the outcome of the project, the notion of "expectation failure" can be adopted for the purpose. The "expectation failure" approach realises the existence of multiple stakeholders of a system having different interests, values, levels of knowledge and power and, therefore, different expectations. Within this perception, failure is recognised as an embodiment of a perceived situation and, hence, a system that fails to

meet the expectation of any of the stakeholders is perceived as a failure. Drawing on the concept of "expectation failure", interviews of the various stakeholders, as provided in the case studies narratives in Chapter 4, were used to drive the primary information on the outcome of each project. Since interviews were subject to problems of bias, inaccurate articulation and poor recall, it was emphasised that every effort was made to validate respondents' perceptions and responses through multiple sources and also interviewing multiple members at different levels in the organisation for cross validation.

The analysis of the initiatives' outcome using the concept of "expectation failure" was used as a basis for the deductive testing of the propositions postulated in Chapter 3. Results of the deductive testing of the propositions revealed that all, except one, were valid. The only proposition, which was deductively invalidated using empirical data from the subject case studies (i.e. the importance of leadership existence), was reformulated using interpretive analysis of data from the same case studies. The discipline of hermeneutics was used to resolve the breakdown in understanding the proposition. The interpretation involved several iterations around the subject data, with each iteration bringing additional data to the researcher's focus, thus different understanding and enigma.

In Chapter 6, the validity, reliability and generalisability of the study and its findings were assessed to demonstrate the quality and rigour of this research. It was further demonstrated how could those propositions serve as a prescription for practice to aid reducing the rate of failure of BPR efforts by aggregating those into an operational BPR framework. The framework elements were classified into facilitators and inhibitors. Facilitators and inhibitors were further categorised into organisational readiness elements, which are necessary factors that an organisation needs to possess a priori to engagement in BPR project, and BPR project implementation elements, which are necessary factors that an organisation has to have during the BPR implementation.

Second contribution: In addition to the main contribution, the research methodology together with the empirical work of this study are considered as other minor contributions, as follows:

In Chapter 3, it was argued that, contrary to the assumption of most social studies that positivism and interpretivism are opposing and irreconcilable perspectives, an integrative approach that enables the "cumulative research" of positivist and interpretivist research would eventually lead to an extensive and adequately verified theory of organisational change. Then, the research methodology of the study, which was predominantly based on Lee's (1991) framework for integrating positivist and interpretivist research, was explained. It was also emphasised that due to the thesis timeframe, positivist inquiry would be the major element of this thesis, whereas limited interpretive analysis would be performed to demonstrate the benefits of this approach. Then, the research framework and its constructs were presented. Propositions related to those constructs were postulated in order to conduct the positivist inquiry.

The rationale behind choosing the socio-technical perspective of the "causal agency" and justifications for considering three constructs (i.e. IT, organisational culture and the change) in the research framework were provided. Important sources of organisational culture were discussed based on a review of related literature. Those include three sources: 1) national culture within which the organisation is situated, 2) vision, management style and personality of the organisation's founder or other dominant leader, and 3) the nature of the business of the organisation. It was also emphasised that according to the Institutional Theory (March & Olsen, 1989), social, religious, political and governmental institutions act to consensually structure social relations.

Central to this study was a conscious effort to maximise deep understanding of the organisational context. It was argued that the "case study" is the most suitable method to describe and explain the BPR phenomenon in its specific context and relate the findings of the investigation to the prevalent principles and beliefs of BPR. The choice of qualitative inquiry using multiple case studies design as the research strategy of this thesis was rationalised. Underling criteria for selecting the three organisations to base the study on were detailed. Major part of this thesis timeframe was dedicated to selecting, arranging and interviewing the subject organisations' members. This has started in June 1998 and the final interviews were carried in September 2000, i.e. over a period of more than two years. In addition to the interviews, which was the primary source of

information, data collection via other sources such as reports, brochures, memos and tabular materials were used.

Details on the employed data collection techniques and sources of case studies' data were provided. It was also elaborated that data collection effort paid special attention to the context in which the BPR initiatives were undertaken and the organisational aspects such as culture and reward system while focusing on the context and process of the change. It was further detailed how triangulation was used to enhance the validity of the study. The country's culture of the subject case studies' organisations was studied and the effect of the researcher's gender on the interviews proceedings was touched upon.

In Chapter 4, detailed narratives of three case studies were presented. The rationale behind providing a "thick description" of the case studies, rather than abstracting only information related to the propositions under testing, was to present the sequence of events that occurred in the subject organisations augmented by clearly cross-referenced methodological procedure and resulting evidence, hence enabling the reader to trace the steps from conclusions to initial research questions and vice versa. The detailed description of how the study was conducted rendered the study more reliable and easily replicable by an independent researcher.

In Chapter 5, the cases were analysed and the constructed propositions were deductively tested using empirical data from those cases. It was argued that since the selected cases were presenting a fresh experience of organisations that have recently completed the BPR initiatives, an assessment of the performance and effectiveness of the BPR initiatives would require more time. As a surrogate, drawing on the concept of "expectation failure", this study used the interviews of the various stakeholders to derive the primary information on the results of each project. Moreover, since the researcher recognised stakeholders' subjective perceptions that may not always reflect the reality, preliminary performance results that were made available were used to authenticate those perceptions.

The proposition regarding the "role of leadership in change initiatives" that was rejected through detective testing using case studies data was reformulated using interpretive analysis of data from the same case studies. The reinterpretation was performed using

validation hermeneutics and was further supported by examining previous research related to leaders' characteristics and behaviour.

In Chapter 6, the rigour of this study was demonstrated. The positivist requirements for rigour were described, discussed and the adherence of this study to those requirements was demonstrated clearly. It was detailed how the "construct validity" of this study was improved using several strategies including: triangulation, member checking and the establishment of multiple chain of evidence. Similarly, it was explained how pattern matching technique was used for enhancing the "internal validity" of the case studies.

The generalisability of the findings was discussed. It was argued that although the findings of few case studies are not generalisable in traditional terms, they have other redeeming features that make every single case highly valuable. It was also explained how analytical generalisability, rather than statistical generalisability, was achieved in this study.

7.3   Implications of the Research

As discussed in Chapter 6, the findings of this study have several implications for practitioners. The findings emphasise the need to pay attention to organisational customs and practices issues and provide support for the BPR project such as the importance of leadership, strategic vision, teams and continuous communication. The findings also emphasise the enabling role of technology and the need to pay attention to the technological issues as well.

The prevalent principles and beliefs of the key facilitators and inhibitors of BPR provided this study's starting point. This allowed the identification of constructs for each of the elements of the proposed BPR framework, thus consequently the development of theoretical propositions for further validation and enhancements. Therefore, the new theoretical framework of BPR can be further detailed by adding those specific constructs that relate to each element in the framework. In addition, measurable indicators were provided as a probe for the availability of each construct in a given context. This framework would allow researchers to further study relationships and extend the combinations of constructs impacting the result of a BPR initiative. The implications for the research community are that this research has provided a framework that is a product

of this thesis's early step of theorising process that may be useful in forming a basis for further research.

7.4   Limitations of the Research

Given the complexity and the breadth of the scope of the subject area under study, i.e. BPR, several limitations of this study can be identified, as follows:

- Due to the thesis constraints, this study attempted to summarise a huge body of knowledge on BPR in a reasonable number of propositions for testing. Clearly, there are other important constructs that this study did not consider. Moreover, although the researcher chose only one proposition for each of the identified constructs based on the prevalent literature of BPR, there are bound to be many more propositions that could be derived for each of those constructs.

- The three cases studies' organisations are based in developing countries, specifically AGCC, in order to investigate the cultural effect on such effort. Obviously, for improved generalisability, more cases of organisations in both developing and industrial countries would have led to a richer study and facilitated the cross comparison of the country's culture effect on the implementation of BPR. However, this was not attainable due to the cost and time constraints of this thesis.

- The integrative framework of positivist and interpretivist of this thesis's research methodology calls for an iterative cycle of positivist and interpretivist analysis. However, this study provided a mainly positivist inquiry with limited scope of interpretivism. A second round of positivist inquiry using different set of cases to verify the interpretive analysis would have proved beneficial.

- Due to the theorizing structure of this study, several constructs and their indicators were identified and related propositions were constructed. To satisfy the "process theory" requirements, those propositions were stated in necessary but not sufficient form. However, this study did not cater for constructs, i.e. factors, that are not indispensably necessary conditions for BPR success. Obviously, there are many constructs that would have a "moderating effect" on the outcome of the BPR

wherein the availability, and its level, of such factor could have an effect on the availability of a necessary condition and subsequently on the level of the BPR outcome. As an example, consider the case of an organization that had successfully undergone a BPR initiative that did not involve the engagement of external consultants. Clearly, the involvement of external consultant in this initiative could have had a "moderating effect" on the outcome of the BPR, i.e. either further increase or decrease the level of success of the project.

7.5   Directions for Future Research

Several directions are available for expanding the scope and addressing the limitations of this study, as follows:

- There is a need to conduct a research on organisations in one of the industrial countries to study the role of organisational culture and IT in BPR. This would lead to comparative studies across different economic regions, where the results of this thesis can be used and compared to other studies. This will enrich and provide a better understanding of the cultural differences and how it would affect the implementation of BPR.

- Although the study has made a tremendous effort to raise and test important propositions related to the organisational culture and IT in BPR, it is obvious that not all crucial issues in the area of organisational culture and IT have been covered. While the framework recommended served its purpose in the study, there is always a place for enhancement. Therefore, a further study could focus on testing more propositions in order to enhance the recommendations.

- In order for the practitioners to achieve more confidence of the results of this thesis, future research to be based on testing the propositions, provided in this thesis, on different type of organisations would definitely help.

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GLOSSARY OF ABBREVIATIONS

ABC	Activity Based Costing
ADC	'A' Distribution Company of WEA
AGCC	Arabian Gulf Cooperation Council
ATM	Asynchronous Transfer Mode
ATPC	'AT' Power Company of WEA
BAPC	'B' Distribution Company of WEA
BDC	'B' Distribution Company of WEA
BI	Business Improvement
BPC	Business Process Change
BPR	Business Process Reengineering
BT	Business Transformation
BTRDC	'B' Transmission and Dispatch Company of WEA
BWEC	'B' Water and Electricity Company of WEA
CRM	Customer Relationship Management
CSF	Critical Success Factor
DCS	Distributed Control System
DSS	Decision Support System
EDI	*Electronic Data Interchange*
ES	Expert System
FAA	Federal Aviation Authority
GATT	General Agreement for Traffic and Trade
GCO	Gas Company (The first case study organisation)
GUI	Graphical User Interface
IPPS	Interactive Personnel and Payroll System
IS	Information System
ISSP	Information System Strategic Planning
IT	Information Technology
LAN	Local Area Network
LNG	Liquefied Natural Gas
M1	Gas Company (newly established)
M2	Oil Refining Company (newly established)
M3	A powerful new force company in polymers (newly established)
MIS	Management Information Systems
MPC	'M' Power Company of WEA
PCO	Oil COmpany (The second case study organisation)
ROI	Return on Investment
STFC	'STF' Company of WEA

TCO	Total Cost of Ownership
TQM	Total Quality Management
UMNPC	'UMN' Power Company of WEA
WAN	Wide Area Network
WCSC	'W' Central Services Company of WEA
WEA	Water and Electricity Authority (name after privatisation, the third case study organisation)
WED	Water and Electricity Department (name before project's implementation)
WTO	World Trade Organisation

INTERVIEW QUESTIONS

This appendix provides a list of questions that was used to guide the researcher during the interviewing process. The questions used in the interview are based on three parts. Part one is about the background of the organisations. The Second part of questions is focused on general issues related to BPR initiatives. The third part of questions is focused to the area of research, culture and IT.

The questions were compared with the research objectives. In order to obtain a full picture of each case study, different type of questions were generated to keep track and to remind the researcher of the information that is required to be collected.

This list of questions was sent to all interviewees, with an explanation of the research area, in advance to give them an idea of the types of questions they should expect. Below are the list questions:

Part A: General Background questions

1. Name of the organisation and When was it established?
2. Nature of the business and whether the company private or public sector?
3. What does the company operate in? What is their product if any?
4. What is their market? Are there any competitors? If yes, who are they?
5. Where is the organisation located?
6. What is the number of employees?
7. Is the organisation a multi-national company? What is the approximate number of nationals and expatriates?
8. Can you provide me with background information about the company and its history? (Maybe brochures would help).

Part B: Questions on BPR initiatives

9. What was the aim of the BPR Project? (Competition, cost reduction, better service).
10. What is your business strategy? Has it changed due to external environment?
11. What is the scope of your reengineering activity:

> *The whole organisation*
> *Multiple divisions*
> *Single division*
> *Multiple departments*
> *Single department*
> *Work group*

12. Is the organisation considering incremental or radical change in this project?
13. Why was a BPR Project proposed?
14. What were the problems faced before deciding to business reengineer?
15. Who recommended this project?
16. How long did the project last? How long did each stage/phase take? Was the project finished in time?
17. Did the project achieve its objectives?
18. What is the result of the project? When did the results of success show?
19. Were the results measured? How where they measured?
20. Were there any qualitative or quantitative results?
21. What was the return on investment? How long did it take to overcome the costs?
22. What is the overall saving expected from the Reengineering project?
23. *What rate is given to the overall success of the Reengineering project on the bottom-line performance of the business?*
24. *As a result of the reengineering, how did the performance change:*
    > *Cycle time reduced*
    > *Product/service cost reduced*
    > *Operational Expense reduced*
    > *Quality Improved by (reduction warrantee cost, services calls*
    > *Market share improved*
25. What was the project plan that was followed?
26. What was the cost of the project?
27. What were the criteria to receive funding?
28. Do you wish to keep the name as anonymous when writing the case study or do you have any disclaimers or acknowledgements you wish to add in the case study?
29. How would you describe the driving force behind the reengineering effort: Top down, bottom up or any other way?
30. Which of the following were considered critical expectation for the project, when obtaining project approval:
    > Improve the quality of the product or service
    > Improve the supplier's quality
    > Reduce the internal process problems
    > Reduce the scrap work
    > Reduce the costs
    > Reduce the cost from the suppliers
    > Reduce the cycle time
    > Improve the timeliness of the suppliers input/product
    > Reduce the overhead costs
    > Improve the customer satisfaction
    > To compete against others product
    > Other
31. *What process (es) is (are) being reengineered? Are there any related documents available?*
32. What methodologies/steps did the organisation use in the project? Why?
33. Which tools/techniques were used during the project? (E.g. Simulations, DFDs, IDEF..)

34. What are the activities/steps that the team has completed at the initial stage as part of the start-up activities of the project:

> *Clearly established the scope or boundaries for the project.*
> *Documented the project objectives, budget, schedule.*
> *Attended a class or seminar on reengineering.*
> *Selected a consultant to assist with the project.*
> *Participated in a special team building activity prior to starting the project.*

35. What role did benchmarking play in the Reengineering process?

36. How would time be distributed on each of the key Reengineering phases (totals 100%):

> Planning for the project and team organising
> Collection of data and studying the current situation
> Process and system design
> Project approval for implementation
> Process and systems development
> Implementation

37. Which steps or activities have the teams completed or planned:

> Used effective change management techniques to manage the change process
> Developed a communication plan for the project
> Developed training and education programs for the new processes and systems
> Implemented a reward and reinforcement program
> Developed an operational transition plan for changing the current process to the new process

38. What was done to gain approval to move to implementation?

39. What was the decision making process to move from design to implementation?

40. Which of the following steps in the design phase that the team have completed or are planned:

> Gained a detailed understanding of the current processes
> Benchmarked other companies processes, technology and organisational structures
> Assess new technologies and tools that may contribute to a reengineered process
> Conducted customer needs assessment (Focus groups, interviews, surveys)
> Conducted employee needs assessment (Focus groups, interviews, surveys)
> Created high level concepts and guiding principles as the foundation for the new process
> Identified new technologies and tools to support the Reengineering process
> Designed the new process off-site (away from company facilities)
> Identified the organisational changes required to support the Reengineering process
> Developed measure to assess the effectiveness of the Reengineering process

41. What was the most important activity during the design process?
   What were the major obstacles during implementation?

42. Which of the following level of changes took place:

> *Process changes*
> *Systems changes*
> *Organisational changes*
> *Job role changes*
> *Other changes*

43. What things happened that significantly helped your implementation?

44. What were the major obstacles during implementation?

45. Did your organisation experience a drop in productivity during the implementation of the new process? If yes, at what level?

46. Did the organisation had to move from Reengineering into any of the following (if yes, why):

> *Too soon to tell*

> ➤ *Continuous improvement*
> ➤ *A measurement phase*
> ➤ *Other (please mention)*

47. *Is there anything that the organisation would do differently next time? If yes, what is it and why?*

- **Questions related to 'Consultation':**

48. Were consultants or outside experts used in the project? If yes, what was their role?
49. What was the area of expertise of the Consultant Company?
50. *At what phase of the project was the consultant most useful?*
51. *How critical was the consultant to your success?*
52. *Would you use consultants or outside experts on another reengineering project? Why?*
53. Did the consulting company or the organisation itself face any problems at any stage/phase of the project? If yes, what were the factors causing these problems? How was it tackled?
54. How did the consulting company react to any kind of resistance from employees? (Such as fear).

Part C: Questions on Culture

- **Questions related to 'Management':**

55. How supportive was the top management? How deep were they involved in the project?
56. How did top management/middle management react to such a project?
57. How critical was top management to the success of the project?
58. Outline the key change management activities that were critical to the success of the project?
59. What were the most critical contributions from top managers?
60. What were the biggest mistakes top managers made?
61. Can you provide an explanation of the organisation structure before implementing the project and after implementing the project?

- **Questions related to 'Human Aspects':**

62. Was there any resistance to change from staff? If yes, how was it tackled?
63. What do you think the reason behind resistance to change from staff?
64. Did the results of this project led to massive layoffs?
65. Is there a union/committee who makes the final decision on what changes to implement?
66. Who was the project leader?
67. How was the project's work divided? E.g. IT group and Management group. How many did each group consist of? What is the range of team members that is considered optimum for an effective reengineering team?
68. How many people were involved in the whole project?
69. Who were the people involved in the project? Were they from the organisation, from a consulting company or both?
70. What were the responsibilities of each group that were involved in the project? How much empowerment did each team have?
71. Was training provided for the groups involved in the project? Who gave the training? What was the training on?
72. Were employees (not involved in the project) provided with training? Who gave the training? What was the training on?

73. How did the employees cope with their work and training?
74. How did the teams collaborate? How were they motivated?
75. How did the employees in different divisions react to such a project during all the stages/phases?
76. Were they co-located? Is co-location recommended?
77. What is the criteria for selecting team members:
    ➢ Understood current processes
    ➢ Representatives from different functional areas with different backgrounds
    ➢ Smartest
    ➢ Strong background in the area of Business Reengineering
78. What is the primary incentive for people to participate on the team?
79. How much time were team members able to devote to the effort?
80. Was there any kind of support team (internal/external) who were skilled in Reengineering? If they are internal, when were they trained, what were they trained and by whom?
81. Were they dedicated to the project, as full time or part time personnel?
82. What factors have contributed to the teams' success?
83. *What factors most inhibited their success?*
84. *What might you do differently next time when selecting or preparing a reengineering team?*
85. *What types of exercises were most valuable to help the team create new solution?*
86. *Have any of the team groups left the organisation after the completion of the project? If yes, why?*

• *Questions related to 'Politics':*

87. Are there any political problems faced? If yes, does it differ from any industrial country? How was it tackled? Why do you think these problems appeared?
88. What were the problems faced during redesigning the processes? For example, certain companies especially if it is a government sector, have their own laws and regulations that cannot be changed. Were changes discussed in advance?
89. There are certain rules and procedures, which are sometimes hard to change to improve some processes, especially if they have been existing for a very long period. What happened to these processes? Were they left without doing any changes to them or the rules and procedures where changed to match with the new processes?
90. Were there any attacks from the competitors?
91. Were there problems related to the organisations structure (high hierarchy)? Problems such as slow in response to internal/external customers, lack of efficiency, lack of support from staff, and lack of internal morale? If so, how were they tackled?
92. Can you provide me with the previous and new organisation chart?
93. Has there been any cultural and structural change? Was it minor or major?
94. Did the project result in staff empowerment? If yes, did the top management accept this?
95. Were the team members under constant pressure trying to distribute the time equally between the daily work and the project?
96. Were there any problems or conflicting ideas among the groups? If yes, how were they tackled?
97. Some say that it is not possible to have a radical change in a public sector or semi public sector, what do you say?
98. *There are some public sectors, which can not be privatised but requires to be reengineered how would you think such organisations and what is the approach for them to be reengineered?*

99. Is reengineering an appropriate approach in semi private sector, in developing country? Would it be more successful in an industrial country?

100.   What is the most critical thing that must be done/must not be done for any organisation thinking of approaching Reengineering project?

101.   Was there any law changes (long political negotiation)?

- **Questions related to staff affected by the change and not involved in the Reengineering project:**

102.   How did you react to the new change? How did you feel?

103.   Were you informed of the project before implementing it? What were you informed?

104.   Were you trained before receiving the new system? What was training in? Who conducted the training?

105.   Did your job change? If yes, in what way?

106.   Do you prefer the new work or the old one? Why?

Part D: Questions on IT

107.   At what stage was IT discussed in the project? When was IT department involved in the BPR project? What was their role?

108.   What was the existing technology used?

109.   Were there any existing IT problems identified before introducing the new IT?

110.   Was there a new IT infrastructure or new IT systems introduced and why? What were the steps followed?

111.   What new system was introduced and how did the employees (end users/technical support) react to such a new IT? Why such a new system and not another?

112.   How was IT and processes linked during the Reengineering process?

113.   How long did the transition of IT take?

114.   How did the introduction of IT help in the redesigned processes?

115.   How did IT department help in BPR project?

116.   Was there a technical consulting company hired to support the reengineering attempt in addition to the management consulting company?

117.   What were the management and technological changes?   (Elimination of tasks/reduction in the number of intermediate manager, and flow of information).

118.   What is the most important contribution that IT makes to the Reengineering project?

119.   How is IT performance and support viewed through the organisation, before implementing project and after?

120.   What should IT team do to move towards the organisation's strategy?

121.   What was the strategy for IT? What would you recommend the strategy to be for the future?

122.   Should IT develop its own technology vision?

123. Should IT use internally developed applications or off the shelf applications? Why?

124.   Is it possible to Reengineer the organisation without IT support? Why?

125.   Does the organisation believe IT is the enabler or driver of reengineering today?

126.   Describe the relationship between IT staff and the rest of the organisation? What change would most improve the working relationship between IT and the rest of the organisation?

127.   Have the responsibilities of IT staff/managers after implementing the project changed? If yes, in what way?

BACKGROUND OF CASE STUDIES' ORGANISATIONS' COUNTRY

This Appendix provides a description about the country and in particular the capital city in which the case studies organisations are based. It discusses the history, current and international market of the country. This description has been provided in order for the reader to get familiar with the background, market and culture of the country. This background is partly extracted from the official country's Website.

History of the capital city

The capital city of country 'A', which is an island, lies on the southern shore of the Arabian Gulf. The size of this island is 67,000 Kilometres surrounded by mountains and high sand dune. The dominating feature of the land is the desert which covers most of the area and ranges from gravel to the towering dunes in the south, some as high as 150 metres. This city island was first settled in 1761 when members of a dominant tribe, had control of the city for at least 100 years. With the discovery of water, the island was absorbed into the migratory economy, which revolved around the tending of flocks and the date harvest at the inland oases and fishing on the coast. The lack of natural resources and the harsh climate encouraged great versatility among the tribesmen.

The British presence in the Arabian Gulf was formalised by the peace treaties of 1820 and 1853, signed by the Rulers on the Trucial Coast and elsewhere in the Gulf. One effect of the contact with the British was to open up the Indian market for Gulf pearls. The pearling industry expanded quickly towards the end of the 19th Century and reached its zenith in the first two decades of the 20th century. The versatile bedu adapted easily to pearling but it was a hard life. During this period, this island was home to about two thousand people, with many of them living there only on a seasonal basis, sharing the time between the pearling season in summer and their date gardens. People were living

in burasti dwellings made from palm fronds.   The world depression of the 1930s and the development of cultured pearls in Japan saw the Gulf industry go into sharp decline. Against this background of a declining traditional economy, came the first signs of new possibilities of exploring oil.

Current

After the exploration of oil the country has completely changed. It has gone through extraordinary changes. The island has taken the appearance of large buildings and towers of concrete, aluminium and gold, blue and red glass, symbolises the new age, which makes it difficult to look at old photographs. With the growth of the city has come the development of a comprehensive welfare state in the island and the country. From primary school to university, the city provides free compulsory education: in clinics and modern hospitals, free health care is available.   One of the most modern telecommunications systems in the world connects the country with the rest of the globe. Today, the citizens of the country have one of the highest per capita incomes in the world. It is thanks to the wealth from oil, and the remarkable vision of the President.

The most significant aspect of oil wealth has been the city's ability to translate its effects into the political will to manage its own destiny and to play an important role in international affairs. The country's progress was recognised at the United Nations when the country was elected for a two year term to the Security Council, the highest position within the international body that can be achieved by any country. Appropriately, the Gulf Co-operation Council was founded, in 1981, in the capital city of this country. This country is also a member of OPEC, OAPEC, and the Arab league. The country's aid programmes, for example, are among the generous in the world and an example to all nations. Such generosity is a product of the memory of an older generation that can recall life in the country when it was much harder.

Oil and gas production has been the mainstay of the economy in the country and will remain a major revenue earner long into the future, due to the vast hydrocarbon reserves at the country's disposal. The capital city is the biggest oil producer in the country, controlling more than 85% of the country's total oil output capacity and over 90% of its

crude reserves. Almost 92% of the country's gas reserves are also located in the capital city.

Proven recoverable oil reserves are currently put at 98.2 billion barrels or 9.5 percent of the global crude oil proven reserves. As for natural gas, the proven recoverable reserves are estimated currently at 5.8 billion cubic metres or 4 percent of world total. This means that this country possesses the third largest natural gas reserves in the region and the fourth largest in the world. At the current rate of utilisation, and excluding any new discoveries, these reserves will last for over 150 years. As a result, this means that the country will continue to hold its position as one of the world's 'big five' oil producers for the foreseeable future. That means a future secured not only for the people but also for the nation as a major political and economic force that will continue to influence and benefit the world.

The country's oil production is limited by quotas agreed within the framework of OPEC to 2 million barrels per day (mbd). Production capacity, however, will rise to around 3 mbd in the year 2000. There are plans to boost that level to 3.6 mbd in the year 2005 and 4 mbd in the year 2010. Gas production is being expanded to meet a forecast doubling of demand to 3.7 billion cubic feet per day (bn cfd) by the year 2000. Domestic demand is expected to increase from 813 million cubic feet per day (mn cfd) in 1996 to 1.137 bn cfd by the year 2000, while gas used for reinjection is projected to double to 1.8 bn cfd. The value of oil exports dropped from $14 billion in 1997 to $10 billion in 1998 due to the deterioration in oil prices which fell by 34% during 1998 compared with 1997 levels, to reach US $ 12.4 a barrel. The value of liquefied gas exports also dropped from $2.3 billion in 1997 to $1.8 billion in 1998, due to the fall in its prices which are closely linked with oil prices and owing to the fact that the value of gas exports in 1997 included a one-time payment of $0.4 billion made to GCO by its main importer. The country exports 62% of its crude oil to Japan making it the Country's largest customer. Gas exports are almost entirely to Japan, the world's largest buyer of liquefied gas, with the Country supplying almost one-eighth of Japan's entire requirements.

International Market of the country

This country plays a vital role in achieving stability in international oil markets through its positive and balanced attitude within OPEC. The country participated in two production cuts in 1998 and also played an important role in the agreement adopted by OPEC member states in March 1999 to reduce production by 1.7 mbd. The country agreed to reduce its production by 157,000 bd to a low of 2 mbd. By early September 1999 international benchmark Brent crude oil was trading at a new high of US 21.03 per barrel. Oil prices were expected to continue rising in the fourth quarter of 1999 when winter weather in the Western Hemisphere is expected to increase demand. The country welcomed a proposal to hold an OPEC summit meeting in Venezuela in late 1999 or the year 2000 in order to reinforce rationalisation of the world supply of oil.

ADDITIONAL INFORMATION ON GCO CASE STUDY

This appendix provides additional details on the first case study: Gas Company (GCO).

The organisation change of GCO has resulted in restructuring the organisation chart of the Finance Division. However, the change was minimal resulting in eliminating some sections. Below is the previous and new Finance Division and sub Divisions.

Previous Finance Division Management Accounts Capital & Projects

Figure:PF

```
                        Finance Manager
                              |
                    +---------+---------+
                    |                   |
              Executive Secretary       |
                                        |
                          Assistant Finance Manager
                                        |
        +-----------------+-------------+-------------+-----------------+
        |                 |                           |                 |
  Financial Accounts   Systems &                Sales & Revenue    Capital & Projects
                       Procedures                Expenditure       Expenditure Controller
    Figure:PF.2        Figure:PF.3                     |
                                            Secretary I |
                                            Accounts Clerk
                                             Figure:PF.1
```

Systems & Procedures — Figure:PF.3

Secretary I
Accounts Clerk

Financial Accounts — Figure:PF.2

Sales & Revenue Expenditure — Figure:PF.1

Capital & Projects Expenditure Controller

- Assets Accountant
  - Accounts Assistant (Assets)
- Assistant Accountant (Projects)
- Projects Accountant
  - 2/Accounts Assistants (Projects)

Management Accounts Controller

- Mgt. Information Accountant
- Support Services Accountant
- Insurance Coordinator

Previous Finance Division
Sales & Revenue

Figure: PF.1

Sales & Revenue Expenditure Controller

Budget Accountant

Materials Accountant

Cost Accountant

Accounts Assistant (Budget)

2/Accounts Assistant (Materials)

Accounts Clerk (Materials)

Accounts Assistant (Cost)

Accounts Clerk (Cost)

Previous Finance Division
Financial Accounts

Figure:PF.2

Financial Accounts Controller

- Secretary II
- **Treasury Accountant**
  - Cashier
  - Accounts Clerk (Treasury)
- **Payables & Credit Accountant**
  - Accounts Assistant (P & C)
  - Accounts Clerk (P & C)
- **Payroll Accountant**
  - Accounts Assistant (Payroll)
  - Accounts Clerk (Payroll)

Previus Finance Division Systems & Procedures

Figure:PF.3

```
                    Systems & Procedures
                         Controller
                              |
            +-----------------+-----------------+
            |                                   |
    Financial Systems                    Data Coordinator
        Analyst                                 |
                                   +-----------------------------+
                                   | Accounts Assistant          |
                                   | (Data Control)              |
                                   +-----------------------------+
                                   | Data Prep. Clerk            |
                                   +-----------------------------+
                                   | Data Prep. Clerk            |
                                   +-----------------------------+
```
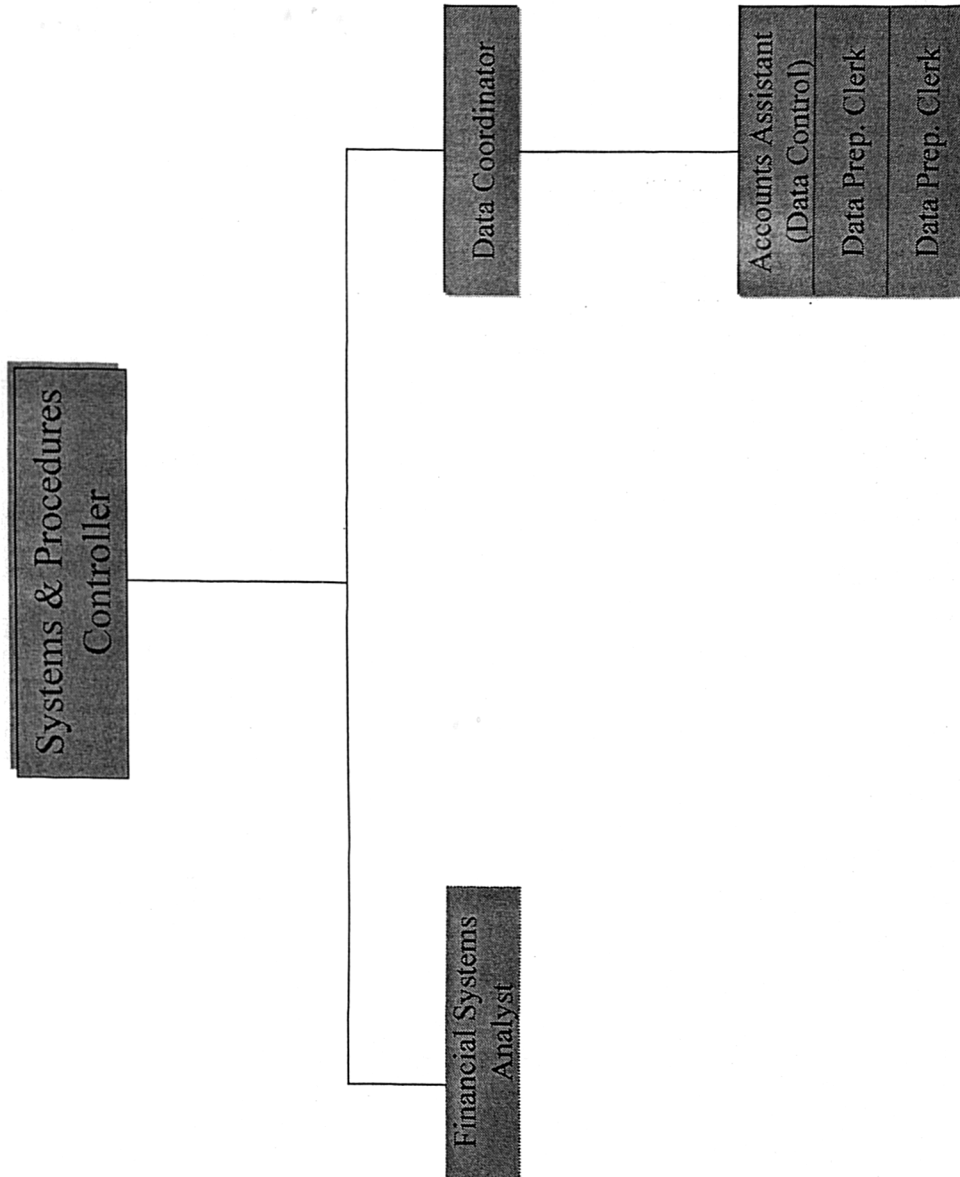
New Finance Division

Figure:CF
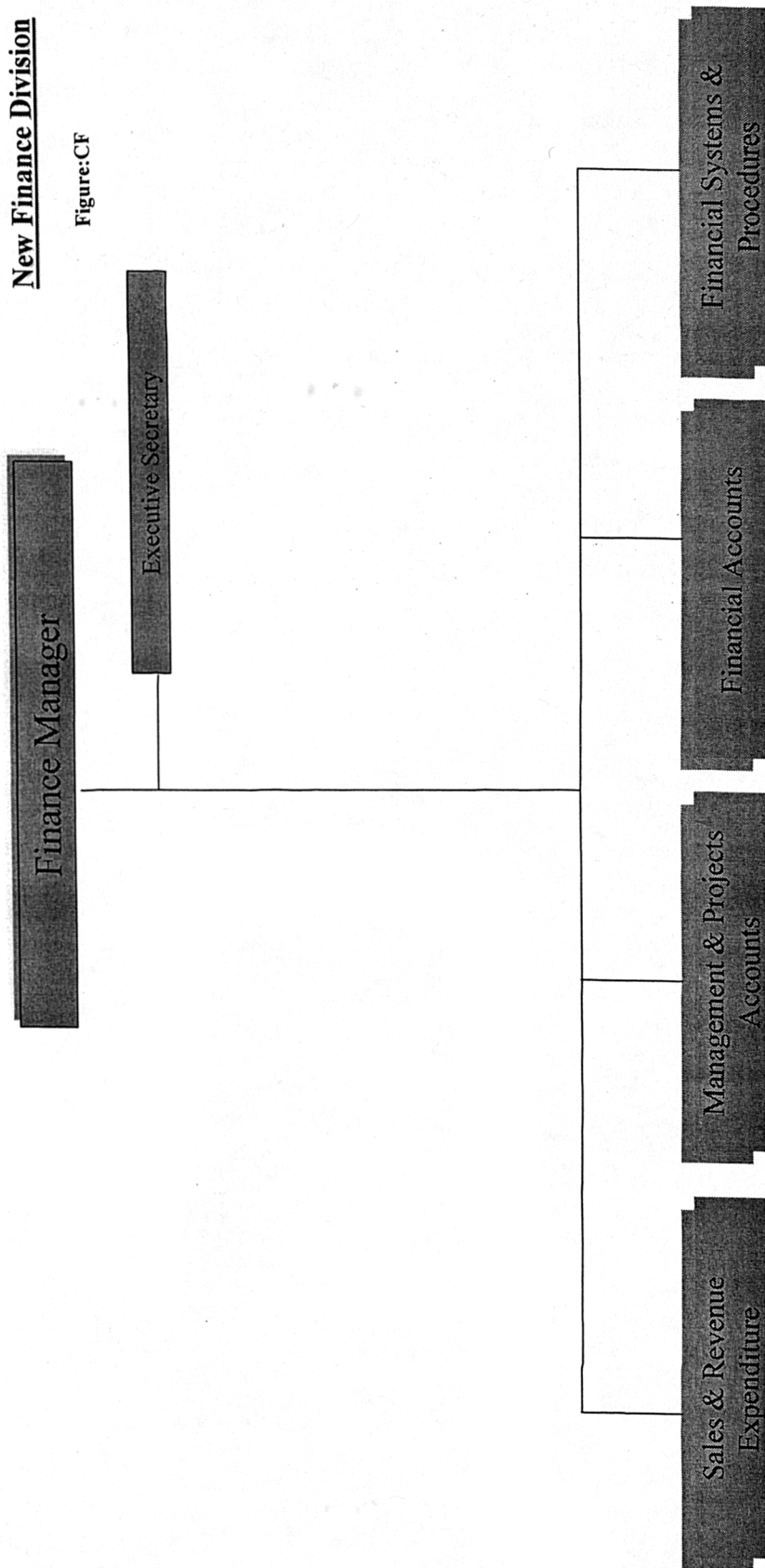
```
                    Finance Manager
                           |
                    Executive Secretary
                           |
   ┌───────────────┬───────────────┬───────────────┐
Sales &         Management &    Financial        Financial Systems &
Revenue         Projects        Accounts          Procedures
Expenditure     Accounts
Figure:CF.1     Figure:CF.2     Figure:CF..3      Figure:CF.4
```

New Finance Division
Sales & Revenue

Figure:CF.1

```
                    ┌──────────────────────────┐
                    │  Head of Sales &          │
                    │  Revenue Expenditure      │
                    └──────────────────────────┘
                                │
          ┌─────────────────────┼────────────────────────┐
          │                     │                         │
   ┌─────────────┐      ┌──────────────┐         ┌──────────────┐
   │ Secretary I │      │ Senior Cost  │         │ Cost & Sales │
   └─────────────┘      │ Accountant   │         │ Accountant   │
                        └──────────────┘         └──────────────┘
                          │        │                    │
            ┌─────────────┘        └──────┐      ┌──────────────────────┐
            │                             │      │ Assistant Accountant  │
   ┌──────────────────────┐    ┌──────────────┐ │ (Cost & Sales)        │
   │ Assistant Accountant │    │ Cost         │ │ Accounts Assistant    │
   │ (Cost)               │    │ Accountant   │ │ (Cost & Sales)        │
   │ Accounts Assistant   │    └──────────────┘ └──────────────────────┘
   │ (Cost)               │           │
   │ Senior Accounts Clerk│    ┌──────────────────────┐
   │ (Cost)               │    │ Assistant Accountant │
   └──────────────────────┘    │ (Cost)               │
                               │ Accounts Assistant    │
                               │ (Cost)                │
                               │ Senior Accounts Clerk │
                               │ (Cost)                │
                               └──────────────────────┘
```

New Finance Division
Management & Projects Accounts
Figure:CF.2

- Head of Management & Projects Accounts
  - Management Information Accountant
  - Senior Capital & Projects Accountant
    - Project Accountant
      - Accounts Assistant (Project)
    - Assistant Accountant (Project)
      - Accounts Assistant (Project)
  - Support Services Accountant

New Finance Division
Financial Accounts

Figure:CF.3


```
                    Head of Financial
                        Accounts
                           |
                           |
            -----------------------------------
            |              |                  |
       Secretary 1    Senior Payables &   Treasury Accountant
                      Payroll Accountant  Accounts Assistant
                           |              (Treasury)
                    ------------------
                    |                |
         Assistant Accountant   Payroll Accountant
            (Payables)          Accounts Assistant
         Accounts Assistant     Senior Accounts Clerk
            (Payables)          (Payroll)
         Senior Accounts Clerk
            (Payables)
```

New Finance Division
Financial Systems & Procedures

Figure:CF.4

```
┌─────────────────────────┐
│  Head of Financial      │
│  Systems & Procedures   │
└─────────────────────────┘
            │
    ┌───────┴────────┐
    │                │
┌──────────────┐  ┌──────────────────────┐
│ Financial    │  │ Senior Financial     │
│ Application  │  │ Applications         │
│ Systems      │  │ Systems Coordinator  │
│ Coordinator  │  └──────────────────────┘
└──────────────┘
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ADDITIONAL INFORMATION ON PCO CASE STUDY

This appendix provides additional details on the second case study: Petroleum Company (PCO).

The implementation of the project has resulted in streamlining the business processes, thus reducing cycle time. Below is an example of one of the business processes 'recruiting expatriates'. The cycle time of this business process has been reduced from 209 (120 working hours) to 87 days (30.5 working hours). The following shows the previous and new business process.

Previous Business Process of Recruiting Expatriates

1. Department identifies need

2. Department issue ER | 10 Mins | 5 Days

3. Recruitment send ER to Compensation | 15 Mins | 2 Days

4. Compensation check post details vs. vacancies | 1/2 Hour | 2 Days

5. Appropriate Manager approve ER | 5 Mins. | 1 Day

6. Recruitment notifies agencies, sends details | 1 Hour | 3 Days

7. Agencies advertise positions | Incl.

8. Agencies screen CVs | Incl.

9. Agencies send CVs to PCO | 14 Days

10. Recruitment receives CVs | Incl.

11. Recruitment selects CVs from files | Incl.

12. Recruitment screens & shortlists CVs | 16 Hours | 10 Days

13. Recruitment sends shortlists to Dept. | 8 Hours | 1 Day

14. Dept. screens & selects for interview | 24 Hours | 30 Days

15. Compensation prepares package | 1 Hour | 2 Days

16. Recruitment notifies agencies | 1/2 Hour | 1 Day

17. Documentation organises (visa, etc..) | 8 Hours | 14 Days

18. Recruitment sets up interview | 1 Hour | 5 Days

19. Dept. conducts interview | 40 Hours | 7 Days

20. Dept. administers test (80% Depts. Don't use tests) | 1/2 Hour | 1 Day

21. Dept. recommends a candidate | 5 Hours | 30 Days

22. Dept. Manager approves candidate | Incl.

23. Recruitment arranges initial security clearance | 1/2 Hour | 3 Days

24. Recruitment prepare contract | 1 Hour | 3 Days

25. SSR of recruitment approves formalities | 1/2 Hour | 1 Day

26. Compensation approves package | 1/2 Hour | 1 Day

27. HCR reviews final offer | 1/2 Hour | 1 Day

28. HRM signs offer | 1/2 Hour | 1 Day

29. Department Manager approves offer | 1 Hour | 7 Days

30. Functional Manager Approves contract | 1/2 Hour | 1 Day

31. GM approves contract for Grade 15+ | 1/2 Hour | 2 Days

32. Recruitment sends final offer | 1/2 Hour | 4 Days

33. Recruitment asks candidate for paperwork | Incl.

34. Candidate accepts offer | 14 Days

35. Candidate takes medical test, paperwork, etc. | 1 Hour | 1 Day

36. Candidate gives notice to current employer | 60 Days

37. Recruitment receives paperwork | 1/2 Hour | 1 Day

38. Recruitment arranges Visa | 2 Hours | 10 Days

39. Candidate arrives to country | 1 Day

40. Candidate sings contract | 2 Hours | 1 Day

41. Recruitment organises security pass for field | 2 Hours | 10 Days

42. Employee starts work on site

New Business Process of Recruiting Expatriates

1	Department issue ER
	2 Hours · 2 Days

2	Recruitment advertises positions
	3 Hours · 14 Days

3	Recruitment screens CVs
	Incl.

4	Recruitment recommendation list for interview
	5 Hours · 2 Days

5	Documentation visa & flight arrangement & setup interview
	8 Hours · 7 Days

6	Recruitment interviews program
	8 Hours · 14 Days

7	Approving the offer
	1 Hour · 2 Days

8	Candidates acceptance
	3 Hours · 43 Days

9	Contract approval by HRM
	1/2 Hour · 3 Days

10	Approval & start of work

Days Taken	87
Working Hours	30.5

The HRD's organisation structure has changed resulting in a flatter structure and 10% manpower reduction. Below is the previous and new HR organisation structure.

Previous
Human Resources Division

Human Resources Division Manager

Head of Recruitment & Compensation
Figure: HR.1
- Secretary
- Senior Recruitment Supervisor
- Senior Compensation Supervisor

Head of Personal Relation
Figure: HR.2
- Secretary
- Senior Human Resources Supervisor
- Senior Personal Relation Supervisor

Head of System & Planning
Figure: HR.3
- Secretary
- Senior Systems Supervisor
- Senior Planning Supervisor

Head of Training & Development
Figure: HR.4
- Secretary
- Senior Career Supervisor
- Senior Training Supervisor

Previous
Human Resources Division
Head of Recruitment & Compensation

Figure: HR. 1


```
                  Head of Recruitment &
                      Compensation
                           |
                       Secretary
                           |
        +------------------+------------------+
        |                                     |
Senior Recruitment                   Senior Compensation
    Supervisor                            Supervisor
        |                                     |
   +---------+---------+           +----------+-----------+
   |                   |           |          |           |
Recruitment      Manpower    Compensation Compensation  Policy Advisor
  Officer      Planning Officer  Officer    Analyst
   |                   |           |          |
Recruitment       assistant   Assistant  Assistant
Assistant

Recruitment
  Officer
   |
Recruitment
Assistant
```

Previous
Human Resources Division
Head of Employee Relation

Figure: HR. 2

Head of Personal Relation

Secretary

Senior Human Resources Supervisor

Senior Employee Relation Supervisor

2/Human Resources Coordinator

2/Human Resources Officer

2/Personal Officer

4/Employee Relation Officer

Assistant

Assistant

Assistant

3/Employee Relation Assistant

Previous
Human Resources Division
Head of Systems & Planning

Figure: HR. 3

Previous
Human Resources Division
Head of Development &
Training

Figure: HR. 4

```
                    Head of Development &
                          Training
                                │
                          Secretary
                                │
          ┌─────────────────────┴─────────────────────┐
          │                                            │
   Senior Training                           Senior Career Development
     Supervisor                                     Supervisor
          │                                            │
  ┌───────┼────────────┐                   ┌───────────┴──────────┐
  │       │            │                   │                      │
Training  2/Training   2/Training    Career Development    Performance
Advisor   Coordinator  Officers         Advisor          Management Advisor
          │            │                   │
       Assistant    Assistant          Assistant
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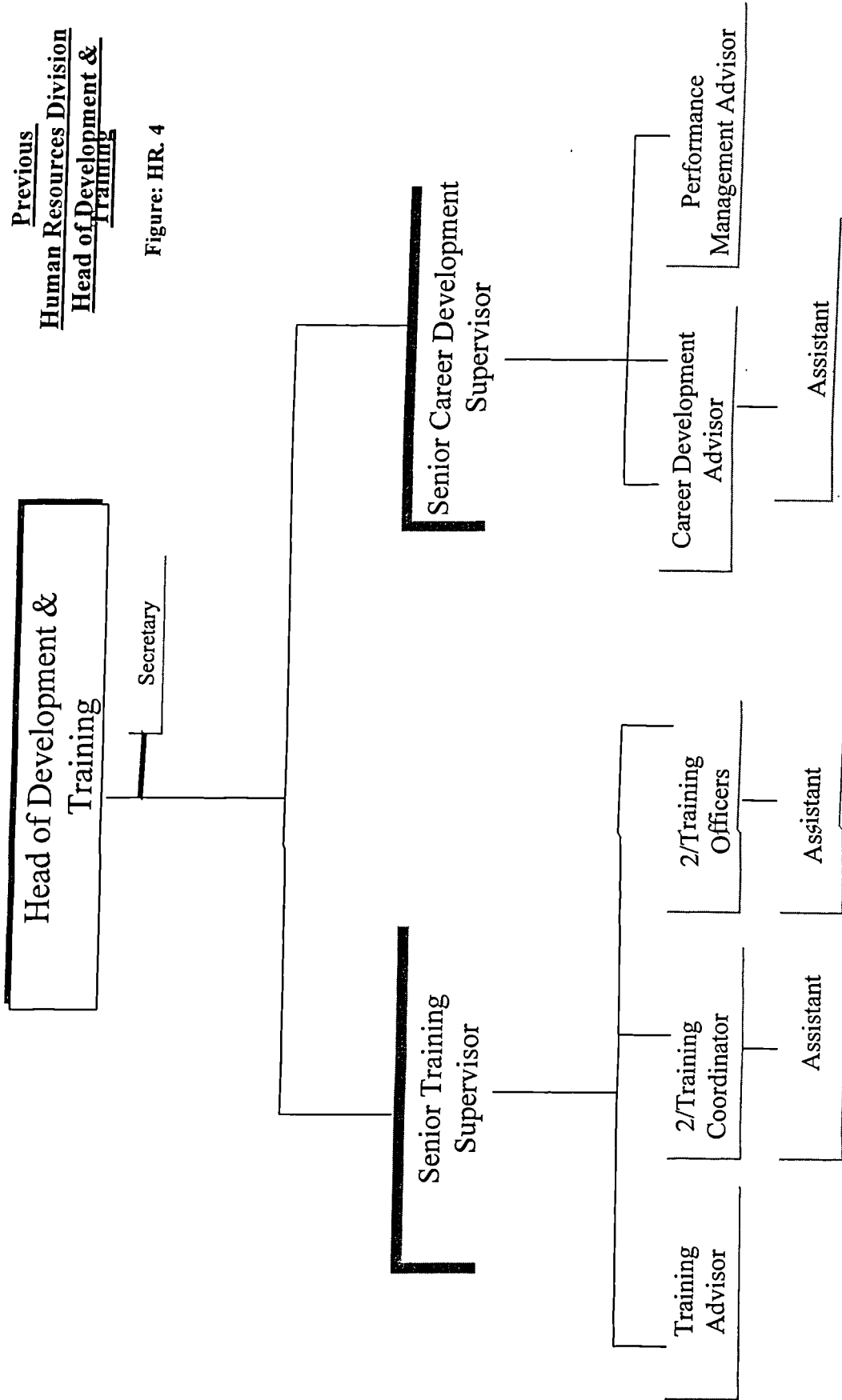
NEW
Human Resources Division

Human Resources Manager

Head of Recruitment & Manpower

- Senior Manpower & Planning Officer
- Recruitment Officer
  - Recruitment & Manpower Assistant
  - Recruitment Clerk
- Technical Admin Officer
  - Technical Admin Assistant
- Technical Officer

Head of Employee Relation

- Senior Human Resource Coordinator
- Senior Personal Compensation
  - Senior Compensation Analyst
  - Compensation Assistant
- 4/Employee Relation Officers
  - 3/Employee Relation Assistant
  - 2/Senior Personal Clerk
- 3/System Officers
- Senior Policy Advisor

Head of Training & Development

- Secretary
- 2/Senior Advisor Training
  - 2/Coordinators
  - 2/Coordinator Assistants
- Performance Management Advisor
- Senior Career Development Advisor
  - Assistant Secretary
- Career Development Advisor

ADDITIONAL INFORMATION ON WED CASE STUDY

This appendix provides additional details on the third case study: Water and Electricity Department (WED).

After the organisational change and restructuring, the Privatisation Committee splitted the WED into 10 companies and WEA replaced the former Water and Electricity Department (WED) in January 1, 1999, which was one of the Government Departments in 'B'. As a result of the radical change, the organisation's structure changed from the old traditional structure to a more flat and horizontal units in order to have better communication among other division and top management. Below are the new Water and Electricity Industry and the Water and Electricity Authority's organisational structures. The WEA will be the entity responsible for the water and electricity sector, but has no direct management role in the separate companies.

In its first effort towards privatisation, WEA undertook a new approach, which is the first of its kind in the region. It has created a joint stock Company in partnership with an American firm, for 'TA-2' project. The share of American firm is fixed as 40% against WEA's 60%. This partnership has given rise to country's CMS Power Company, which is considered the first independent company for the production of water and electricity in the region. It is believed that this project will encourage private sector investment, create new employment opportunities, accelerate economic & social development and increase revenues. The successful launch of 'TA-2' project has given rise to another two multi billion Dollars independent projects in 'SH' and 'TA-1'.

WEA has become an exhilarating and illuminating success story known for its productivity, competency and efficiency in every aspect of its operations. In fact, it has become an ideal exemplary entity whose experience and expertise are sought by others in

the region. Constant planning and forecasting to meet the demands of the consumer and the public at large are the crux of its policy thereby making its own contribution to the spectacular economic growth of city 'B'.

The Board, being the supreme authority, sets the overall policy and guidelines pertinent to Water and Electricity in city 'B' including the production, distribution, transmission and marketing of its supplies. Approves the annual budget of WEA and its Group Companies; ratifies contracts and agreements concluded between WEA and other parties; reviews and follows-up the execution of the policies and guidelines; fixes tariffs, fees, charges and penalties related to electricity and water. The Board, also issues rules, regulations and by-laws organising the structure and functions of WEA and its Group Companies.

WEA regularly endeavours to see that both quantity and quality of services provided are of the highest standards in consistency and reliability. It extends its services to approximately more than 226708 and 125620 electricity and water consumers respectively in city 'B'. The Authority provides these services through its dedicated workforce of 9,465 employees.

WEA has taken full control of the water and electricity in city 'B' and has been entrusted with over all responsibility of organising all affairs of this sector. It has the authority to incorporate both public and private joint stocks and to create limited liability companies as it sees fit solely or with partnership. Moreover, WEA may enter into agreements with private sector entities for the financing of its major independent projects. It may lease, or procure the lease of land owned by government for the construction of such projects. Among other things, WEA owns the shares of certain companies who operate in the areas of production, transmission and distribution of Water and Electricity. Moreover, it has under its authority the right to merge some of its incorporated companies; sell all or part of its shares as well as the assets of these companies. In addition, WEA can enter into agreements on behalf of these companies in areas of production, distribution, operation and financing. The newly established subsidiaries of WEA are stated hereunder:

'A' Distribution Company (ADC)

ADC is an electricity and water distribution company in one of the cities. ADC currently employs a staff of 1748. It was formed from the Electricity and Water distribution functions of the former WED on 1st of January 1999. ADC was established to deliver water and electricity from the wholesale market to consumers (100,000 customers) in the city region of the Country. The ADC is located in 'A' City and has geographically distributed operations and maintenance activities in and around City 'A'. ADC is responsible the sales and distribution of Water and Electricity in addition to the functional responsibility for the connection and delivery of services to consumers, meter reading, billing and collection, and remit of revenues back to the wholesale market players.

The Water and Electricity sector is under the overall control of the WEA. However, with the need for the investment and improvements to customer services ADC is responsible to manage these changes.

'B' Distribution Company (BDC)

BDC is an electricity and water distribution company in 'B' City. BDC currently employs a staff of 2849. It was formed from the Electricity and Water distribution functions of the former WED on 1st of January 1999. BDC was established to deliver water and electricity from the wholesale market to approximately 200,000 consumers in the 'B' City and western region of the city excluding area 'A'. The BDC while located in 'B', has geographically distributed operations and maintenance activities. BDC has functional responsibility for the connection and delivery of services to consumers, meter reading, billing and collection, and remit of revenues back to the wholesale market players.

Currently the Water and Electricity is under the overall control of WEA. However, the need for investment and improvements to customer services BDC was to manage these changes.

'B' Water and Electricity Company (BWEC)

BWEC is a private joint stock company incorporated in 1999. It is a wholly owned indirect subsidiary of WEA. This company is a power and water procurement company located in 'B' City that serves as the sole wholesale buyer and seller of power and water in

the industry. Additionally, BWEC purchases fuel for the Generation and Desalination companies, including those future new capacity expansion companies. BWEC currently has a staff of 29 employees.

The main role of BWEC is to act as a guarantor of the security of supply of water and electricity to the consumers in city 'B'. This mission is fulfilled through careful short-and long-term balances of supply and demand, through long term power and water purchase contracts with the Power/Water Production Companies, through Bulk Supply sales contracts with Distribution Companies and through organising tenders new capacity when planning shows the need for capacity additions.

One of the main roles and functions of BWEC is to develop load forecasts both short-term and long-term for the demands for water and power in city 'B', and to use these forecasts to specify the amount and timing of capacity expansion or addition for desalination, power generation, water and power transmission and distribution in order to secure the future demands of water and electricity to the consumers. The company is responsible for preparing a long-term expansion plan for additional capacity for water and electricity based on demand forecasts as well as on reliability targets.

'BA' Power Company (BAPC)

BAPC is an electricity generation and water Desalination Company comprised of three separate power and desalination stations located in 'B' City, 'AT', and 'A'. The 'BA' Power Company currently has a multinational staff of approximately 685 employees coming from 20 different countries. BAPC has the installed capacity to produce 950 Megawatts of electricity and 15 Million gallons of desalinated water per day. BA Power Company is in the process of divesting itself of its TA-1 power and desalination station as a further step in the complete privatisation process. 'BA' Power Company has the installed capacity to produce 1216 MW of electricity and 44 MGD (million gallons per day) has desalinated water. At peak capacity, BAPC produces approximately one third (1/3) of total electricity and one fifth (1/5) of the desalinated water produced by the former WED.

It is formally established as a public stock company on 1ˢᵗ of January 1999. This organisation was formed from three stations from the former WED, which was unbundled and then privatised. The Management and staff of this organisation are dedicated to the operation and maintenance of the assets of the firm in order to produce desalinated water and electricity in sufficient and reliable quantities for ultimate delivery to the consumers to aid in the social and economic development of city and the country.

'M' Power Company (MPC)

MPC is an electricity generation and water Desalination Company located some 200 kilometres to the west of 'B' City. The 'M' Power Company currently employs a staff of 260, and has the installed capacity to produce 300 Megawatts of electricity and 17 Million gallons of desalinated water per day.

'W' Central Services Company (WCSC)

WCSC is a centralised transportation services company that owns and operates a fleet of light and heavy-duty vehicles and equipment. WCSC leases its fleet vehicles and equipment to the WEA group companies. WCSC company presently employs a staff of 470 and is headquartered in an area close to 'B city.

'STF' Company (STFC)

STFC is a centralised estate services company, which provides support and maintenance services for the shared facilities at the 'T' site. At 'T' there are three separate and independent power companies: TPC, ECMS Power Company, and Gulf TT Power Company. They all use common roads, street lighting, fire protection, seawater intake, etc. Although the ownership of the STFC is less than 100% vested in the Government of city, administration and management of the company falls within the WEA Group Companies umbrella. The STFC currently employs a staff of 68 and is located in 'T'.

'AT' Power Company (ATPC)

ATPC is an electricity generation and water Desalination Company located some 60 kilometres Northeast of 'B' City. It is the largest single site producer of electricity in the

city. The 'AT' Power Company currently employs a staff of 393, and has the installed capacity of 750 Megawatts of electricity and 75 Million gallons of desalinated water per day. ATPC has just completed the construction of an additional 308 MW of electricity with an additional 22.5 Million gallons of water per day.

ATPC was incorporated and licensed to operate as an independent company within the WEA group of Companies, when the electricity and water sector unbundled from Government at midnight on 31 December 1998. ATPC is one of the several companies operating on 'AT' site located 80 KM from the city 'B', on the southern shore of the Arabian Gulf.
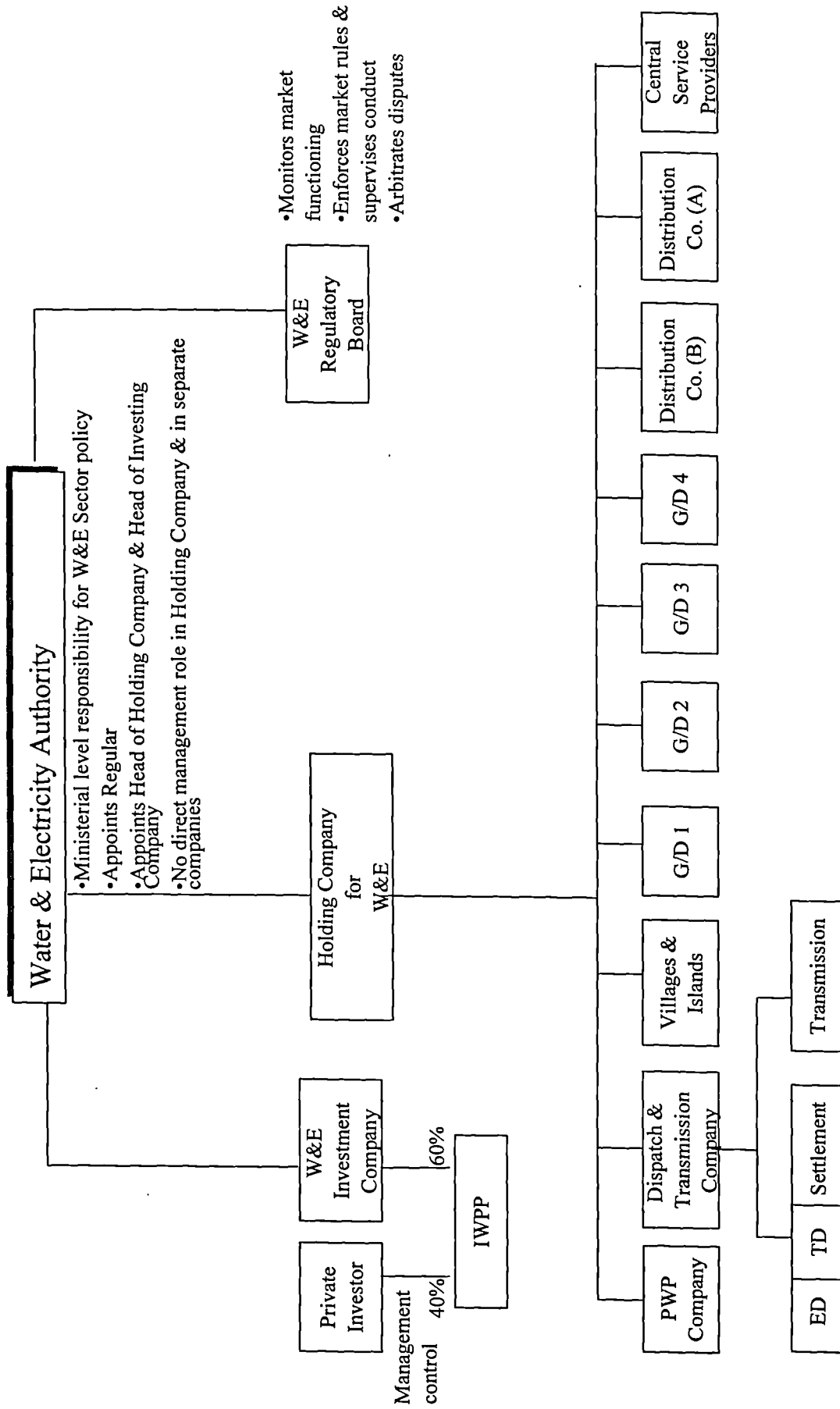
'B' Transmission and Dispatch Company (BTRDC)

BTRDC is an electricity and water transmission and dispatch company located in 'B' City, with geographically distributed operations and maintenance activities. This firm was created as legal entity on 1st of January 1999 from the transmission element of the Water and Electricity Department. It is now a subsidiary company of the Authority, wholly owned by the Government of the city. However, the company is obliged to operate on a commercial basis.

BTRDC currently employs a staff of 1139. The dispatch function is handled in a separate division that consists of Economic and Technical Dispatch departments and a Settlements Department. Dispatch has the functional responsibility to minimise the variable cost of water and electricity, to maintain system reliability through the central management of all relevant system parameters, and to support the financial settlement of contracts for the purchase of power and water from the generation and desalination companies. Transmission is functionally responsible for consolidation and the effective and efficient operation and maintenance of all water and electricity transmission assets. Moreover, BTRDC provides the high ways (by pipelines or wire) for the producers to transport their goods to the distributors.

'UMN' Power Company (UMNPC)

UMNPC is an electricity generation and water Desalination Company located some 10 kilometres Northeast of 'B' City. The 'UMN' Power Company currently employs a staff

of 799, and has the installed capacity of 1200 Megawatts of electricity and 80 Million gallons of desalinated water per day. Currently, UMNPC is in the process of expanding their desalination capacity for an additional 62.5 Million gallons per day for commissioning in years 2001 and 2002.

Water & Electricity Authority
- Ministerial level responsibility for W&E Sector policy
- Appoints Regular
- Appoints Head of Holding Company & Head of Investing Company
- No direct management role in Holding Company & in separate companies

W&E Regulatory Board
- Monitors market functioning
- Enforces market rules & supervises conduct
- Arbitrates disputes

Holding Company for W&E

W&E Investment Company

Private Investor

Management control   40%   60%

IWPP

PWP Company | Dispatch & Transmission Company | Villages & Islands | G/D 1 | G/D 2 | G/D 3 | G/D 4 | Distribution Co. (B) | Distribution Co. (A) | Central Service Providers

ED | TD | Settlement | Transmission

WEA Board of Management

Water & Electricity Authority Chairman

Secretary & Support Staff

Planning & Coordination Bureau

Research Centre Manager

Portfolio Management Manager

Projects Manager

Procurement & Contracts Manager

Personnel & Administration Manager

Information Technology Manager

Finance Manager