UNIVERSITY SAINS MALAYSIA

School of Housing Building and Planning

MSC In Project Management

Competence and Impact of Critical Factors of BPR: A Case Study of the Libyan OIL Sector

Student Name :
Ahmed Mohamed Maki (P-RM132/02)

Date :
2002 / 2003

Supervisor :
Dr. Abd. Hamid Kadir Pakir

Dedication

I would like to dedicate this work to my lovely wife and newly born baby

Ahmed

Acknowledgements

I would like to acknowledge the support of my supervisor ***Dr.Abd.Hamid Kadir Pakir*** for all his help and guidance in producing this dissertation.

I am extremely grateful to my ***wife*** and my friends ***Ashraf Tumi*** and ***Mohamed Feturi*** without whose help I could not have studied for the MSc in Project Management .

I would also like to thank all the employees at the (NOC), especially at management level, for all their cooperation in the preparation of the case study element of this academic research.

I would like to give my sincere thanks to all the staff at the school of Housing, Building and Planning .

Especially gratitude is given to ***Dr.Abdullah Bin Mahmmud*** and ***Dr.Abdulsalam Nafad*** for their understanding and encouragement upon my arrival in Malaysia .

Last, but by no means least, I dedicate this effort to my father and my son, with my love and sincere thanks.

Abstract

In the increasingly competitive environment of the 21st century, changes are inevitable in any organization that wishes to survive; the key to success is how to manage that change. Business Process Reengineering (BPR) has become a vital key for this change. This dissertation presents a holistic review of the literature related to BPR. Its review of the literature relating to the BPR critical factors that cause success and failure for BPR implementation, classifies these factors into subgroups, and identifies key factors of success and failure.

To demonstrate the impact of the BPR critical factors, a case study of the National Oil Corporation (NOC)and its Affiliated Companies is used. The impact that occurred at this organization is analyzed and compared within academic literature review. To examines whether; the Libyan Oil sector NOC is really reengineering its Companies, or its just seeking incremental improvement.

This dissertation concludes that the Libyan Oil sector NOC, is not emphasizing on some of the most important factors, such as human element, top management commitment and support, and the involvement of staff out side the BPR teams. In short way, the NOC is compelled to sacrifice a longer term competitive advantage in order to achieve short term cost saving.

TABLE OF CONTENTS

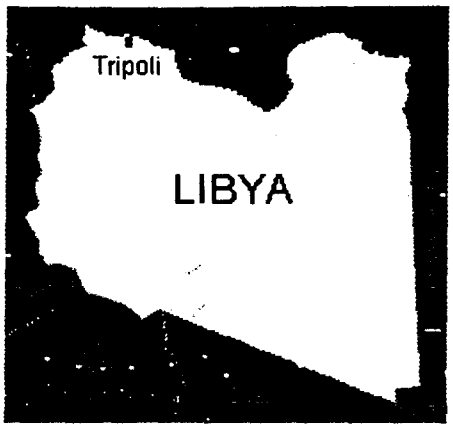
CHAPTER 3.0 Methodology

CHAPTER 4.0 Questionnaire Results

List of Figures

List of Charts

Chapter One : The National Oil Corporation and its Affiliated Companies in Libya.



1.0 Introduction

Libya About 1,760,000 square kilometers (excluding Aouzou Strip claimed by Chad) consisting mainly of desert. Land boundaries 4,345 kilometers long and coastline 1,770 kilometers long. Twelve-nautical- mile maritime claim, including disputed Gulf of Sidra. Topography: Main contrast between narrow enclaves of fertile lowlands along Mediterranean coast and vast expanse of arid, rocky plains and sand seas to south. Coastal lowlands separated from one another by predesert zone and backed by plateaus with steep, north-facing scarps; country's only true mountains, Tibesti, rise in southern desert. Country has several saline lakes but no perennial watercourses. Less than 5 percent of territory economically useful.

Climate Dominant climate influences Mediterranean Sea and Sahara Desert. In coastal lowlands, where 80 percent of population lives, climate Mediterranean, with warm summers and mild winters. Climate in desert interior characterized by very hot summers and extreme diurnal temperature ranges. Precipitation ranges from light to negligible; less than 2 percent of country receives enough rainfall for settled agriculture.

1.1 Population

Approximately 3.63 million inhabitants according to 1984 census, including at least 260,000 aliens. Indigenous population was increasing at one of world's highest annual growth rates, estimated variously at between 3.4 percent and 4.5 percent.

Languages and Ethnic Groups: Official language Arabic. Government policy discourages use of other languages, but English used extensively--even by government for some purposes-and ranks as a second language. Italian and French also spoken, and small minorities speak Berber dialects. Arabic-speaking Sunni Muslims of mixed Arab and Berber ancestry make up well over 90 percent of indigenous population. Most of remainder Berbers, Tuaregs, and black Africans, and small but long-settled Greek and Maltese communities. Expatriates, imported under government contract to meet labor shortages, largely citizens of other Muslim countries; many technical and professional positions filled by East and West Europeans. Altogether, representatives of more than 100 nationalities live in Libya.

1.2 Health

Number of medical doctors and dentists reportedly increased sevenfold between 1970 and 1985, producing in case of doctors ratio of 1 per 673 citizens. In 1985, about one-third of doctors Libyan natives, remainder expatriate foreigners. Number of hospital beds

tripled in same time period. Among major health hazards endemic in country in 1970s were typhoid and paratyphoid, infectious hepatitis, leishmaniasis, rabies, meningitis, schistosomiasis, venereal diseases, and principal childhood ailments. Progress included eradication of malaria and significant gains against trachoma, tuberculosis, and leprosy.

In 1985 infant mortality rate was 84 per 1000. Life expectancy for men 56 years, for women 59 years.

1.3 Literacy

In early 1980s, estimates of total literacy between 50 and 60 percent, about 70 percent for men and 35 percent for women, but gap narrowing because of increased female school attendance.

1.4 Religion

Islam official religion; nearly entire population adheres to Sunni branch of Islam.

1.5 National Oil Corporation.

The National Oil Corporation (NOC) was established on 12 November 1970, under Law No: 24/ 1970 to assume the responsibility of the oil sector operations. It was later reorganized under Decision No: 10 / 1979 by the General Secretariat of the General People's Congress, to undertake the development of petroleum, supporting the national

economy through increasing and exploiting the oil reserves, and by investing in those reserves, to realize optimum returns. Arab Oil &Gas Directory (2001).

In carrying out its activities, NOC may enter into participation agreements with other companies and corporations carrying out similar activities. Therefore, NOC is carrying out exploration and production operations through is own affiliated companies, or in Participation with other companies under service contracts or other kinds of petroleum investment agreements.

This is in addition to the marketing operations of oil and gas, locally and abroad. For this purpose, NOC has its own fully owned companies, which carry out exploration, development and production operations, in addition to local and international marketing companies.

NOC also maintains participation agreements with specialized international companies. Such agreements have developed into exploration and production sharing arrangements, in accordance with the development of the international oil and gas industry, and international petroleum marketing.

Various stages of exploration and production of oil and petroleum products, performs quality control tests and issues certificates in this respect.

It also evaluates patents and licenses for exploitation, and the fees and forms relating to oil operations and petroleum products. It publishes work carried out by the centre in it's NOC owns refining, and oil and gas processing companies, operating refineries such as Zamia and Ras Lanuf refineries, ammonia, urea and methanol plants, the Ras Lanuf petrochemical complex and the gas processing plant. To establish petrochemical

industries, a further stage of development of the ethylene plant has been completed, as well as low and high-density lineal polyethylene plants.

NOC also owns national service companies which carry out oil well drilling and other work operations, provide all drilling materials and equipment, lay and maintain oil and gas pipelines, build and maintain oil and gas storage tanks and carry out related technical and economic studies. They also provide the sector with other services such as catering, procurement of materials and equipment, and the training and employment of foreign employees.

Also affiliated to NOC is a petroleum research center which carries out research and technical studies related to the oil industry, conducts technical analyses and tests for the own publications, as well as local and international scientific publications.

1.6 Manpower.

In the area of manpower development, NOC provides the oil industry with qualified nationals within a well planned scheme founded on a base of educational and training institutions, for training and developing qualified manpower in such professions as engineering, accounting and immunization.

Training outside the Great Jamahiriya is limited to those technical specializations, which are not available locally, to cope with the rapid development of the industry.

Technical training is being carried out at the training centers and institutions belonging to NOC, to develop specialized technicians for the operation and maintenance of industrial facilities and plants.

1.7 Change management

"Since the time progress has been remarkable, Libya having risen to become one of the world's major oil producing Countries, thus playing an important part in meeting the universal need for this vital source of energy" (Hassan Yahya) Acting General manager NOC.

For the project to go ahead, first the employees were informed about how the BPR project would affect the NOC as a whole, how the change would affect the employee's work and how the change would take place. The purpose of this is that BPR project has generated such enormous media business interest. Therefore, information about how the NOC will implement BPR project has helped the employees to understand such a project like BPR.

Feeding in the Oil industry with qualified employees through out the implementation of BPR project. This reflects the increasing interest of BPR programmers in the Libyan Oil sector, a well prepared training plans as a means to the Libyans key positions and meet the objectives of improving the efficiency and skills of employees. Therefore, NOC has established a main training channel such as:

- The petroleum training and qualifying institute.
- The Zawia specific center.
- Vocational training and development.

However, training abroad is limited to those rare specializations that are not available nationally.

1.8 Management support

As state earlier, Libya is playing an important part in meeting the universal need for Oil energy. Libyan Oil sector are generally interested in applying business reengineering process to make themselves more competitive and need to employ totally different business systems in today's information society when compared to past Oil society.

The (NOC) management has proposed a basic BPR strategy such as: customer's service cost reduction, quality an achievement and time reduction. More specifically, the Libyan management needs to set the overall BPR strategy, diffuse this strategy to the Affiliated Companies, motivate employees, give priority to change efforts, allocate sufficient resources to BPR project, set clear directions, and share the overall vision with employees.

1.9 Information technology

Information technology has came to realizes the fact that, it's quicker, better and more varied service that any managers are demanding, to establish a greater productivity and efficiency in today's information management. However, the important role that IT within program has brought is enhancing the decision-making, in addition, document management, databases and communication network.

On the other hand the Libyan managers had played an active role to possess good knowledge to be experts in each IT tool. Nevertheless, the non-technical managers had required effort to become familiar with IT reengineering outfit.

1.10 Critical success factors

Although a multitude of companies are actively pursuing reengineering, mounting evidence reveals that many of the efforts are not meeting original expectations. One of the key successes in the project is how the organizations have focused on the importance of critical success factors.

The ranking of critical success factors by the Libyan managers were as following:

First the most important factors were:

- Top management's understanding of the procedure.
- Establishment of performance improvement goals for processes;
- Aligning strategy with corporate strategy;
- The involvement of personnel division;
- Training programs, to cope with the change.

Second the less important factors were:

- Effective teams selection;
- Appointment of an external reengineering team;
- Reengineering team's commitment to the task.
- Regular communication of progress to all staff.

1.11 Business process re-engineering (BPR)

Business process re-engineering (BPR) was first introduced in 1990 by Hammer (1990), and Davenport & Short (1990). In their articles the authors outlined a new approach to the management process, which, it was claimed, was producing radical improvements in

performance. Since then, BPR has become one of the most popular subjects in business management and among researchers worldwide.

Organizations have to face change on a regular basis, whether small or large scale. Nevertheless, there remains a shortage of cases providing data about the effectiveness of the critical factors of BPR in different circumstances.

Many organizations have undertaken re-engineering projects. Some of them have reported significant benefits from their BPR experience, and some suggest that the failure rate of re-engineering attempts has been equally high; over 70 percent. In consequence, there is need for more information about the reasons for the success and failure of these attempts, that is to say the critical factors governing success and failure of BPR.

The author has been investigating the Libyan Oil Sector through the National Oil Corporation (NOC), and its Affiliated companies, which has implemented a BPR project recently. Libyan organizations are generally interested in applying business process re-engineering (BPR). In the 1990's, Libyan firms began to realize that efficient and effective innovation is a key survival strategy in the global market place. nThis was especially true in the Oil sector, where Libyan managers tend to believe that their companies need more effective business systems to respond successfully to rapidly changing business environments.

The proactive Libyan National Oil Corporation and its affiliated companies are utilizing BPR to catalyze change from the more traditional industrial business framework to more information-based business design. Arab Oil & Gas Directory, (2000).

This dissertation is to use the Libyan Oil sector through the National Oil Corporation and its affiliated companies as a case study, to determine wither; the NOC is far enough along in the reengineering process, or just seeking incremental improvement.

1.12 Research Objectives:

The Research Objectives are as follows:

- To carry out research into the critical success and failure factors in BPR implementation in the National Oil Corporation (NOC).
- To find out the importance of critical BPR factors, by obtaining staff/ employee perceptive data on those factors.
- To conduct the research in a large sector organization (National Oil Corporation (NOC))
- To find out how the NOC managed their BPR implementation and whether to integrate or eliminate some of the BPR critical factors.
- To discover whether the top management in NOC are paying attention to the most important factors.

In order to achieve these objectives, the author chose to conduct secondary research in the form of a literature review using books, journals, the Internet and some recent documents regarding (BPR) implementation , and to perform primary research by analysing and comparing the critical success factors as well as how top management in the Libyan Oil Sector focused upon those.

1.13 Methodology

This study was designed to examining wither the Libyan Oil Sector has gave far enough in the Business Reengineering Process or just seeking incremental improvement? Primary research was then conducted to collect original data for these specific purposes. This was supplemented by secondary data collection, focusing on the features of BPR projects examined in the primary research.

1.14 Scope of Study

The first chapter will present a historical background of the National Oil Corporation NOC, before moving on research using interviews and questionnaire. The primary research is designed to enable further understanding of the impact of BPR in the Libyan Oil sector, firstly from the top management viewpoint and then from the employees' view. Secondly, it is to compare the critical factors focused upon by NOC with those expressed in the literature review.

Chapter two, the start of the literature review research, will discuss two themes. Firstly defining the concept along with the role of business processes, and the core principles of BPR by examining the theoretical basis for BPR. Second, the organizational elements of BPR will be examined and the arguments regarding the reasons for implementation, and the enabling, in addition to the constraining, roles of IT. Last but not least, the debated critiques of BPR.

This chapter will examine the positive and negative elements of each of the above arguments, whether in statement, defense or criticism of BPR. By doing so, the critical success and failure factors of BPR will have been introduced, and an explanation given

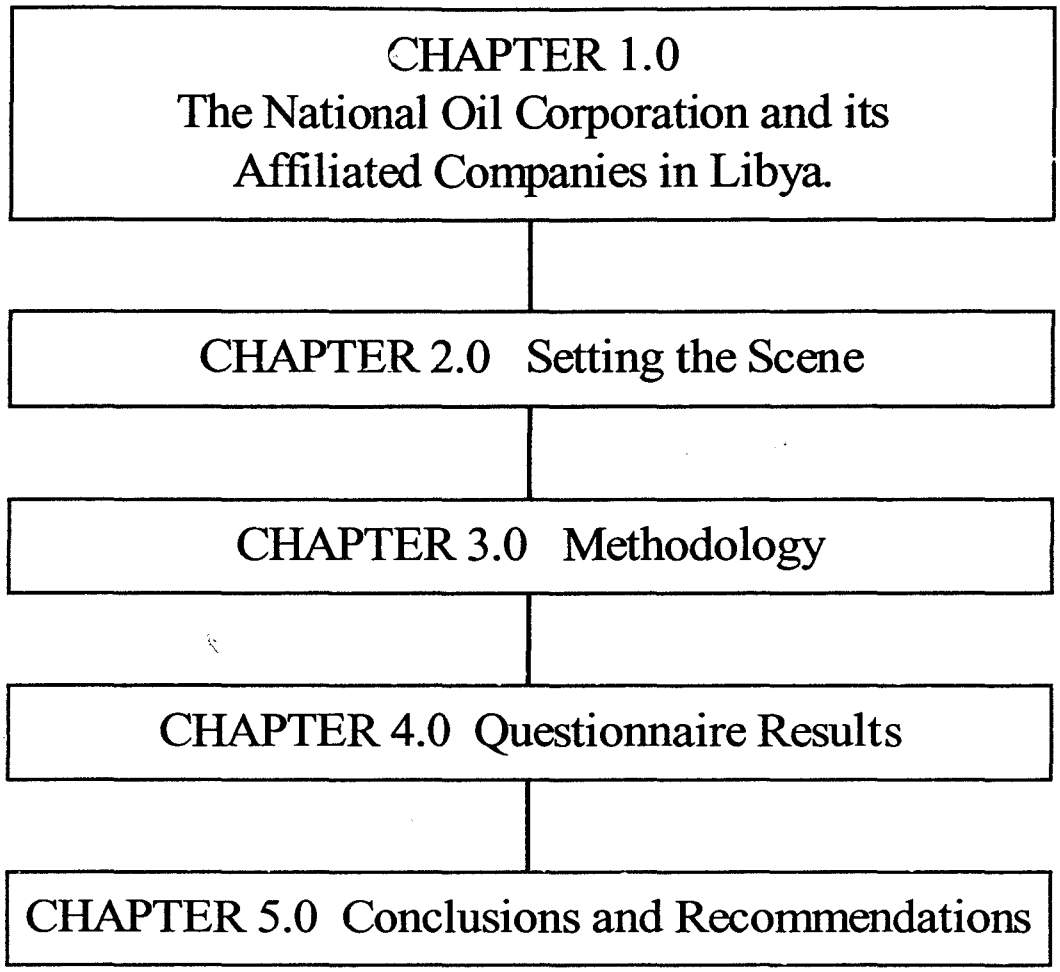
why any company wishing to implement a BPR project should be aware of these most important factors.

To provide the reader with an insight into the dissertation, chapter there will illustrate the methods chosen by the author, beginning with clarifying the importance of methodology and why it provides the core concept underlying all researches.

The chapter will then move on to an in-depth attempt by the author to justify the methodology used, through covering both a theoretical viewpoint in the form of the literature review, and also practicalities of the subject in the form of the primary and secondary research.

Chapter four will explains the result from the questionnaire and interview. The last chapter will provide a conclusion of the findings. In the last section of this chapter the author will present some recommendations to the senior managers, in order to draw attention to the important factors of the study. The organization of the study is shown in chart 1.

Chart 1 : The Organization of the study



1.15 Summary

Business process re-engineering (BPR) was first introduced in 1990 by Hammer (1990), and Davenport & Short (1990). In their articles the authors outlined a new approach to the management process, which, it was claimed, was producing radical improvements in performance. Since then, BPR has become one of the most popular subjects in business management and among researchers worldwide.

Organizations have to face change on a regular basis, whether small or large scale. Nevertheless, there remains a shortage of cases providing data about the effectiveness of the critical factors of BPR in different circumstances.

Many organizations have undertaken re-engineering projects. Some of them have reported significant benefits from their BPR experience, and some suggest that the failure rate of re-engineering attempts has been equally high; over 70 percent. In consequence, there is need for more information about the reasons for the success and failure of these attempts, that is to say the critical factors governing success and failure of BPR.

The author has been investigating the Libyan Oil Sector through the National Oil Corporation (NOC), and its Affiliated companies, which has implemented a BPR project recently. Libyan organizations are generally interested in applying business process re-engineering (BPR). In the 1990's, Libyan firms began to realize that efficient and effective innovation is a key survival strategy in the global market place.

This was especially true in the Oil sector, where Libyan managers tend to believe that their companies need more effective business systems to respond successfully to rapidly changing business environments.

Chapter 2 : Setting the scene

2.0 Introduction

There has been an increase in the number of organizations that have chosen to take advantage of this new change initiative, as well as in the number of relevant publications. Nonetheless, when it comes to defining the nature, content and methodology of business process re-engineering confusion reigns, mostly caused by its novelty and the contradictory results that have been reported.

The aim of this chapter is to produce a clear and precise picture of what exactly BPR is, the features it encompasses, and the problems that are associated with it. Therefore, this chapter shall concentrate on exploring the nature of BPR on two levels.

Firstly, this chapter will examine the literature in order to analyze the different definitions that have been placed upon BPR. Several such definitions have been put forward, and therefore this body of literature shall be fully analyzed. However, this analysis will further focus upon the role of business processes in BPR, as well as the core principles of BPR. This focus will therefore allow the underlying themes and theoretical basis for BPR to be identified, and an assessment in relation to the literature to be conducted.

Secondly, this chapter shall use the theoretical discussion as a basis for a focus on the organizational elements influencing success and failure factors of BPR. This will include an analysis of the driving strategic forces of BPR, the organizational role of Information Technology as an enabling and constraining force, and the constraints, which are argued to be inherent in BPR projects.

This chapter will therefore produce a synthesis of the BPR literature, and identify a theoretical and organizational framework upon which an analysis of success and failure factors can be based.

2.1 Defining BPR

In order to understand better the nature and concepts of Business Process Re-engineering it will be helpful to explore the extended literature, so that the diverse approaches can be integrated in the construction of a complete picture. While most of the writers talk of business process re-engineering, others use terms like process innovation, business engineering, core process redesign or organizational redesign. An exhaustive analysis, however, reveals that they all describe an initiative with the same or similar characteristics.

The origins of BPR can be traced to 1990. Hammer (1990) stated that instead of fixing or repairing outdated processes, companies should take advantage of the numerous possibilities offered by Information Technology (IT) and move towards radically redesigning any obsolete and outmoded processes. To prove his point, Hammer used examples of American industries, such as Ford and Mutual Benefit Life, achieving competitive advantage through BPR. Hammer pointed to Ford's introduction of a database-driven accounts payable process, which replaced a paper-based process while achieving improvements in efficiency.

This 'Re-engineered' process required 75% less staff than its predecessor. Mutual Benefit Life, on the other hand, reduced handoffs in its policy application process through the creation of a generalist Case Manager position to replace a range of

specialists. This resulted in the company being able to handle more than twice the volume of applications, than before the BPR project.

Davenport and Short (1990) emphasized the ways in which " business process redesign" can lead to successful changes in all aspects of the organization. Their article bears similarities to the one from Hammer, but focuses extensively on the role that IT should play in an effort to clear the confusion that exists around the subject. However, most of them are descriptions of BPR, and shed little light on the nature or content of the initiative itself.

The concept of BPR has generated such enormous media business interest that various definitions have arisen. These include the following:

> *"The fundamental re-thinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed" (Hammer and Champey, 1993, p.32).*

> *"Re-engineering is only part of what is necessary in the radical change of processes; it refers explicitly to the design of the new process. The term process innovation encompasses the envisioning of new work strategies, the actual process design activity, and the implementation of the change in all its complex technological, human, and organizational dimensions" (Davenport, 1993 p.2)*

> *"The fundamental rethinking and radical redesign of business processes to bring about dramatic improvements in performance"* (Hammer and Stanton, 1995).

> *"The radical redesign of broad, cross-functional business processes with the objective of order-of-magnitude performance gains, often with the aid of information technology"* (Grover, V. and Kettinger, W. 1995, p.1).

Clearly BPR means different things to different people. However, the basic idea underlying these definitions can be outlined as the necessity for transforming the business via redesign of the work processes to improve performance.

According to Hammer and Champey (1993), re-engineering emerged from their experiences with several US companies and encompasses a new way to organize work. From the definition derive four key words: fundamental, radical, dramatic and processes.

Re-engineering is " fundamental " because it drives people to question basic assumptions about the company's operations; it is " radical " because people are not encouraged to improve or fix the existing structures and procedures, but to invent completely new ones; " dramatic " implies that the results of the effort will not be partial or limited but complete and total; and finally processes is an important word, and at the centre of every effort that wishes to be called re-engineering. Because of the weight that processes bear for re-engineering, the term will be addressed in detail below.

Davenport (1993) prefers the term Process Innovation because it "*encompasses the envisioning of new work strategies, the actual process design activity, and the implementation of the change in all its complex technological, human and organizational dimensions*" (1993, p.2).

Davenport argues that this approach is more complete, while re-engineering as described by Hammer and Champey is limited to the design of the new process.

However, another argument defines Business Process Re-engineering as:

"*The means by which an organization can achieve radical change in performance as measured by cost, cycle time and quality, by the application of a variety of tools and techniques that focus on the business as a set of related customer- oriented core business processes rather than a set of organizational functions* " (Johansson et al., 1993, p.15).

The similarities with Hammer and Champey's definition are obvious, since they also place emphasis on the radical changes that can be achieved by an approach that is intensely focused on the core business processes and not on the functions.

Jacobsson et al (1995) talk about Business Engineering, which is defined as:

"*A set of techniques a company uses to design its business according to specific goals. The set of techniques includes:*

- *Step - by - step procedures to design the business.*
- *Notations that describe the design.*
- *Heuristics or pragmatic solutions to find the right design, measured in terms of the specific goals* " (Jacobsson et al. 1995,p.2)

They use an engineering approach to view the organization and design the best possible way to operate successfully, and use this term to include the concepts of both business process re-engineering and business improvement.

Despite their difference in terminology or emphasis, the above definitions each describe an approach to organizational change with similar principles and characteristics. Each of the definitions identify that, through BPR, great importance is placed upon business processes within organizations. The following section will explore the literature regarding business processes in more depth.

2.2 Business Process

Business processes lie at the heart of each definition of BPR set out above.

Hammer and Champey (1993) define a business process as

"A collection of activities that takes one or more kinds of input and creates an output that is of value to the customer" (1993,p.35).

However, Davenport (1993) takes the definition further, stating that since.

"It implies a strong emphasis on how work is done within an organization ... a process is a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs: a structure for action" (1993,p.5)

Therefore, rather than being organized functionally, which produces what Hammer and Champey call "functional silos" (1993,p.28) built upon narrow pieces of processes, companies are also a collection of cross functional business processes and should be structured around them.

However, Grover and Kettinger, (1995) have another point view of process in which:

"Way things get done, i.e., a series of actions or operations conducting to an end. It includes all processes and procedures, from human resource practices to manufacturing process. It also includes the process measurement schema" (p.62).

Ould (1995) chooses to "work around the concept a little first " and lists some of the essential features of a process in the following way:

"A process involves activity: people and/or machines do things. A process also generally involves more than one person or machine: a process is about groups; it concerns

collaborative activity. And a process has a goal: it is intended to achieve something" (1995,p.1).

He then proceeds to divide business processes into three types:

- Core processes that concentrate on satisfying external customers.
- Support processes that concentrate on satisfying internal customers.
- Management processes that concern themselves with managing the core processes and the support processes, or with planning at the business level.

Towers, 1993, p.3.commented final definition of process focuses on the core business process:

"*A business process is a set of interrelated activities which, when executed. Result in a business outcome* ".

Following are some examples of business processes:

- Handling an order for goods: the sequence of activities that are generated once a company receives an order from a client; how this order is received and the stages it goes through until the goods are delivered to the customer.
- Recruiting staff: the process includes the advertisement of the available position, the collection of applications and selection of the appropriate candidate.

- Designing new products: in this case, once the need for a new product is identified within the organization, the process will include research, testing and production of the product.

2.3 The Principles of BPR

Hammer (1990) used the accumulated knowledge from applied re-engineering to prescribe the seven principles on which every BPR effort should rely. They are:

- *"Organize around outcomes, not tasks".*

In other words, to appoint only one person to carry out the whole process and design the work around the desired outcome. This way, performance is improved and customer satisfaction more easily achieved.

- *"Have those who use the output of the process performed the process".*

This is one of the many instances in which it can contribute positively to have individuals able to take charge and control the process they are asked to perform.

- "S*ubsume information - processing work into real work that produces the information".*

An organization that produces information should also be able to process it by itself. That way, again with the contribution of IT, organizations have the chance to handle the information where it is generated, reducing cost and time, and increasing effectiveness.

- *"Treat geographically dispersed resources as though they are centralized".*

Using databases, telecommunication networks and other modern technological features, organizations can overcome geographical boundaries and become more flexible.

"Link parallel activities instead of integrating their results.

By creating links between parallel functions it becomes easier for the organization to co-ordinate and control them, therefore mistakes can be avoided and performance can be maximized.

- *"Put the decision point where the work is performed, and build control into the process ".*

This principle aims at flattening the organization, by passing control and monitoring of the process from managers to the people who are actually doing the work.

- *"Capture information once and at the source".*

In this principle lies probably the most important contribution of information technology: it is now simple and easy to collect and store information that can be retrieved and used at any point of the process. The elimination of data duplication has apparent benefits for the organization, such as saving time, money and reducing all the problems that are associated with paperwork (Hammer, 1990,p.108-112).

Coulson - Thomas (1997) point to a list of BPR principles evolved since the 1980's, among which the following stand out:

- *Externally, focus on end customers and the generation of greater value for customers.*
- *Internally, focus on harnessing more of the potential of people, and applying it to those activities, which identify and deliver value to customers.*
- *Encourage learning and development by building creative working environments.*
- *Think about and execute as much activity as possible horizontally, concentrating on flows and processes through the organization.*

- *Concentrate on outputs rather than inputs, and link performance measures and rewards to customer related output.*
- *Keep the number of core processes in the organization to a minimum.*
- *Ensure that continuous improvement is built into the implemented solutions* Coulson –Thomas (1997,p. 40-41).

Again, through this collection of BPR principles, it is useful to point out some similarities and differences. In summary, they all place a great emphasis on the customer and on the different ways to ensure and increase their satisfaction. Another important issue involves the employees, and the importance of allocating them extensive responsibility not only for the outcomes, but also for the design and development of the process they must perform.

Hammer and Champey (1990) emphasize this by providing specific guidelines to achieve the necessary staff empowerment, and Coulson - Thomas (1997) also acknowledges this necessity; Carr et al., (1992) on the other hand, are more general in their approach to produce the set of principles, on which every re-engineering effort must be based. Whichever differences may exist between re-engineering efforts, the basic principles remain more or less the same in the pursuit of radical change in any organization that wishes to improve its performance.

2.4 Why BPR? Drivers of Change

Hammer (1990) promotes re-engineering as the only solution for US corporations that wish to remain competitive. He argues that the speed at which the world and the business environment are changing means that it has become impossible for traditional methods to keep up. Companies need therefore to find more drastic solutions, and "*stop paving the*