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**CORPORATE BENCHMARKING: THE CASE OF LIBYAN  
MANUFACTURING ORGANISATIONS**

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## **DECLARATION**

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# **DEDICATION**

**To my beloved parents,**

**Wonderful brothers**

**Dearest wife and children**

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## ABSTRACT

The focus of this study is to identify and explain problems that confront Libyan organisations which implement benchmarking practices. There are two aspects of the process that lead to these problems. Benchmarking is an exogenous process for an organisation as well as a multivariate practice. In this sense, best practices arise from outside of the organisation, and the organisation seeks to benchmark several performance metrics simultaneously. Concerning this, this study investigates the surrounding environment in which seven Libyan manufacturing organisations (LMOs) are operating in relation to benchmarking implementation. Further discussion is devoted to culture and organisational issues relevant to benchmarking.

To achieve these objectives, discussion of the Libyan environmental development context in terms of social, political and economic aspects is followed by a review of benchmarking, related literature and theoretical perspective on benchmarking. This provides the basis for the research questions generated and the research methodology applied. The Analytic Hierarchy Process (AHP) methodology is used in this study to make pairwise comparisons at criteria level based on data obtained from fieldwork. Substantial fieldwork was carried out using quantitative methods such as questionnaires and supplemented with some interviews with certain managers to improve understanding of benchmarking practices in LMOs.

This study contributes to the knowledge and understanding of the nature of benchmarking problems that confront LMOs. It also makes some suggestions to Libyan organisation and society.

The main findings of this study revealed the following:

- (i) Benchmarking implementation in LMOs is influenced by many organisational factors including company culture, technology, etc. and by the surrounding environment.
- (ii) Many LMOs which have failed to achieve their product target also failed to achieve their sales target. This was a result of shortages in raw material and spare parts, and poor maintenance and technology caused by the embargo which was imposed on Libya by the UN and US.
- (iii) The judgements of respondents over the relative importance of cost and quality control, sales maximisation and market share with respect to determination of benchmarking criteria suggests that cost and quality control are the superior benchmarking criteria within most LMOs.
- (iv) Libyan companies are not paying enough attention to accounting compensation systems that can encourage employees to work and improve company performance. This may causes difficulty and creates low managerial performance, which affects benchmarking implementation in LMOs.

## **ABBREVIATIONS**

<b>LMOS</b>	<b>Libyan Manufacturing Organisations</b>
<b>A, B, C, D, E, F, G</b>	<b>The seven Libyan Manufacturing Organisations</b>
<b>AHP</b>	<b>Analytic Hierarch Process</b>
<b>GSPLAJ</b>	<b>Great Socialist People's Libyan Arab Jamahiriya</b>
<b>RCC</b>	<b>Revolutionary Command Council</b>
<b>BPCs</b>	<b>Basic People's Congress</b>
<b>GPC</b>	<b>General People's Congress</b>
<b>PCs</b>	<b>People's Committees</b>
<b>LPs</b>	<b>Libyan Pounds</b>
<b>OPEC</b>	<b>Organisation of Petroleum Exporting Countries</b>
<b>LDs</b>	<b>Libyan Dinars</b>
<b>MTDPs</b>	<b>Management Training and Development Programmes</b>
<b>R&amp;D</b>	<b>Research and Development</b>



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## CHAPTER 1

### 1. Introduction: background, objective and overview of the thesis

#### 1.1 Introduction

Libya, as a developing country, depends on the effectiveness of its industrial and business organisations in the public and private sectors. The success of those organisations in achieving their objectives depends upon the effectiveness of their managers (e.g. skills, knowledge and attitudes) to find solutions to their difficulties and problems and to take appropriate action (Ejigu and Sherif, 1994).

Katz (1974) stated that the skills required to implement change can be classified into three kinds - technical skills, conceptual skills and human skills<sup>(1)</sup>. All managers should have these skills because they are involved in their organisation's long term decision making (e.g. adoption of benchmarking) which will affect all parts of the organisation (Carrol, 1993). Because managers are dealing with the internal and external environment, they must create a balance between the fast changing external environment and the complex structured internal environment and its interrelated relations (Bramham, 1997).

It is important to point out that employees have a difficult task in managing an organisational environment that is continually changing owing to global market competition as well as rapid advances in technology (Lau et al., 2001). It is commonly believed that well-trained employees will improve organisational effectiveness and make it ready for any new change, such as the implementation of benchmarking (Lau et al., 2001; Bramham, 1997).

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<sup>(1)</sup> Technical skills, related to abilities to use the techniques, procedures and tools of a specific technical field. Every organisation needs to possess this skill to be able to perform the mechanics of the change for which it is responsible. Conceptual skills, related to the performance and co-ordinative activities of an organisation. In this case, managers should be able to see their organisation as a whole, and understand the interrelationships between its level (management) and parts. Human skills, related to abilities to participate and work with other people. This includes motivation, and understanding the needs and problems of individuals or groups (Carrol, 1993).



When implementing benchmarking, the culture and environment of the firm are two issues with which firms should be concerned. Difficulties will be encountered if there is insufficient understanding of the cultural and environmental implications of change (Carrol, 1993; Hill et al., 1998). More significantly, Bramham (1997) notes that benchmarking will not be effective if the organisation does not have the infrastructure to carry it through. It is therefore essential that culture and environment are considered before benchmarking is introduced (see chapter 3).

This thesis is concerned with benchmarking<sup>(2)</sup> and its implementation in Libyan organisations. It endeavours to explain some problems that confront Libyan Manufacturing Organisations (LMOs) attempting to implement benchmarking practice. The aim of this chapter is to present background information and the research motivation (1.2) and objectives (1.3) as well as the research questions at the centre of the study (1.4). A summary of research methods and methodology is provided (1.5). Attention is also paid to the contributions (1.6) and limitations (1.7) encountered during the period of the research. The outline of the structure and organisation of the thesis is also presented in this chapter (1.8).

## **1.2 Background and research motivations of the study**

Many developing countries, including Libya, have paid a great deal of attention to national economic and social problems, but less attention has been given to managerial and organisational difficulties, which can have an important impact on the achievement of development strategies. In implementing their economic development strategies, developing countries need new management tools (e.g. benchmarking), but at the same time they are surrounded by a complex and changeable environment in terms of increases in organisation size, technological advancement, demand for skilled employees (Khan et al., 2002; Agnaia, 1996), high inflation and competitive market conditions (Brickley et al., 1997). For these development strategies to succeed, attention to new knowledge, to the relevance of

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<sup>(2)</sup> It is a word used to characterise a definite concept which was originally used by land surveyors to compare elevations (Frost and Pringle 1993). Another meaning of benchmarking is the new process that organisations seek to implement to obtain superior performance, and consequently, improve quality, reduce costs, maximise sales, or lead to market share (Yasin et al., 1995).

human resources, and to appropriate organisational performance needs to be developed.

This study deals with benchmarking as it applies to the Libyan environment. Recent studies carried out in Libya indicate that this country appears to suffer from certain political, social and economic factors which inhibit development (Abusneina, et al., 1993; Burgat, 1987). These factors, as well as cultural differences, are still not widely recognised in developing countries such as Libya, and little work has been conducted on these issues in Libya itself. Accordingly, this study attempts to understand and discuss these factors which have influenced the extent of benchmarking implementation in LMOs (see chapters 2 and 3).

During the 1980s, Libya's economy was severely restricted by fluctuating oil prices. For example, oil revenue declined from \$32.2 billion in 1980 to \$5 billion in 1988 (Fisher, 1990), and decreasing revenues created serious cash flow problems that led to major revisions in development plans (Khader, 1987). This caused insufficient amounts of actual expenditures necessary to achieve the programme plan (e.g. improve productivity) in Libyan organisations, and resulted in production outputs remaining at low levels (The Arabic Economic Report, 1994). In respect of this, Abusneine et al (1993) indicated that 13 out of 27 Libyan industries operated at less than 50% of their production capacity.

Libyan government policy has supported the industrial sector because of its important role in the development of the country. Industrial policy has been developed through the four development plans (see chapter 2) which targeted several different sectors in both light industry (e.g. food processing, light chemical, engineering and minerals) and heavy industry (e.g. iron and steel complexes, trucks and buses). Despite the priority that Libya accorded to the industrial sector by spending a large amount from the oil revenues on the development of the light and heavy industries, many industrial organisations have faced considerable problems. There remains a climate of

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inefficiency, mismanagement, low levels of productivity, rises in the costs of production, and low rates of return on investment. This climate has had an adverse effect on employee behaviour and ultimately on organisational performance. These problems have been complicated by an ineffective rewards system and shortages of skilled and trained personnel in Libyan companies (Ejigu and Sheri, 1994).

Tarbaghia (1995); Abusneina, et al. (1993) and Abusneina (1991) stated that several investment decisions appear to have been made with inadequate feasibility studies and not based on economic factors. Decisions in many industrial companies show a lack of distinction between political and economic criteria, thus leading them often to inappropriate strategic and operating decision-making for any change adoption. Decisions concerning where projects need to be established and what can be produced seem to be more heavily influenced by political and social factors rather than strategic factors (Ejigu and Sherif, 1994). Furthermore, industrial companies in Libya appear to be inhibited by their environment in carrying out any change adoption. Accordingly, it is important to understand these problems within the wider socio-economic, environmental and political contexts of the industrial sector. These issues are related to factors such as state involvement and economic and socio-cultural aspects (see chapters 2 and 6) which need to be considered carefully in order to increase productivities and improve the performance of LMOs. By understanding and investigating the impacts of these factors on selected organisations in this study, some improvements related to organisational performance in carrying out new change adoption may become more feasible.

The problems of benchmarking practices in LMOs, and their relation to the developmental and environmental contexts, are certainly very complex. This study explores these problems further. The seven LMOs<sup>(3)</sup> were selected from the industrial sector both to generate survey data and to serve as mini-case studies in the context of the Libyan developmental environment. For some, the whole notion of benchmarking has been defined rather naively, as the process of implementing, understanding and

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<sup>(3)</sup> For further detail see chapter (6)



adapting best practices from inside or outside the organisation to help improve a company's performance (Vermulen, 2003). For others, such a view is inadequate since it fails to locate benchmarking in its political, social and economic contexts (e.g. Companies F and G).

This research attempts to study the social environment from the perspective of organisational actors. The focus is on understanding and explaining what organisations did to adopt changes, the methods used to accomplish daily operations, and the perceptions concerning benchmarking practices. In this sense, organisations and society are viewed as socially-constructed systems of reality (Hopper et al., 1985) in terms of the socio-political, economic development processes and cultural differences and their transferability into a Libyan context.

This study seeks to capture the complexity, diversity and network of influences operating on benchmarking practices in the Libyan environment, and to attempt to understand the results of benchmarking implementation processes in LMOs operating in this environment. On the one hand, benchmarking practices are little used in developing countries, especially in Libya. On the other hand, few studies have been conducted in the cultural context of Arab countries in general and Libya in particular. Bakhtari (1995) indicated that although Arabs may hold similar cultural values, specification of this culture may differ from one country to another. Also, Hofstede (1980, 1991) in his research into culture highlighted a few examples of Arab culture to explain how cultural values affect the practices and theories of organisations. In a study of labour turnover in the Libyan oil companies, El-Jehemi et al. (1984) found the high levels of labour turnover to be the result of social, cultural, and environmental factors. One of the motivations for the present study is to provide some additional insight into the Libyan cultural context of business.

In light of the above discussion, the motivational factors for this study can be summarised as follows. First, benchmarking in developing countries has remained largely unexplored. Second, there are no studies of benchmarking practices in Libya.

Third, this is the first study of LMOs which attempts to understand and explain cultural and organisational aspects relevant to benchmarking (see chapter 3) by using the proposed methodology and data collection methods (see chapter 5). Fourth, the study of seven industrial LMOs would contribute to the development of suggestions about benchmarking practices helping to improve the industrial sector in Libya. In other words, this study aims to improve organisational efficiency by identifying problems related to benchmarking implementation in LMOs, so that solutions to these problems can be defined and better performance levels can result.

Overall, this study attempts to address some of the gaps in the literature by clarifying what benchmarking implementation would entail in Libyan organisations. It contributes to knowledge in understanding the nature of benchmarking implementation problems and the cultural contexts in which organisations operate by testing these concepts in Libya. Also, this study examines whether the adopted instruments and the framework of testing these concepts are transferable into the Libyan setting. This study will also suggest some important implications for theory, research methods and methodology in Libyan organisations and society (see sections 9.4 and 9.5).

### **1.3 Research aims and objectives**

The researcher is interested in understanding the ways in which benchmarking is practised in Libyan organisations and why this management tool operates in the ways that it does. The study is motivated by the desire to explain and understand the relationship between culture, environmental factors and organisational processes in carrying out the implementation of benchmarking. Moreover, this study is concerned with understanding benchmarking practices primarily from the point of view of the actors (organisational participants) who were involved in making decisions on the process to be adopted. However, the general aim of this thesis is to understand and explain benchmarking problems in LMOs within their environmental development context.

The study surveys several problems that confront organisations attempting to implement benchmarking practices, in order to present richer descriptions and analysis of these problems in the context of LMOs. Sub-objectives of the study are:

- 1.3.1 To study and explain the surrounding environment<sup>(4)</sup> in which LMOs are operating in relation to benchmarking implementation (chapters 2 and 6).
- 1.3.2 To identify aspects of benchmarking that lead to implementation problems (chapter 3).
- 1.3.3 To understand the nature of the benchmarking problems faced by organisations when they implement benchmarking (chapters 3 and 4).
- 1.3.4 To examine organisations' reactions and considerations to benchmarking implementation (chapters 6 and 7).
- 1.3.5 To examine the views of managers in terms of the relative importance of the criteria and sub-criteria which influence benchmarking judgments and processes (chapter 8).
- 1.3.6 To consider the implications of this study for Libyan organisations and society (chapter 9).

The next section summarises the research questions investigated in addressing the general research objective.

#### **1.4 Research questions:**

The primary purpose of this study is to provide answers to questions regarding the following (see chapters 6, 7 and 8):

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<sup>(4)</sup> Such as: economic, political, social environment, accounting system, managerial accounting efficiency, culture differences, etc.



- 1.4.1 Do LMOs understand benchmarking in advance of its full implementation?
- 1.4.2 Do LMOs understand the change in market conditions and technological innovation as well as being able to determine and measure the effectiveness of benchmarking in situations of new adoption?
- 1.4.3 Do firms need to give consideration to culture and environmental factors in benchmarking implementation?
- 1.4.4 Does the nature of the accounting systems in LMOs provide enough information when implementing benchmarking?
- 1.4.5 Does the firm consider criteria or set priorities in terms of the process to be adopted based on economic factors and/or the relevant importance of performance measures?
- 1.4.6 What methods do LMOs rely on to encourage employees to accept benchmarking adoption?
- 1.4.7 Does the selection of organisational goals by managers cause the firm to be more concerned with some benchmarking criteria and less concerned with others?

In order to achieve these research objectives and questions, a literature review has been conducted, an empirical field study carried out, and related hypotheses tested. The substantial fieldwork (5.3) was carried out using predominantly quantitative methods to improve the author's understanding of benchmarking practices in LMOs. Where appropriate, qualitative data (e.g. semi-structured interviews, mini-case studies, documentary materials and archival records) and analysis are used to support the research.

## **1.5 Summary of research methods and methodology**

This section briefly outlines the research methods and methodology undertaken in this study.

### **1.5.1 Research methods**

This study used a mixture of questionnaire surveys, semi-structured interviews with managers and mini-case studies for data collection from the seven companies (5.2). The instruments used in this study were designed to explore a wide set of industrial organisations. Seven organisations from the Libyan industrial sector were selected in order to provide a better understanding of the environment in which LMOs are operating (see chapter 6). The questionnaire was based on the literature review and methodological background (5.3.3). The questionnaire was pre-tested in order to ensure that the questions would be understood by the respondents.

Semi-structured interviews were conducted in order to provide opportunities for interviewees to present their perceptions freely. In addition, general information was obtained from organisational records. This also enabled the interviewer to discover additional information not covered by the questionnaire and/or to clarify difficult points about answering questions concerning pairwise comparisons (using Saaty's response scale of Analytic Hierarchy Process).

The mini-case studies were employed to gain further insights into the nature, contexts and processes of benchmarking implementation in LMOs from the point of view of the actors who were interviewed in the seven organisations. All interviews were conducted in Arabic and then translated by the researcher.

### **1.5.2 Research methodology**

Saaty's Analytic Hierarchy Process (AHP) is the underpinning methodology for this study (5.2). It was used to provide a framework and model for the criteria, sub-criteria and specific sub-criteria used in this study to determine the values of selection choices in a hierarchy through judgements elicited under a nine-point scale (5.2.2). The reliability of the model and framework which are produced under AHP may be tested by reference to the consistency ratio proposed by Lee et al. (2002),

Saaty (1980, 1995) and Vargas (1982). Measurements of consistency in judgements accurately reflect the cognitive process of the managers in this study.

AHP uses matrices of simple pairwise comparisons to show with what strength a particular criterion dominates another with respect to the objective with which they are compared (Apstolou et al., 1993). Overall, AHP was considered suitable in this study for guidance in the analysis of the data, and it enabled the researcher to understand the phenomenon of benchmarking implementation at a deeper level of meaning and consequences in LMOs.

## **1.6 Contributions<sup>(5)</sup> of this study**

The research contributes to knowledge in the following ways:

- It contributes to the authpr's knowledge by explaining the nature of the environment in which LMOs are operating with respect to benchmarking.
- It finds that the environment in which LMOs are operating is very problematic and has a huge negative impact on organisational performance.
- The study suggests that the accounting systems of many Libyan organisations do not provide enough information to evaluate management efficiency, effectiveness and performance fully, all of which are required for successful benchmarking adoption.
- This study contributes to the literature by providing a general outline for the two aspects of benchmarking that lead to many benchmarking problems.
- This study demonstrates that cultural dimensions have to be taken into account whenever practices such as benchmarking are borrowed from alien societies. Management theories and practices are created by people, and people's ideas are culturally relative.

- It discovers that benchmarking implementation within many LMOs was perceived to be influenced negatively by a lack of managerial leadership, clear objectives, equipment and skilled staff, and by top management instability, different leadership styles, etc. These difficulties may exist because of the economic crisis, political instability, and the adoption of public enterprises rather than private ones.
- The study shows that there was an important conflict of interest across divisions within many LMOs. This conflict is difficult to resolve since cost and quality control divisions are interested in maximising their own utility. LMOs may in fact be benchmarking too many things. This created difficulties and led to conflict across divisions.

### **1.7 Limitations of the study**

Some of the limitations of this study relate to a lack of literature and data availability about benchmarking implementation in Libyan organisations. These may be outlined as follows:

First, owing to the lack of literature on benchmarking implementation, relevant practical methods (e.g. case studies, questionnaires) and statistical information related to benchmarking practices in Libya, the study employs theoretical frameworks, measurements and other methods for use in developed countries. These, however, may not be suitable for many organisations in developing countries such as Libya.

The study is concerned with understanding and explaining problems related to benchmarking and its implementation within Libyan organisational structures. However, the sample is limited to Libyan industrial companies and in particular to seven different manufacturing companies. It should be considered that causation and generalisations from the results of this study are tenuous inferences.

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<sup>(5)</sup> For further discussion see section 9.5



The limitations imposed by the unavailability of data for some companies are recognised. For instance, limitations relate to the collection of data and attitudes of many managers in industrial companies towards surveys in general. Some managers were unwilling to complete the questionnaire, and others failed to answer all the questions. Accordingly, semi-structured interviews with managers were incorporated with the questionnaire method to clarify some points in the questionnaire and to collect relevant information from the companies' records.

Other limitations are imposed by the unavailability of specific information about best practice performance frameworks for Libyan organisations. This study was unable to find a single framework that included all the issues relating to it, and each of these frameworks could not be the same across the organisations because of different organisational cultures.

## **1.8 The structure and organisation of the thesis**

The present study is organised into nine chapters which are briefly outlined below.

**Chapter 1** summarises the background and research orientation of the study. It outlines the research aims and objectives as well as the research questions, research methods, methodology, contributions and limitations of the study. The chapter ends with a presentation of the structure of the thesis.

**Chapter 2** provides the necessary contextual information about the economic, political and social environment in Libya. It presents a description of the Libyan environmental context at a macro level within which the organisations under investigation operate, and which are relevant to the current study. The chapter discusses the historical background of the Libyan economy prior to the discovery of oil and its effects on the industrial sector. This is followed by a discussion of economic development planning, organisational environment (accounting systems and managerial accounting efficiency) and cultural differences in terms of the transferability of western cultures into the Libyan context. A summary of the chapter discussion is provided at the end of each chapter.

**Chapter 3** reviews the related literature on benchmarking problems. This chapter is presented to explain various definitions of benchmarking and the historical context in which benchmarking began. The existing research into benchmarking practices and primary focus on organisational and national culture are also reviewed in this chapter.

**Chapter 4** covers the theoretical perspective of this study. This chapter discusses the inferences of managers about benchmarking as the main theoretical framework for this study. It provides arguments about the sensitivity of managers to available information about best performance and the behaviour of employees, the two simple judgmental heuristics, and the script and schema theories for carrying out benchmarking implementation.

**Chapter 5** deals with the research methodology and methods adopted for this research. Consequently, the discussion in this chapter is concerned mainly with the following: an introduction to the Analytic Hierarchy Process (AHP) and its related hierarchy as the methodology used in this study. This is followed by discussion of data collection, pairwise comparisons, and the methodological limitations of AHP. It also discusses the research strategy of data collection methods. This includes the methods of investigation adopted, a discussion of the measurement techniques used for data collection in the questionnaire research, the population and the sample utilised in the study, scope of the study, distribution and collection of questionnaires, and statistical techniques used in the analysis.

**Chapter 6** presents a descriptive analysis of the organisational context of the seven companies at the micro level in the Libyan environmental context, and provides the historical background of Libyan industry. It identifies an overview of each of the seven LMOs and the major issues facing them, such as company management and structure, objectives, accounting systems, production problems and the effectiveness of benchmarking. A summary of the above descriptive analysis is provided in this chapter.

**Chapter 7** deals with the general data analysis and discussion of the data results of personal and organisational information, general information about benchmarking adoption in LMOs, characteristics of the behaviours of LMOs when benchmarking is implemented, characteristics of the attempts by LMOs to implement and adopt benchmarking, and potential reasons for some LMOs not implementing benchmarking.

**Chapter 8** examines and discusses the need to obtain a deeper understanding of the importance of each criterion, sub-criterion and specific sub-criteria in determining benchmarking best practices in LMOs. The chapter then discusses the pairwise comparison at criteria level to illustrate priorities for each criterion. The AHP methodology is used in this comparison of five LMOs.

**Chapter 9** Provides a summary of the thesis, research objectives, research questions and research methods and the main research findings. The implications of the findings of the study, such as implication for theory, research methods and methodology as well as contribution to knowledge in terms of understanding the nature of benchmarking problems and the contribution of benchmarking to Libyan organisations and society, are discussed in this chapter. Limitations of the study and suggestions for further related research are also provided.



## CHAPTER 2

### 2. The environment of Libyan manufacturing organisations

#### 2.1 Introduction

This chapter addresses the first sub-objective of this study (1.3.1). It familiarises the reader with the historical, political, social, and economic aspects of Libyan society, as well as laying a foundation for the later discussion on the findings of this research. Thus it provides the necessary background information.

The aim of this thesis is to understand and explain the surrounding environment in which Libyan manufacturing organisations (LMOs) are operating in relation to benchmarking implementation. The environment connotes the factors, both natural and man-made, under which people carry out their activities. However, a country's environment can influence both managers and organisational behaviour in a situation of change adoption. This influence is associated with a long history of past and present social, political and economic aspects of Libyan society. In order to carry out this description of the Libyan environmental context, it is important to indicate the historical background of the Libyan economy prior to the discovery of oil and oil exploration, and the effects on the industrial sector. A related discussion is devoted to economic development planning, cultural differences and transferability of Western cultures into the Libyan context. This chapter, then, concentrates on the Libyan environment, and discusses the aspects mentioned above which have contributed to implementing changes in LMOs.

#### 2.2 Historical background

The official name of Libya today is the Great Socialist People's Libyan Arab Jamahiriya (GSPLAJ). It is located on the Mediterranean Sea in North Africa, bordered to the east by Egypt and Sudan, to the west by Algeria and Tunisia, to the South by Chad and Niger. The country's coastline on the Mediterranean Sea extends for 1900 kilometres. Libya has an area of some 1,760,000 square kilometres, making it fourth in size among the countries of Africa and fifteenth across the countries of

the world. According to the census estimates in 1995, the total population of Libya was 4,799,065 million people (see Table 2-1).

**Table (2-1): The 1973, 84 and 95 Libyan census and net annual growth of population**

Census	Libyans			Non Libyans			Total Males and Females	Net Annual Growth %
	Males	Females	Total	Males	Females	Total		
1973	1,057,919	994,453	2,052,372	133,934	62,931	196,865	2,249,237	3.23
1984	1,651,562	1,579,497	3,231,059	302,195	109,322	411,517	3,642,576	4.21
1995	2,231,079	2,158,660	4,389,739	270,677	138,649	409,326	4,799,065	2.86

Source: National Agency for Information and documentation (NAD), 1995, p: 40, cited in Aghila, 2000, P:22.

Table (2-1) also shows the annual growth percentage of the Libyan population as 3.23, 4.21 and 2.86 for 1973, 1984 and 1995 respectively. The reduction in growth from 1984 to 1995 may be due to the economic problems caused by decreases in oil prices (Group of Libyan Experts, 1998. For more details see *Ebbs and Flows of Libya's Economy "1975-1995"*).

Libya contains three provinces called Tripolitania (Western area), Cyrenaica (Eastern area) and Fezzan (Southern area). Most of the Libyan land (92%) is desert or semi-desert, and farming is possible on less than 1.5% of the country's total area. Farming occurs mostly on the coastlands as well as the uplands of northernmost Tripolitania and Cyrenaica (Naur, 1986, Wright, 1982).

Libya has been an independent country for about five decades. It was part of the Greek and Roman Empires before 1551 and was under the Ottoman Empire until 1911 and became an Italian colony until 1942. After World War II, the country was under British and French administration. The British controlled Cyrenaica and Tripolitania, while the French controlled Fezzan (Naur, 1986; Wright, 1982).

On 24<sup>th</sup> December, 1951, Libya was declared an independent state ruled by King Idris Al-Sanusi, with a federal constitution. At the time of independence, Libya was one of the poorest countries in the world, with an estimated population of one

million. There were no sources of power or of mineral resources. Agriculture and animal husbandry were the sole mainstays of the Libyan economy as well as a number of factory<sup>(1)</sup> industries managed by Italians (Waddams,1980, cited in Aghila, 2000).

On 1<sup>st</sup> of September 1969 the government of King Idris was ended by a military revolution led by Mummer Al-Qaddafi and his supporters. The governing authority became the Revolutionary Command Council (RCC) under the leadership of Colonel Mummer Al-Qaddafi. The revolution declared that freedom, socialism and unity were the goals for achieving major social, economic and political changes. The RCC promised innovative management and managerial development, concentrating on establishing training centres and management and technical institutions. These were aimed at maximising available skilled employees, correcting the misallocation of resources, giving chances to more entrepreneurs while not limiting privileges to a chosen few, and ending distributional inequalities, limitations on the demand side, monoprodukt dependence, and dependence on foreign goods for which local industries could be developed (Gzama, 1999, p: 58-59).

The first ten years of the revolution saw tremendous political changes as various political systems of mass organisation, representation, and participation were implemented. New forces and structures replaced traditional elites which had inhibited modernisation and these forces fostered revolutionary commitment and support for the ruling regime amongst the population as a whole.

In light of the above discussion, one of the greatest changes which the revolution has created is the new political organisational structure. According to this structure the country is divided into Basic Popular Congresses (BPCs), and each BPC chooses its Secretariat. The Secretariats together form a General People's Congress (GPC) [parliament]. Then the masses of those BPCs choose administrative People's Committees (PCs), which have replaced government administration. Thus, all public

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<sup>(1)</sup> They included flour-milling, olive-oil-refining, tobacco and salt manufacturing, textile, foot wear and clothing, vehicle repairs, printing, fish processing, soap manufacture, canning fruit and vegetables and manufacture of alcoholic and soft drinks (Gzama, 1999, p: 46).



utilities are run by PCs which are responsible to BPCs, and these dictate the policy to be followed by PCs and supervise policy operations. Both the administration and the supervision have become popular (Aгнаia, 1996, p: 140-141; Gzama, 1999; Bait-Elmal, 2000).

The GPC is considered to be the highest legislative authority in Libya since 1977. It is responsible for taking all management decisions in respect of setting up general policies and preparing the general laws upon which the Libyan institutions and public sector organisations are managed. The General People's Committee is responsible to the General People's Congress for formulating the state's policies. Also, the role of the People's Committee is to undertake the responsibility of managing and representing their organisation for which they have been working. For example, manufacturing companies work under the supervision of the Secretariat of Industry and Minerals.

### **2.2.1 Libyan economy**

Libya is a Third World country with a small population and a large area which is mostly desert. As mentioned above, it was part of the Ottoman Empire from 1551-1911. During that period, the country was too poor to have meaningful forms of organisation as recognised nowadays or even as was recognised from the beginning of the twentieth century (Kilani, 1988). The economy was undeveloped, mainly dependent on simple agriculture and animal husbandry.

At the end of the nineteenth century, the Ottoman Empire (Khelapha), which by then occupied Libya, started to lose its controlling power over the provinces because its military power had become weakened. Therefore, in 1911 Libya became an Italian colony until 1942.

As the people of Libya were mainly Muslims and the Ottoman Khelapha was the last form of the Islamic Khelapha (state), the only law that influenced Libyan economic affairs was the teaching of the Islamic religion. For Libyan Muslims, all wealth, including land, is owned by God. The human owner is merely considered as an agent trusted with the wealth and is accountable for the way he/she uses it. The reward of

property cannot be earned without the owner utilising his resources in a socially beneficial way. Not all individuals are equally endowed with resources. For believers, an uneven distribution of property can be justified only as long as those with the greater property rights are aware of their obligations to the poorer members of society (Kilani, 1988, p: 80-81).

During the period of Italian occupation and many years later, the Libyan economy was offered discouragingly little with which to work. The annual income per capita was about 40 Libyan Pounds (LPs). Agriculture was the basic staple of the Libyan economy, and it was based on the limited productivity of simple agricultural land. Additionally, there were a few small traditional and light industries such as plants for olive oil refining, fish canning, leather tanning and so on (Farely, 1971).

During the first years of independence the Libyan economy faced a number of problems; one of these was financing the government budget deficit, which reached 1.7 million Libyan Pounds in fiscal year 1951-1952. Another problem was the balance of payments deficit and how to finance it; in fiscal year 1951 – 52 that year it was around LPs 3 million. Moreover, the Libyan economy faced the problem of developing and pricing the skills required to develop effectively the country's natural and human resources. For many years after independence, Libya was deeply dependent on international aid, receiving large amounts from the United Kingdom, the United States of America, France and other sources. In 1956-59 foreign aid averaged one-third of gross domestic product. The situation was completely transformed by the discovery of oil, which converted Libya into a large creditor (Issawi, 1982; Ateiga, 1972).

The Libyan economy is one of the most important environmental aspects in forming organisational attitudes and behaviour toward change. It is important, therefore, to look at the development of the Libyan economy to determine the influence of this aspect in implementing change. This section also attempts to provide an idea of trajectory of Libyan economy policy development. The section will be divided into two sub-sections: the period to the discovery of oil and oil exploration and its effects.

### **2.2.2 The period to the discovery of oil**

Before the discovery of oil in 1958 Libya was a poor country. Its prospects for economic development were very exposed. The annual income per capita was 40 Libyan Pounds in rural areas, and a little over LPs 40 in towns (Farley, 1971). The national income was evaluated in 1955 to be about LPs 15 million, but by 1958 it had increased to LPs 52 million (Abuarroush, 1996). The agricultural sector was undeveloped and had been rather stagnant for hundreds of years. Nevertheless, it was considered to be the main resource base of the Libyan economy in addition to animal husbandry and a few small industries. It is worth mentioning that during the three decades of Italian colonisation there was some enlargement of the economy. From 1911 to 1942 era, the Italian administration spent over 50 million Libyan Pounds on public works, utilities, agricultural development and land reclamation. But, most of these expenditures were devoted to agricultural development and land reclamation (Farley, 1971, p: 27, 108). The expenditures largely amounted as an improvement in the welfare of Italians who were settled in Libya rather than for the Libyan people.

As discussed earlier, after the Second World War the three Libyan territories were placed under British and French administrations. This occupation continued with no material changes up to the declaration of Libyan independence by the UN on 24<sup>th</sup> of December 1951. At this point, the economy started to grow gradually, and by then the national income of the country had increased to 25 million Libyan Pounds, largely as a result of the commencement of oil operations and an increase in the presence of foreign, oil-related companies. In 1958, 1962 and 1969, the national income reached LPs 52, 63 and 400 million respectively (Ateiga 1972, P: 79-80).

### **2.2.3 Oil exploration and effects**

There is no doubt that the discovery of oil was an important event in Libyan history. It created positive effects on all aspects of Libyan life. In the early period of oil discovering in 1959, Libya was lacking greatly in terms of skilled human resources and planning administration and organisation. Oil discovery also increased the interest of businessmen from many parts of the world in investing and establishing various enterprises in Libya (US Department of Commerce, Bureau of International Commerce, 1970, p: 100-109). The discovery of oil transformed Libya from a very



poor to a rich country. At the beginning of volume exports in 1964, the government engaged in a number of development plans. The lack of qualified people such as planners, administrators and technicians rendered Libya dependent on foreign experts and consultants (for more details see the International Bank for Reconstruction and Development, 1960; and Farley, 1971). When Libya exported its first crude oil in 1960, the wealth of the country increased rapidly and changed from a situation of extreme deficit to considerable surplus. As a result of oil discoveries, the country started to implement several economic development plans in many areas in order to raise the standards of living, to develop human resources and to establish production and service sectors (Aagnaia, 1996).

The discovery and exploration of oil dramatically changed the situation in the Libyan economy and social structure. However, within a short period of time Libya moved from a capital deficit nation to a capital surplus nation, from an aid recipient to an aid grantor. The considerable change effected in Libyan revenues from oil over the first three years of oil discovery after 1958 is an important factor behind the change. For example, oil revenues in 1963 had increased from about LPs 4 million to about LPs 117 million (Ministry of Planning, 1963, p: 10). Accordingly, Giurnaz (1985, p: 173) has indicated that oil production increased rapidly in the 1960s, and by "1969 Libya was the second largest producer in the Middle East/North Africa region" (*ibid.*). The gross domestic product and per capita income increased substantially because of oil revenue increases. Furthermore, "national income increased from £L m 131 (million Libyan Pounds) in 1962 to £L m 798 in 1968" (Fisher, 1990, p: 644).

The increasing oil discoveries affected the country's economy in many ways. There was an increase in salaries and in the prices of goods, and the demand for many goods and services rose sharply. Also, oil discovery triggered many profound changes into the country's administrative structure. For instance, the Ministries of Petroleum Affairs and Industry were established in May 1961. Libya joined the Organisation of Petroleum Exporting Countries (OPEC) in 1962 (Ministry of Planning, 1963, p: 12, Farley, 1971, p: 190).

The impact of oil exports and revenues on economic and social development was recognised in the first five-year comprehensive development plan. This plan was approved in 1963 to cover the period 1963-1968 and allocated total funds of LPs 336 million to different sectors of the economy (Nyrop, 1973, p: 207). The plan was extended several times because of growing income surpluses, and finally extended for one more year until 1969. Accordingly, the allocation of funds for this plan increased to reach LPs<sup>(2)</sup> 625 million (Ghanem, 1987, p: 59). The focal attention of this plan was on agriculture, forestry, communication, and public services such as education, health and the development of rural areas. Nyrop (1973, p: 207) stated that despite the huge amount of funds allocated to develop these fields, there were many technical and administrative problems, which minimised the degree of success.

In the seventies, Libyan oil revenue increased as a result of increased oil prices which resulted from the 1973 oil crisis. Oil revenues increased from "2.4 billion Libyan Dinars (LD)<sup>(3)</sup> to about LD 6.5 billion (or \$ 21.4 billion) by 1980"(Giumaz, 1985, p: 177). Accordingly, the Libyan economy became heavily dependent on oil revenue which supplied between 90% and 95% of the country's export earnings and accounted for approximately 30% of GDP. Oil revenue in 1980 stood at \$ 21.4 billion (bn) and then was reduced to stand at \$ 10.6 bn in 1984 (Khader, 1987; Agila, 2000). Growth in oil revenues in the 1970s enabled the Libyan Revolutionary Government to reserve large funds for developing all sectors, particularly the agricultural and industrial sectors. These two sectors "received the highest priority in order to achieve the objectives of self-sufficiency and reduced dependency on the oil sector" (African Development Report, 1994, cited in Bait-Elmal, 2000, p: 36). Further discussions regarding the Libyan industrial development will be presented later in this chapter (see section 2.2.4).

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<sup>(2)</sup> Since the name of Libyan Pounds (LP) was changed by the 1969 revolution to the Libyan Dinars (LD), with no change in its power, the LD will be used in the rest of this thesis. However, distinction can be made in terms of the date of the currency; the period from 1952-70 is LP and for the period from 1970 onward is LD.

<sup>(3)</sup> The Libyan Dinar was fixed at par with sterling and its initial issue was 100 percent backed by the British Government (Waddams, 1980, p: 124). Its parity with British sterling was maintained until the latter's devaluation in 1967 (Gzama, 1999, p: 46).

The first full development plan after the Revolution was the three-year plan (1970-1972), followed successively by another three-year plan (1973-1975), and then a five-year development plan (1976-1980). The estimated cost of those three plans was about LDs 11 billion which was reserved to develop various projects in all sectors over a period of 11 years (Khader and El-Wifati, 1987, p: 63).

A five-year development plan was instituted for the period 1981-1985. This was entitled the First Socio-Economic Transformation Plan, which can be considered complementary to previous plans. It was aimed at transforming the process in all activities, in order to create new sources of income. The cost of this Transformation Plan was approximately LDs 17 billion (Secretariat of Industry and Minerals, 1997). The plan's first priority was placed on the industrial sector [light and heavy industries] (LD 3,930 million); agriculture and land reclamation was its second priority (LD 3,100 million), while transport and communication as well as housing were allocated LD 2,100 million and 1700 million respectively (Secretariat of Planning, Socio-Economic Transformation Plan, 1997).

Another five year plan (1986-1990) was instituted and complementary to the previous ones. During this period, the Libyan economy was severely restricted by the effects of low prices. Oil revenue declined from \$ 23.2 billion in mid-1980 to \$5 billion in 1988. In this event, the Libyan government planned to regulate or increase the role of private sector activities. It was announced that Libya would be able to import and export in a completely open economy (Fisher 1990).

#### **2.2.4 Libyan Industry**

As stated before in this chapter, the Libyan economy before the 1960s was mainly dependent on agriculture and small factory industries, which had been established during the Italian occupation. Such factories were located in Tripoli, Benghazi Darnah and Misurata (Abbas, 1987; Barker 1982). Most of them were involved in the processing of local agricultural products, and included flour milling, tobacco and salt manufacture, olive oil refining, vehicle repair, printing, boot and shoe industry, manufacturing of various types of leather goods, and clothing (Waddams, 1980, p: 24). In addition, there were other agriculture-related industries including wine and



fish processing, and traditional industries were based on converted import-furniture making, beverages, textiles and food products (Farley, 1971, p: 139). Factory industries in Libya at that time employed around 15,000 to 20,000 people and supplied about 10% of the national output (International Bank for Reconstruction and Development, 1960, p: 48).

Industrial establishments at the beginning of Libya's independence (1950s) were very limited. This was related to a shortage of power and fuel resources, very limited raw materials, and a very small indigenous market. Before the First of September Revolution, industry was controlled by the private sector. This situation started to change after the second half of the 1970s, when the private sector was replaced by public sector firms. By the end of the 1970s most of the private sector in Libya was abolished (Fisher, 1995; Abbas, 1987). This transformation was carried out in accordance with a new socialist perspective in Libya.

The industrial sector received considerable attention after the First of September Revolution of 1969. Since it was intended to be the most vital sector when oil ran out, the Libyan government dedicated a considerable amount of capital to it. In this case, five development plans were implemented in the industrial sector, one each for the periods 1970-1972, 1973-1975, 1976-1980, 1981-1985<sup>(4)</sup> and 1986-1990 (see an earlier discussion of these development plans in section 2.2.3 of this chapter). Beschorner and Smith (1991) indicated in their special report that industry in Libya had two aims to achieve. The first was the promotion of production in many industries rather than sole reliance on one industry (e. g., oil extraction) in order to reduce dependence on crude oil exports, and the second was quantitative, aiming to alter the ratio of workers in productive sectors to those in non-commercial services.

Libya has invested huge amounts of money in petro-chemical manufacturing, using more of its natural gas and transforming crude oil into more valuable products,

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<sup>(4)</sup> This transformation plan allocated 1200 million LDs for light industries (food processing, leather and clothes, wood and furniture, paper, etc.) and 2730 million LDs for heavy industries (chemical industries, oil refinery, petro-chemical industry, basic metal industry, etc.) and the planned investments for industrial projects were 2115 million LDs for heavy and 909 million LDs for light industry (the Ministry of planning, 1990, Economic and Social Transformation 1981-1985, part two, p: 73).

thereby enhancing Libya's revenues. These investments have been established in different areas of Libya; for example, Abu-kammash Chemical Complex, Marsa Brega Petro-Chemical Complex and Ras-Lanouf Petro Chemical Complex. In addition, the country possessed several oil refineries. Other non-oil projects consist of light and heavy industry. Light industry companies include food processing and the manufacture of electrical goods, light chemical, engineering and minerals, furniture and paper products industries, prefabricated construction materials, cables, glass and others. Heavy industry companies include iron and steel complexes, chemical industries, trucks and buses, tractors, trailers; etc. Accordingly, there are about 415 industrial projects in Libya of which 161 are heavy industry projects and 254 are light industry projects (Aгнаia, 1996; Kilani, 1988).

In light of the previous discussion in this chapter, more attention was given by the new Libyan government to the development of the industrial sector in terms of all development plans. This was to achieve the objectives of self-sufficiency and reduced dependence on the oil sector by increasing the contribution of other sectors, such as the industrial sector, to the national income (Barker, 1982). It was also to build and improve the economic framework for the industrial sector which would concentrate on diversified economic production in the third development plan (1981-1985). The revolution accorded the highest priority to the industrial sector compared to other sectors. It was allocated about 23% of the total planned development of 17,000 million LDs to industry. Overall these investment plans for the two five-year plans (1976-80 and 1981-85) were considered a turning point in the industrial development of the nation and remain the more significant plans to date for the industrial sector in Libya.

Libyan industrial development, as discussed, was heavily dependent on the oil sector, both for investment revenue and for raw material (Federal Research Division, 1989). From the middle of the 1980s until the mid 1990s, oil revenue declined as a result of UN and US sanctions and reduction in oil prices. Then, the industrial sector, in common with other parts of the economy, suffered from low expenditure compared with estimated figures. Oil revenue decreased from \$22 billion in 1980 to \$5 billion

in 1988. This decline caused serious cash-flow problems necessitating a major revision of the 1981-85 development plan and the subsequent annual development programs (Fisher, 1995; The Arabic Economy Report, 1994; Elfeturi, 1992; Ghanem, 1987). Despite this, the output of the industrial sector has continued to rise, aided by large investments, which the country put into the economy. The industrial sector supplied 210.4 million LDs to the GDP in 1980, 547.1 million LDs in 1990 and 686.8 million LDs in 1992. The Industrial Sector Report states that the output value of this sector over these years was about 86.324 million LDs in 1992, 1,141.614 million LDs in 1993 and 952.122 million LDs in 1994 (Secretariat of Industry and Minerals, 1992, 1993 and 1994).

In the three year program 1994-1996, about 619.5 million LDs (10% of the total development plan) was allocated to the industrial sector. But the decline in oil revenues since the 1980s caused changes in the financing of the development programs in the industrial sector. The industrial organisations became responsible for sponsoring their development plans rather than the government (The Secretariat of Industry, 1994). Accordingly, there were many improvements in the value and quantity of industrial organisation products between 1970 and 1996, but the average utilisation of the production capacity remained low in many of these organisations (The Arabic Economic Report, 1994).

Abusneine et al (1993) stated that the industrial sector in Libya had been characterised by the low amount of actual production or low rate of return on investment. For instance, several decisions in many industrial organisations appeared to be taken without adequate feasibility research and others have not been revised or updated at different stages of construction (Tarbaghia 1995; Abusneine, et al., 1993). This in turn caused high costs of industrial products compared with similar products imported from other countries. Accordingly, many Libyan industrial products were unable to compete with imported products, even in the local market (Abusneine, et al, 1993). Also, Bengharbia (1994) indicated that the fact of high cost of industrial products is seen as one of the main problems encountered by the industrial sector. Reasons behind this increase in the cost of local products are the high cost of



importing raw materials and spare parts; the rise in the cost of manpower as a result of a greater numbers of workers in factories; reduction in actual production and the failure to use cost accounting and budget systems in certain companies. Additionally, many organisations were built without economic feasibility studies (Abusneine et al, 1991). These organisations have faced considerable problems and difficulties which affected their development.

### **2.3 Organisational environment**

The 'environment' denotes the current conditions, factors and/or circumstances under which people carry out their activities. In this respect, the surrounding environment in which organisations are operating has a huge impact on their performance. Also, organisations' behaviour and performance are highly predictable on the basis of environmental aspects. The Libyan environment, like other Arab countries, has witnessed a number of changes. These changes have had an effect on organisations' management and employees' behaviour as well as performance in several ways (Abbas, 1995). However, Libyan organisations have also faced several environmental and organisational problems. For instance, limitations of economic development, inefficient production, limited skills and educational levels and cultural background, as well as a climate of inefficiency and mismanagement (Ejigu et al., 1994).

Like other developing countries, Libya accorded high priority to national economic and social problems, but less priority has been given to managerial and organisational issues, which have had a strong impact on the performance of development plans. These managerial difficulties were revealed by the problems related to low levels of productivity and capacity utilisation as well as rises in the cost of production (Aghila, 2000; Agnaia, 1996; Abdalla, 1995). However, the Libyan government created a new cadre to manage these organisations' problems, with new recruitment and promotion procedures as well as the implementation of management training and development programmes (MTDPs) which helped to transfer knowledge and skills needed for organisational development (Gzema, 2000; Agnaia, 1996).

Libyan organisations exist in an environment characterised by continuous change resulting from a variety of factors<sup>(5)</sup>. Such change requires the continued development of new practices and procedures (Ejigu et al, 1994). Also, organisations are now characterised by the increasing complexity in their tasks, which makes it important to employ managers with well developed skills and education who possess the talents to meet job requirements. In this case, Libya is placing more attention on the education system and other training programmes (Aгнаia, 1996; Kilaani, 1988).

The intention of this overview of Libyan organisational environment has been to lay the foundation for understanding the conditions surrounding organisations. Accordingly, environmental factors found to influence organisations' efficiency and also employees' attitudes, behaviour and performance are most likely to be predictable on the basis of these environmental factors (Abbas, 1987).

Most Libyan organisations are subject to the government control, though they retain their own management, which is responsible for their decisions and policies. Public organisations began to operate in different sectors at the mid 1970s as a result of the principles of socialism. Accordingly, these principles were translated practically to mean that the ownership of all organisations was to be transferred to the public. The objectives of these organisations vary from one organisation to another according to the establishment's statutes (see chapter 6). Most of them are managed by People's Committees (PCs)<sup>(6)</sup>, though the oil companies are still managed by a board of directors (General People's Committee law no. 13, 1981 article 8).

The fact is that there is an absence of practical and academic qualifications amongst many committee members, and also there are frequent changes and transfers of such

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<sup>(5)</sup> Such as characteristics of the milieu, social, economic and political climate, market competition, the legal framework, the wants expectations and of the community and the situational variables that will influence the nature and timing of opportunities/constraints and decisions made (Bennet and Brodie, 1979, p: 16-17).

<sup>(6)</sup> The People's Committee of each company consist of five members, who must be chosen by the employees in the company. These five members should be chosen one member from among themselves who will represent them to the Specific General People's Committees (SGPCs) or Specific People's Committee (SPC) depending on the level of company activities (General People's Committee Law no. 13, 1981 article 8).

committee members. The Central Agency for Administrative Control (CAFAC) in one of its reports to the GPC (General Peoples Committee) has concluded that the performance of Libyan organisations remains far behind the expectations of the public (CAFAC, 1983, p: 37). According to Law no. 13 of 1981, PCs (People Committees) of Libyan organisations are responsible for establishing their organisational structures which are subject to approval by their respective Ministries. But, the absence of a clear definition of the authority and responsibilities of various sections still faces Libyan organisations (CAFAC, December, 1983, p: 97).

In the middle of the 1980s, Libyan industry started to see change in the form of small organisations. To encourage this, the Libyan government took the decision to allow a new kind of private organisation called a partnership organisation. This kind of change in Libyan industry which allowed privatisation of small companies and light industry was scheduled to start in 1985 under Law no. 9. The new style of partnership organisations gave an opportunity to a group of people to own, work and share the profit of their work. According to the development plan of 1991-95 the number of additional partnership organisations was expected to be 7483. Also, at the beginning of the 1990s, the Libyan Government started to give permission for several small public organisations to become private and to change to partnership organisations. During 1992 the estimated number of small organisations which had finalised their privatisation process was 18 (Haftari, et al, 1994B, p: 239).

Overall, Libyan industrial organisations face a number of problems which results from their operating environment. These problems are as follows:

- 1- A lack of highly qualified and experienced managers who are able to operate without any deficiencies in the context of change adoption.
- 2- A lack of sufficient qualified and competent managers and leaders, especially those working at high levels of management.
- 3- Many LMOs were prepared to use imported raw material and semi-finished goods as well as equipment and related spare parts. In this case, many of these organisations had difficulty in obtaining a normal supply of such materials and



spare parts as a result of the need for foreign exchange (see chapter 6), which was one of the economic crises conceded by declines in oil prices and by the UN embargo on Libya (Ejigu and Sherif, 1994, p: 11).

- 4- Government interference in Libyan organisations related to structure, location, budgets, and responsibilities characterised by a lack of distinction among political and economic decisions as well as centralised decision making (Ejigu and Sherif, 1994).
- 5- Many organisational processes and operating procedures are overly complex and unclear and require a great deal of experience and skill to manage.

### **2.3.1 Accounting system**

The social changes discussed earlier in this chapter have influenced the accounting systems in Libyan enterprises. The colonisation of Libya by the Italians undermined the official use of the Arabic language. All signs and legal documents in Libya prior to Italian occupation had been written in Arabic, but Italian language superseded the Arabic language throughout the period 1911 to 1942 (Kilani, 1988; Elfathaly et al, 1980). Thus, many current accounting documents, rules and procedures have derived from those originally rendered in Italian. The second major social change which influenced the development of the accounting system in Libya is Islam (Gambling and Karim, 1986). Zakat<sup>(7)</sup> (wealth tax) and the distribution of inheritance must be carried out in accordance with Islamic teaching. Third, the fact that people began to study accounting abroad (mainly in the UK and USA) and the increasing availability of accounting education and training in Libya have led to accounting improvements. This means that British and American accounting techniques have been adopted in the Libyan accounting system. Therefore, Libyan public organisations' accounting systems have typically been established in the interest of private sector needs rather

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<sup>(7)</sup> Zakat is one of the five "Pillars of Islam". This means purification and growth. It a purification of the zakat payer himself, as anyone who gives away part of his wealth generously to another cannot but be made pure. Zakat is also the purification of property because it means paying what is due on the property after which its wealth is legal. Furthermore, zakat is tax due to be paid to people in need, as decreed by the Quran. Zakat also means growth, for it imposes taxes on wealth held for a full year without investing it in one way or another, thereby discouraging hoarding. Idle wealth does not contribute to growth of the economy, and it is only when wealth is put to productive investment that new jobs are created and there are increases in production and the economy (Kilani, 1988, p: 82-83).

than public sector and towards external reporting rather than internal decision-making (Bait-Elmal, 2000; Kilani, 1988).

As mentioned in this section, organisational accounting in Libya has been strongly influenced by British and American accounting practices, whereas, accounting education was British oriented and is now American oriented. Also, the accounting systems of Libyan organisations have been mostly designed by British and American accounting companies, or by Libyans who have graduated from British and American universities (Gzema, 1999; Kilani, 1988).

Accounting systems in Libya needed greater co-operation from economists, politicians, engineers, sociologists, psychologists and lawyers (to function some objectives such as control over the efficient use of the resources, etc) (Abusneina et al, 1993; Kilani, 1988). This would entail extensive education and training programmes in order to establish such measures and introduce performance evaluation. However, any country's accounting system does not exist in a vacuum but comes from the broad environment with which it should be in tune (Briston, 1978). Accordingly, the accounting system should be a system which aims at providing for the needs of the country, and its scope should include enterprise, government and social accounting. Kilani (1988) stated that the accounting information needs of Libyan development planning would be better served by the adoption of a full uniform accounting system. This would provide relevant, reliable and timely information needed for the construction of social accounting data for development planning, project appraisal and other economic analysis and policy. A uniform accounting system for Libya should include a uniform chart of accounts, and uniform procedures, rules and measurements as well as cost and budgeting provisions.

The adoption of a uniform accounting system seemed to be the most important step towards improving the linkage between accounting and its environment in Libya. It was clear that a new system must not only be desirable, but also feasible.

Furthermore, the adoption of a uniform accounting system would reduce the need for an external body to certify that an organisation had applied generally accepted accounting principles or that it was consistent from year to year in its application of accounting standards, policies and procedures (Gaudi Arabia, Ministry of Commerce, 1986). A full uniform accounting system at an organisational level was necessary not only for the needs of the management of such organisations but also to improve the quality of a wide range of economic appraisals and decisions at (the macro and micro)<sup>(8)</sup> level in both accounting and the economy system (kilani, 1988; Hussein, 1981).

In a country like Libya, however, the degree of uniformity at the micro accounting level is very weak, while linkages between micro and macro accounting are almost completely absent. In this case, Kilani (1988) and Mirghani (1982) stated that the only way for Libya to resolve the inconsistencies between micro accounting and macro accounting and to promote awareness at the micro level of the interrelationship between it and the macro level is to adopt an accounting system which is specifically tailored to Libyan accounting information needs and which results in an accountancy function compatible with the Libyan economic and social structure.

All in all, Libya provides a very suitable environment for a uniform accounting system and one which is very inappropriate for a British or American style accounting variant (Bait-Elmal, 2000; Kilani, 1988). Also, the accounting system in Libya should be based on a general framework which takes into consideration the socio-economic needs of the country for planning, implementation, control and performance evaluation (Gzema, 1999).

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<sup>(8)</sup> There is a strong relation between the micro and the macro economy on the one side and micro accounting on the other. Macro accounting is based primarily on economic theory, but in practice it uses several micro accounting concepts and classification methods. Thus the macro-accounting framework is a combination of both economic and the accounting frameworks, which suggests that micro and macro accounting could be better integrated with a view to reducing differences between their concepts and improving the quality of the information which they generated (Mirghani, 1982).



### **2.3.2 Managerial accounting efficiency and performance evaluation**

It has been suggested above that the accounting systems of Libyan organisations do not provide enough information which is oriented towards micro- and macro-economic decision-making. Kilani (1988) stated that the need for changes in accounting systems, followed by changes in accounting information systems, could assist by providing the requisite performance needed for managing and planning. It could also facilitate the execution of the managers' and planners' functions, especially if managers and planners have not been trained to handle the work required of them. As Abusneina et al (1993) and Kilani (1988) indicated, a developing country like Libya requires a managerial accounting information and performance evaluation system which can facilitate control over the growth of the country's economy.

A change in the orientation of the accounting system of Libyan organisations is needed to fully evaluate management efficiency, effectiveness and performance (Gzema, 1999). Further, Bait-Elmal (2000) and Briston (1978, p: 120) indicated that many developing countries, in particular Libya, have been encouraged to adopt accounting systems which could provide relevant information for their social and economic development. However, at the micro level such information is required to evaluate each production line, department and policy. At the macro level such information is required to evaluate each organisation, sector or the whole economy. This information should identify, measure and communicate all relevant information for both micro and macro purposes. However, such information should be adapted to its environment. Thus, the adoption of the system is expected to be generally smooth, since most existing environmental factors are in favour of uniform accounting (ibid).

Managerial accounting scarcely exists in Libyan companies, apart from some simple budgeting techniques. Cost benefit analysis, shadow prices, input-output tables, cost analysis and current cost account records are all completely absent. Uniformity of form or substance in accounting forms, procedures and classification is virtually absent (Gzema, 1999; Kilani, 1988).

Overall, the orientation of accounting systems in Libya has very little relevance to the Libyan environment (Kilani, 1988). This has created a wide gap between the accounting information needs of the Libyan environment and the information provided through accounting in Libya. Whilst the emphasis has been on enterprise accounting regulations, government and national accounting has been mostly neglected, for all the regulations and laws were concerned with financial accounting and external reporting (Gzema, 1999; Kilani, 1988).

The importance of the socio-economic development of the country should be recognised and laws and regulations should be adjusted accordingly to reflect economic and social reality rather than compliance and control of various economic units (Abusneina et al, 1993).

## **2.4 Cultural differences and Libyan aspects**

The aim of this section is to understand the importance of cultural differences and discuss key aspects related to Libyan culture. The present study will attempt to outline the concepts of culture and cultural differences before discussing the cultural dimensions of Libya and how these aspects generally influence work attitudes or behaviours of employees.

There is a noticeable increase in interest being paid to culture in organisations. Having a suitable culture enables organisations to successfully implement new change like benchmarking. This source of organisational culture is discussed further in chapter 3. Culture refers to dominant human attitudes, values, norms and beliefs in a given society and the way these aspects influence people's behaviour and performance in their organisations (Hofstede, 1991). Further, Torrington, et al (1992) stated that culture means how people should behave and treat each other, the nature of the working relationship that should be developed and attitudes to change. Culture can be a powerful source of identity, and can also be a barrier to change or can be managed to organisational advantage (Armstrong, 1990; Torrington et al, 1992). Another definition describes culture as "the collective programming of the mind

which distinguishes the members of one human or group from another" (Hofstede 1991, p: 5).

Culture can also be seen as ideas and theory about how things must be done in the society. It determines behaviour, beliefs and attitudes and these may affect management practices, which may in turn affect the context of work attitudes and performance (Hofstede, 1993). The culture of any society or organisation is a result of interaction between many factors such as communication, motivation, and leadership. Organisations and policies or practices are completely influenced by the society's culture and employees' behaviour and attitudes. Organisations can be more productive when their policies and plans devised by their managements are compatible with their cultural aspects (ibid).

Organisational culture helps to explain many organisational phenomena and can aid or hinder organisational effectiveness (Trompenaars, 1995). In this case, in order to understand how organisations function, organisational culture must be well understood. Dadfar et al (1999), for example, states that many studies, both theoretical and empirical, have found cultural influences acting as determinants of individual and organisational behaviours. They give examples of cultural perspectives which have been developed within organisation theory such as cross-cultural management and the management of cultural diversity (Adler, 1984; Redding, 1995).

Although cross-cultural management research is overwhelmingly of North American origin, Hickson (1997) indicated that developing countries are beginning to make a research contribution in this area. Asian researchers who made no contribution two decades ago tend these days to occupy a significant place. Unfortunately, African and Arab research are still making only a slight contribution. In this case, Hickson (1997) points out that Africans' cross-cultural management research contributes not more than 0.30% of the whole.



It is noticeable from the previous discussion in this section that culture plays an important role in our life and it can influence individuals, organisations and societies. Cultural differences have to be considered in any study of new change which is adopted across organisations or societies. For example, the Volvo and Renault case for merger (Mason, 1993) is analysed further in chapter 3.

Cultural aspects, have been recognised as important determinants of economic development in Arab countries in general and Libya in particular. These aspects play an important role in the country's development. For example, Arabic culture and Islamic rules are the most dominant criteria in individual and group beliefs, attitudes, behaviours, social values, state laws, and political and economic policies in Libyan society (Aghila, 2000; Agnaia, 1996). In Libya, like other Arabic and Islamic countries, family, religion and language have a high impact on the attitudes, behaviours and performances of these people (Kaabur, 1995; Abuznaid, 1994). For instance, the family system is supported by Arabic culture and Islamic rules as discussed in the following sections.

#### **2.4.1 Family in Libyan Culture**

The basic units of the social structure of contemporary Libya are the extended family, the clan, the tribe and the village. Each of these plays a major role in the individual's and community's life (El-fathaly and Plamer, 1980). Since any individual in Libyan culture is identified with his family, his good or bad deeds bring collective fear or shame to the family and the tribe. The family therefore controls and shapes its members' behaviours. The individual has to obey, respect, and preserve the rules and traditions of the family, the clan, the tribe and the village (El-fathaly, 1979).

Libyan society is classified as a collective society because the family and tribe play major roles in Libyan culture (Aghila, 2000). It typically consists of large families, and the members of these families usually have strong ties to each other. The family provides its members with their roles, responsibilities and achievements and also determines the individual's position in relation to other members of the family. The cultural values and norms of the society demand that kinship and tribal relationships

should be given preferential treatment in almost all circumstances. As a result of the discovery of oil, there was a movement of people from the villages to the cities in order to find better paying jobs in the modern economy. Many Libyans have found that the demands of work in big cities like Tripoli and Benghazi conflict with the values, behaviour and habits of their formal rural lives (ibid).

Libyan society, like other Arab societies, is best described as one which is characterised by masculinity. Scarborough (1998) stated that Arabs express a high degree of distinction in male and female roles. Hofstede (1991) describes the masculinity of the Arabs as moderated by the low value placed by them on task accomplishment and the high value placed on strong, emotive relationships and verbal skills. Overall, these above cultural characteristics of Libyan society are incorporated into Libyan industry and influence industrial relations and management strategies and practices reflecting people's values, attitudes and behaviour.

#### **2.4.2 Language and religion**

The Arabic language and culture were brought to Libya during the Middle Ages (Aghila, 2000; Kaabur, 1995; Abuznaid, 1994). Arabic language influence permeates the culture, among both the common people and the social, political, economic and intellectual elite. Language is a vehicle for the continuing transmission of information as well as ensuring the continuity of national thoughts and maintaining and reinforcing cultural identity (Abuarroush, 1996). Furthermore, the Arabic language has influenced not only the development of Libyan culture but also all Arab cultures as well as other Muslim cultures (Aghila, 2000; Agnaia, 1996).

Regarding religion, Abuznaid (1994) argues that religion has a great impact on people's behaviour, attitude, social interactions and social relations. Islam as a religion and a way of life has an influence on the political, economic and educational system as well as other cultural aspects of Arab and Muslim societies.

Islam is the only religion of the entire Libyan people. Values and behaviour have been a function of religious background and attachment. For this reason, evaluation

and acceptance of innovation and change are subject to religious beliefs and notions. Libyan people look to the Qu'ran as a source of legislation and guidance for correct action (Aghila, 2000; Gzema, 1999). The supreme laws are the laws of God, and these determine people's relations with each other and with God. Libyans as Muslims see prophetic prescriptions as guides in conducting their business and family affairs. Islam is largely compatible with economic development. Islamic values and traditions influence behavioural attitudes towards the conduct of business and attendant management practices (Anastos, et al, 1980). Furthermore, Kaabor (1995) stated that Muslim people believe that Islam offers the highest ethical standards of truth, justice, freedom, equality, brotherhood and respect for others. Also, the misinterpretation of these values discourages effective progress in many organisations (Aghila, 2000).

## **2.5 Cultural differences and the transferability of Western and American ideas and management knowledge into the Libyan context**

This section gives some indications about the importance of cultural differences and the transferability of Western and American ideas and management knowledge into the Libyan context.

The world has exhibited cultural differences since time started. Human life has existed for more than 1000 decades (Hofstede, 1991). Contemporary life is now full of confrontations between people inside or outside their society that think, feel and act differently. Trompenaars (1995) indicates that as increasing management contact and interdependence across culture are inevitable, cultural differences are becoming more entrenched. It is more important than ever to try to understand different cultures and their influence on the ways people do business (Hoecklin, 1995). Having a compatible culture has become a very important requirement for an organisation to implement new change adoption (see chapter 3). Zairi and Ahmed (1999) found that cultural differences were a concern when transferring new process of best practices (e.g., benchmarking) in global organisations.



In recent years, many authors and researchers have raised questions about the compatibility of American and Western management theories and practice with other countries, in which the cultural aspects that govern attitudes, behaviour and relationships are different (Zairi et al, 1999; Hofstede, 1987; Mueller, 1983; Navis, 1983). However, understanding management theory would be impossible without understanding its cultural context. Studying organisational theories and particularly trying to test some of them in different environments is impossible without understanding cultural differences. Many researchers focus attention on the limitations of the validation of theories in the context of developing countries (Hofstede, 1987; Mueller, 1983; Navis, 1983; Buera and Glueck, 1979). For instance, Navis (1983) drew attention to the differences between the Chinese and American interpretation of management motivation theories. The researcher attributed these differences to cultural concepts and assumptions that underlie management concepts in each country. The social, economic and political environments were found to be the main factors that form the culture of any country (Navis, 1983, p: 252-54).

The management theories and ideas of Western and American culture which have been transferred to many developing countries are based on Western or American values and norms (Hofstede, 1987). Libya, as one of the developing countries, is not characterised by the same aspects of culture, which means that there are different forms of social life, language and religion that describe rights and duties in a different way. Other values and norms govern attitudes and behaviour, and relationships are different (Aghila, 2000; Kilani, 1988). Furthermore, Hofstede and Bond (1988) have argued that certain nations have particular cultural traits that are extremely difficult to change.

Aгнаia (1996) stated that Western and American societies focus on the individual; everyone is supposed to look after his or her own self-interest and the immediate family. Libyans, as a result of their religion, customs and other traditional aspects of social life, are characterised by a tight social framework. Libyan employees work for their superiors, friends and relatives rather than to accomplish the task of achieving

organisational goals (Aghila, 2000; Agnaia, 1996). A person in Libyan culture will disregard self-interest in favour of the family's interest, in his work, seeking and maintaining personal status without paying proper attention to organisational objectives (Agnaia, 1996; Kaabur, 1995). Therefore, transfer of management theories from other countries without taking into account differences in culture and social environment has led to difficulty in applying these theories in a Libyan environment.

It becomes clear that direct transfer of Western and American management knowledge and theories to developing countries such as Libya, without understanding cultural differences, may produce difficulties (Aghila, 2000; Agnaia, 1996). However, the Libyan working environment is full of problems that make achieving goals difficult even when not considering cultural differences (Hafteri, et al, 1994A). For example, frequently managers who are supervising the activities of others do not possess the necessary managerial training. This affects their performance, and in turn satisfying the needs of achievement will be difficult. Lack of much needed resources, support staff, efficient communication systems, management commitment, and public support are also considered to be drawbacks for motivation programmes in improving performance (Agnaia, 1996). These problems and others contribute towards reducing managers' expectations of achieving their tasks and lead to poor performance (Bait-Elmal, 2000). Consequently, there is a need to adapt and develop ideas and practices for use in such developing countries as Libya because the culture of organisations in developing countries is different from those of developed countries (Hickson, 1997). At the same time knowledge of cultural differences is necessary because of the development of telecommunication and globalised economies in the world today (Pavlica, 1996).

Hofstede (1991) in his research highlighting cultural differences between nations, insists that Arab countries rank in the middle between individualist<sup>(9)</sup> and

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<sup>(9)</sup> Individualist cultures control and motivate their members by internal pressures, by inducing guilt and developing opportunities for self-achievement. Individualist cultures describes the relationship between an individual and a group to which he or she belongs. For example, they stress individual's achievements and rights and expect individuals to focus on satisfying their own needs (Mead, 1994, p: 20).



collectivist<sup>(10)</sup> cultures. Kaabur (1995) claims that Libya as an Arab country may be characterised more as a collectivist culture. Aghila (2000) suggests that members of Libyan organisations seek tight social relationships. This type of organisational culture has been carried through the society in which there are tight relationships of individuals in the family and tribe and these relationship are reflected in the organisations.

Hofstede (1991) insists that most Arab countries should be considered to fall in the middle, between masculine<sup>(11)</sup> and feminine<sup>(12)</sup> cultures. Aghila (2000) indicated that Libyan culture is mainly masculine because the dominant roles in this society belongs to men. The findings of this study indicated that most employees in Libyan organisations are males. Females still have less of a role in Libyan society, although the Libyan revolution in 1969 has motivated women by providing equal opportunities for them in education, work and other economic activities.

After reviewing the Libyan environmental context and discussing some cultural aspects related to this environment, it is important to consider how this culture and environment influence the implementation of benchmarking in Libyan organisations (see chapters 6 and 7). At this point, the Economic Intelligence Unit (EIU) report (1994) and the findings of this study have suggested that the work environment in Libya could affect employees' work attitudes, behaviour and performance. Also, economic environmental difficulties and mismanagement, for example, will affect the performance of Libyan organisations. Sanctions have affected for many years the country's economy and development policies. The system lacks an effective rewards system such as motivation, company services and health services that can all encourage employees to work and raise their level of satisfaction towards their work

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<sup>(10)</sup> Collectivist cultures are characterised by tight social networks in which members identify closely with their organisation. In these cultures loyalty may be valued above efficiency (Hofstede, 1991).

<sup>(11)</sup> Masculine cultures describe sex roles in national culture. In masculine cultures sex roles are differentiated, and traditional masculine values such as achievement and the effective exercise of power determine cultural ideals. Men are expected to be assertive and competitive (Hofstede, 1991).

<sup>(12)</sup> Feminine cultures also describe sex roles in national cultures. The sex roles in these cultures are less sharply distinguished, and dominant values are those usually identified with the feminine role. Members prefer to relate to others rather than to compete with them (Hofstede, 1991).



(ibid). All these environmental factors have a profound affect upon employees' satisfaction, behaviour and performance to implement new change adoption in Libyan organisations.

## **2.6 Summary**

This chapter has discussed major aspects of the Libyan environment which are included in the historical background (2.2) in relation to the Libyan economy. Discussion focused on periods prior to as well as after the discovery of oil. The organisational environment (2.3) was discussed in relation to accounting systems, to managerial accounting, to efficiency, to performance evaluation; to cultural differences (2.4), and to the transferability of Western and American ideas and management knowledge into the Libyan context (2.5).

Arabic is the only language, and Islam is the only religion. The country has been subject to a number of foreign powers, and independence was achieved only in 1952. Economically, the country was very poor until the exporting of oil in 1964 which transformed Libya to an oil-rich economy. Accordingly, a number of social and economic plans have been chosen as the country's path to development, with the latest plan covering the period of 1986 to 1990.

There have been serious and systematic changes in the Libyan economy after the 1969 revolution. The transfer of the Libyan economy from a market-oriented to a socialist system type introduced basic changes in management and in the ideological structure. As a result of the adoption of revolutionary principles, foreign businesses were nationalised and foreign military bases were closed. Moreover, considerable attention was given to the industrial sector, and huge amounts of money were invested in light and heavy industries as well as in petro-chemical industries.

Throughout this chapter it has been emphasised that the current role of the accounting systems in Libya should be extended so that information needs can be satisfied. Libya as a developing country needs an accounting system which covers social as well as economic transactions and which should be carefully considered

when formulating successive development plans. Therefore, an accounting system which integrates micro and macro accounting records and which provides information based on the true social and economic value of economic figures on a unified basis is needed for socio-economic development planning in Libya.

The idea of cultural differences was also discussed in this chapter and shows that concepts and management theories, particularly in attempting to test some of them in different environments, is impossible without understanding cultural differences. The previous discussion about culture demonstrates that the direct transfer of management theories and practices can be faced with serious difficulties if the transfer is made without considering cultural conditions.

Overall, the intention of this overview of the Libyan environment was the laying of foundations for understanding the surrounding environment because environmental aspects are found to influence organisation efficiency and employees' attitudes, behaviours and performance. In addition, it is to be considered as background for later discussions in subsequent chapters.



## CHAPTER 3

### 3. Corporate benchmarking and related literature

#### 3.1 Introduction

The purpose of this chapter is to address the second (1.3.2) and third (1.3.3) sub-objectives of this study. It provides the necessary background information about the cultural and organisational issues relevant to benchmarking. Maull et al. (2001) state that it is important to understand culture before implementing changes (such as benchmarking). They believe that it is important to match the programme for the adoption of benchmarking to culture before organisations implement benchmarking.

This chapter reviews the literature relevant to benchmarking and illustrates problems that confront organisations which implement benchmarking practices. Benchmarking is a rather loosely defined area since it emerges out of practices in various forms rather than from theoretical and operational definitions. For that reason, the first section of this chapter gives an explanation of various definitions of benchmarking and the historical context in which benchmarking has emerged (3.2). This historical context is very important since the application of benchmarking in particular companies is an important component in understanding the literature. The second section provides a discussion about the existing research into benchmarking practices, with a primary focus on organisational and national culture (3.3). The third section of the chapter outlines some of the applied research focused on the implementation of and problems with benchmarking (3.4). The final section (3.5) summarises the above discussion.

#### 3.2 Nature of benchmarking

The past two decades have seen a rapid increase in new management tools and techniques aimed at improving organisational performance. Gillies and Rigby (1995) identify the most popular and commonly used new management tools and techniques. These include downsizing, empowerment, utilisation of mission statements, satisfaction surveys, Total Quality Management systems, Re-engineering, Value



Chain Analysis, Five Forces Analysis, Mass Customisation, Dynamic Simulation, and Technology S-curves. While it is certainly beyond the scope of this thesis to address all of these innovative techniques, it is important to point out that benchmarking is just one among many innovations in managerial techniques that have reshaped modern managerial practice. In addition, these techniques are often interrelated.

There are suggestions that benchmarking is among the more significant of these innovations. Gillies and Rigby (1995) state that benchmarking rose from sixth place in their league table of 25 management tools in 1980 to third place by 1995. This is perhaps because intense competitive pressure in the past two decades has caused many organisations to experiment with new techniques. For many organisations, profits have dwindled, budgets have been cut repeatedly, market share has eroded, and new products have failed. These same organisations have understandably looked to the adoption of the practices of their competitors who have been more successful. Benchmarking has been the primary practice through which organisations have sought to learn from their successful competitors (Bramham, 1997).

According to some, benchmarking can be traced back to early Egyptian construction work (Codling, 1992). At that time, a notch was cut in a lump of stone at an accurately determined point whilst a flat strip of iron was placed horizontally to act as the support (or bench) for levelling staff. Using this as a reference (benchmark), further heights and distances could then be measured (Meyer, 1991). According to others, benchmarking seems to have originated in Japan (Zairi, 1996, p: 34)<sup>(1)</sup>. Many Japanese companies consider benchmarking as a positive process aimed at changing operations in a structured model to achieve superior performance (Vermeulen, 2003). Benchmarking seems to have been practised in different ways in Japan. One of the most common approaches is based on the principle of "shukko" – the practice of loaning employees to other firms (Meyer, 1991; Zairi, 1996). With this practice, employees can gain some knowledge from other companies that can be useful for

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<sup>(1)</sup> In his book: Benchmarking for Best Practice

their host companies. This practice occurred because Japan was isolated from the world until the 19<sup>th</sup> century, so companies in Japan had to learn from each other (Meyer, 1991). The modern etymology of benchmarking seems to have begun with land surveyors who used the term to compare two or more high positions (Frost and Pringle, 1993); thus the sense of “best practice” has origins in the connotations associated with the term “high.” The term benchmarking has evolved into many definitions, but the notion of implementing both an internal and an external assessment in order to develop and implement a plan to achieve leadership in the marketplace seems common to all such definitions.

In terms of contemporary company culture, it is commonly accepted that benchmarking practices and development began with the Xerox Corporation (Sisson et al., 2003). For Xerox, "the need for benchmarking was identified in the 1970s and it has now become one of the three processes, along with quality and problem-solving, that are central to Xerox's 'leadership through quality' programme" (Bramham, 1997, p: 29). Early in the 1980s, Xerox faced extreme financial and competitive pressure. Xerox's market share had decreased from about 80% to 35%, and concerns over costs and quality were salient. Xerox then adopted benchmarking practices. Since that time, Xerox has regained market share, decreased cost, and improved quality, though it would be naïve to assume that such a turnaround was simply the result of the adoption of benchmarking practices (Pryor, 1989).

During 1985, the Ford Motor Company introduced its "Taurus and Sable" automobiles. Both products grew out of development processes strongly wedded to benchmarking principles. These two models proved themselves to be the two most successful Ford products in over two decades and their continued success has helped make Ford the most profitable U.S. car company since the late 1980s. Because of the success of these two product lines, benchmarking became an integral part of future development programmes at Ford. Further, benchmarking is designed to allow managers in the Ford Motor company to understand how their functional



performance compares with that of other companies, particularly those that excel in that function, and to identify why their performance differs (Pryor, 1989).

These two examples – Xerox and Ford – are fairly representative of many other corporate experiences with benchmarking. Other firms, including IBM, Motorola, and AT&T introduced benchmarking programmes to minimize production defects so as to improve productivity and meet customer needs (Chen, 2002). With its growing popularity, diverse meanings of ‘benchmarking’ have emerged, and attempts have been made to clarify the term and develop typologies to classify and refine the practice. Ettore (1993, p:12) offers perhaps the most general definition -- “It (benchmarking) is a systematic, rigorous examination of your organisation’s product, service or work processes measured against those of organisations recognised as the best to produce changes and improvements in your enterprise”.

The formal definition of benchmarking used by the Xerox Corporation, mentioned as the first modern firm to use benchmarking, is: “It (benchmarking) is the continuous process of measuring products, services, and practices against the toughest competitors or those companies recognised as industry leaders” (quoted in Robert Camp, 1989, p: 10; see also Frost and Pringle, 1993; Ettore, 1993; Rolstadas, 1995; Delpachitra et al., 2002). The word ‘continuous’ in this definition points out that benchmarking should not be thought of as a one time event. Benchmarking cannot be performed once and disregarded thereafter in the belief that the task is completed. It must be a continuous process because industry practices constantly change and industry leaders constantly get stronger (Camp, 1989).

Maleyeff (2003), Welch et al. (2001) and Camp (1989, p: 12)<sup>(2)</sup> state that a good working definition for benchmarking is: “It is the search for industry best practices that lead to superior performance”. Definitions become more narrowly expressed as one begins to identify different categories of benchmarking practices; among them, internal benchmarking, competitive benchmarking, and functional/generic

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<sup>(2)</sup> In his book *Benchmarking: The Search for Best Practices That Lead to Superior Performance*.



benchmarking (Spendolini 1992)<sup>(3)</sup>. To understand benchmarking more fully, it is necessary to explain these different types of benchmarking.

**Internal benchmarking** is the simplest approach and involves only internal (within-firm) comparisons. Comparisons across units within a single firm and processes of information-sharing across departments of the same firm or across affiliated firms can be relatively simple (Frost and Pringle, 1993; Rolstadas, 1995). Some have suggested that internal benchmarking should be considered first in order to establish a baseline performance against which to compare external performance and to identify the scope of intra-company improvement opportunities (CMA, 1998). This form of benchmarking was also identified to improve internal operations or standards, in a multi-division or multi-national organisation (Sarkis, 2001).

Many companies (e.g. the Nationwide Building Society, the Australian Insurance Company and the Xerox Corporation) initiate benchmarking activities by comparing business practices internally. Internal benchmarking efforts in companies with strong decentralised cultures may actually be more difficult than benchmarking with outsiders. On a positive note, in many cases, benchmarking has helped bridge the gaps that divide companies by encouraging internal communications and joint problem solving (Spendolini, 1992).

**Competitive benchmarking** – This constitutes benchmarking against other organisations in the same industry, whether they are direct competitors or not (Sarkis, 2001). Competitive benchmarking involves identification of the products, services, and work processes of an organisation's direct and strongest competitors in the industry (CMA, 1998). Clearly, at the level of normative ideals, focusing on the practices of one's strongest competitors has much appeal. However, recent studies indicate that "the problem is that one seldom gets any useful information at all, because nobody wants to share sensitive information with competitors. Therefore,

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<sup>(3)</sup> Discussion of these categories is not the main issue of this study but is quite relevant to this dissertation. The reason for that relevance is that the research problems dealt with here are more severe for some types of benchmarking and less severe for others.

competitive benchmarking will most often either take place as a superficial comparison of key performance indicators (metrics) based on publicly available information, or as a comparison of metrics between a group of companies that have provided their information in an anonymous way" (quoted in Rolstadas, 1995, p: 123; see also Welch et al., 2001; The Benchmarking Exchange, 2001).

That is perhaps an overstatement; some useful information certainly will surface. In addition, this form of benchmarking helps create a culture that both values continuous improvement and increases sensitivity to change in the external environment (Vaziri, 1992). Nevertheless, there are additional drawbacks associated with this form of benchmarking. It is difficult to gain the co-operation of competitors to share information at the functional or operational level. Also, the information is unlikely to result in any breakthrough innovations since competitors most certainly protect that sort of information. This type of benchmarking may be limited to a small group of participants, depending upon the company's industry (CMA, 1998).

**Functional benchmarking** – This refers to the process of benchmarking against the operations or leaders in any industry (Sarkis, 2001). This form involves specific business activities within a given functional area, such as manufacturing, marketing, engineering, or human resources. Xerox Corporation and L. L. Bean are the most frequently cited examples of organisations which practise functional benchmarking. It appeared that Company B (one of the Libyan companies investigated in this study) is an example of practising this form of benchmarking (see section 6.10).

Functional benchmarking focuses on a specific aspect of a company's functional operations and identifies ways to achieve "best-in-class" status (Sarkis, 2001; Camp, 1989, 1995). It has the practical advantage of extending the scope of firms beyond one's own particular industry. Functional benchmarking involves identifying those companies that are recognised as having superior logistics functions wherever they exist (Frost and Pringle, 1993; Camp, 1989). Within this form of benchmarking, it is often difficult to use metrics because the companies and their accounting systems can



be very different; however, a more qualitative method can be used, and there are always some common processes or functions that can be compared. The result of benchmarking across industry borders can often be the identification and adaptation of practices that have been completely unknown to the company's industry sector (Rolstadas, 1995).

Irrespective of the type of benchmarking employed, the practice is related to other managerial techniques. Benchmarking adds external perspective to a total quality management system (TQM)<sup>(4)</sup>. It ensures that the wheel of continuous process improvement is turning in the right direction towards achieving higher standards of competitiveness. Several organisations have adopted benchmarking as part of a TQM programme. Alcoa, AT&T, and Kodak are commonly cited examples (Zairi and Hutton, 1995).

Benchmarking inherits from TQM a binding commitment to continuous improvement and monitoring. Competitive forces in changing markets tend to drive benchmarking performance trends to ever higher levels of attainment. "A rule of thumb is that if the benchmark measurements are more than three years old, they are likely to be out of date" (CMA, 1998).

Two questions arise from the idea that benchmarking is indeed a continuous process. The first relates to the life cycle of the benchmarking concept, and the second is that of questioning whether benchmarking is merely a fad or fashion (Wilson, 1995). One contention might be that benchmarking will remain a 'hot' issue only to the extent that it leads to greater profitability in firms committed to benchmarking practice. Further, Tatcher states that "every organisation approaches continuous improvement in a slightly different way, and it is quite common for a fashionable idea to be used as the vehicle for those initial stages" (1994, p: 44). Benchmarking can be considered in a list of such fashionable ideas, because many organisations have rushed into

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<sup>(4)</sup> The links between total quality management and benchmarking are therefore obvious - establishing processes based on industry best practice that result in better meeting of the internal and external customer requirements (Zairi and Hutton, 1995).



benchmarking with great enthusiasm, considering it to be fundamental to their quality process. However, before rushing off with such enthusiasm, it is important to confirm that the culture of the organisation is ready for benchmarking. If a few key important components are missing, then benchmarking will become a costly failure (CMA, 1998; Wilson, 1995).

Many managers feel uneasy about the idea of benchmarking (Tutcher, 1995) because benchmarking is deliberate, time consuming and, at times, difficult. It requires organisational discipline to be sustained in the face of "day-to-day" pressure. However, competitors are likely to redefine the rules by raising the benchmark performance threshold. "It is therefore necessary to recalibrate benchmarks periodically to support continuous process improvements" (Kharbanda, 1993, p: 30-33).

In reviewing the literature on benchmarking, it appears that there are two aspects of the process that lead to the problems being addressed in this research. The first is that, with the exception of internal benchmarking, benchmarking is an exogenous process for an organisation: it attempts to identify best practices across many organisations and then provides performance standards within a single organisation based on best practice. This creates very important questions concerning the reasonableness of adopting standards from one organisation and using them in another organisation. Problems can occur through the absence of sensitivity to different organisational cultures. For example, if changes are to be adopted across cultures, it is important to understand the extent to which factors in the decision-process vary from one to another culture in a more objective fashion (Carroll, 1993). Organisational culture is perceived as a set of collective norms, which influence the behaviour of employees within the organisation (Andriopoulos, 2001). The main argument is that different cultures produce differences in structure and managerial behaviour independent of other conditions. In this case, the relationship between culture and structure affects the ways in which the managers of organisations respond to their environment, their technology and the size of their firms. It also affects the

values and expectations of most of the employees in the organisation. The relationship with performance is not so well established.

The second aspect of benchmarking that is central to the research in the present thesis is that benchmarking is a multivariate practice. Organisations attempt to benchmark many items (dimensions) of performance. These items may not be compatible with each other. In the opinion of the present author, the most common mistakes benchmarking firms make lie in trying to adopt changes in too many areas simultaneously. It is helpful, therefore, to set priorities on the processes to be benchmarked, based on economic importance, future strategic importance and internal readiness to change (Walleck et al., 1991). For example, attempting to meet “best practice” standards concerning cost containment or cost control can conflict with the attempt to meet “best practice” standards for product quality, since quality and short-term measures of cost efficiency may run counter to each other. There are many other examples of conflicting goals in organizations, some of which are addressed in this study.

A good illustration of such conflicts in a multivariate setting is the Tetra Pak case (Zairi, 1996). Tetra Pak is the international leader in packaging liquids for human consumption. Worldwide sales are in the region of \$2 billion. The major breakthrough innovation for the company was the Tetra Brik aseptic carton introduced in the 1970s, best known as a container for long-life fruit juices. The main benefit of this product is that fruit juices need no longer be refrigerated, as the contents are sterilised and aseptically packed.

Tetra Brik sales account for two thirds of Tetra Pak’s total sales. Tetra Brik is used to package the majority of juices in the UK. However, this success was achieved only after Tetra Pak added more costs, to the point where a higher percentage of sales revenues was spent on R&D than by any major competitor. These costs created major problems and could have put Tetra Pak out of business, since the quality and innovation that made the company successful left it with a very sizable financial



burden. This example shows how “best practice” in one dimension (innovation) was insensitive to another (cost) dimension.

This introduction provides a background for the understanding of some of the results obtained from theoretical and applied research into benchmarking practices, research that is summarised below. For purposes of this study, the review includes an array of benchmarking practices – internal, competitive, and functional. The first part of the literature review below focuses on the relevance of culture to understanding practices such as benchmarking. The literature discussed below has emerged within the context of developed, usually Western, economies. Unfortunately, no studies have been identified that focus upon organisations and economies similar to the Libyan cultural context upon which this dissertation is focused. The second part of the literature review below focuses on applied research in benchmarking.

### **3.3 Cultural and organisational issues relevant to benchmarking**

‘Culture’ can be understood in the narrow sense of organisational culture, or more generally as including the wider cultural context in which an organisation operates. In general, organisational culture can be seen as ideas and beliefs about how things (e.g. benchmarking) ought to or must be done. According to many, organisational culture takes in many forms, such as norms, which mean the unwritten or unspoken rules of behaviour; values, which mean beliefs about what is important and good for the organisation; and management styles, which indicate ways in which managerial authority is, or is not, exercised (see Mondy and Noe, 1987).

The importance of culture in understanding any new adoption before its implementation is widely supported by many articles in the literature. For example, authors such as Patten (1992) and Kim et al. (1995) have encouraged the acceptance and the recognition of the organisational culture construct within new adoptions, especially as a primary foundation for their successful implementation (Maull et al., 2001).



An organisation's culture is considered as an important factor because of its relation to the way in which the organisation is performing its business. For instance, many US firms failed to implement Japanese management practices (e.g. benchmarking, TQM) because of Japanese and US cultural differences (Awashi, et al., 2001; Young, 1992; Fucini, 1990). Temporal (1991) stated that it is important for those who are trying to adopt benchmarking fundamentally to understand their organisation's culture. The firm's culture includes the whole complex of opinions, measures and values that determine the attitude or behaviour of members of the firm. It expresses the way managers and employees can handle jobs, the basic attitudes to work and performance, to customers, to innovation, to costs, and to technology. These dimensions ensure that the organisation's culture helps, and does not hinder, the drive to be 'the best' (Pumpin, 1987; Bramham, 1997). Therefore, if the benchmarking adoption is to be achieved, the culture of an organisation should be directed to supporting this programme, and the programme itself must be sensitive to the culture in which it functions.

Bramham (1997) underlines the importance of understanding the culture in which benchmarking takes place. As a fundamental prerequisite for implementing benchmarking successfully, he argues, a firm must carefully consider the culture and understand the problems and the opportunities inherent in it. The hypothesis here is that the culture of any organisation must be receptive to the concept of benchmarking and, furthermore, permit its adoption. Mitroussi (2003) indicated that when a culture becomes weak or unstable, managers must understand the problematic areas and demonstrate the ability and commitment to redefine or replace the already existing assumptions with others that are more appropriate.

Research has shown that a firm's culture has a strong effect on its performance (Pumpin, 1987). In fact, there is a close interrelation between corporate culture and strategy. The culture can play an important role when strategy is being developed or implemented. According to Pearce and Robinson (1991), a problem arises if the firm's culture from which a benchmark is taken is not compatible with that firm's

strategy. Benchmarking must then be implemented with great care, and very carefully designed social change may be required.

Managers can detect opportunities and threats as well as judge risks by understanding the firm's environment. For example, the introduction of a new material can create opportunities. On the other hand, it may create risk for new products if competitors can use it to displace the firm's products from the market (see Pumpin, 1987; Pearce et al., 1991). The environment can provide key ideas about competitors or groups of main competitors; for example, the main capabilities and weaknesses of a competitor, future strategies and present position on total market share, total turnover, product policy, cost structure, etc. "This can lead to more effective strategy formulation" which is usually part of a formal planning process (see Walleck and O'Halloran, 1991, p: 3).

Firm size is an important factor affecting the change to more complex management systems such as benchmarking. More specifically, Chenhall and Smith (1998, p: 12-14) have written that, "studies of recently-developed management accounting practices have shown that adoption rates are much higher in large firms". One reason for larger firms being more likely to adopt benchmarking is their ability to commit more resources to management innovations, to "experiment more with innovative accounting systems". Furthermore, large organisations (as measured by turnover and number of employees) are more likely to benchmark than smaller ones. Macneil and Rimmer (1993) confirmed this, in terms of both annual turnover and number of employees, in their study on benchmarking in Australian organisations. Organisational size is an important variable affecting organisational structure in implementing benchmarking (ibid). Pugh et al. (1969) indicated that larger organisations in comparison with smaller ones tend to be more specialised, more standardised and more formalised in situations of any new adoption. Further, Merchant's (1981) results indicated that in larger organisations, where there is greater diversity and decentralisation of decision making, a strong preference for selecting benchmarking as a tool may exist despite less personal interaction between managers.



Watts and Zimmerman (1987, p: 118) state that the size of the firm has an important effect on managers' choices and actions. Top managers therefore need to give some consideration to firm size in selecting benchmarking partners where it is important to consider partners of similar size. Partner selection is also important because the extent of learning can be very different with different groups of partner firms, and "because once the firm's operations have been changed as a result of a benchmarking effort, the change often accompanies substantial sunk cost <sup>(5)</sup>" (see Elnathan and Kim, 1995, p: 346).

Overall, there is a need for additional groundwork before commencing any benchmarking activity. First, it is very important to confirm that the culture of the firm is suitable. If small but essential elements are missing, then the firm will face difficulties from the beginning (Tutcher, 1994). An organisational culture is a unique product of organisational history, development and present situational issues (Maull, 2001). Secondly, "having an environment in which managers and employees are receptive to benchmarking is of crucial important, according to Tracy <sup>(6)</sup>, Hull <sup>(7)</sup>, and Carter <sup>(8)</sup>" (Bemowski, 1991, p: 22).

The culture and the environment of the organisation from which benchmarks are taken should be considered very important factors for firms before adopting change. An example of the problems created by benchmarking is illustrated in the Volvo and Renault case (Mason, 1993). Volvo and Renault planned to work together despite the fact that they came from different environments and cultures. Nevertheless, they share a common business vision and have complementary resources and skills. Volvo manufactures 400,000 cars a year in an industry where major competitors manufacture millions, so in order to remain competitive Volvo sought a partner.

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<sup>(5)</sup> Sunk cost is the past cost that is unavoidable because it cannot be changed no matter what action is taken (see Horngren et al., 1994).

<sup>(6)</sup> Tracy Edward, the operation vice-president of distribution for AT&T's Material Management Services (MMS) Division.

<sup>(7)</sup> Hull Darel, manager of transportation and planning for AT&T's MMS Division.

<sup>(8)</sup> Tom Carter, vice president of quality at Alcoa.



The two companies are in the same industry: they both manufacture cars, trucks, and buses. Volvo is the leader in “larger cars” and “gasoline technology”, and it has a solid reputation in northern Europe and North America. On the other hand, Renault is the leader in “small cars” and “diesel engines”, and it has a strong reputation in southern Europe and in North America.

After the alliance was successfully completed in February 1990, Rick Dowden, president and CEO of Volvo, stated that benchmarking was effectively compromised by complexities (e.g. sensitivity of sharing information and differences of work in process and product) emerging from differences in company cultures and value systems. Volvo is structured as a decentralised company, and Renault has remained a centralised company. Overall, “Volvo doesn’t expect to enter into any major alliances of the size and scope as the one with Renault any time soon” (Mason, 1993, p. 12).

All of the issues discussed above are relevant primarily in the context of organisational culture. Clearly, as with any other process or system, benchmarking processes must fit well with an organisation’s culture. The narrative now turns attention to the relationship between benchmarking and culture, as it is understood more generally. This relationship takes on added significance since the Libyan context of this study has unique features, one of which is a relatively low level understanding of the benchmarking process in some key organisations.

Chenhall and Smith (1998, p: 15) indicated that “It has been noted that some ‘western’ innovations may not be adopted readily in various European countries because of cultural factors and historical differences in the development of costing systems”. Moreover many management theories and practices concerning ‘best performance’ are a Western and American notion and based on Western and American assumptions, values and norms (discussed in chapter two). Further, Agnaia (1996) stated that these management theories and practices have been transferred to the Libyan environment without taking into account differences in the cultural and social environment. Developing countries (e.g. Libya) are not

characterised by the same aspects of culture, which means that there are different forms of social life, language and religion that describe employees' rights and duties in different ways. Other values and norms govern employees' attitudes, and behaviours and relationships are different. Hofstede and Bond (1988) have stated that certain nations have certain cultural traits that are rather difficult to change. Many researchers have raised questions about the applicability of Western and American practice and theories to the environment of other developing countries (see Hofstede, 1987; Mueller, 1983; Navis, 1983; Buera and Glueck, 1979).

It is clear that different cultures can result in different attitudes towards and motivations to carry out benchmarking processes. Blunt (1983) concludes that there are serious limitations in applying these practices and theories, and suggests that they should be used with caution. For example, although needs motivate employees in any culture, these needs may vary dramatically from culture to culture. Since benchmarking is based on something like an assumed need for achievement and is also often tied to performance evaluation, it may not be particularly appealing in less individualistic and less capitalistic cultures.

While wholesale adoption of foreign practices may prove difficult, the importation of key ideas from abroad sensitively adopted may prove to be useful influences in a developing society such as Libya. Therefore, in spite of motivational differences between Libyan and Western and American cultural assumptions, management theories and practices in the latter may still be applicable in the Libyan cultural context for the following reasons:

- 1- The education system adopted by the Libyan authorities is designed according to Western and American educational values, and the source of curriculum techniques, facilities, etc. is mostly drawn from Western and American countries.
- 2- As a result of the discovery of oil in the early 1960s, various Western and American countries participated in oil exploration, refining, export and other services. This enabled Libyan organisations to interact with them in many ways, and enabled employees to learn from those companies by attending management



development programmes, and working and dealing with these companies. Therefore, the participation of Libyans in management activities increased dramatically, with more understanding of how Western and American companies practise management, especially as they did in the 1970s.

The Libyan cultural work environment is different on several dimensions (e.g. achievement, recognition, responsibility, promotion) and hygiene factors (e.g. pay, interpersonal relation supervision, company policy, work conditions), which are the main sources for encouraging employees to implement change in their organisations (Aгнаia, 1996; Hafteri et al., 1994A; Abbas, 1987). These factors and others (e.g. political, economic and social) contribute towards reducing managers' expectations of achieving their tasks and lead to poor performance (Bait-Elmal, 2000). Therefore, employees cannot be motivated effectively if such motivation is based on simple Western assumptions.

The aspect of developing employees' abilities and practices was given very little attention in most Libyan organisations before the 1960s. But through the decade of the 1960s, understanding of administrative developments in the country, and improvements in employees' skills and knowledge in the fields of accounting and public administration were increased. Also, in the 1970s economic development plans were aimed at establishing information systems to enable organisations to find the required data and statistics regarding employees and their needs in different fields in order to increase productive ability (El-Jehaimi et al., 1987). Further, developing human resources became an important part of many development programmes (Bramham, 1997). Generally speaking, despite the high consideration being given to improve and develop employees at different levels of management, many Libyan organisations are still faced with shortages of skilled and trained people in several fields. This is because new needs continue to appear as a result of changes in economic, organisational and social structure (Aгнаia, 1996; Abbas, 1987).



The literature review (as discussed in chapter two) indicated that organisational accounting practices in Libya have been influenced by British and American accounting practices. Also, the accounting practices of Libyan organisations were mostly designed by British and American companies (Bait-Elmal, 2000; Gzema, 1999; Kilani, 1988), or by people who had graduated from British and American schools. These "adopted" accounting practices may not match the inherent conditions existing in the organisation. Accounting systems should be relevant to the country's needs rather than parody another country's system (Briston, 1978; Enthven, 1977). Environmental aspects (e.g. social, political and economic) have an essential impact on the actual accounting practices and information within organisations (see Nahapiet, 1988; Laughlin, 1987; Berry et al., 1985; Cooper and Sherer 1984; Burchell et al., 1980).

Therefore, a change in the orientation of accounting practices was essential in the Libyan organisational context. El-Jhemi et al. (1984) argued that many Libyan organisations are not paying enough attention to accounting rewards methods that can encourage employees to work hard and improve their company's performance when change is implemented. This includes pay, promotion and other direct and indirect remuneration. The accounting rewards' system of an organisation influences the satisfaction, behaviour and performance of employees. Aghila (2000) found that employees in many Libyan organisations regarded the accounting rewards system as inadequate and a source of demotivation. However, he also found that organisational accounting rewards positively correlated with work satisfaction and organisational performance. Therefore, poor compensations had to be a source of dissatisfaction across employees and lack of process performance in situations of new change adoption.

Within a benchmarking context, Jensen (1983) stated that accounting theories do not assume that accounting practices are the same across organisations (profit versus

not-for-profit firms)<sup>(9)</sup>. For instance, Dundas and Roper (1998) indicated that differences in a firm's accounting practice can make benchmarking difficult to adopt. The impact of these differences (firm's assets and liabilities evaluation, etc.) can lead to conflict over the organisation's structure and plans. Skinner (1993) stated that in some cases<sup>(10)</sup> the structure of management compensation plans is likely to be different across firms as a function of firm performance. However, firms with benchmarking-based compensation plans are expected to be more likely to adopt accounting practices which directly tie compensation to measures of firm performance. In addition, firms in the same industry tend to adopt similar accounting practices, because it is likely to be the case that the nature of benchmarking varies across industries more than within industries (Skinner, 1993). Therefore, managers are required to understand and select accounting methods in respect to any new adoption of benchmarking, because performance to maximise firm-value can be affected by the accounting practices selected.

Moreover, it appears from the fieldwork that many Libyan organisations do face difficulties in sales maximisation because of lack of productive ability (see chapter 6 and 7). This is a result of shortages in raw materials and spare parts caused by some restrictions which the government put on its importation policy because of UN and US sanctions against Libya. Also, lack of sufficient R&D in both quantity and quality affected sales maximisation in Libyan organisations. Such developments can be related to the Libyan economy before the 1970s - an agriculture-based economy with very few investment projects and industrial corporations (Tarbaghia, 1995). These factors limited the role and extent of R&D.

Basic economics suggests that an organisation needs to examine the important links between planned strategy and resource allocation and achieve greater flexibility in

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<sup>(9)</sup> Not-for-profit firms do not include capital assets on their financial statements and do not consider depreciation (Jensen, 1983).

<sup>(10)</sup> For example, compensation contracts would do little to motivate managerial performance if earnings-based management compensation plans did not specify the accounting practice on which earnings calculation was based. Also, managers are likely to have the best information about which accounting practices provide the best way of motivating employees (Skinner, 1993).



the planned strategy if resources are to be allocated efficiently during periods of organisational change (Allingham and Burstein 1976). Organisations must provide sufficient resources training, and encouragement to carry out benchmarking adoption. Resources include such elements as adequate time, people with necessary expertise, sufficient funds, relevant information and the availability of training (Andriopoulos, 2001). However, one research study found that opinion exists in many Libyan organisations that the resources allocated to implement changes are inadequate. It indicated that many organisations are no longer able to send employees for management training development programmes (MTDPs) to increase their performance and to improve organisational efficiency to implement new change adoption (Aagnaia, 1996). This is caused by a lack of financial support for plans and programmes (ibid). Some of them are cancelled because the resources are needed either for buying new facilities or for participation in benchmarking programmes outside the organisation. Such difficulties arose mainly from the economic embargo levied against Libya.

The above mentioned factors of the culture and environment of Libyan organisations differing from those of Western and American countries may limit how much and how well Western and American practices and motivational theories can be used in a Libyan organisational context. Western and American organisations concentrate on individualism and self-actualisation as an important factor in motivation, whereas in Libya, because of cultural influences, more attention is paid to the group (e.g. family, tribe, work group), with employees seeking respect in relationships with group members (see chapter two).

### **3.4 Overview of current research into benchmarking**

This section focuses on a rather broad set of recent research studies in benchmarking. Each of these studies is relevant to the research in this study; each of them has some meaningful connection to the issues addressed through the author's survey of Libyan managers. The studies are presented in no particular order of relevance.



Elnathan, Lin and Young (1996) provide some useful evidence on how benchmarking processes should be modelled and implemented. Key implementation features include (1) identification of which firm activities will be benchmarked; (2) establishment of a benchmarking team; (3) identification of benchmarking partners; (4) extensive data analysis on firm inputs and outputs; and, (5) organisational action. These features give benchmarking a unique identity which other systems of “standards” lack. They go on to identify a research framework for benchmarking, one which recognises the need to identify antecedent variables (results of a preliminary competitive analysis; the degree of organisational commitment; prior benchmarking experience); contextual variables (scope and areas selected; information gathering and sharing methods; partners selected); and, outcome variables (how performance will be measured and judged). Beretta and Dossi (1998) produce a conceptually similar set of categories.

The research design used in this study is derived from the Analytic Hierarchy Process (AHP). It is interesting that at least four authors (Eyrich, 1991; Korpela et al., 1996; Min et al., 1997; Sarkis 2001) have advocated the use of an AHP maturity matrix in evaluating outcomes from benchmarking processes. The appeal of AHP is that it makes it possible to protect the multivariate and often conflicting range of firm goals, all the while converting the subjective perceptions of managers into a reliable, quantified set of metrics.

Garnnett and Pickrell (1995; 2000) have focused on case studies of benchmarking in the construction industry. Their conclusions confirm the view that industry-specific factors greatly influence both the efficiency and the effectiveness of benchmarking programmes. In the construction industry, factors such as internal resistance, difficulty in obtaining partners, and similar difficulty in obtaining data from partners seem particularly troublesome.

Mikaelsson (2002) provides a thorough and case specific analysis of the difficulties which follow from information-sharing practices in the context of new product

development. Focused on the experiences of product developers in an alliance between Volvo and Renault, Mikaelsson shows how traditional, linear views of how knowledge gets developed and, once implemented, can hinder the innovation that is so very central to the success of “partnerships” in new product development.

As with this study, several others have surveyed managers in order to gauge their perceptions of benchmarking, the extent of its use, and the perceived benefits or lack thereof from benchmarking experiences. In a study of 140 manufacturing firms in Australia, Chenhall et al. (1998) report that managers generally view benchmarking as a medium through which employees can be sensitized to the need for external performance standards. However, the authors find little evidence for either extensive use of benchmarking or for managers’ beliefs that significant benefits are derived from its use. In a UK survey, Drysdale and Dunn (1996) found that only 13 percent of 561 financial directors believed that benchmarking had been useful. Israelsen et al. (1996) report that 25 percent of firms in Denmark had implemented benchmarking practices. Several studies seem to indicate that larger organisations are far more likely to implement benchmarking than are smaller firms (Davies and Sweeting, 1993; Innes and Mitchell, 1995; Bjornenak, 1997).

Though indirect, there is a relationship between benchmarking and the appeal of a contingency model of organisations (Otley, 1995). The sheer complexity of organisations means that strict, objective implementation of univariate benchmarks may be dysfunctional. To that end, some (Beretta et al., 1998; Clarke and Marton, 1997) have seen the value of both contingency theory and innovative senses of the usefulness of benchmarking, senses which focus on elements such as the value of shared information rather than “performance” evaluation as the rationale for benchmarking. Zyglidopoulos (1999) provides a clever example of contingency-based models with a focus on differences and nuances in what is meant by “technological change.” Andriopoulos (2001) provides a succinct literature review around the notion of organisational innovation, a key driving factor behind the goals of a commitment to engage in benchmarking.



It follows, therefore, that in the context of a benchmarking firm's culture and environment, two issues of concern stand out. Benchmarking can fail if there is insufficient understanding of the cultural and environmental implications of change. Equally significantly, Bramham (1997) has stated that it is not sufficient to work on benchmarking processes if the organisation does not have the infrastructure to carry them through. From this perspective, it is essential that culture and environment are considered before the most significant changes are implemented. Consideration of the facilitative and constraining aspects of culture and environment is essential for effective change management.

### **3.5 Summary**

The discussion in this chapter has provided some background to the terminology, history, and applied research related to benchmarking. Emerging from practice, benchmarking lacks tightly defined terms and rigorous theoretical structures. To that end, some discussion of both the terminology and the applied research was considered necessary. A second issue was concerned with the importance of two senses of culture to benchmarking – organisational and national. The importance of culture is clearly relevant to this dissertation since it focuses on Libyan manufacturing firms. The cultural context in which these firms operate is different in important ways from the overwhelmingly developed and Western context in which benchmarking has emerged.

The chapter concluded with some discussion of the findings emergent from the applied research into benchmarking processes. Such research indicates that benchmarking – performed well – requires considerable investment and much thought, planning, and design.

This chapter has reviewed various definitions of benchmarking, the historical context in which benchmarking has emerged and the existing research into benchmarking practices, with a primary focus on the importance of organisational and national culture. However, the theoretical perspective, research methodology and methods adopted for this research will be discussed in the next two chapters (chapters 4 and 5).



## CHAPTER 4

### 4. Theoretical perspectives on benchmarking

#### 4.1 Introduction

This chapter addresses the third sub-objective of this study (1.3.3). It explores the theoretical framework and provides insights into benchmarking implementation in manufacturing organisations in Libya. It also presents some previous studies (regarding the sensitivity and behaviour of managers to information about benchmarking), which help to formulate testable hypotheses and also to interpretate the findings (see chapter 7).

The aim of this chapter is to understand and explain some aspects relevant to benchmarking theories and to indicate the ways in which these aspects influence benchmarking decisions. The chapter contains a discussion about the managers' inferences about benchmarking as the main theoretical framework for the study. The key aspects of this study are the managers' sensitivity to available information about benchmarking, two simple judgmental heuristics<sup>(1)</sup>, namely knowledge structures about benchmarking and the environmental conditions (causes) influencing benchmarking decisions, as well as formulation of the test hypotheses. Therefore, this chapter provides a review of relative trends in the literature, and focuses on studies relevant to this thesis.

The previous chapter provided a description of benchmarking problems related to both the exogeneity of best practice measures and the multivariate character of benchmarking. The main task now is to determine clearly aspects that influence managers in making judgements about both outstanding and poor performance. Consequently, the discussion in this chapter is concerned mainly with the following:

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<sup>(1)</sup> Two types of heuristic are employed in making judgements with uncertainty: (i) representativeness heuristic which is usually employed when people are asked to judge the probability that an object or event A belongs to class or process B; (ii) availability heuristic which is often employed when people are asked to assess the frequency of a class or the plausibility of a particular development. These heuristics are highly economical and usually effective, but they lead to systematic and predictable errors. A better understanding of these heuristics and of the biases to which they lead could improve judgements and decisions in situations of uncertainty (Kahneman and Tversky, 1982).

section 4.2 provides general arguments about available information about benchmarking performance, such as information about organisational best performance (vividness information) and information about employees' skills and behaviours (statistical information). The simple judgmental heuristics (e.g., the representativeness and availability heuristics) and knowledge structures (e.g., script and schema theories) will be the subject of sections 4.3 and 4.4 respectively. This is followed by formulation of the testable hypotheses in section 4.5. Finally, a summary of the above discussion is provided in section 4.6.

## **4.2 The sensitivity of managers to available information about best performance of benchmarking**

Many decisions are based on beliefs about the likelihood of uncertain events, such as benchmarking implementation, the future value of the dollar, etc. However, beliefs concerning uncertain events are expressed in numerical form as priorities or subjective probabilities (Kahneman et al., 1982). How do managers assess the probability of an uncertain event or the value of an uncertain quantity? This study will attempt to show that managers rely on a limited number of heuristic<sup>(2)</sup> principles which reduce the complex tasks of adopting change in situations of benchmarking implementation. In general, these heuristics are quite useful, but sometimes they lead to difficulties and systematic errors (ibid). A detailed discussion of these heuristics will be found in section 4.3 of this chapter.

Nisbett and Ross (1980) argued that the sensitivity and behaviour of managers are much more influenced by vivid<sup>(3)</sup> information than statistical<sup>(4)</sup> information. In the

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<sup>(2)</sup> Which can be defined as "guides to discovery" or, in the present context, guiding the discovery of effective decisions. No guarantees can be given on how successful the search will be, and results may vary considerably from one attempt to another. There is definitely an element of luck involved, and the heuristic procedure is designed to weight the priorities in one's favour as much as possible (Hillier, 1983).

<sup>(3)</sup> Vivid is defined as "emotional interest of information, the concreteness and imaginability of information, and the sensory, spatial, and temporal proximity of information" (Nisbett and Ross, 1980, p.62). When information may be described as vivid, "that is, as likely to attract and hold our attention and to excite the imagination to the extent that it is emotionally interesting" (Nisbett and Ross 1980, p: 45).

<sup>(4)</sup> Statistical (or pallid) information, is not emotionally interesting and has no effect on managers' views as well as no substantial effect on inferences (Nisbett and Ross, 1980).



context of benchmarking adoption, vividness relates to salient information about excellent performance, while statistical, pallid data relate to reports on individual and unit behaviour. In many organisations, managers do not give enough attention to statistical consideration, such as information about an organisation's future and revenues (which is not easily available) (see Zimmerman, 1997) and requires technical and behavioural skills<sup>(5)</sup>, organisational learning level, developing personal contributions and so on (Bramham, 1997). Thus, decision making is more difficult without the requisite statistical information to adopt a new change.

In fact, many organisations who apply benchmarking are paying attention to vivid information only; they do not give enough attention to consensus information. For instance, organisational information about performance is often displayed as deterministic rather than stochastic. What this means is that a single piece of data that may be vivid or attractive is not a reliable indicator of performance on any dimension. That is because any single piece of information is subject to variance, chance, unreliability, etc. Thus, any organisation applying benchmarking "best practice" needs to be sensitive to the importance of statistical information.

Concerning this, one aspect of the present research is to examine, the sensitivity of the manager to the importance of statistical information (7.4.1.1). Managers will be provided with single observation and vivid information about a new change (best practice). They will also be given statistical information. Then, examination will be made of the two types of information to which they are most responsive in making judgements about "best practice". Results of this approach for the companies investigated will be shown in detail in chapter seven.

As Hamill and colleagues (1979)<sup>(6)</sup> and Borgida and Nisbett (1977) report, managers' inferences may sometimes be unaffected by statistical information, for the simple reason that they find such information too boring to pay any attention to. Although this is of practical importance for communicators, it is of little theoretical interest. It

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<sup>(5)</sup> The abilities of employees are the skills required to do the tasks and finish them with best work and planning schedule time such as benchmarking practice (Bramham, 1997).



is only when managers are exposed to such information, learn it, and still fail to make the appropriate inferences that the phenomenon provides the basis for the theoretical contention that statistical information has little impact on inferences. Nisbett and Ross (1980, p: 45) argue that part of the reason for the greater inferential impact of vivid information is theoretically trivial but pragmatically very important: “vivid information is more likely to be stored and remembered than is statistical information. Information that is easily remembered is by definition more likely to be retrieved at some later date and therefore affect later inferences”.

McArthur’s studies<sup>(7)</sup> (1972, 1978) illustrate the effects of consensus information (do other managers behave in the same way to a given stimulus?); distinctiveness<sup>(8)</sup> information (does the manager, and do other managers, behave in the same way to other stimuli?); and consistency<sup>(9)</sup> information (does the manager, and do other managers, behave in the same way to the given stimulus across time and situational contexts?). She found that consensus information had little impact on causal attributions. Nisbett and colleagues (1976) also studied the effect of consensus information on managers’ behaviour. They recognised that sensitivity to the personal implications of consensus information might have led managers to hold less unfavourable attitudes toward themselves and therefore to be less inactive. Or, the study may suggest that managers are not sufficiently sensitive to consensus information to change their attention in logically permissible ways in response to such information. The fact that managers did not respond in this way suggests merely that they gave little weight to consensus information, and not that they were illogical in ignoring it. Therefore, both studies mentioned above suggest that managers are not sufficiently sensitive to consensus information to change their views to adopt new change in response to such information.

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<sup>(6)</sup> For more details about these studies, see Nisbett and Ross (1980).

<sup>(7)</sup> For more details on this, refer to Kahneman, Solvic and Tversky (1982).

<sup>(8)</sup> The degree to which the effect occurs primarily in the presence of one particular causal candidate and not in the presence of others (Nisbett and Ross, 1980).

<sup>(9)</sup> The degree to which the effect is observed reliably when a particular causal candidate is present (Nisbett and Ross, 1980).

In light of the above discussion, the question is why organisations are so unresponsive to consensus information? Or, why do managers treat consensus information as if it were uninformative? One possibility is the nature of consensus information, or perhaps more accurately, the character of consensus manipulations used in most research conducted to date. Consensus information generally has been quite statistical (or pallid) and abstract, especially when compared with competing information, about the stimulus or manager. Also, the relative pallor of consensus information, compared with more vivid information about the stimulus and the manager and the relative indirectness of consensus information, seems remote from an understanding of the particular manager and his/her action (see Nisbett and Ross, 1980). In the study by Miller and colleagues (1973), in which subjects were told of a Milgram demonstration<sup>(10)</sup>, a table of data (of the percentage of managers who administered various levels of shock) was required to compete with more concrete and vivid information about the behaviour of a particular division (a manager whose photo the subject was allowed to see). Similarly, statistical information about the reaction of other managers (divisions) to 'the first stage of benchmarking' may have little chance of affecting the depressed manager who is responding to vivid and all too real stimuli. Clearly, a more concrete and compelling presentation of consensus information would provide a better test of understanding the possibilities of consensus information.

Overall, the fact that different managers behave differently in similar situations, or at least in situations that people (e.g., observers, shareholders, et al.) have coded as similar across organisations, may make the managers regard situational attributions as being less plausible than dispositional ones (Nisbett and Ross, 1980). For example, in benchmarking, many organisations are interested only in obtain vivid information about the new change adoption and its dimensions (e.g., performance evaluation, capital structure, costing, quality and sales practices, etc). They do not

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<sup>(10)</sup> In a remarkable demonstration of the failure of consensus information to affect causal attribution, Miller, Gillen, Schenker, and Radlove (1973) showed that consensus information about the behaviour of managers in Milgram's (1963) obedience study had little effect on judgements about a particular manager who delivered the highest possible amount of shock to a confederate. All managers in Miller's and colleagues' experiment were told about Milgram's procedures, including the fact that his subject sample was a cross-section of the community in which the study was conducted (for more details see Nisbett and Ross, 1980).



give enough attention to statistical information with full abstract detail (e.g., a manager's behaviour or attitude, the linkage between action and managers, and the linkage between action and situation, etc). In this case, Nisbett and Ross indicate that managers' decisions for the new change adoption have many flaws (e.g., time required, lack of preparation, lack of technology). These flaws are compounded by the knowledge and the strategies that managers do not possess which are necessary to make the change successful.

### **4.3 Simple judgmental heuristics about benchmarking decisions**

Managers in many situations will use a few simple judgmental heuristics as tools for solving a variety of inferential tasks. Specifically, new change adoption may involve a highly structured decision model, or it may consist of the so-called heuristic that managers have developed from previous experience. The heuristics might be "information-processing biases" as are reflected by such terms as "the representativeness heuristic" and "the availability heuristic" (Shanmugam et al., 1992; Magee et al., 1978).

Problems can emerge if heuristics are the only judgmental strategy when they cannot alone provide an effective judgement. The simple judgmental heuristics produce many more correct inferences than erroneous ones, and they do lead managers to choose best performance or make better judgements with little effort in situations of change adoption. Also, the use of such simple tools may be an inevitable feature for organisations and do lead managers to make undefined decisions in some important inferential tasks (Nisbett and Ross, 1980).

The representativeness heuristic<sup>(11)</sup> involves the application of relatively simple resemblance criteria to problems of categorisation in situations of adoption of change. However, in some cases, the use of the representativeness heuristic produced errors if it was misapplied and operating environmental factors were not considered (Kahneman et al., 1982). For example, many managers have difficulty in adapting to

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<sup>(11)</sup> It is "a subjective judgement of the extent to which the event in question 'is similar in essential properties to its parent population' or 'reflects the salient features of the process by which it is generated'" (Kahneman et al, 1982).



new change mainly because important information is not considered, that is, the role of the environmental conditions is ignored.

The assessment of the representativeness heuristic often depends less on simple similarity criteria than on more sophisticated 'theories' of the types of attributes and events that occur together, or that cause each other (Kahneman et al., 1982). Accordingly, it is important to refer to some of the evidence indicating that people's theories of the causes of manager behaviour may give excessive weight to personal, dispositional causes (Ross et al., 1980). The evidence for the inaccuracy of the dispositional theories<sup>(12)</sup> is of two types. First, research indicates that managerial differences in behaviour, though often marked in any given situation, are not very consistent across situations. For example, managers who adapt to a change in one situation are not very likely to be those who adapt to a change in another. Second, slight differences in situations often produce large differences in the behaviour of most managers in those situations (Nisbett and Ross, 1980). For example, in benchmarking, managers will behave differently in adapting to a change when the situations are different. They will attach different levels of importance to each benchmark. Some will give excessive weights to items; some will reduce the weights attached to each item. This would lead to a conflict in decisions between managers. Further insights about weights attached to each benchmarking criteria will be reported in chapter 8.

As several theorists have noted, culture and environmental factors may be pertinent to the fundamental attribution error (see Nisbett and Ross, 1980). It is very important to confirm that the culture factors fit with the managers. That includes the way managers handle jobs, their basic attitudes to work and performance, their attitudes to innovation, their attitudes to technology, and so on (Pumpin, 1987; Bramham, 1997).

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<sup>(12)</sup> Dispositional theory is shared by almost everyone socialised in our culture. The dispositional theory, "in short, thoroughly woven into the fabric of our culture" (Nisbett and Ross, 1980, p: 31).

In terms of the environmental factors, people do not consider certain factors (e. g., luck, task difficulty and chance) as important elements in respect to managers' behaviour and skills when considering new change adoption (Kahneman and Tversky, 1982). For instance, if people are told that a manager succeeded at a task, and that most managers do not succeed at that task, and that the manager did not try hard to succeed at the task, they are more likely to attribute the manager's success to ability and effort than to luck, chance, or the easiness of the task (Weiner and Colleagues, 1972). However, if people are told that a manager failed but that the majority of other managers failed as well, they attribute the manager's failure to that task difficulty rather than in terms of ability (see Nisbett and Ross, 1980). According to these factors (task difficulty, luck and chance), performance indicators are (under the representativeness heuristic) likely to be related to causes that have to do with the manager him/herself. Also, performance indicators may be the result of environmental attributions. At this point, Arrington et al (1985, p: 2) indicated that the work done by Weiner and colleagues (1972, 1974) to expand Heider's (1958)<sup>(13)</sup> division suggested that manager attributions "are attributed either to ability or to effort, while environmental attributions are attributed to either task difficulty or luck".

From the above discussion, another aspect of the present research study has been adopted to test performance indicators under the representativeness heuristic in a benchmarking setting (7.4.1.2). Information will be provided about the ability and effort of managers and about difficulties within the organisation's operating environment as well as chance considerations. At this point, the researcher establish whether if managers will correlate success and failure with internal causes (e.g., ability and effort) or external causes (e.g., easy/difficult task, luck and chance) as a function of the information given. What may be found is that managers will place too much weight on the internal causes. Results of these will be shown in chapter seven.

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<sup>(13)</sup> In his classic work, *The psychology of Interpersonal Relations*



The impossibility of having complete, reliable, predictive information about employees' and their organisations' behaviours suggests that managers adopt heuristics that enable them to make inferences and predictions from what scanty and unreliable information is available. One such heuristic is availability<sup>(14)</sup> (Lee, 2001; Shanmugam et al., 1992). In general, frequent events are easier to recall or imagine than infrequent ones. However, availability is also affected by various criteria which are unrelated to actual frequency. If the availability heuristic is applied, then such criteria will affect the perceived frequency of classes and the subjective probability of events. On one hand, the reliance on availability can lead into systematic biases and can be a helpful and efficient tool of inference. On the other hand, indiscriminate use of the availability heuristic clearly can lead managers into serious judgmental errors (Lee, 2001; Kahneman et al., 1982).

Under some circumstances, the use of the availability heuristic may lead to a perfectly appropriate conclusions; however, under those circumstances where there is a bias in what information is available, faulty inferences follow. Specifically, biases of salience, biases in retrieval, and biases emerging from cognitive structures such as beliefs and values can lead to the heightened availability of incorrect or misleading information in social judgement tasks (Kahneman et al., 1982).

In general, an actor's (manager's) behaviour will be judged by the actor differently from how it will be judged by others<sup>(15)</sup>. This may be because the manager/actor has private information about his or her past performance that other people do not have. The manager and others are likely to take different perspectives toward the same information. For others, the manager's behaviour is the figural stimulus against the ground of the situation. On the contrary, the manager's attention is focused on

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<sup>(14)</sup> The availability heuristic helps people to judge an event as likely or frequent if instances of it are easy to imagine or recall. Because frequently occurring events are generally easier to imagine and recall than are rare events, availability is often an appropriate cue. However, availability is also affected by numerous events unrelated to frequency of occurrence (Tversky et al., 1982).

<sup>(15)</sup> When one compares the manager with other managers and judges his/her attributes accordingly, "The manager, on the other hand, is more inclined to use an idiographic reference scale: This action is judged with reference to his other previous action rather than the acts of other manager." For example, managers and people often bring different information to bear on their inferences about the manager



outward situational cues rather than inward cues on his/her own behaviour. Moreover, those situational cues are endowed with intrinsic properties that are seen to cause the manager's behaviour toward them. In short, for others the proximal cause of action is the manager; for the manager the proximal cause lies in the compelling qualities of the environment. The manager's attention of his behaviour emphasises the role of environmental conditions at the moment of action. People's attention emphasises the causal role of stable dispositional properties of the manager. Therefore, these differing attributional tendencies of managers and people might in part reflect differing attentional perspectives and consequent differences in the availability heuristic on which managers seem to rely, and by which they sometimes are misled, in a variety of inferential tasks (Nisbett and Ross, 1980).

Everyday experience demonstrates that managers often do not believe evidence that opposes some theory they hold. If the evidence cannot be discredited outright, it may nevertheless be given little weight and treated as if it were of little consequence. In benchmarking, which is a growing area of management practice in which theory is insufficiently developed, there is evidence to explain differences in the availability of information about performance (Wolfram Cox, Mann, Samson 1997). For instance, the managers' evaluation system for organisation may reflect what they consider to be the decision function of the organisation to adopt change in cost control. Specifically, if managers implicitly believe that the labour cost is primarily the originator of cost control, they would assign little importance to material and overhead cost. On other hand, they might rate this weight (for material and overhead cost) to be important, but for reasons that are very different from the reasons that motivate someone who values the importance of the labour cost. Managers might rate the labour cost as the most important sub-criterion of cost control because they want to minimise what they see as a high cost in determining change adoption in cost control. Other managers might disagree and rate labour, material and overhead cost as equally important because of misleading information caused by the availability heuristic that managers use to judge changes (like benchmarking) in cost control.

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and his/her environment. Typically, the manager has more, and more precise, information than people about his/her own emotional state and his/her intentions (Jones and Nisbett, 1971, p: 7).

However, a more analytical presentation in relation to this study is reported in section 8.3.2.1.

Therefore, the third aspect of the present study is to test the availability heuristic (7.4.1.3). The way to test this is to give managers information about “best” performance taken from a highly visible organisation. Also, they will be given information about “best” performance taken from a less visible organisation. Then, the study will determine to which of the two types of information they are most responsive in making judgements about best performance. Specific results in respect of testing the availability heuristic aspect for the companies investigated will be provided in chapter seven.

As many have noted, people do not believe evidence that opposes some theory that they hold. Even if one cannot recall the evidence about the availability information of best performance from which the theory was originally derived, this does not mean that the evidence does not exist. It may mean that managers cannot currently recall such evidence or the logic by which they inferred the view that they now hold. In this respect, a study undertaken by Lord, Ross and Lepper (1979) indicated that managers' responses to new evidence or change adoption may be quite inappropriate. In one case, they were using punishment methods (e.g., firing the managers and/or hiring new managers) as performance to make managers do the tasks successfully in situations of new change adoption. These methods, in addition to other encouragement methods, are analysed briefly in section 7.5.1.

In other cases, Lord et al. (1979) made managers undertake the tasks and implement change without any punishment methods being applied. The work of Lord and colleagues suggests that managers' responses to new evidence or new change addressing a previous belief may occasionally be somewhat inappropriate. However, different standards of available information are used for criticising opposing evidence or new change from those used for criticising supportive evidence (Nisbett and Ross, 1980). Also, the evidence or new change generated by a method that does not much affect belief when it is opposed to the belief, strengthens belief



substantially when it is supportive. Therefore, managers tend to search for evidence or new change that confirms their prior beliefs (ibid).

The most significant and far-reaching of the intuitive scientist's theories are those addressing general human behaviour. These theories<sup>(16)</sup> determine the meaning managers extract from social interaction and, in large measure, they determine the way managers behave in response to the actions for any change (Nisbett et al., 1980). For example, the lay person, like the professional manager, believes that rewards for particular behaviours increase the subsequent likelihood of such behaviours and that punishment decreases their likelihood. Managers, like theorists, believe that behaviours are guided by plans and goals, and believe that individuals seek to maximise profit and minimise cost (loss). Such tacit, 'global' theories as well as many more specific theories, including theories about specific individuals or organisations, govern managers' understanding of behaviour, managers' causal explanations of past behaviour, and managers' predictions of future behaviour (Nisbett et al., 1980). For example, managers' behaviour is caused primarily by the enduring and consistent dispositions of the manager, as opposed to the particular characteristics of the situation to which the manager responds for any changes (e g., benchmarking) (ibid). Generally, managers accept and encourage the change when they are ambitious and motivated, and they oppose it when they are not. It is difficult to prove that managers' behaviours adhere to any adoption of benchmarking without guiding them by plans and goals and rewarding them to have that behaviour proved (7.5).

Well-schooled managers are told, typically as their earliest principle of social inference, that first impressions<sup>(17)</sup> about performance are important. "The

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<sup>(16)</sup> There has been little research on those theories shared by the mass of people in our culture. Heider (1958) was the first to emphasise their importance, and Abelson (1968) was the first investigator to attempt to study them empirically.

<sup>(17)</sup> Jones and Goethals (1972) argued that first impressions in information processing are the rule because people are 'theorists' in their approach to information about organisations or the new adoption of organisations. Early-encountered information serves as the raw material for inferences about what the object (or change) is like. These inferences, or theories about the nature of the change, in turn bias the interpretation of later encountered information. Then, theories about the nature of the change are revised insufficiently in response to discrepancies in the later presented information.

implication is that one should take special care with one's self-presentation when meeting someone for the first time. This rule is so widely taught, and contrary principles so seldom find expression in the folk wisdom, that one would have to suspect that it expresses some fundamental truth about social judgement and impression-formation" (Nisbett and Ross, 1980, p: 172).

First impression information about best practice performance (in change adoption) is important, and the primacy effect<sup>(18)</sup> in impression formation, in which early-presented information has an undue influence on final judgements, is found almost as universally as would be suggested by its predominance in lay psychological theorising (Nisbett and Ross, 1980). To be sure, recency effects, in which later presented information has undue influence on final judgements, are sometimes found, but these are rare and appear to depend on the existence of one or more potently manipulated factors<sup>(19)</sup>. In many cases it is likely that organisations are positive to the early-impression information about best performance (Nisbett and Ross, 1980). For instance, subjects are more impressed by organisations who were early adopters of best practice performance (e.g., IBM and Xerox Corporation) than they are with organisations who have practised best performance for a lesser time (e.g., Viglen and Dell computer company). Anderson (1974) argued that instructions of managers' impressions for the three major processes (e.g., value, intensity and frequency) are established by early presented information. Thus, early information is weighted more strongly than information received later (Nisbett and Ross, 1980).

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<sup>(18)</sup> The primary effect can be interpreted as occurring because early-formed impressions dominate over the implications of later information. The interpretation is central to the change-in-meaning view, but it is also implicit in the view of Anderson (1965, 1971, 1974) and his colleagues, who appear to prefer a 'discounting' explanation of the phenomenon. That is, later-presented information, if it is inconsistent with the affective implications of early-presented information, is 'discounted' or given a lower weight by managers (Nisbett and Ross, 1980).

<sup>(19)</sup> These include (a) special knowledge constraints favouring the recall of later presented information, (b) circumstances producing strong contrast effects, and (c) presentation of information about a change or process which can be presumed to be capable of changing over time, so that later information, if it has implications different from those of early information, can be presumed to be more valid (Jones and Goethals, 1972).



#### 4.4 Knowledge structures of script and schema theories about benchmarking decisions

Besides the two simple judgmental heuristics of representativeness and availability, knowledge structures of script<sup>20</sup> and schema<sup>(21)</sup> theories may influence managers' decisions in situations of new adoption (Chen et al., 2004; Nisbett et al., 1980). The concepts of script and schema have been used to explain text comprehension and as a way of understanding behavioural expectancies (Hershey et al., 1990).

Mandler (1984) indicated that the term 'script' refers to a particular kind of event schema. It differs from a story schema in that it is more concretely tied to specific content. Script is still a generic knowledge structure, in that it does refer to memory for a particular event. It is a kind of encapsulation of managers' knowledge about what happens in organisations in general. Bower, Black and Turner (1979) suggested that script represents action organised around the sub-goals involved in achieving the main goal of a script. Thus, in an organisational script the main goal of implementing benchmarking can be decomposed into the importance of sub-goals and then specific sub-goals.

In general, a schema enables managers to perform certain operations with limited information and thereby to reach certain inferences or decisions in order to implement change (Kelley, 1972). Despite the important efficiencies that accrue to the schema user, there seems little doubt that there often are serious costs as well. A schema is apt to be overused and misapplied, particularly to the social sphere, and it is apt to be used when other less rapid and intuitive methods of judgement would fully merit the additional time and effort required (Nisbett et al., 1980).

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<sup>(20)</sup> "A script is a type of schema in which the related elements are events involving the individual as manager or observer. Unlike most schema, scripts generally are event sequences extended over time, and the relationships have a distinctive flavour, that is, early events in the sequence produce or at least 'enable' the occurrence of later events". A script can be represented as a computer program with a set of tracks, variables, relationships, operations and subroutines which are 'instantiated' with particular values for any particular application of script (Nisbett and Ross, 1980, p: 34).

<sup>(21)</sup> "The schema is a kind of mental summary of sensory, cognitive, and motor experiences in a sequence of actions involving body parts. The schema represents experiential knowledge of the relationship between mass and volume (or number and position) and the outcomes likely to result from various action sequences involving a fixed mass of material" (see Nibett and Ross, 1980). It has been defined as 'an active organisation of past reactions, or of past experiences' (Kelley, 1972).

Script and schema are commonly employed to predict and explain results, which in turn are used to revise or update information. Accordingly, managers may apply the script or schema to explain the occurrence of a particular event or change. The managers may also employ the information provided by the occurrence of a particular change to correct or revise their decisions in approaching judgement tasks (Kahneman et al., 1982). Also, it would be inappropriate to criticise the general tendency of managers to employ scripts, schemas and other knowledge structures than it would be to criticise their general tendency to rely on the availability and representativeness heuristics (Lee, 2001; Brett et al., 1998). Thus, it is not the existence of these heuristics and knowledge structures that can be criticised, but, rather, their overuse, misuse, and use in preference to more appropriate strategies. Even when more appropriate strategies are subsequently employed for a given judgmental task for the adoption of new change, the undue influence of the simpler, more intuitive strategies may persist (Fiedler, 1978; Mandler, 1984).

Moreover, a schema is a package of knowledge about a certain domain, similar to a concept, but, unlike a concept, it contains rules for thought and action (Manktelow, 1999). According to Tesser (1978), a schema is 'naïve theory' of some stimulus domain and the manager uses it as a type of background information in benchmarking exercises. Rumelhart (1975) and Schank and Abelson (1975) have also argued persuasively for the necessity of schema or cognitive script constructs to explain how managers consider background information about stability/instability of organisational structure, managers and leadership as well as uncertainty of the market in which the organisation operates in situations of new adoption. Further analytical discussion in relation to this study is presented on the testable hypothesis in chapter 7.

Script and schema theories which relate to several types of processing (e. g., selecting, abstraction, interpretation, integration and motivation) are operationally influenced by structure in the environmental event. However, any environmental event which introduces instability of organisation structure, managers, and leadership as well as uncertainty of the market will reduce situational control and/or



efficiencies in the organisation. These decreases in situational control or efficiencies might arise for any number of reasons. The most common of these are "shake-ups" in organisational hierarchy, the reassignment of managers to different jobs or units, or shifts of the organisation's position in response to new change adoption (Fiedler, 1978).

Ezzamel and Hart (1987) have pointed out that stability of organisation structure, managers, leadership and market conditions have been considered by several researchers as a prime element of environmental conditions when implementing change. Stinchcombe (1965) contended that the stability of organisational structure is influenced by the age of the industry in which it operates, irrespective of the age of the organisation itself. He defends this finding as an event schema by arguing that industries develop in response to the technical and economic conditions of their time. As long as these conditions remain the same so, too, do the structures remain unchanged (or stable). As in the case of event scripts and schema theories, the findings of Inkson et al. (1970) suggested that the older an organisation is in respect to stability of managers, leadership and organisation structure, the more formalised its activities are. This seems consonant with Starbuck's (1965) suggestion that organisational learning about new change tends to improve with the stability of managers' leadership and organisation structure; an organisation will usually try to perpetuate the benefits of its learning about new change by adapting it. This will be further analysed in 7.4.2.

As discussed elsewhere, knowledge structures of the industrial environment of Libyan enterprises are not stable (in respect to managers, leadership and organisation structure) and are sensitive to internal socio-political and economic changes as well as international changes. For example, the change of political ideology to socialism in the 1970s led industrial ownership and control to move from the private sector to the government (see chapter 2). Furthermore, the US embargo on technology in 1986, the 1992 comprehensive UN embargo, the freezing of bank accounts in the US and in Western Europe, and prohibitions on international

flights in and out of Libya, have all had a tremendous impact on Libyan manufacturing organisations.

Overall, the use of script and schema theories has become widespread in different research areas. The phrase itself is perhaps misleading, because of the lack of research which could develop a coherent schema theory for any domain. A more accurate phrase might be a schema framework, since the principles subsumed under this view of the mind consist of very general beliefs about how this form of organisation works (Mandler, 1984).

In light of the above discussion, the fourth aspect of the present study is to examine the uncertainty of market conditions in which the organisations operate, the stability of organisational structure, and managers and leadership under script and schema theories (7.4.2). How could these be examined? The thesis will indicate questions to managers in order to collect information about the number of changes occurring in their organisation within the last five years in respect to organisational structure, managers, leadership and market conditions. Then, managers' responses will be analysed as to whether to select stability (no change) or instability of organisational structure, managers, leadership and market conditions. The results of this for the companies investigated will be discussed in detail in chapter seven.

#### **4.5 Formulation of the testable hypotheses**

Based on the literature review of this chapter, the research problems mentioned in chapter 3 may occur through the absence of sensitivity to the importance of statistical information, misapplication of the representativeness and availability heuristics, and instability of organisational structure, managers, leadership and market conditions. However, the following observations should be mentioned relevant to each stated hypothesis.

1. The discussion of each hypothesis is related to variables which are tested in the fieldwork to provide information about benchmarking, given that, each hypothesis has been cited to reflect a set of variables.



#### **4.5.1 First hypothesis: Managers' sensitivity to information about best performance benchmarking**

The earlier discussion mentioned in this chapter relating to organisations' sensitivity to information about best performance has suggested that managers who adopt new performance pay attention only to vivid information; they do not give enough attention to statistical information. In general, benchmarking and its effectiveness in many LMOs have remained largely unexplored. This could be related to a lack of complete understanding of benchmarking within the organisations which the author has studied. Tarbaghia (1995) and Abusnana et al. (1993) found that many investments and change programmes appear to have been implemented without adequate feasibility studies within many Libyan organisations. Decisions concerning which items should be produced or other organisational changes appear to be influenced more heavily by social factors than strategic factors (Ejigu and Sherif, 1994). However, this study seeks to capture the complexity, diversity and network of influences operating on benchmarking practices in the Libyan environment. Furthermore, it attempts to shed light on the results of benchmarking implementation in LMOs. Therefore, the first phase of this study considers managers' sensitivity to available information about the optimal way to implement changes, such as the adoption of benchmarking.

Based on the above discussion, the first research hypothesis concerns managers' sensitivity to major information related to new change adoption; namely, vivid information (e.g., general information about best performance) and statistical information (e.g., information about employees' behaviour). This hypothesis is formulated as follows:

**H<sub>1</sub>:** *Managers are insensitive to the importance of information about employees' behaviour (statistical information) through the implementation of benchmarking.*

From previous research and theoretical perspectives (Bramham, 1997; Kahneman et al., 1982; Nisbett et al., 1980), one would expect that managers in LMOs are not

likely to give statistical information as much consideration as they give to vivid information. This variable is further discussed in 7.4.1.1.

#### **4.5.2 Second hypothesis: The representative heuristic and benchmarking**

As discussed in chapter 2, the environment in which LMOs operate has had a massive impact on their performance (Abbas, 1995). In addition, LMOs have faced numerous environmental and organisational problems. These include limited economic development, shortage of raw material and spare parts, poor maintenance, limited skills and educational levels, the Libyan cultural background aligned to a climate of inefficiency and mismanagement (Ejigu et al., 1994). To that end, many organisations have difficulty in adapting to change because significant information is not considered and environmental considerations are ignored (Kahneman and Tversky, 1982; Shanmugam and Bourke, 1992).

The second hypothesis, as stated below, was constructed in light of the theoretical considerations discussed earlier, that management will place more weight on managers' ability and effort than on the companies' operating environment when implementing change. The discussion of the representativeness heuristic results is shown in 7.4.1.2.

**H<sub>2</sub>:** *The representativeness heuristic will influence managers' benchmarking decisions.*

#### **4.5.3 Third hypothesis: The availability heuristic and benchmarking**

Many developing countries, including Libya, have paid little attention to managerial organisational difficulties which can have an important impact on the process of the implementation of organisational change like benchmarking. For instance, Libya, as a developing country, is surrounded by a complex and changeable environment in terms of organisational growth, technical innovation, and the increasing demand for skilled employees (Khan et al., 2002; Agnaia, 1996). It has to pay more attention to new knowledge, the importance of human resource development, and to the development of appropriate organisational performance measures. For these reasons, this study deals with benchmarking as it applies to the Libyan environment and



attempts to understand the difficulties which have influenced the extent of benchmarking implementation in LMOs. At this point, the researcher wants to involve the application of relatively simple judgemental heuristics as tools for understanding the process of change adoption in LMOs. This includes the availability heuristic which will have a significant impact of managerial decision-making (Lee, 2001).

From the above discussion, the third hypothesis was formulated to test the attributional tendencies of managers when they are given information about best practice from both highly and less visible organisations. Thus, extant theory leads to the following hypothesis:

**H<sub>3</sub>:** *The availability heuristic will influence managers' benchmarking decisions.*

From the theoretical considerations related to the availability heuristic (Lee, 2001; Shanmugam et al., 1992; Kahneman et al., 1982), one would expect managers to be more interested in information about best performance taken from highly rather than less visible organisations. This variable is further explained in 7.4.1.3.

#### **4.5.4 Fourth hypothesis: Script and schema theories and benchmarking decisions**

Previous literature relating to theories of script and schema (Ezzamel et al., 1987; Kahneman et al, 1982; Nisbett et al, 1980) has suggested that environmental events that introduce organisational instability (structural, managerial, leadership, and markets) will lower organisational performance in times of organisational change. The environment in which organisations operate has a huge impact on their performance. The Libyan environment has witnessed unique circumstances which have made it very difficult for managers to control organisations and employees' behaviour and consequently to maintain high levels of performance (Aгнаia, 1996; Abbas, 1995; Ejigu et al., 1994).

Based on the above discussion, the fourth hypothesis tests the role of script and schema theories which are relevant to benchmarking through such things as uncertainty of the market in which the organisation operates, stability of organisational structure, and leadership. These two knowledge structures are useful to correct or revise managers' decisions about change adoption. The specific hypothesis is:

**H<sub>4</sub>: *Script and schema theories influence managers' benchmarking decisions.***

Following other academic research (Chen et al., 2004; Brett et al., 1998; Ezzamel et al., 1987; Kahneman et al, 1982) it would be reasonable to expect that there will be high levels of instability with respect to company structure, managers, leadership and market conditions in many LMOs. Discussion of these results is shown in 7.4.3.1.

2. The hypotheses themselves have been derived directly from some aspects relevant to benchmarking theories mentioned in the literature review and may be used to guide the collection, analysis and interpretation of data in this study.

#### **4.6 Summary**

From the previous discussion, managers in many organisations are giving only inferential weight to vividness when applying benchmarking. However, "vividness" is the emotional interest of information, and the "concreteness" and "imaginability" of information. More vivid information is more likely to be remembered and hence to be more available for influencing inferences at any time after the information is initially encountered. Managers do not give enough weight to statistical information. This information is not emotionally interesting and has little effect on managers' views in situations such as benchmarking (see 4.2).

This chapter also describes two of the general tools that managers use to 'go beyond the information given', judgmental heuristics (e.g., representativeness and availability heuristics) and knowledge structures (e.g., script and schema theories).



The simple judgmental heuristics (4.3) do lead managers to look for best performance or help them to make better decisions in situations of change adoption. The misapplication of each heuristic does lead managers astray in some important inferential tasks. As Nisbett and Ross (1980) indicated, heuristics are not applied in a totally indiscriminate style. In many contexts in which a given heuristic would promote error, managers refrain from using it and probably could articulate why its use would be worthless.

The representativeness heuristic has played an important role in many types of predictive judgements (e. g., political, economic, etc). Also, the heuristic sometimes misleads if misapplied and operating environmental factors are not considered (e. g., task difficulty, luck and chance). For instance, many organisations face difficulty implementing benchmarking because the representativeness heuristic is misguided and environmental factors are ignored.

The availability heuristic can also be a useful tool of judgement. Reliance on the availability heuristic can guide managers to reduce the difficulty of tasks. However, the misuse of the availability heuristic can lead managers to adopt ineffective responses to information about performance in situations of new change adoption.

In addition to heuristics, managers use certain knowledge structures (e. g., script and schema theories) in determining new change adoption. In this case, the concepts of script and schema have been used to explain, understand, and update information about the stability of organisational structure, manager, leadership, and the uncertainty of market conditions (4.4).

Moreover, the formulation of testable hypotheses (4.5) has been adopted for all aspects reviewed in this literature. The results of testing these hypotheses will be discussed in detail in chapter seven. However, before giving this, the methodological and methodical approaches adopted for this research will be discussed in the next chapter.

## CHAPTER 5

### 5. Research methodology and methods

#### 5.1 Introduction

It has been stated that the aim of this thesis is to understand and discuss benchmarking and its implementation problems in LMOs. To do this, a discussion of cultural and organisational issues relevant to benchmarking and theoretical perspectives on benchmarking has been presented in chapters 3 and 4. The purpose of this chapter is to provide a discussion of the research methodology (5.2) and methods (5.3) used in this study. This chapter includes two main sections as follows: Section 5.2 is concerned with the research methodology and is divided into the following sub-sections: 5.2.1 provides an introduction to the Analytic Hierarchy Process (AHP) as the methodology used in this study; 5.2.2 describes the idea of a hierarchy in AHP; 5.2.3 outlines the nature of an assessment hierarchy; the role of pairwise comparisons in AHP is the subject of sub-section 5.2.4. The section concludes with a review of the methodological limitations of AHP.

Section 5.3 presents the research methods and is divided into the following sub-sections: 5.3.1 describes data collection methods which can be adopted as a research strategy of data collection; 5.3.2 explains the methods of investigation adopted; the measurement techniques used for the questionnaire are described in 5.3.3; 5.3.4 describes the population. The scope of the study is reviewed in sub-section 5.3.5. The discussion of distributing and collecting the questionnaires in this study is included in sub-section 5.3.6. Sub-section 5.3.7 describes the statistical techniques used for data analysis. A section summary is provided in section 5.4.

#### 5.2 Research methodology

This section begins with a discussion about the research methodology used in this study. It explains Saaty's AHP which provides a method for determining the values of decision criteria when benchmarking (Korpela 1996; Eyrich, 1991).



### 5.2.1 An introduction to the Analytic Hierarchy Process

The AHP is the primary methodology which is used in this study. Thomas Saaty developed AHP in the 1970s. Since its inception, numerous books and research papers which explain the theory and evidence on AHP applications have been published<sup>(1)</sup> (Schmoldt et al., 2001; Harker and Vargas, 1987). AHP is a practical, useful technique designed to represent complex decision problems analytically and to yield inferences about the cognitive processing of subjects. “It is designed to address decision-making questions that are complex, ambiguous, difficult to quantify, and involve multi-attribute preference rankings” (see Hassell and Arrington 1989, p: 529; Saaty 1980, 1995).

AHP was developed in response to research indicating that individuals have difficulty making multi-criteria choices (see Harper, Apostolou et al., 1992; Ashton, 1982; Libby, 1981). As many factors influence decisions, individuals must determine the relative importance of these factors, assign priorities to them and assimilate them to produce a decision. AHP has been applied in such diverse areas as the electric utility industry, medicine, politics and business (Golden et al., 1989), portfolio selection (Saaty, Rogers and Pell, 1980), accounting and auditing (Hassell and Arrington 1989; Arrington, Hillison and Jensen, 1984), architecture (Saaty, 1982), health (Mine et al., 1997; Lusk, 1979), education (Saaty and Rogers, 1976), and computer- aided systems (Ayag, 2002). All of these cases involve decision problems. The range of applications exhibited here is reasonably exhaustive, and the interested reader is referred to Saaty (1994), Vargas (1990) and Zahedi (1986) for a fuller discussion of AHP applications<sup>(2)</sup>. Apostolou and Hassell provide a discussion of

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<sup>(1)</sup> The four major works deal with the subject of AHP are, ‘The Analytic Hierarchy Process’ (Saaty, 1980), ‘Decision Making for Leaders’ (Saaty, 1982 and 1995), ‘Logic of Priorities’ (Saaty and Vargas, 1982) and ‘Fundamentals of Decision Making’ (Saaty, 1994). Also, other published papers dealing with the same methodology in the operations research / management science literature include the papers by Saaty (1977, 1983) Wind and Saaty (1980), Cook et al. (1984), Saaty and Gholamnezhad (1982), Vargas (1983), Saaty and Vargas (1979), Mill (1974), Zahedi (1986), Harker (1986), Golden et al. (1987), Eyrich, 1991, Ulengin et al. (1994), Korpela et al., 1996, Min et al. (1997), Salo et al. (1997), Millet et al. (1998), Ayag, (2002) and Hafeez et al. (2002).

<sup>(2)</sup> Numerous applications of the AHP have been made in industry and government by using the software package Expert choice. The proceedings of the first International Symposium on AHP held in Tianjin and the Government of China. The Xerox Corporation has institutionalised use of the AHP in their strategic decision making (Saaty, 1994).

AHP applications in accounting research. Also, there are consulting firms, corporations, and many US government agencies which use AHP to analyse complex policy and planning issues (Harker and Vargas, 1987).

Vargas (1990) stated that as a measurement technique AHP derives dominant priorities from paired comparisons of homogeneous elements with respect to a common criterion (or attribute). The arithmetic operations in AHP are based upon the idea of dominance, which AHP theorists see as 'natural' in human thinking. AHP is based also upon the principle that, in order to make decisions, the experience and knowledge of subjects are at least as valuable as the data which they use.

Korpela and Tuominen (1996) suggested that the AHP is a theory of measurement for dealing with quantifiable and intangible criteria that has been implemented in several areas such as decision theory and conflict resolution. AHP is a problem-solving framework and a systematic procedure for representing the elements of any problems. For example, benchmarking is most often a team effort, and AHP is one available method for forming a systematic framework for group decision-making (Korpela et al., 1996).

Moreover, Korpela et al. (1996, p: 226) indicated that AHP has previously been used for benchmarking by Eyrich<sup>(3)</sup>. His application was for benchmarking computer-integrated manufacturing (CIM) sites, and AHP was used basically for determining the success factors, the corresponding requirements and their importance for a best-of-breed CIM site. Accordingly, Eyrich stated that in considering benchmarking it is important to develop a common understanding of what it means to be the best in order to obtain the maximum result. Eyrich (1991) suggested that AHP is appropriate for use in the benchmarking process because it facilitates consensus and develops hierarchical models to solve problems. Thus there is justification for the selection of AHP as a methodology for this study of benchmarking in a Libyan context.

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<sup>(3)</sup> For more detail see H.G. Eyrich, "Benchmarking to become the best of breed," *Manufacturing Systems*, April, 1991.



Through a hierarchy, AHP takes factors which are important in a problem or decision and compares the importance of each factor relative to its impact on the solution (Saaty, 1994). The discussion of benchmarking problems in the literature review illustrated the multidimensional nature of the concept. Through AHP, it is possible for managers to assess jointly and simultaneously the various criteria (elements) which define benchmarking “best practice”. Using AHP, this study is able to model the determination of how to consider multivariate criteria in benchmarking decisions.

AHP starts with attributes (criteria) likely to be important in making unstructured, qualitative decisions. It has the capacity to structure hierarchically categories of criteria, and performs the necessary matrix manipulations to produce hierarchical decomposition of the overall decision (Hassell and Arrington, 1989). AHP uses matrices of simple pairwise comparisons to show with what strength one activity dominates another with respect to the objective with which they are compared (Apostolou et al., 1993). Saaty (1990) states that as AHP assumes and uses reciprocal matrices the technique is closely related to the concept of consistency of thought. However, AHP also takes account of inconsistency in judgements and shows the impact on the overall results of such inconsistency.

AHP uses paired comparisons as ratios, and relative scales<sup>(4)</sup> are produced from judgements made under a standard scale<sup>(5)</sup>. As Saaty (1990, p:12) states in support of the use of pairwise comparisons to derive relative scales, “the most effective way to concentrate judgement is to take a pair of elements and compare them on a single property without concern for other properties or other elements”. It is for this reason that AHP uses pairwise comparisons to facilitate measurement.

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<sup>(4)</sup> Relative scales must be generated for a specific set of entities. It is essential to show priority if the scale is generated by direct observations and judgements over the property under study. Consequently, “relative scales are always needed to represent subjective understanding” (Saaty, 1990, p: 12).

<sup>(5)</sup> Standard scale may be regarded as given (e.g. the kilogram, the metre and the dollar). Measurements in a standard ratio scale may be transformed into measurements in a relative ratio scale by normalising them (Saaty, 1990).

### 5.2.2 The hierarchy in the Analytic Hierarchy Process

The first step of AHP is to form a hierarchy of goals, criteria, and alternatives. The decision maker must attempt to account for all important elements, goals, and criteria to be considered. The hierarchy structure is often suggested by the system itself, brainstorming sessions, literature reviews, working with others, and consulting with experts. Ultimate goals must be identified, followed by sub-goals and specific sub-goals down the hierarchy (Debeljak et al., 1986). In this way, the influences over complex decision processes are not just identified but also ordered in terms of dominance.

A hierarchy is a fundamental structure of how AHP theorists deal with multiple-criteria decision making. It involves identifying the elements of a problem, grouping the elements into homogeneous sets, and organising these sets into different levels (Saaty, 1995). It is also a representation of a complex problem in a multilevel structure whose first level is the goal followed by levels of criteria and sub-criteria down to the bottom level of specific sub-criteria (Saaty, 1994). A hierarchy is a structure used to describe the simplest type of functional dependence of one level or component of a system on another in a sequential manner. It is a convenient way to decompose a complex problem in search of cause-effect explanations into steps which form a linear chain. The structure of a hierarchy is linear and proceeds downward from the most general and less controllable (goals, criteria, sub-criteria, etc.) to the more concrete and controllable factors terminating in the level of alternatives (Saaty, 1995, 1994). Consequently, the object of a hierarchy is to assess the impact of criteria at a higher level on those at lower levels; or, alternatively, the contribution of criteria in the lower level to the importance of the criteria in the level above (Saaty, 1995).

Saaty (1980, p: 5) states that “a hierarchy is an abstraction of the structure of a system to study the functional interactions of its components and their impacts on the entire system”. Saaty and Vargas (1987, p: 4) explain the reasons why AHP uses a hierarchy to deal with complex decision problems: the purpose of constructing hierarchies is to study, evaluate, and prioritise the influence of the alternatives (or



activities) on the criteria to obtain or satisfy the overall goal. It is necessary to understand that the hierarchy constructed for a particular decision problem is unlikely to be unique and different decision analysts are likely to build different hierarchies for the same decision objective or problem (Saaty and Vargas, 1982).

In a typical hierarchy, the highest level reflects the overall objective of the decision maker. The elements affecting the decision are called criteria, and they are represented at the intermediate level. Criteria can be further divided into sub-criteria for additional refinement (see figure 5-2). They can be objective<sup>(6)</sup> or subjective<sup>(7)</sup>, depending on the means used in evaluating the contribution of the elements below them in the hierarchy. Furthermore, criteria are mutually exclusive and do not depend on the elements below them in the hierarchy. The lowest level comprises the decision option or alternatives (Andijani, 1998).

A hierarchy is considered to be complete when the elements in a level are evaluated in terms of all the elements in the level above. Alternatively, it is considered to be incomplete when an element on a given level does not have to function as a criterion for all the elements in the level below (Saaty, 1994). At this point, Saaty indicates that a decision maker can add or eliminate levels and elements as necessary to make clear the task of setting priorities: "Elements that are of less immediate interest can be represented in general terms at the higher levels of the hierarchy, and elements critical to the problem at hand can be developed in greater depth and specificity" (1995, p: 39). Furthermore, the only restriction for the hierarchy arrangement of elements is that any element on one level has to be capable of being related to some elements on the next above level, which serves as a criterion for assessing the relative impact of elements in the level below (Saaty, 1995).

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<sup>(6)</sup> Objective criteria include explicit, verifiable measures such as paying employees on piece rates or sales (for details on this, see Zimmerman 1997 and Brickely et al., 1997).

<sup>(7)</sup> Subjective criteria focus on multiple hard-to-measure factors. For example, the subjective performance measures of a manager include a variety of factors, such as improving team spirit, getting along with peers, meeting budgets and schedules, and affirmative action hiring. Most firms use implicit, subjective performance measures because jobs typically have multiple dimensions (for details on this, see Zimmerman, 1997 and Brickely et al., 1997).

Andijani (1998) states that the number of elements or alternatives should be sensibly small in order to give consistent pairwise comparisons. Saaty (1980) suggests a maximum number of seven. In situations where the number of elements or activities is more than seven, two things can happen. One can group the criteria with respect to a common property and add another level to incorporate the groupings. In the situation of the activities, the ratings mode of AHP may be used (Andijani, 1998). Once the hierarchy has been constructed, the decision maker gives the details of pairwise comparisons to estimate the relative importance of various elements on each level. Then, the next step is the integration of these elements, using weights for an overall prioritisation of decision activities.

Despite the fact that there is no established theory concerning hierarchy construction, there are, nonetheless, several well-recognised processes followed (Saaty, 1980, Saaty and Vargas, 1982). First, the problem must be decomposed such that the decision analyst breaks the decision problem down into a hierarchy of interrelated decision elements. For a realistic model to be constructed, the hierarchy should include all important tangible and intangible and quantitative and qualitative factors deemed necessary to represent the problem. In constructing a hierarchy, enough relevant detail should be included to represent the problem as thoroughly as possible, while still maintaining sensitivity to a change in the elements. The decision analyst should also consider the environment (discussed in chapters 2 and 3) which surrounds the decision problem, and identify associated participants. The attributes which contribute to the solution may then be identified. As Saaty and Vargas (1982, p: 15) state with respect to the construction of the 'correct' hierarchy, "only by experience, reason, intuition and other attributes of actually knowing, can we know". As a general starting point, the forces which shape the system must be identified. An example of a basic hierarchy is shown in Figure 5-1 below.

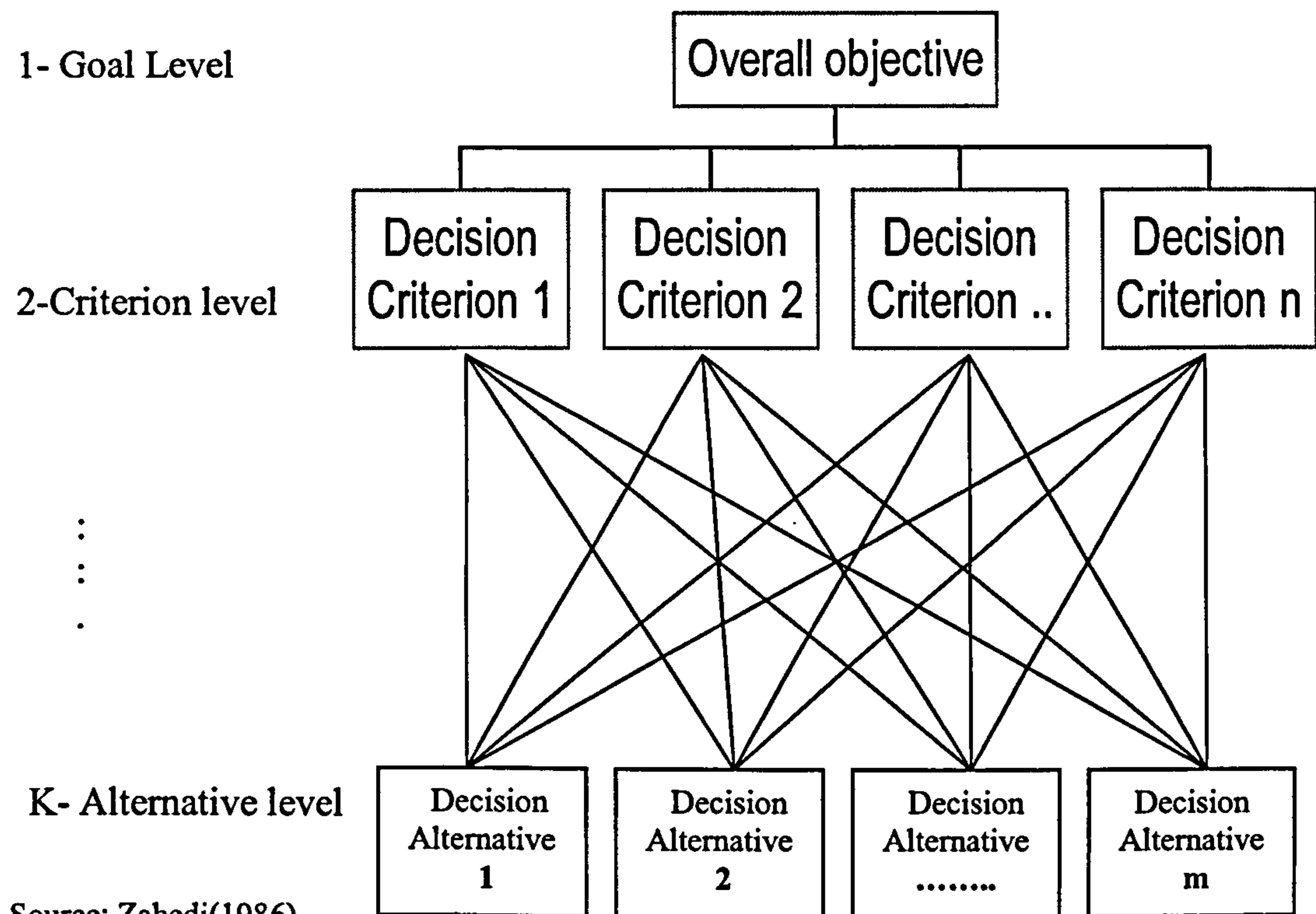
Saaty (1990) states that a hierarchy does need to be complete; that is, an element in a given level does not have to function as a criterion for all the elements in the level below. Therefore, under AHP, one may 'go off tangent' and examine an element of particular interest in detail. For example, a decision to benchmark a criterion (e. g.



maximise sales or market share, etc.) could be further examined by inserting or taking away elements in levels as necessary to sharpen the focus on one or more parts of the system. It is important, however, for elements in a level to be compared amongst themselves with respect to the elements in the next highest level.

**Figure 5-1**

The standard form of decision schema in the analytic hierarchy process: a hierarchy with K levels.



As there is no generally accepted method for constructing a hierarchy, an intuitively appealing structure must be identified (Saaty 1983; Srinivasan et al., 1990). Brainstorming by researchers (or experts) in the area of decision problems is one method for identifying potential elements. However, in social science research, owing to the time and expense involved in this procedure, alternative identification methods are normally used. It is common practice to structure the hierarchy through reference to the existing literature and discussion with experts on the subject under study (for example, see Srinivasan and Bolster, 1990). After elements have been identified they may then be arranged into groups according to their perceived

dominance; this gives the hierarchy levels. The hierarchy structure should be kept tentative and then refined as necessary. Elements must also be carefully defined in order to achieve consistency in responses and to avoid ambiguity over the meaning of elements. Once the final hierarchy has been constructed, the assessment hierarchy is then made and input data may be obtained through the process of pairwise comparisons (Saaty, 1994, 1994b; Apostolou et al., 1993; Arble et al., 1990).

Overall, the structuring of any decision problem hierarchically is an efficient way of dealing with complexity and identifying the major components of the problem. Wind and Saaty (1980, p: 642) state that “there is no single general hierarchical structure, and one of the major attributes of the AHP is the flexibility it allows management in constructing a hierarchy to fit their idiosyncratic needs”. Whenever hierarchies are designed to reflect likely criteria (e.g. cost control, quality control, maximise sales, and market share) and alternatives, the AHP can provide a framework and methodology for the determination of a number of criteria and alternative decisions of the firm.

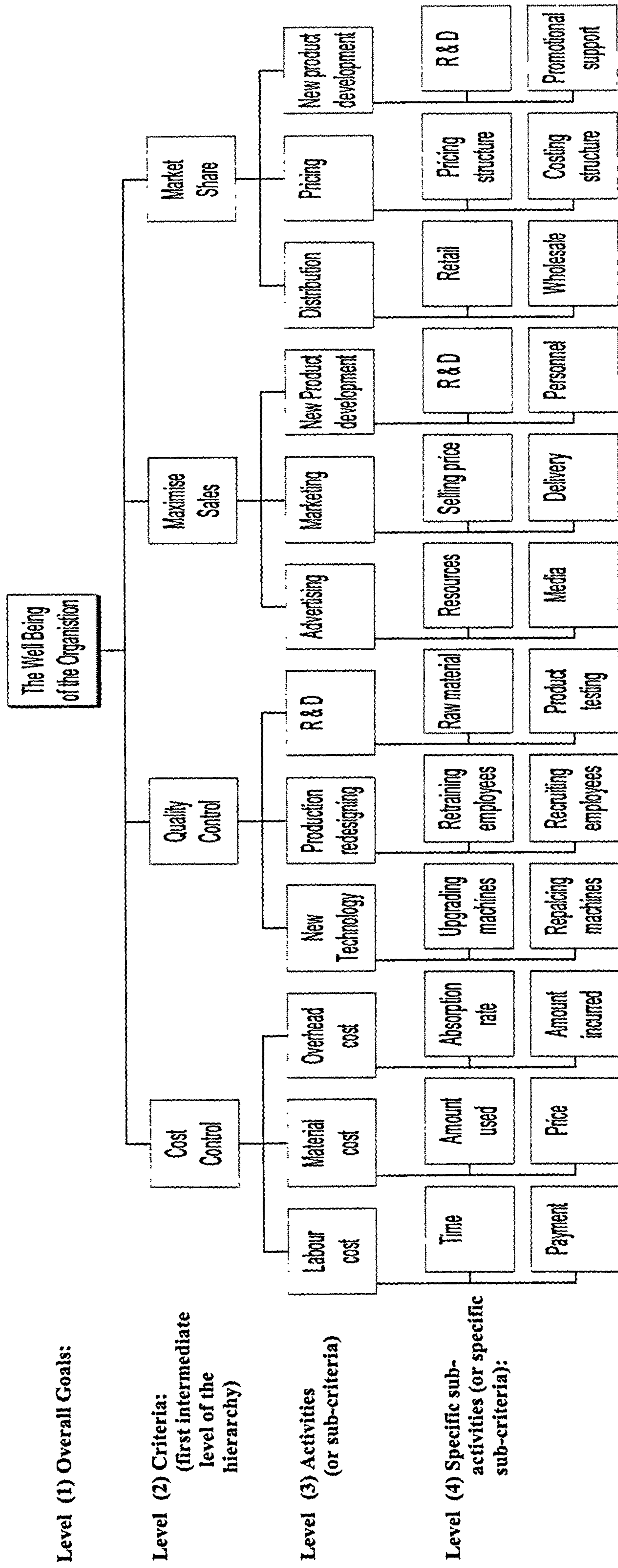
As a general starting point of this study a basic hierarchy, as illustrated in Figure 5-2, can aid in identifying criteria. The levels of hierarchy interconnect like layers of cell tissue to form an organic whole that serves a certain function. This can involve three levels or more (e.g. overall goals, criteria, sub-criteria and specific sub-criteria presented in the hierarchy below).

This hierarchy designed in Figure 5-2 is based on two major levels:

- 1- Organisational criteria - the criteria in this level for the evaluation of the various activities are identified as cost and quality control, sales maximisation, and market share.
- 2- Activities (or sub-criteria) level: these include sets of sub-criteria (labour, material, and overhead cost, developed device, production redesigning, etc.). There are also sets of specific sub-criteria at the low levels of this hierarchy (time, payment, amount used, price, absorption rate, amount incurred, upgrading machines, etc.). All of those sets are presented in Figure 5-2.



**Figure 5-2**  
**An Analytical Hierarchy of the selection of cost control, quality control, maximise sales and market share for an organisation (Elements within all levels in this hierarchy are developed by the researcher)**



**Level (1) Overall Goals:**

**Level (2) Criteria:**  
 (first intermediate level of the hierarchy)

**Level (3) Activities**  
 (or sub-criteria)

**Level (4) Specific sub-activities**  
 (or specific sub-criteria):

Figure 5-2 while utilizing different criteria draws upon the model developed by Wind and Saaty (1980) and Eyrich (1991) for the selection of best new product activities. The construction hierarchy of Figure 5-2 is specifically designed to include the author's selection of four major criteria and sets of sub-criteria and specific sub-criteria as being important strategically for LMOs. Thus these criteria are key to the development of benchmarking. The first level consists of four major factors associated with organisational well-being (cost, quality, sales, market share). These factors are decomposed further in the lower levels of the hierarchy.

Thus, having selected the hierarchical structure, the hierarchy is broken down into a series of criteria, sub-criteria, and specific sub-criteria, as shown in Figure 5-2. In this case, evaluation of all pairwise comparisons (using the 9-point scale)<sup>(8)</sup> can be used. These evaluations result in reciprocal matrices of the components of each level against the items in the level above (Wind and Saaty, 1980). Consider for example the evaluation of activities (sub-criteria) or specific activities (specific sub-criteria) against the criteria (or objectives). This involved many pairwise matrices. An example of one pairwise comparison matrix (e.g. cost control sub-criteria) for part of the hierarchy presented in Figure 5-2 is illustrated in Figure 5-3. However, the inputs of each matrix of pairwise comparisons used in this study were taken from Saaty's 9-point scale (see detail in section 5.2.4.1).

**Figure 5-3**

**An example of one pairwise comparison matrix**

Cost control <sup>(9)</sup>	Overhead Cost	Labour Cost	Material Cost
Overhead Cost	1	1/3	1/5
Labour Cost	3	1	1/4
Material Cost	5	4	1

In general, the judgements for each criterion or sub-criteria (shown in Figure 5-3) can be obtained. For instance, material cost is of strong importance (5) over overhead cost

<sup>(8)</sup> The 9-point scale will be discussed in detail in section 5.2.4.1.

<sup>(9)</sup> The hierarchy (in Figure 5-2) is broken down into a series of paired comparison matrices for criteria (e.g. cost control, quality control, sales maximisation, and market share), sub-criteria (e.g. overhead, labour and material cost in terms of cost control and developed devices, production redesigning, R&D in terms of quality control) and specific sub-criteria (e.g. time and payment in terms of labour cost and amount used and price in terms of material). For example, the paired comparison matrix (Figure 5-3) presents the extent to which labour cost is preferred over overhead cost (3/1); material cost is more preferred over labour cost (4/1); material cost is most preferred over overhead cost (5/1), etc. in terms of benchmarking cost control.



in leading to the achievement of an organisation's objective at the cost control level. Also, material cost is less important when compared with labour cost (4). Furthermore, in evaluating labour cost versus overhead cost the organisation judges labour cost to be of weaker importance than overhead cost (3). With these three judgements given, reciprocals could be added, and an organisation could continue with the pairwise comparison tasks of other matrices. These include the evaluation of criteria against the overall activities of each criterion of the organisation, and evaluation of the sub-activities and specific sub-activities against each of the criteria.

### **5.2.3 Collecting input data by pairwise comparisons in AHP**

In the AHP technique, pairwise comparison should be made at the criteria level and the alternative level. The pairwise comparisons at the criteria level are used based on data obtained from questionnaire responses and/or interviews with managers of Libyan manufacturing systems. Questions are designed (section III of the questionnaire) to elicit judgements about the relative importance of each of the selected criteria in satisfying market (or customer) demand requirements. For example, a question could be related to the judgements of managers about the importance of quality control (e.g. a company's services or products). This could then be compared with, for example, judgements about the importance of average cost. In this case, respondents may answer this question with relative ease, using descriptive performances (e.g. equally important, moderately more important, etc.). The result of this evaluation is a preference matrix presenting these judgements as numerical values. Once the preference matrix is calculated or decided, the standard AHP calculation is employed to calculate the local priorities or weights for criteria (Andijani, 1998).

Elements in each level of the hierarchy are compared in relative terms as to their importance to criteria occupying the level immediately above the elements being compared. The input data for the problem consists of matrices of pairwise comparisons of elements of one level that contribute to achieving the objective of the next higher level (Zahedi, 1986). In the assessment of the benchmarking example (shown in Figure 5-4), quality control may be considered as twice as important (or preferred) as cost control in practising benchmarking. The input matrix in this case would be similar to this.

(Figure 5-4)

**The assessment of benchmarking example**

	Cost control	Quality control
Cost control	1	1/2
Quality control	2	1

(Number of elements in this matrix = 2)

Suppose one wants to know which of two criteria (e.g. cost control and quality control) to consider as most important to benchmark. From the above matrix, it appears that value '2' in row 2 and column 1 shows that quality control is twice as important as cost control in achieving the objective of the next higher level. In row 1 and column 2, the inverse of '2'; '1/2' (the reciprocal of 1/2 is 2) shows the relative importance of cost control compared with quality control. When compared with itself, each criterion has equal importance. Saaty (1995, p: 75) suggested that the element "appearing in the left-hand column is always compared with the element appearing in the top row, and the value is given to the element in the column as it is compared with the element in the row". Diagonal elements of the input matrix will always equal one, and lower triangle criteria of the matrix will be the reciprocal of upper triangle criteria or elements. Therefore, pairwise comparison data are collected for only half of the matrix, excluding diagonal elements (Forman, 1990; Zahedi, 1986).

In general, each set of comparisons yields  $n(n-1)/2$  judgements in a matrix of size  $n^{(10)}$ , when in fact  $n-1$  judgements are required to solve for priorities using simple algebra (Forman, 1990). Consequently, if the matrix deals with, for example, four elements, the number of judgements needed to fill the entries is  $4(4-1) \div 2 = 6$ . The four unit entries are subtracted down the diagonal and divided by 2 because half the judgements are thus entered automatically (Saaty, 1995).

From the completed matrices a relative scale of measurement of priorities (weights) of elements (or criteria) may be derived. The relative weights of the elements in each level will sum to unity. Criteria in each level are compared with respect to the criteria in the level immediately above. Overall, the final weights of the elements (decision

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<sup>(10)</sup>  $n$  is value equal the number of elements in the matrix.



alternatives) at the bottom level of the hierarchy are obtained by adding all contributions of elements in a level with respect to all criteria in the level above. This is the principle of hierarchic composition (Saaty, 1995, 1980; Saaty and Vargas, 1982).

### 5.2.3.1 The pairwise comparison scale used in AHP

Saaty developed a standard measurement scale for the purpose of implementing the AHP. This scale ranges from equal to extreme, where 1 represents equal importance and 9 indicates absolute importance. It is reproduced in Figure 5-5<sup>(11)</sup> (Apostolou and Hassell 1993). Therefore, the scale is 1, 3, 5, 7, and 9 with 2, 4, 6, and 8 as intermediate value. Figure 5-5 shows Saaty's standard scale which respondents use in AHP.

(Figure 5-5)

#### Election technique response scales which can be used by respondents in AHP

<i>Intensity of Importance</i>	<i>Definition</i>	<i>Explanation</i>
1	Equal importance	Two activities or items contribute equally to the objective.
3	Weak importance of one over another	Experience and judgement slightly favour one activity or item over another
5	Essential or strong importance	Experience and judgement strongly favour one activity over another.
7	Demonstrated importance	An activity or item is strongly favoured and its dominance is demonstrated in practice.
9	Absolute importance	The evidence favouring one item over another is of the highest possible order of affirmation.
2, 4, 6, 8	Intermediate values between the two adjacent judgements	When compromise is needed.

Source: Saaty (1980; 1990, 1995); Saaty and Vargas (1982); see also Hassel and Arrington (1989); Min et al. (1997); Hafeez et al. (2002); Lee et al., (2002).

#### Sample Responses

\_\_\_\_\_ Cost Control: Quality Control   5    
  7   Cost Control: Maximise Sales \_\_\_\_\_

The instrument continues until all 30 pairwise comparisons made by each of the fifty subjects in this study are completed (see questionnaire appendix - 1).

<sup>(11)</sup> The exact form of the pairwise comparison scale has evolved over time. The scale presented in Figure 5-5 is the version used in expert choice (see Apostolou and Hassel, 1993).

Hassell and Arrington (1989) suggested that in order to present pairwise comparisons between two criteria, each respondent assigns a value from 1 to 9 beside one of the two criteria indicating the relative priority of that criterion with respect to the other criterion in the pair. An example of the scale and elicitation procedure which will be used in this study is shown in Figure 5-5 above. It illustrates that this hypothetical respondent views quality control as "of essential or strong importance" ("5" as the response) over cost control with respect to determination of hypothetical benchmarking. Similarly, the response of "7" in the second comparison indicates that cost control is of "demonstrated importance" over sales maximisation.

Harker and Vargas (1987) and Hassel and Arrington (1989) defend the use of a 1-9 standard scale. As they point out, although the use of a ratio scale between 1 and 9 is open to debate, experiments reported since Saaty (1980) tend to support the view that the standard 1-9 scale captures fairly well the preferences of an individual. Saaty (1990, 1994) suggests that when the criteria being compared are closer together than indicated by the scale, one can use the scale 1.1, 1.2, ..... 1.9, ..., 9. If still finer scaling is desired, one can use the appropriate percentage refinement in terms of importance. Furthermore, if one wishes to remove the upper limit of 9 set on the scale, the mathematics of AHP are even capable of dealing with a standard scale of 1-infinity (Harker and Vargas, 1987). Although there is not a prior reason to prefer the standard 1-9 scale to any other possibility, convention and experimental precedent since Saaty (1995, 1980) lend credence to the appropriateness of the scale.

### 5.2.3.2 Pairwise comparison matrices in AHP

Once the hierarchical structure has been formed, the judgmental process begins. For each level of the hierarchy, beginning at the top and working down, a comparison matrix for the components is formed (Saaty, 1994; Debeljack et al., 1986). However, the input matrix of pairwise comparisons shows the extent to which one criterion is preferred over another in achieving an objective of one level higher in the hierarchy (Zahedi, 1986).

Let it be considered that an evaluator has  $n$  objectives,  $A_1, \dots, A_n$  and their weights  $W_1, \dots, W_n$  which are known to them. As the actual relative weights of



the  $n$  criteria (elements) are known (at one level of the hierarchy with respect to the next level above) then the pairwise comparisons may be represented as follows (Saaty,1990; Zahedi, 1986; Saaty and Vargas, 1982):

**Figure 5-6**

**Pairwise comparison matrix in AHP**

$$A = \begin{bmatrix} W_1/W_1 & W_1/W_2 & W_1/W_3 & \dots & W_1/W_n \\ W_2/W_1 & W_2/W_2 & W_2/W_3 & \dots & W_2/W_n \\ W_3/W_1 & W_3/W_2 & W_3/W_3 & \dots & W_3/W_n \\ \vdots & \vdots & \vdots & \dots & \vdots \\ W_n/W_1 & W_n/W_2 & W_n/W_3 & \dots & W_n/W_n \end{bmatrix} \quad (1)$$

(When the matrix has as many rows as columns,  $n = n$  is called a square matrix)

Where the  $w_i (i = 1, \dots, n)$  and  $w_j (j = 1, \dots, n)$  are the weights or priorities and the ratios  $w_i/w_j$  are assigned by the decision maker. Essentially the decision maker must answer the question: How important is component  $i$  (which represents the row) when it is compared with component  $j$  (which represents the column)? The main concern of this comparison is only to consider the ratio of  $w_i/w_j$  and not the actual values of  $w_i$  and  $w_j$  (Saaty 1990).

This matrix shown in Figure 5-6 has positive entries everywhere and satisfies the reciprocal property  $w_{ji} = 1/w_{ij}$  (or  $w_j/w_i = 1/(w_i/w_j)$ ). It is called a reciprocal matrix. It is noted that if  $A$  is multiplied on the right by the vector of actual relative weights,  $w = (w_1, w_2, \dots, w_n)^T$ , then the result of this multiplication is  $n \cdot w$ . Consequently, the following holds (Schmoldt et al., 2001; Saaty, 1995; Saaty, 1990; Saaty and Vargas, 1982):

$$A \cdot w = n \cdot w \quad (2)$$

Where  $w = (w_1, w_2, \dots, w_n)^T$  is the vector of actual relative weights, and  $n$  is the number of elements in the matrix. In the matrix algebra,  $n$  is termed the eigenvalue and  $w$  is called the right eigenvector of matrix  $A$  (Zahedi, 1986).

In a situation where the evaluator does not know the actual weights of the elements,  $W$  will not be known to them. Consequently, they may be unable to produce the pairwise relative weights of matrix  $A$  consistently. Therefore, the observed matrix  $A$  may contain inconsistencies. These estimations of  $W$  (written as  $\hat{W}$ ) could be obtained as into (2) from (see Saaty, 1995, 1980; Zahedi, 1986):

$$\hat{A} \cdot \hat{W} = \lambda_{\max} \cdot \hat{W} \quad (3)$$

Where  $\hat{A}$  is the observed matrix of pairwise comparisons,  $\lambda_{\max}$  (lambda max) is the largest eigenvalue of  $\hat{A}$ , and  $\hat{W}$  (constitutes the estimation of  $W$ ) is its right eigenvector. In (3)  $\lambda_{\max}$  is the estimation of  $n$  from (2). Saaty (1995, 1980) and Zahedi (1986) have shown that  $\lambda_{\max}$  is always greater than or equal to  $n$ . The closer the value of the computed  $\lambda_{\max}$  is to  $n$ , the more consistent the observed values of  $\hat{A}$  will be. This property has led to the construction of the consistency index and ratio which are discussed next.

### 5.2.3.3 Consistency in matrices

The AHP deals with consistency explicitly because, in making paired comparisons, just as in thinking, people do not have the essential logical ability to be always consistent. Saaty (1990, p: 217) indicated that "the measurement of consistency in the AHP is obtained as a theorem based on the principal eigenvalue  $\lambda_{\max}$  and its relation to the principal eigenvector, which captures higher order transitivity. The deviation of the principal eigenvalue from  $n$  is shown mathematically to be the measure of departure from consistency". Specifically, the principal eigenvalue may be used to estimate consistency in a matrix as reflected in the proportionality of preferences (Saaty, 1995). The closer  $\lambda_{\max}$  is to the number of elements ( $n$ ) in the matrix ( $A$ ), the more consistent the matrix will be. Also, Arrington et al (1984) pointed out that strong consistency exists in the matrix when the principal eigenvalue is equal to the dimension of  $A$ , i.e.,  $\lambda_{\max} = n$ . Inconsistency throughout the matrix can be captured by a single number;  $\lambda_{\max} - n$ . This number measures the deviation of the judgements from



the consistent approximation. The consistency index (C.I.) illustrates to what extent  $\hat{W}$  accurately reflects the evaluator's actual opinion.

It has been indicated that  $\lambda_{\max} \geq n$  and that  $(\lambda_{\max} - n) / (n - 1)$  serves as a consistency index which measures standard from consistency in estimating the ratios  $w_i/w_j$ , with consistency obtaining when  $\lambda_{\max} = n$  (Wind et al., 1980). The consistency index (which has given theoretical derivations) is given by (see Lee et al., 2002; Schmoldt et al., 2001; Saaty, 1995, 1990, 1980; Forman, 1990; Zahedi, 1986):

$$\text{Consistency index (C. I.)} = (\lambda_{\max} - n) / (n - 1) \quad (4)$$

Generally, if the C. I. is less than 0.10, the consistency of the decision maker is considered satisfactory. The vector  $\mathbf{w}$  is then assumed to be the decision maker's optimal weights or priorities (Saaty, 1995; Apostolou et al., 1993; Debeljak et al., 1986). But, if C.I exceeds 0.10, some revisions of judgement may be required (Lee et al., 2002; Anddijani, 1998)

The value produced by the C. I. is compared with a value from the same index obtained as an average over a large number of reciprocal matrices of the same order where entries are random. The consistency index of a randomly generated reciprocal matrix under the scale 1-9, with reciprocals forced, is the Random Consistency Index (R.I.)<sup>(12)</sup>. The ratio of C. I. to the average R. I. for the same order of matrix is the consistency ratio (C. R.)<sup>(13)</sup> (Lee et al., 2002; Hafeez; 2002; Saaty, 1980, 1995;

<sup>(12)</sup> "If numerical judgement were taken at random from the scale 1/9, 1/8, ..., 1/2, ..., 9", then by using a reciprocal matrix it would be possible to obtain the following average consistencies for different-order random matrices, as given by (Lee et al., 2002; Saaty, 1995, p: 83):

Size of matrix (or $n$ )	1	2	3	4	5	6	7	8	9	10
Random consistency Index	0.00	0.00	0.52	0.89	1.11	1.25	1.35	1.40	1.45	1.49

<sup>(15)</sup> The computation for the consistency ratio is as follows (Apostolou and Hassell, 1993, p: 5; Saaty, 1986a, p: 21):

$$\begin{aligned} \text{Consistency Ratio} &= \text{consistency Index} / \text{Random consistency Index.} \\ &= (\lambda_{\max} - n) \div (n - 1) / \text{Average Random consistency Index.} \end{aligned}$$

Where:  $\lambda_{\max}$  = maximum eigenvalue of the priority matrix.  
 $n$  = number of elements in the matrix.  
 Random Index = computed for matrices of order  $n$ .

Apostolu et al., 1993). Saaty (1990) suggested that the estimate of  $W$  should be accepted if the CR was less than or equal to 0.10

#### 5.2.3.4 Combining relative weights

The last step in AHP is to combine weights of the various levels obtained to produce a vector of composite weights. This vector works as a rating of decision alternatives (selecting choices) in achieving the overall objective of the problem. The composite relative weight vector of criteria (elements) at  $k$ th level with respect to that of the first level is calculated from (Saaty, 1980, 1995; Zahedi, 1986):

$$C [1,k] = \prod_{i=2}^k B_i \quad (5)$$

Where  $C [1,k]$  is the vector of composite (or relative) weights of criteria at level  $k$  (last level), with respect to the criteria on level 1;  $B_i$  is the  $n_{i-1}$  by  $n_i$  matrix with rows consisting of estimated relative weights ( $\hat{W}$  vectors).  $n_i$  (e. g., cost and quality control, sales maximisation and market share) is the number of criteria at level  $i$  and is the same as  $n$  in (2) but subscripted to show that it belongs to level  $i$ .

The resultant vector produced under (5) for the final level in the hierarchy gives relative weights for criteria (elements) with respect to the overall objective of the decision at the first level. These composite weights may be called decision alternatives and they form the basis for selecting an alternative (Saaty, 1980, 1995; Zahedi, 1986).

This section has provided a discussion of AHP as a methodology and has presented all the steps for pairwise comparisons of AHP. These steps will be empirically demonstrated in chapter 8.

#### 5.2.4 Methodological limitations of AHP

The AHP is a qualitative method that allows a decision maker to analyse systems, even if they are large and complicated, by reducing judgements to a sequence of



pairwise comparisons of properly identified components (Saaty, 1980, 1995). The AHP is based on the principal hierarchy structure. Most systems can be modelled in a hierarchical fashion; that is, the model is constructed on several different levels of increasing aggregation, or priority, until a top level or objective is reached (Debljak et al., 1986). Also, it was designed to model the relative importance of criteria that enter into a complex decision and to identify the preferred alternative (Apostolou et al., 1993).

Indeed, the AHP is an approach to solving Multiple Criteria Decision-Making (MCDM) problems with wide applications. It also offers the advantage of not needing explicit decision variables, objective functions, or utility functions. However, there are also some limitations to the AHP approach (Debeljak et al., 1986). First, the AHP procedure generates points on an implicit utility function and solves the MCDM problem by commensurating the objective to a single measure. Another limitation is that it does not allow the decision maker to express different weights according to different combinations of objective levels. Finally the AHP assesses the decision maker's weights before commencing the optimisation process - a fact that limits the amount of knowledge the decision maker will obtain concerning the system (Debeljak et al., 1986).

There are some methodological limitations concerning the use of AHP. They include five principal areas as follows: (a) selection of an appropriate method for deriving priority weights from the pairwise comparison matrix; (b) use of the standard nine points scale, (c) problems associated with rank reversal; (d) calculation of the consistency ratio; and, (e) the impact of judgement heuristics in AHP models. Consequently, a brief discussion of these five areas of concern is presented, along with some other general comments about the use of AHP in the area of accounting research (Apostolou and Hassell, 1993).

An issue of interest to AHP researchers is that of the derivation of priority weights. The right eigenvector<sup>(14)</sup> estimation method is the most common way to derive

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<sup>(14)</sup> The right eigenvector expresses priorities in terms of dominating. In the comparison matrix all values are expressed on the 1-9 scale. The 1-9 scale assumes that judgements are more likely to be correct when the criteria being compared are close. When they are nearly the same, one can compare

priority weights in AHP, and is prescribed by Saaty (1980), and Saaty and Vargas (1982). However, when using the right eigenvector an attempt is made to measure how much a criterion dominates the other criteria. If one were to use the left eigenvector one would be asking the question of how much the given criteria is dominated by other criteria, which cannot be done directly (Apostolou et al., 1993). Saaty (1980; 1994, p: 213) considered several other approaches but “rejected them because of the proof that the eigenvector is the unique way to derive the priorities and ranks when the matrix is inconsistent”. Also, Zahedi (1986) and Jensen (1984) state that several other methods of estimation have been proposed (e.g. the arithmetic mean, the simple row average, etc.).

The use of the 1-9 judgement scale advocated by Saaty is also a point of concern in AHP. Judgements made under the bounded nine-point comparison scale illustrated in Figure 5-5 may produce measurement error (inconsistency) in the response matrix (Apostolou et al., 1993). However, Saaty (1994a, p: 213) stated that this “scale is not a guess at some arbitrary numbers which has associated with a verbal intensity. Rather, the numbers selected to correspond to the verbal intensities were carefully chosen through a long period of trial and experimentation, and they represent people’s sensing of relative magnitudes in making comparisons”. Furthermore, Harken and Vargas (1987) stated that the AHP could work with any bounded ratio scale. The nine-point scale produced values closest to the actual distances (Apostolou et al., 1993).

Given a straightforward application of the AHP in Saaty’s original form, the notion<sup>(15)</sup> of rank reversal of alternatives may occur if either a new alternative is added or an existing alternative is removed. In this case rank reversal arises as the integrity of the original alternatives may be called into question if rank reversal is presumed to exist

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them by magnifying the interval between 1 and 2 and using the 1-9 scale in the form of decimals 1.1, 1.2... 1.9 (Apostolou et al., 1993).

<sup>(15)</sup> The fallacy of rank reversal was first reported between Belton and Gear (1983). Saaty and Vargas (1984) argued in response to Belton and Gear that human preferences are affected by the presence or absence of other alternatives, owing either to a change in the range of options available, or to a realisation that a previously unrecognised criterion should also be taken into consideration. These effects need, however, to be modelled explicitly, and can then be accommodated into any MCDM approach (Stewart 1992).



(Schmoldt et al., 2001; Salo, 1997; Apostolou et al., 1993; Holder, 1990). Arguments over how best to deal with rank reversal are rooted in utility theory, and Saaty (1980) offers suggestions for the use of absolute<sup>(16)</sup> measurement in order to solve the problem of rank reversal.

It may be recalled that Saaty (1980) and Saaty and Vargas (1982) propose use of a consistency ratio, which is based upon the principal eigenvalue's relation to the principal eigenvector. Controversy exists over the suggestion by Saaty that a consistency ratio above 0.10 may be unacceptable. This is of concern to AHP researchers as it may be extremely difficult to persuade subjects to re-estimate inconsistent judgement matrices. Apostolou and Hassell (1993) claimed that the choice of a 0.10 threshold is arbitrary. However, Saaty (1994b) responded to this accusation by stating that the choice of the figure of 0.10 is based upon tests performed upon the random consistency index (R.I.). The issue over the appropriate cut-off point for tolerable inconsistency is unresolved, and it therefore appears reasonable to use the 0.10 threshold as a guide for deriving inferences about consistency. Apostolou and Hassell (1993) reported that when averaging results of AHP models across subjects, the results were not altered when models with consistency ratios up to and including 0.20 were included. Therefore, researchers with the objective of examining how particular subjects weight criteria in a decision may consider including models with consistency ratios in excess of 0.10.

The last stage of concern raised by Apostolou and Hassell (1993, p: 20) belongs to the effects of judgement heuristics<sup>(17)</sup>. They argue that "the presence of this heuristic implies that a judge may distort the relative importance of items in the paired comparisons". Also, Arrington et al. (1982) argued that the potential impact of judgement heuristics (e. g., availability and representative heuristic) on AHP models may lead to biased results. Furthermore, Saaty (1994) agrees with this point in

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<sup>(16)</sup> Absolute measurement is the comparison of some value on a scale with the unit value of the scale (Saaty, 1994). It is based on observation stored in memory, which depend on experience and on the ability to recall. Also, it is used on standardised problems. Absolute measurement is applied to rank the alternatives in terms of the criteria, or rather in terms of ratings or intensities of the criteria, such as excellent, very good, good average, below average, poor and very poor (Saaty, 1986, 1990).

<sup>(17)</sup> Judgement heuristics include: (1) The availability heuristic which "leads to overstatement of the frequency of lurid events and understatement of everyday occurrences". (2)The representativeness heuristic which "refers to a judge forcing data into existing models when such models do not accurately depict the reality of the situation being modelled" (Apostolou et al., 1993, p: 18).

principle and argues that the fault lies not with AHP but with the actual process surrounding the construction of the decision hierarchy.

Finally, as with all AHP studies, the results obtained are largely dependent on the structure of the hierarchy. An alteration of the decision hierarchy, the surrounding environment, or the underlying assumptions will have an unknown effect on results. Further, in order to achieve the research objectives and complete the requirements of this chapter, a discussion of the research methods of this study is essential. This will be the subject of the next section.

### **5.3 Research methods**

The objective of this chapter also is to discuss the research methods used in this study. It is appropriate to present an explanation of the data collection procedures. The methods investigation is presented and the questionnaire discussed further. Population and sampling are discussed.

#### **5.3.1 Fieldwork: Data gathering procedures**

Fieldwork means having direct and personal contact with people involved in the processes under scrutiny in their own environments. It is “usually taken to mean studies of social practices, such as accounting practices, in the field of activity in which they take place” (Ryan et al., 1993, p: 113).

There are various possible methods which can be used by researchers for the purpose of data collection. There are three methods that have been used frequently: observations, interviews and questionnaires (Nachmias and Nachmias, 1996). One or more of these methods may be adopted to collect data in any organisational study.

##### **5.3.1.1 Observation**

Observational techniques enable researchers to study behaviour as it occurs. The investigator does not have to ask participants about their own behaviour and the actions of others; he or she can simply watch as individuals act and speak. Investigators can also use observational methods when participants are unwilling to express themselves verbally (Nachmias and Nachmias, 1996). This method is



associated with field research, whereby the researcher attempts to attain a close attachment to the organisations that he or she plans to study. The researcher considers either a complete participant role or a participant-as-observer role (Nachmias et al., 1996). In most cases, the researcher desires that the members' behaviour and interaction remain natural. Some phenomena, however, are not accessible to the researcher's direct observation. Observational methods may, however, be used as one of the tools for collecting data in organisational studies (Gilbert, 1995).

### **5.3.1.2 Interviews**

Interviews could be either structured or unstructured. The structured interview is a face-to-face contact based on the design of a specific number of questions in which the interviewer directly records the interviewee's responses. The unstructured interview is also a face-to-face contact but it is characterised by the free nature of the discussion. In this kind of interview, there are no specific questions that the interviewer must ask since his or her main concern is to establish the emotional content of the interview (Gilbert, 1995).

The interview as a method of data collecting has both advantages and disadvantages. The technique is preferable for some problems or under certain conditions. The interview is usually used when numerous open-ended questions must be asked, in order to allow the respondents to say exactly what they think. By interview, the interviewers can give a prepared explanation of the purpose of the study more convincingly than in a covering letter. Also, the interviewer can see and talk to the respondent; therefore, he or she can write a set of real responses without too many misunderstandings (Nachmias et al., 1996).

Nachmias et al. (1996) identify some disadvantages of interviews. Interviews require both money and time, specifically when the interviewer has to interview all the respondents. The interviewees sometimes become unable/unwilling to focus on the interview points. Further, researchers sometimes find themselves confronted with a huge volume of rich data produced by the interview, which leads to the difficulty of analysing this data.

In light of the above discussion, it seems that interviews are useful techniques for obtaining rich data. However, Sekaran, (2000) suggests that there are many different types of interview method. For example, semi-structured interviews provide the opportunity for interviewees to talk freely about their knowledge. It may provide the potential for discovering issues that have not been considered before (ibid). Accordingly, the author of this study has tried to incorporate some interviews with the questionnaire to collect information used to present the seven mini-case studies of LMOs. Accordingly, a wide range of issues is covered in this study.

### **5.3.1.3 Questionnaires**

The questionnaire is an important survey method used in data collection in organisational research. It "does not require a trained staff of interviewers". The questionnaire requires only the cost of planning, sampling, duplicating, mailing, and providing stamped, self-addressed envelopes for the returns. At this point, processing and analysis are usually simpler and cheaper than any other survey methods (Nachmias et al., 1996, p: 225).

Nachmias and Nachmias (1996) suggest that there are some advantages for this kind of survey method. First, questionnaires reduce biasing errors that may result from the personal characteristics of interviewers and variability in their skills. Secondly, the questionnaire is a relatively inexpensive mode of data collection. Thirdly, the assurance of anonymity is helpful when the survey deals with sensitive issues and when people do not have to face an interviewer or speak to someone directly. Fourthly, the questionnaire is more efficient and allows for the use of larger samples. Finally, the questionnaire permits wide geographical contact at minimal cost.

### **5.3.2 Methods of investigation adopted**

In order to achieve the objectives of this study, the questionnaire has been adopted as a major vehicle for collecting data. A variety of documents was used to gather information on vital aspects of research interest about the seven companies. Considerable time was also spent in obtaining hard data (documents) from different organisations (e. g., the seven LMOs, Ministry of Industry, Ministry of Planning, etc.). Some of these organisations gave free access to some documents requested. This included several documents and records, such as regulations concerning the industry,



organisational structure, published and unpublished accounting reports, and production and sales plans.

The author believes that the questionnaire is the best device for collecting data in this study. This is because the technique can be used at a relatively low cost, in a shorter time. Nachmias and Nachmias (1996) pointed out that the questionnaire is considered to be the most frequently used data gathering technique in behavioural studies of organisations. The questionnaire provides useful information, since it yields differences in answers between groups or categories of respondents.

The decision to use the questionnaire is related to the culture context because the author's education and training were based on the employment of quantitative methods. He put a large amount of effort into thinking how to operate a methodology. However, in considering this thesis and contacting many managers from the companies investigated, he realised that the questionnaire would be difficult to operate because of the very limited opportunities for access to participants. Difficulties were encountered because of the attitudes of Libyan managers toward research in general and interviews in particular. The respondents in the study were reluctant to be observed or even to be interviewed. Therefore, the quantitative method was conducted and supplemented with some interviews with certain managers to obtain general information on the companies and the required data that should be obtained from the companies' records. This is in addition to the extreme difficulty of clarifying points about answering questions of pairwise comparisons, as described in section III of the questionnaire.

### **5.3.2.1 The study questionnaire**

The questionnaire is, therefore, the main technique employed for this study. It was designed to obtain a measure of variables related to benchmarking information. Its format was taken from the questionnaire of Nachmias et al. (1996) and Weiss et al. (1967). Also, AHP elicitation procedures to present pairwise comparisons were adapted from those of Saaty (1995) and Hassell and Arrington (1989).

The questionnaire used in this study (see appendix-1) is divided into five main sections. Sections one, two and four consist of sub-questions, each of which contain

questions pertaining to specific research variables. These sections represent: (1, part: a) personal information; (1, part: b) general information about the organisation; (2, part: c) general information about the new adoption; (2, part: d) organisational behaviours; (2, part: e) characteristics of organisations attempting to implement and adopt benchmarking; and (4, part: g) characteristics of organisations not introducing benchmarking. All of these questions are straightforward and are easy and quick to answer.

Section three consists of questions to elicit pairwise comparisons of criteria, sub-criteria and specific sub-criteria. For each pairwise comparison, the participant assigned a value from 1 to 9 beside one of the two elements, using Saaty's response scale. This was used to illustrate the relative importance of that element with respect to the other elements in that pair (see questionnaire in Appendix-1).

Section five also includes open-ended questions which concerned the effectiveness of benchmarking in LMOs. The aim was to allow respondents to present their views and express their own opinions and comments about the issues of benchmarking implementation in their organisations.

### **5.3.2.2 Reliability and validity of the questionnaire**

In general, to achieve the goals of any research effectively, validity and reliability are important considerations (Ryan et al., 1993). In many social science studies, it is difficult to attain perfect validity because of many factors, such as obstructed concepts and the infinite number of indicators of concepts (Gilbert, 1995). In this study, various strategies were used to limit threats to the validity and reliability of questionnaire responses. One such strategy was the use of multiple methods of collecting the required data and information, such as questionnaires and interviews. However, these empirical investigations involved interviewing individuals with various functions and positions. General managers and heads of departments and divisions were required to have been in the post for two years or more so that they were fully knowledgeable about benchmarking and implementation problems in their organisations.

In order to highlight any design deficiencies, the questionnaire was tested among the PhD students of the Department of Accounting and Finance, University of Strathclyde. Fifteen copies were distributed. Based on this, ten of the questionnaires



were returned with some concerns regarding the length of the questionnaire, which the researcher took into account, and the researcher found that the questionnaires were reasonably clear to the respondents. The researcher also translated the questionnaire from English to Arabic with the help of two highly qualified individuals<sup>(18)</sup> who were familiar with the environment of Libya.

### 5.3.3 Level of measurement

Measurement is closely related to the task of determination of the questionnaire variables. Nachmias and Nachmias pointed out that measurement is mostly linked to the concept of operational definitions. “Operational definitions are measurement procedures bridging the conceptual-theoretical level with the empirical level” (Nachmias and Nachmias, 1996, p: 155). Accordingly, the author has studied a number of scales which were constructed to connect a large number of criteria that could define the characteristic of variables related to this study.

#### 5.3.3.1 Managers’ characteristics

Managers’ personal characteristics as well as positional and organisational information are considered to be important in the process of adopting benchmarking in LMOs (see chapter 7 for detail).

Parts (a) and (b) in Section One of the questionnaire in Appendix-1 were designed to obtain personal information for respondents and general information about organisations:

- i. **gender:** respondents were asked to indicate whether they were male or female.
- ii. **educational background:** respondents were asked to classify their levels of education as secondary school (score=1), undergraduate degree (score=2), postgraduate degree (score=3), specialist diploma (score=4).
- iii. **place of study:** respondents were requested to indicate the place of obtained degree: Libya (score=1), Arab Countries (score=2), USA or Canada, Western Europe (score=4), Eastern Europe (score=5).

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<sup>(18)</sup> These individuals were Libyan academics with industrial experience. This ensured that the questions would be understood by the respondents.

- iv. **job position:** respondents were asked to indicate their position as manager (score=1), supervisor (score=2), accountant (score=3), engineer (score=4), administrator (score=5).
- v. **number of employees:** respondents were asked to indicate the number of employees in their organisation. This was arranged on a five-point scale and ranged from fewer than 500 employees to 2000 employees or more.
- vi. **length of time of organisation in business (experience level):** respondents were requested to indicate on a three-point scale the number of years of their organisational experience that they have in business. Experience ranged from one year to more than eight years.

### 5.3.3.2 General information about new change (benchmarking) adopted in LMOs

As shown in Section Two, part (c) of the questionnaire in appendix-1, several questions related to information about benchmarking and its implementing in LMOs as:

- i. **implementation of benchmarking:** respondents were asked to indicate whether their organisation had introduced benchmarking (score=1), intended to introduce benchmarking (score=2), had given consideration to introducing benchmarking (score=3), had decided not to introduce benchmarking (score=4).
- ii. **length of time that organisation has practised benchmarking:** respondents were requested to indicate the length of time that their organisation had practised benchmarking. This length was on a five-point scale and ranged from 1 year to more than 15 years.
- iii. **areas of benchmarking:** respondents were asked to determine their organisation's area of benchmarking. Areas were classified as: cost control (score=1), quality control (score=2), sales maximisation (score=3), market share (score=4).
- iv. **length of period to implement benchmarking fully:** respondents were requested to indicate on a four-point scale the length of time to implementation of benchmarking fully in their organisation. This ranged from less than 1 year to 2 years or more.



- v. **model of benchmarking:** respondents were asked to classify whether their initial benchmarking goals were taken from large organisations (score=1), small organisations (score=2), medium-sized organisations (score=3), or unknown sized organisation (score=4).
- vi. **evaluation of organisation assets:** respondents were requested to indicate on a five-point scale the evaluation of their organisation's assets in situation of benchmarking adoption. This ranged from under 50 million Dinars to 500 million Dinars and more.
- vii. **benchmarking process reviewed:** respondents were asked to indicate how frequently benchmarking processes are reviewed in their organisation, measured as monthly (score=1), quarterly (score=2), semi-annually (score=3), annually (score=4).

### 5.3.3.3 Organisational behaviours

Part (d) of Section Two of the study's questionnaire in appendix-1 consists of the following:

- i. **there are ten statements regarding managers' behaviours in situations of benchmarking adoption:** respondents were asked to evaluate these statements on a five-point scale, such as strongly disagree (score=1), disagree (score=2), agree (score=3), strongly agree (score=4). This part of the questionnaire was adopted from information based on theoretical perspectives of benchmarking, discussed in chapter four of this study. Therefore, the adaptation of this information was developed and re-written to make it suitable for use in this study.
- ii. **Stability/instability of benchmarking organisation:** respondents were asked to identify whether their organisation's structure, managers, leadership and market conditions have changed significantly within the last five years. The identification of number of changes for the organisation was measured by a four-point scale ranging from one time (score=1), two times (score=2), three times (score=3), none (score=4).

### **5.3.3.4 Characteristics of organisations attempting to implement and adopt benchmarking**

Part (e) of Section Two of the study's questionnaire in appendix-1 was specifically directed at finding out what methods were used by organisations to encourage employees to accept benchmarking. This part also presents characteristics related to organisations' consideration of whether to implement benchmarking (e.g. culture and environment, setting priorities of criteria, firm size in selecting partners and model of benchmarking, employees' skills, resources available, accounting system, R&D, technology, markets, etc.).

- i. **methods used to encourage employees to accept benchmarking:** respondents were asked to determine what methods were used by their organisation to encourage employees to accept benchmarking. The determination of this was classified on a four-point scale as never (score=1), sometimes (score=2), usually (score=3), always (score=4).
- ii. **there are fourteen statements considered to be important in the situation of benchmarking implementation:** respondents were asked to evaluate the importance of each statement on a numeric value scale from 1 to 4 ranging from: not important (score=1), somewhat important (score=2), important (score=3), very important (score=4).

### **5.3.3.5 The pairwise comparison criteria**

Section Three (f) of the questionnaire consisted of six comparisons criteria, twelve comparisons sub-criteria, and twelve comparisons specific sub-criteria. These thirty (6+12+12) pairwise comparisons between the elements should be made by each participant into the questionnaire. At this point, each participant was required to give weights ranging from 1 to 9 (AHP elicitation technique response scale) beside one of the two criteria, sub-criteria or specific sub-criteria. Definitions of each element in this section were supplied by the researcher in order to reduce ambiguity and ensure consistency across participants' responses (see questionnaire appendix-1).

### **5.3.3.6 Reasons not to introduce benchmarking**

In Section Four (g) of the questionnaire in appendix-1 there are many important factors which some organisations have not considered in the context of benchmarking. Such factors are many dimensions of performance; insufficiently trained manpower;



insufficient resources; conflict of interest between managers; incompatibilities of organisation structure; changes in market conditions and technology; lack of skilled employees; economic importance; resources allocation organisational culture and environment; etc. Respondents were requested to evaluate each factor on a four-point scale ranging from: strongly disagree (score=1), disagree (score=2), agree (score=3), strongly agree (score=4).

### 5.3.3.7 The effectiveness of benchmarking in LMOs

Section Five (h) of the questionnaire in appendix-1 consists of six open-ended questions as follows:

- i. **type of benchmarking:** respondents were asked to indicate whether the most effective benchmarking in their organisations would be product, function, best practice, or strategic benchmarking.
- ii. **benchmarking goals:** respondents were requested to determine who understands benchmarking goals, whether it be their top management, top management and most middle management, every manager or supervisors and a few managers.
- iii. **Benchmarking not effective:** respondents were asked to determine why benchmarking was not as effective as they expected. The possible reasons for effectiveness relate to relevant organisational culture change, unclear benchmarking goals, lack of implementation of benchmarking findings, or other.
- iv. **Success of benchmarking activities:** respondents were asked to evaluate the level of success in benchmarking activities as completely successful, very successful, moderately successful, or still in the process of implementing benchmarking.
- v. **Measure the effectiveness of benchmarking:** respondents were requested to describe the way their organisation measures the effectiveness of benchmarking. The measurement of this was related to profitability, increased competitive advantage, improved customer satisfaction, or improved process performance.
- vi. **Perceive benchmarking as a management tool:** respondents were asked to judge whether benchmarking in their organisations was very effective, somewhat effective, or not effective.

### 5.3.4 Population and sampling

The Libyan economy in recent years has been dominated by the oil sector as discussed earlier in chapter 2. During the period of the seventies, Libya made development of its industrial sector a priority, based on the belief that this sector could play a vital role in the development of the economy, perhaps replacing the oil sector in the future. Industrialisation is regarded as the major means of solving the problem of under-development and making it possible to achieve a higher level of economic development in Libya. Therefore, the researcher considers only industrial sector organisations in this study.

According to information obtained from the Industrial Guide for the Secretariat of Industry and Minerals (1999), industrial sector organisations are categorised in terms of the type of their products into six sub-sectors: metallurgical industries (e.g. iron and steel company), electrical and engineering industries (e.g. trucks and vehicles companies), chemical industries (e.g. national company for soap and detergents), spinning, textiles, furniture and paper industries (e.g. general national company for spinning and textiles, general furniture company, etc.), food production industry (e.g. general national company for processing soft drinks) and building materials industry (e.g. Arab cement company).

The thirteen manufacturing organisations located in Tripoli and areas near it (e.g. Tajora, Al-Khums, Zliten and Misurata) were contacted. These organisations were contacted by facsimiles and by formal letters<sup>(19)</sup> sent out from the Higher Institute of Management and Finance (the researcher's workplace), in addition to informal contacts through friends and relatives. Out of 13 organisations contacted, only 10 replied; of these, 7 organisations replied with a positive answer. Of these 7 organisations 5 have fully implemented benchmarking and 2 were experiencing benchmarking problems; therefore, they had failed to implement benchmarking (see chapter 6, 7 and 8 for more detail).

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<sup>(19)</sup> The letter explaining the objective of the study and ensuring anonymity of responses was sent in advance to the organisations.



### **5.3.5 Scope of the study**

As mentioned in the above section, this study covered seven companies in four different geographical areas in Libya (Tripoli, Al-Khums, Ziliten and Misurata). However, these companies are under the supervision of the Secretariat of Industry and Minerals. As a condition of obtaining access for data collection, this study was not allowed to mention the real name of the companies under investigation. Accordingly, the researcher adopted a new name for each of the seven anonymous companies to be used in presenting data collected for this study. Seven different letters 'A', 'B', 'C', 'D', 'E', 'F' and 'G', are used to refer to these companies and their activities.

The researcher was able to obtain access to collect data through personal relationships with managers within the companies named above. He believes that getting access plays an important part in conducting research in Libyan organisations, as efforts to obtain information by other methods (e.g. letters, facsimiles) fail to achieve a response. It is very difficult for Westerners to understand the complexity of something as apparently simple as data collection.

The fieldwork of this study has limitations on available resources such as time scheduled and required. For example, there were difficulties travelling to Libya at the time scheduled to conduct the fieldwork because of a UN Air Sanction. Also, the procedure of visa extension for Libyan nationality has been made very difficult by the immigration office in London. The author was unable to travel to Libya in June 1999 and May 2000 to collect data because he was not in possession of his travel document. Therefore, the fieldwork was not conducted until July 2000.

### **5.3.6 Distributing and collecting the questionnaires**

In this section, the procedures of data collection will be discussed. The data took four months to be collected from the seven companies mentioned. The first stage involved 3 months (from August to October 2000). The second stage involved only one month (September 2001) to collect missing essential data for this study. This was in addition to data collected in March/April 2003 to provide additional information about the seven LMOs.

After obtaining permission from the sponsors to conduct the research fieldwork in Libya, the first step in the fieldwork was to take an official letter from the sponsors requesting the Secretariat of Industry and Minerals in Libya to assist the author in collecting the information by giving him permission to gain access to the companies. Moreover, he visited the Secretariat of Industry and Minerals in order to obtain the names and locations of manufacturing organisations, and other useful information for this purpose. Data collection procedures were carefully prepared, starting from determining the number of managers who were selected to fill in the questionnaire. The researcher visited the general management of each of the seven companies to arrange a personal meeting with their respective chief executives in order to obtain their agreement on this matter. The chief executives of the seven companies appeared eager to co-operate with him in distributing the questionnaires in their organisations and in providing other information which was needed.

The questionnaire was distributed personally to 140 participants in seven companies. The participants who showed their readiness to respond were informed of the purpose of the study and were assured that their individual responses would be treated confidentially. To secure effective participation, an opportunity to discuss the questionnaire was offered to the participants through the researcher's personal attendance. Accordingly, completion<sup>(20)</sup> of the questionnaire could be considered as semi-structured interviews, because the discussion enriched the researcher's knowledge of the respondents' answers, instead of having to rely solely on what was written in the questionnaire. Respondents to questionnaires in developing countries, such as Libya, are frequently reluctant to help or to give meaningful information.

Distributing the questionnaire required five weeks owing to many factors, such as geographical distances between the seven companies, and the time spent waiting for meetings with managers who were often not found or busy. After this period of time, the researcher started to contact the participants to find out whether they had finished completing the questionnaire. At this stage, some of them requested two more weeks, others three weeks, and a few numbers had finished on time. About two weeks later,

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<sup>(20)</sup> The questionnaire was completed in the seven companies by general managers (or managers) of accounting and finance, auditing managers, R&D managers, technical general managers, sales managers, marketing managers, operational managers, et al.



the researcher contacted the participants to remind them about the questionnaire. However, only 106 (75.71%) completed questionnaires were received (see Figure 6-1 below) and reviewed by the researcher in order to avoid any missing answers.

It is worth mentioning that the questionnaires of only ten participants from each company are considered as a sample of data for analysis and results of this study. This is because the study was based on a convenience sample and included managers from different departments in the seven companies.

**Figure 5-7**

**Distribution of the population sampled for questionnaire**

Name of companies (investigated) <sup>(1)</sup>	Number of questionnaires distributed	Number of complete and incomplete questionnaires received (or returned)	No. of complete questionnaires considered <sup>(2)</sup>
1- Company A	20 (14.29%)	14 (13.20%)	10
2- Company B	20 (14.29%)	15 (14.15%)	10
3- Company C	20 (14.29%)	16 (15.10%)	10
4- Company D	20 (14.29%)	13 (12.26%)	10
5- Company E	20 (14.29%)	13 (12.26%)	10
6- Company F	20 (14.29%)	18 (16.98%)	10
7- Company G	20 (14.29%)	17 (16.03%)	10
Total	140 (100%)	106 (75.71%)	70

- (1) The participants within each of companies A, B, C, D and E have indicated that benchmarking has been introduced in their organisation. Therefore they were required to answer all questions included in the questionnaire. However, the participants in companies F and G have indicated that benchmarking has not been introduced in their organisation. Accordingly, they were required to answer only the questions in sections I and IV of the questionnaire. Furthermore, many of returned questionnaires from the seven companies were uncompleted. Therefore, the researcher had to go back to the participants who had returned incomplete questionnaires and ask them to complete the questionnaire in order to obtain the considered sample (10 participants from each company) used for this study.
- (2) The choices of the ten considered questionnaires within each company were based on the fully completed questionnaires by participants who belong to different departments in the seven companies. Also, these choices were made to participants who showed their readiness to respond and their awareness of the concept of benchmarking when they were interviewed. This was in addition to the fact that these ten chosen participants were selected in respect of their experience and knowledge of benchmarking implementation problems as well as the length of their service in the company (e.g. two years or more).

Fieldwork usually has its difficulties regarding time, communication behaviours of managers to such studies, and past experiences of managers. Some participants are busy with their work, especially those working in big companies; therefore, the researcher spent a long time waiting to meet those participants as well as waiting for them to return completed questionnaires. Other participants did not even bother to complete the questionnaires, but kept on asking the researcher to come back another day. Others promised to mail the completed questionnaires back but did not keep their promises. Despite these problems and others, 106 questionnaires were completed and collected out of the 140 questionnaires distributed.

### 5.3.7 Statistical techniques used for data analysis

The statistical techniques applied in analysing data were based on the types of variables related to this study. Descriptive statistics such as mean, standard deviation and frequency distribution are used to describe the important aspects of the study variables. Other statistical tests are used, such as Pearson product correlation coefficients (two-tailed) to examine the links between the variables (see chapter 7). This statistical test is useful when a relationship between the variables is expected, but the direction of the relation is not predicted. The Pearson product correlation coefficient requires parametric data because it is based upon the average deviation from the mean (Field, 2003). It measures how the variables could be positively or negatively related or not related at all. Underneath each correlation coefficient both the significant value of the correlation and the sample size ( $N$ ) on which it is based are displayed. Each variable is perfectly correlated with itself when  $r = 1$  along the diagonal of table or has significance value when the probability ( $P$ ) value below 0.050. The outputs of Table (7-24) for chapter 7 show results of the correlations of some variables. For instance, the correlation coefficients between the four scale variables in question 14 of the questionnaire (e.g. question 14.1, 14.2, 14.3 and 14.4) are positively but moderately correlated ( $r = .210$  to  $.500$ ) with each other and statistically significant at  $P \leq .020$ .

All the responses of sections one, two and four were processed and analysed through the Statistical Package for Social the Sciences (SPSS)<sup>(21)</sup>. Responses to section five

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<sup>(21)</sup> The statistical package used here is SPSS (McCormack and Hill, 1997); Kinnear and Gray, 1999; and Field, 2003).



were used in writing the mini-case studies for the seven LMOs (see chapter 6). Also, the responses of section three were directed and analysed through AHP (see chapter 8 for detail) by using pairwise comparison, consistency index, and consistency ratio to illustrate priorities across criteria.

#### **5.4 Summary**

This chapter was divided into two sections. The first section introduced Saaty's Analytic Hierarchy Process. AHP has been developed as an aid to decision processing in many areas of politics and business, medicine, accounting and auditing, and education. In accounting research, the primary uses of AHP have been in modelling the decision process of individuals (Apsotolou and Hassell, 1993), and accounting judgments (Hassell and Arrington, 1989) and expert judgments on analytical review procedures (Arrington et al., 1984).

The structure of AHP can deal with complex decision problems. AHP is able to provide a framework and model for a number of criteria, sub-criteria and specific sub-criteria that impact upon decisions. Consequently, constructing a hierarchy is attained to assess the impact of the criteria of a higher level on those of a lower level. Criteria in any level are required to be compared amongst themselves with respect to criteria in the next highest level. Also, through the eigenvalue approach to pairwise comparison, AHP provides a method for determining the values of decision criteria and selection choices in a hierarchy through judgements elicited under a nine points scale.

The reliability of the model which is produced under AHP may be tested by reference to the consistency ratio proposed by Saaty (1995, 1980) and Vargas (1982). Measurements of consistency in judgements enable the researcher to determine whether judgements accurately reflect the cognitive processes of managers under study.

AHP has found a vast range of practical and research applications. However, there is some controversy regarding certain elements of the process and their axiomatic foundations. The importance of these potential limitations cannot be understated; but,

on the basis of existing evidence and owing to a lack of more proven methods, the prominence of AHP continues to grow.

This study employs AHP as a procedure for modelling managers' priorities for benchmarking criteria as a function of the desirability of various multiple attributes. Specifically, the cognitive processes of managers' priorities with respect to their determination of benchmarking criteria, sub-criteria and specific sub-criteria, as modelled under AHP, form the most important part of this study.

The second section has outlined the methods and procedures employed in this study. The author used the questionnaire method to collect data, a difficult task when conducted in a society where no value is placed on research. Several interviews were conducted with selected managers to obtain the required information with additional data acquired from company records.

The questionnaire method was selected for data collection in seven manufacturing organisations (named A, B, C, D, E, F, and G) in four geographical areas (Tripoli, Al-khums, Ziliten and Missurata). The questionnaire contained four main sections as a measure of variables related to organisations and managers' behaviours in the context of benchmarking. The questionnaire was pilot-tested among the PhD students of Department of Accounting and Finance, University of Strathclyde, in order to highlight any design deficiencies.

Data collection was performed in August, September and October 2000 as well as September 2001. At this point, 140 questionnaires were personally distributed, 106 completed questionnaires were received, while only 70 of them have been considered as a sample for data analysis in this study. Statistical techniques and AHP were applied to this data (chapters 7 and 8).

This study also used mini-case study methods for data collection in order to undertake a descriptive analysis of the organisational context within the seven companies (chapter 6). These will be the subject of the next chapter.



## CHAPTER 6

### 6. Descriptive analysis of the organisational context: 7 mini-case studies of LMOs used in this study

#### 6.1 Introduction

This chapter addresses the first (1.3.1) and fourth (1.3.4) sub-objectives of this study. It also responds to the first (1.4.1), second (1.4.2), third (1.4.3) and fourth (1.4.4) research questions in order to provide complete information which enhances understanding benchmarking practices in LMOs. Thus, the aim of the chapter is to understand and explain general information about benchmarking adoption in LMOs within their environmental development context. To understand this task effectively, it is important to clearly provide both a detailed description and evaluative analysis of the Libyan environmental context at two development levels (macro and micro). The Libyan environmental context, including culture at a macro level, was discussed in chapters two and three. In order to achieve the research objective, a descriptive analysis of the organisational context at the micro is provided in this chapter.

The data presented in this chapter concerning the seven companies was obtained by means of questionnaire and semi-structured interviews with managers (discussed in chapter 5). As indicated in 5.3.1.2, an interview method was planned in order to gather insights into significant issues related to benchmarking practices in LMOs within their environmental context. This is in addition to information collected from six open-ended questions focused on the effectiveness<sup>(1)</sup> of benchmarking within each company<sup>(2)</sup> (see Appendix-1 of the questionnaire).

This chapter is organised as follows: Section 6.2 provides some additional explanation of the historical background of Libyan industry. The next seven sections discuss and review each of the seven companies. Section 6.10 presents brief

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<sup>(1)</sup> The effectiveness of benchmarking in LMOs in respect of types (e.g., function, production and strategic), level of understanding benchmarking goals (e.g., top management, middle management), and level of successful of benchmarking activities (e. g., very successful, moderately successful, etc).

<sup>(2)</sup> The discussion of the six open-ended questions will be only considered in five companies. The other two companies have been eliminated in this section because they are failed to implement benchmarking.

discussion of managers' responses to six opened-questions focused on the effectiveness of benchmarking for the companies investigated. The final section, 6.11, presents the chapter summary.

## **6.2 Historical background of Libyan industry**

As mentioned in chapter two, industry was effectively introduced in Libya during the Italian occupation (1911-1942). By 1938, 789 industrial establishments were in existence, making basic consumption goods within the country. These establishments were mostly small in size and were located in Tripoli, Benghazi, Darnah and Misurata (Abbas, 1987; Barker, 1982).

Libya started the industrialisation process from a very low level. The development of industry was very limited at the beginning of Libyan independence (1950s). The industrial organisations existing before the discovery of oil were very small due to the lack of investment resources, raw materials, and power and fuel resources (Giurnaz, 1985; Barker, 1982).

In 1961 Libya's Ministry of Industry was established to supervise state-owned companies and to plan the development of private and nationalised industries. Consideration was given to developing the industrial sector in 1964 (Bait-Elmal, 2000). Accordingly, "Libyan industry policy was [focused on] raising the level of industrial production in quantity, kind and quality". Government policy was also supporting the private sector by providing loans and technical information for private investors (Aгнаia 1996, p: 188; The Middle East Economic Handbook, 1986).

Libyan industrial organisations are classified under six sub-categories, namely: basic mineral industrial; electrical & engineering; chemical; spinning, textiles, furniture & paper; food industries; and building materials. These sub-categories contain more than 31 industrial organisations including 180 (or more) compounds and productive factories (Industrial Guide to the Industry and Minerals Sector, 1999).

Through the fieldwork and analysis of company documents, it appears that only a limited number of organisations in Libya are well informed about benchmarking.



My interviews showed that many managers reported that the business goals in their organisations are unclear. They reported that firms frequently display multiple and conflicting objectives.

The present study is specifically aimed at understanding and explaining the benchmarking process in seven LMOs. In order to undertake this effectively, it is important to clearly provide a brief description of the organisational context for each of the seven LMOs. The seven companies - treated anonymously in this account were given the designators 'A', 'B', 'C', 'D', 'E', 'F' and 'G'. Confidentiality of information was thus assured.

### **6.3 An overview of company A**

Company A is in the chemical industry and is located to the west side of Tripoli. Established in 1968 with capital of 4.5 million Libyan Dinars (LD), capital has increased to 30 million LD (see Table 6-1 in appendix-2). The company includes 4 compounds, factories, and production units. It was established to manufacture an array of widely used chemical goods. The work force size currently comprises more than 1000 employees (see Table 6-1 in appendix-2). The company achieved 7.39, 9.80 and 9.08 million Dinars during the years 1998, 1999 and 2000 respectively (Central of Industrial Information, 2001).

#### **6.3.1 The company management and structure**

In accordance with the political system in Libya, many industrial companies are managed by peoples' committees (see chapter 2) consisting of five members elected by employees or appointed by the government, with one of the members chosen as the General Secretary (chairman) of the committee. While many such committees have officiated over the company's management since it was established, the current committee and its chairman were appointed during 1991 and were chosen by the Ministry of Industrial Affairs. When the new committee started its work, there were changes of many heads of departments, with people from outside the company becoming heads of department and advisers to top management.

The company's structure consists of the central management and factories and production units. The central management occupies three main hierarchical levels: the management committee level, departmental/factory level, and divisional level. The management committee establishes policy which is transferred to the departments and factories at the divisional level and then down to the operational level. This line of authority is also utilised to exercise accountability for performance in the factories and departments. The following information summarises the structure of company A central management and factories:

1. **Company central management:** this consists of three departments each headed by a manager responsible for the day-to-day operation of work and co-ordination of tasks. The main duty of central management is to support the four factories by providing the services and logistics they need, and to aid in the supervision and oversight of these factories by sending and receiving periodic reports and paying site visits. The lower-level departments and their functions are as follows:
  - a) *Marketing department:* this department handles the sales and marketing of company products. It is also responsible for the supervision and control of all inventories and storage facilities. This consists of three divisions: sales, imports, and inventory and storage facilities.
  - b) *Financial and administration department:* this department is responsible for financial affairs of the company in general and for the financial statements for the company as a whole. It is concerned with administrative procedures in the company such as employment, attendance, mail, transport, etc. This department is divided into five divisions: accounting, costing, auditing, budgeting, service and general affairs.
  - c) *Technical department:* this department is concerned with the supervision and observation of production operations in the factories and attempts to find solutions for any problems which may face them. It consists of four divisions: production, research and development, quality control, and maintenance.



2. **The factories:** the company has two factories for processing production. Each factory has its own managers who are accountable to central management. The heads of divisions within the factories report and are accountable to their factory's manager. The role of factory managers is centred with the production process and day-to-day duties in the factories, such as co-ordination between the factory's divisions, and between them and managers' departments. Each of the factories consists of a financial and administrative division, production and inventory division, planning unit and industrial safety unit. Furthermore, each factory is responsible for preparing its accounts and financial statements and sending them to the company central management.

### **6.3.2 The Company's objectives**

Many surveyed managers indicated that this company does not face any difficulties in marketing its products, as the demand for its products exceeds supply. Problems occasionally arise due to shortages in raw materials and spare parts. To that end, the company's objectives have not apparently been formalised into a written statement. The formal purpose in establishing the company was to provide goods of high quality in the company's market area. However, within the last decade the company has found it difficult to achieve this purpose. Constraining factors include shortages of hard currency, raw materials, and spare parts.

### **6.3.3 The accounting system in the company**

It is important to understand the role and purpose of the accounting system in this company. According to the Libyan commercial code of 1953, companies act of 1970, and Libyan tax law No. 64 of 1973, organisations must keep the following: a general journal, an inventory and balance sheet book, and other records and books i.e., general ledger, subsidiary journals. This company also has a financial system which registers events and records by writing all transaction entries in daybooks and ledgers as well as preparing financial statements. Accordingly the main function of the accounting department in company central management and factories appears to be

to record, classify, and report financial transactions to general management and to promote accountability for performance evaluation purposes.

#### **6.3.4 Company effectiveness and benchmarking**

Company A appears to be one of the LMOs which has implemented benchmarking in quality control for many years. Such benchmarking took the company years to fully implement (see Table 6-1 in appendix-2). This was underlined by two factory managers when they asserted: “our company has been practising benchmarking in quality control for many years. We have considered some other criteria (i.e. cost control and sales maximisation) but not as much as quality control.” They added that “sometimes the company does not have quality targets because of the shortage of raw material and spare parts.” There was, at the time of interview, a shortage of good quality raw material.

### **6.4 An overview of company B**

This company is considered one of the four industrial companies in the field of basic metallurgical industries. It is located on the east side of Tripoli. This company was established in September 1979. The capital assets of this company are 1.25 billion LD (see Table 6-1 in appendix-2). It is therefore considered to be a large company. There are eight factories and production units related to this company. It employs more than 5000 people (see Table 6-1 in appendix-2), supplying high quality 'self-service' products. The company achieved 207.02, 234.96 and 230.15 million LD in production output during the years 1998, 1999, and 2000 respectively (Central of industrial information, 2001).

There are two different managerial structures that have been used to manage company B since its establishment in 1979. In the first period of the company's history a management committee (1980-1988) was appointed by the Ministry of Industrial Affairs. Since 1988, the company has shifted to a general representative managerial structure. In general, the management committee was composed of the president and four other members. Within the boundaries of laws, regulations, decisions and recommendations, the committee has the right to 1) recommend the



general policy which the company should follow; 2) study the budget, balance sheet, profit and loss account and profit dividends; 3) issue internal regulations, and other regulations which organise and concern the company's financial and managerial affairs and its organisational chart; 4) invest the company funds; and 5) discuss and analyse the suggestions and recommendations of the president and/or general managers as they relate to the company.

Management by a 'general representative' was the second managerial structure used in the company. All authorities and responsibilities were entrusted to this general representative to whom twelve general (senior) managers and four general managers (of sector) reported directly. The representative's role is similar to what is known in Western companies as a chief executive. However, two managers expressed their dissatisfaction with this managerial type and argued that the previous one was more appropriate for running the company. Their point of view was that this managerial structure was a retrograde movement and was responsible for bringing about less co-operation among the company's personnel.

Through the interviews and documented information, it appears to the researcher that the company objective is to improve the quality level of its products. However, one manager stated, "in the beginning the objective of establishing this company, as a part of the country's development plan, was the creation of an industrial structure in this field. But after many years, the company noted that losses were becoming larger, and so it started thinking about new processes in order to deal with the problem. The new process was different in that it became necessary for any project to be economically feasible, although profit was still not the goal. But it was important for the company at least to be able to cover its product costs, and it did not matter if the company was able to make some profit."

#### **6.4.1 The company management**

As discussed above, the general representative (or chief executive) sits at the commanding heights of the hierarchy of company B. The next level is entrusted to the general managers of four operational sectors (viz. services and administrative

affairs, financial accounts and commercial affairs, technical affairs and production affairs. At the level below the operational sectors there are twelve general managers who concurrently are also the members of company committee. These general managers occupy the middle level in the company's management structure.

In providing a clear picture of the general management sector of financial accounts and commercial affairs, it is important to point out that this sector includes three general management groups<sup>(3)</sup> headed by a senior manager who supervises three or more managers. The structure of these management groups is functional; for example, general management for materials and purchases deals with company operations and transactions procedures, vouchers and other records of payments, receipts, etc. The purpose of these vouchers and documents is to help understand the company's operations by making it possible to easily review any transaction or process at any stage. This management group plays a central role in procuring the whole range of different purchases, contracts and invoices for the company. The general management group responsible for accounts and finance is headed by a senior manager who supervises three managers such as general accounts and budgeting, cost accounting, and asset accounting.

#### **6.4.2 Company meetings**

The company regularly holds daily, weekly and monthly meetings. The senior managers (within each of the general managements) and junior managers (within each division) meet daily. The objective of such daily meetings is centred on the technical problems which face the company's production process and when and how these problems can be resolved. Despite consuming much of higher management's time, these meetings play a vital role in communicating lower level problems (through senior managers) to the general managers' level of the sectors and then to the chief executive. Through these meetings top managers try to improve the production procedure to achieve the targeted production.

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<sup>(3)</sup> Such as general management for material and purchases, general management for marketing and commercial, and general management for accounts and finance.



The weekly meetings are attended by the general managers of four sectors and senior managers of each general management group. In these meetings work or procedural problems which may last for a week or more are discussed. These meetings are usually concluded with certain actions identified and responsibility allocated so as to solve these weekly problems. The recommended actions and procedures are formally inscribed in meeting minutes, and their implementation is normally followed up.

The monthly meetings are confined to the company chief executive and general managers within each of the sectors, with less technical issues discussed. General policies, new processes or procedures, and productivity and manpower planning are usually explored in these meetings. The conclusions reached at such meetings are not normally final but are heavily dependent on industrial sector agreements in Libya signed off by the ministry.

### **6.4.3 Company problems**

Two of the company B general managers described some problems which the company has faced within the last five years. They indicated that these problems bring undesired consequences and impair the company's efficiency and effectiveness. They summarised as follows:

1. The US technological embargo and 1992 UN embargo on Libya have harmed the company in the following ways:
  - a) Failure to attain certain connection and spare parts for some equipment has impacted negatively on many operations;
  - b) Business travel costs and expenses of training abroad have increased dramatically;
  - c) The technology boycott on Libya makes it difficult to continue the company's development projects and program.
2. The remarkable increase in local market prices has increased the cost of production.
3. Frequent delays in authorising capital budgets by industrial sector for several months harms the company and delays its capital projects.

4. The calls on company personnel for military deployment cause shortages of experienced operators with consequent increases in production costs (i.e., overtime payments).

Most of the above mentioned problems were highlighted by several managers in this case and in other surveyed companies. Such difficulties are very influential in their day-to-day work. In the company B case the embargo brought about structural and operational changes. The embargo has also required the company to pay higher prices, invest more money, and use more working space.

#### **6.4.4 Company effectiveness**

Observed decline in productivity may reflect the company's shortage of skilled personnel, facilities and systems. During the period (1999 - 2000) as two managers indicated, the company paid little attention to managers' performance and reward. This was because of the delay in authorising capital budgets and the substantial budget cuts. Consequently they stated that when employees receive unsatisfactory salaries or rewards which do not permit maintenance of an acceptable living standard, they normally reduce their work effort and/or look for another job. However, the researcher observed throughout the fieldwork that many managers were satisfied with their job before 1999. For example, many of them indicated that the reward system encouraged productivity and improved quality. At this point, the company was awarded certificates as 12<sup>th</sup> quality international European award for the year 1998 in France.

From the above discussion, it appears clear that company B has implemented benchmarking in quality control (as the most effective tool and function of benchmarking) for more than five years. It regarded quality control as the most important area (90%) to be benchmarked, along with cost control (40%) and sales maximisation (40%) (see Table 6-2 in appendix-2). Most managers indicated that it took more than two years to completely implement benchmarking. However, a few managers stated that the length of time was less than two years (see Table 6-3 in appendix-2).



## 6.5 An overview of company C

Established in 1972 and located in Tripoli, Company C is in the food production industry. With working capital of 58 million LD, it is a medium-sized company with a workforce in excess of 1500 (see Tables 6-1 in appendix-2). The company includes two compounds, factories and production units as well as branches in Benghazi and Sabha. It achieved 30.5, 34.05 and 31.4 million LD in production output during 1998, 1999 and 2000 respectively (Central of industrial information, 2001).

Since 1982, a people's committee (PC)<sup>(4)</sup>, consisting of five members selected by employees, manages the company. One of the five members is appointed as the General Secretary (PC's secretary) of the committee. The secretary and the four members of the PC play an important dual role in company C. They occupy the highest level in the company and, at the same time, they head the five sections at the middle hierarchical level. The general managers develop tactical plans and directly supervise middle-level management. The PC secretary has the role of chief executive.

A management committee is comprised of the president and two members. The committee is accountable to and controlled by the Company's General Assembly. The management hierarchy consists of three levels, top management (e.g. president and two members), middle management which is composed of four general management groups (e.g., technical, production, commercial and administrative, and financial and accounts) and lower level management. Other management positions include:

1. *General management for technical affairs* consisting of three departments. These managers address problems that confront company operations and assist the two factories in providing maintenance and services.

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<sup>(4)</sup> For further discussion see sections 2.2.

2. *General management for production* consisting of eight departments. The main concerns of this management are improving productivity, performance measurement, and quality improvement.
3. *General management for commercial and administrative* is responsible for hiring and training new employees, managing purchases, sales, and marketing of company products, and control of inventories and storage facilities. This management consists of seven divisions: administrative affairs, credit and insurance affairs, sales, purchasing, general services, and inventories.
4. *General management for financial and accounts* develops performance measures and is responsible for the reporting functions. Senior managers have described this management group as change agents instrumental in the development of performance measures that relate ongoing activities to the company's strategic priorities. It consists of four departments -- general accounts, budgeting, costs accounting, and information accounting.

### **6.5.1 The accounting system**

Despite the claims of some managers, investigations revealed that the role of accounting in Company C is mainly clerical and directed towards decision confirmation and legitimisation. However, an accountant in the financial department asserted that “the role of the accounting system in this company is to record the cash movement and daily events, and nothing else”. The researcher observed little use of accounting information in the day-to-day affairs of the company. For example, decisions regarding pricing, evaluation of cost centres or departments, product lines, etc. were not based on accounting data. Also, the role of accounting reports in decision-making is limited. Overall, financial issues seem to carry little weight, and accounting and finance personnel are rather detached from the mainstream of management practice. Consequently, concern for financial criteria, profitability, and economic efficiency was predominantly indicated by those who were directly confronted with the problem of obtaining finance (e.g. top management and the finance manager).



### 6.5.2 The company's objectives

Based on observation of internal performance reports as well as one manager's interview responses, it seems that this company has unclear objectives. Such lack of clarity confuses the lines of authority and responsibility of company management as well as delaying the company in day-to-day operations. As one manager stated -- "many managers work in an atmosphere of uncertainty, because they do not know exactly what objectives they are seeking. Such uncertainty creates a major source of dissatisfaction. They have very little say in setting objectives and usually have no confidence in, nor agreement with, the objectives which situations (e. g., absence of comprehensive planning and interference from the governmental bodies in not giving letters of credit for external purchase orders and determining the price of the products) indicate to them as essential goals to pursue".

It appears that the company's main objective is seen as ambiguous to many people within it. Some of them indicated that the objective was to serve the product market well. Others said the objective was profit, while still others said it was to create a better industrial structure both inside and outside the company. Others said they did not know. Further, for all objectives, there was little agreement as to how they might be achieved. A representative response from a member of the product planning management group captures this organisational ambiguity: "the objective of our company is not clear, because we do not know exactly if it is to provide products to the market of superior quality at a low price, which means that we sell at a loss, or whether the objective is to endow the company's products with a reasonable profit margin.

The formal purpose of establishing the company was to provide goods in the company's market segment displaying good quality at a low price. However, the company has found it difficult to achieve this target within the last five years or more. This is due to general reasons including shortages of hard currency causing resultant shortages in new materials and spare parts and interference by various governmental bodies in the company's policies (e.g., sales price,) and management.

Through discussions with a key member of the company's management committee, it is apparent to the author that there are differing points of view as to whether the company has a realistic strategy to survive and/or achieve the objective. He said: "the company's management has created a lot of procedures in the last five years to help the company survive, such as loans from banks and other companies to buy raw material to operate the company; all administrative expenses have been reduced; many bonuses have been stopped; and all unnecessary expenses have been cancelled. Therefore, most of the managers and employees in the company are dissatisfied and these procedures frustrate them. However, we in the top management feel that the company has been in a difficult position and we should create these procedures in order to move away from such difficulty".

From the above discussion, it appears that company C needs to achieve multiple and conflicting objectives. This was also confirmed by most managers' responses to question 9 of the questionnaire when they indicated that their company has implemented benchmarking (since 1990) in cost control (70%), quality control (70%), and sales maximisation (60%). Table 6-2 in appendix-2 illustrates the fact that company C is trying to benchmark too many items (for further detail see chapter 7 and 8).

## **6.6 An overview of company D**

The company established in 1976 with capital of four million LD, and it is located to the east of Tripoli. It is ranked as the second of seven companies in Libya's basic chemical industry. It employs approximately 2000 and is considered as a large company. The company was founded with the objectives of manufacturing and marketing goods through its factories and marketing department so as to adequately address local market needs for its products. Two years after its inception, it diversified into other activities, increasing its capital to 57 million LD (see Table 6-1 in appendix-2). The current company structure consists of two factories, 23 service centres and four operation centres. It achieved production values of 8.6, 10.6, and 25.9 million LD during the years 1998, 1999 and 2000 respectively (Central of industrial information, 2001).



### **6.6.1 The company management and structure**

The management structure has been in existence since 1992 and is centred on a management committee. The committee consists of the president (chief executive) and two other members. The hierarchy of company D management consists of three levels (e. g., top management, middle and lower management). The top management level includes the management committee, general manager of company offices, general manager of planning, production and technical affairs and general manager of finance and accounts and budgeting. Its responsibility is to structure a formal relationship across all departments and divisions to achieve the company goals without delay. Also, it is responsible for approving and appointing the factory managers and the heads of departments and divisions. It has the right to suggest and to make any changes to the company structure.

The middle management level includes the areas of finance and accounts, budgeting, internal auditing, technical, planning, production, quality control, and purchasing and storage. Except for internal auditing and quality control (which are headed by management committee), these units are headed by managers supported by several divisions. The middle management participates in drawing up the tactical plans at the higher company level and directly supervises lower management.

### **6.6.2 The production system**

The highest production value achieved by company D took place during 1995, 1997, and 2000, when it reached 13.6, 13.1, and 25.9 million LD. 1998 was the lowest value production (8.6 million LD). As a key person in top management said: “we can see that company D failed to achieve its production target in some years (e.g. 1998, 1999). This happened for many reasons, such as shortages in raw materials and spare parts, which were considered the major reasons for the failure.” Company D has not had a long-term production planning system during the last six years. It deploys a short-term operation programme system. The reason for this is that the company depends heavily on the level of hard currency it can obtain and how much raw material it can import.

### **6.6.3 The accounting function at the company**

The accounting function prepares financial returns for the two factories, 23 service centres and four operation centres, as well as dealing with the accounts payable and payroll functions and a variety of management accounting functions. These latter functions consist of administering the budgeting system, allocating costs between various cost and profit centres, and processing data for performance reports. The department prepares a monthly 'key performance measures' report that contains financial indicators for the company and a few non-financial measures. These non-financial measures are typical of those used by companies in the industry. For example, they include safety statistics for the factories and the percentage of production achieved and introduced to market. A site accountant is located within the two factories responsible for collecting and processing the transaction data at the sites and warehouses, producing site reports of actual costs versus budget for the month, and many administrative duties.

### **6.6.4 Background to the change program**

In the late 1980s company D introduced programs to change the organisational structure, improve work practices and systems, and modify the nature of performance measures that were being used. These structures and processes are still developing. During the first decade of company D establishment, it was regarded by managers within the large company group as a poor performer both in terms of operating efficiency and financial results. As a key manager indicated, "it was seen as old fashioned and 'more like a civil service than a real company'. The drive to change (e. g., benchmarking) adoption commenced to reduce cost and increase productivity which recognised that company D's customers required better customer service, and that the company was achieving only approximately 50% of its production target with high costs which did not satisfy customers. The change was initiated and led by the newly appointed management committee".

The new management identified strategic priorities, enhanced customer satisfaction, and reduced costs. This enabled the company to gain competitive advantage. One of the key factors in this success was explained as follows: "the first was to introduce a



company training program to encourage all employees to adopt a distinct customer orientation. These training programs emphasized the new values and goals which were key to the new strategy. As part of the change, non-performing managers were ignored, which decreased the number of layers of management and increased spans of control."

It can be observed from the discussion above and managers' responses to the questionnaire that this company has been practising a form of benchmarking for more than five years. The required time for this company to fully implement benchmarking was more than two years (see managers' responses in Table 6-1 of appendix-2). The findings of managers' responses demonstrated that company D paid more attention to cost control (70%) as one of the most important benchmarking areas compared to quality control (60%) and sales maximisation (50%) (see Table 6-2 in appendix-2). However, adopting a strategy of benchmarking of too many items has created difficulties in practising benchmarking in this company and led to conflict situations within the organisation's structure (see chapter 7 and 8 for further detail).

## **6.7 An overview of company E**

Company E is in the food production industry. It was established in 1979 at a large compound situated in 20 acres of farmland on the south side of Tripoli. The working capital for the company has reached 32 million LD. It is a large company with more than 2000 employees (see Table 6-1 in appendix-2). The company includes five compounds, factories,<sup>(5)</sup> and production units in addition to branches in Tripoli and Sabha. The aim of this company is to supply food at affordable prices to all sectors of Libyan society.

The company is government financed, managed, and monitored. Maintaining health standards is critical. As a general manager of one factory indicated, "our company achieved large profits and increases in the work force of 10% annually till 1989

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<sup>(5)</sup> One of these combined factories was established 1964 with starting budget of half million LD. Before its alliance with company E the working capital of this factory reached 7.5 million LD.

when the Libyan government began to allow the private sector to import food products, especially from neighbouring and Arab countries. Since 1989 company profits have decreased to less than 5%. The company achieved 26.6, 29.2, and 32.6 million LD in production output during 1997, 1998 and 1999 respectively (Central of Industrial Information, 2000).

### **6.7.1 The company management and structure**

The company has evolved through two different managerial structures since it was established. The first type of management system was entitled “Peoples’ Committee Management” (1980-1988). Two peoples’ committees officiated over the company’s management until 1988. Each committee consisted of the General Secretary (chairman) of the committee and four members. Also, each factory was managed by its own “Factory People Committee”. All of these committees (committee of the company and each committee of five factories) were appointed by a free vote of the employees. Because of this, all committees’ chairmen were considered to be members of “The High Peoples’ Committee” of the company. The General Secretary of “The High Peoples’ Committee” for the company and its combined factories was chosen by each committee’s chairman.

The second management structure was introduced in 1989 and was called the “Company Management Committee”. It consisted of the chairman of the committee and four scientific members. It was chosen by the Ministry of Industry, while the chairmen of the factories were chosen by the Management Committee, not by the workers’ free vote. The management committee serves as a point of contact between the company and the Ministry of Industry. This management committee is considered the supreme authority and can introduce any new policy in the company’s factories. The following is the current company management structure as indicated through interviews with managers:

1. Top management: this includes the General Secretary of the company and the four members who formalise the company’s policy and determine the job descriptions of middle- and lower-level managers. This management also
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includes four scientific general managers (e.g., food technology and safety, industrial engineering, accounting, and marketing advisor) who are tracing day-to-day operations. The internal auditing, information systems, health specification, and quality control office are included in this management level.

2. Middle and lower management consists of seven managers who are head of technical and production affairs, administration and accounts affairs, marketing affairs, costs and inventory control, purchases and storage affairs, central training affairs, and branches and factories management. Each of these management positions has a job description. For example, one duty of general marketing management is to study market needs and the need for expansion. Also, the duty of general cost management is to compare the company production cost structure to the cost structure of other companies especially in neighbouring countries. Purchasing and general storage management is concerned with the import and purchase of all raw materials. Concerning this, the company has four storage centre facilities situated in four cities to facilitate supervision and control of all inventories and storage facilities.

Each of these middle management groupings are divided into many divisions (four to six divisions) of lower management. For example, general accounts, budgeting, accounting production, producer affairs, general relations and service affairs, etc. are considered to reside at the lower level of administration and general accounts management. This type of division is similar to the other management groupings mentioned in the middle management level. However, the heads of departments and divisions in the company (headquarters) are appointed by a decision from top management, but the heads of divisions are appointed according to suggestions from the heads of departments. The heads of division in the factories are mostly appointed by the factory managers, but at the same time, top management has the right to suggest anyone or change anyone in the factories' management.

### 6.7.2 The accounting system

From the researcher's observations and interviews with company managers, it seems that the accounting system in company E is responsible for recording cash movements, cost measurements, administering the budgeting system, and allocating costs across profit centres or factories. The financial statements and accounting reports are prepared and discussed monthly. Furthermore, the accounting systems in company E play a vital role in the company's day-to-day work. As the manager of accounts pointed out, "the customer satisfaction program<sup>(6)</sup> was developed independently from the financial measures used in the monthly performance evaluation reports. At this point, the role of accounting function in this programme was that of a participant department. As part of the program, the accounting department was required to examine its relationship with internal customers and other departments".

The different operations within the company and its factories go through a predetermined cycle. At each stage of this cycle certain documents or vouchers have to be issued, certain procedures followed, and also certain authorised signatures have to be drawn up to legitimise all stages of a cycle. An example is the purchasing cycle. Procuring a local or foreign purchase requires successive predetermined procedures, vouchers and approvals. The purchasing cycle starts at the requesting division where a requisition form has to be completed and passed to the responsible managers for approval. When a purchasing decision is reached, the process continues through further stages. After this process, the accounting management carries out some steps such as issuing a purchase order, opening a letter of credit, seeking the approval of Libyan Central Bank for the hard currency, insuring the purchased items, and completing the customs and clearing processes.

Many managers from technical and production departments in company E believed that the accounting system was technically competent but was not helpful in assisting in the development of performance measures. They considered that the accounting

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<sup>(6)</sup> The Management Committee introduced this program when the government introduced new measures toward economic reform such as opening food products to private investors to import and setting up small-scale production units therefore introducing competition to company E. Competition is unfamiliar to company E which lacks the experience and expertise to deal with it.



system should provide greater assistance and expressed disappointment with their contribution to the performance-related pay initiative. Consequently the accounting system was not fully involved in the development of performance measures. It was very much focused on operational matters such as safety and yield but did not directly support the profit-based strategy. Other managers stated “that the accounting system or function should work closely with the production and sales department, to gain their trust by giving business advice and acting essentially in a training role to keep staff from losing perspective”.

### **6.7.3 Company effectiveness of benchmarking**

An effective change initiative at company E was the creation of a company-wide training program aimed at improving customer focus. The objective was to develop a strong customer focus throughout the company and for customer satisfaction to become the sine qua non of business practice. The program was initiated by the Management Committee of the company which believed that concentrating on customer satisfaction could provide a competitive advantage for the company. The customer satisfaction training program was conducted by a group of people from different departments. The Customer Satisfaction Group pointed out that a key to changing the company was to focus on improving quality.

It appears clear that company E has been practising some form of benchmarking for more than five years (see Table 6-1 in appendix-2). This company was giving clear priority to quality control (80%) and maximisation of sales (50%) as the most important criteria (see Table 6-2 in appendix-2). Most managers indicated that the length of time for company E to fully implement benchmarking was over two years (see Table 6-1 in appendix-2).

## **6.8 An overview of Company F**

Company F was established in accordance with decree No 77 issued by the General People’s Committee in 1988. It was to include two combined factories. Another two factories joined this company a year later. After this alliance, company F became a large company in the building materials industry. It was located to the Northeast

side of Tripoli. The capital of this company is 180 million DL, and it employs more than 2000 people (see Table 6-1 in appendix-2) (Central of industrial information, 2000).

The company evolved through two different management structures since establishment. The first was management by a general representative, which lasted until 1993. The general representative and general managers of each factory were chosen by the Ministry of Industry (not by free vote). The second managerial structure (current management) is called “the superior management committee”. This committee consists of the General Secretary (chairman) of a superior management committee and the chairman of each factory. Each factory is managed by its own Factory Management Committee, which consisted of the chairman of the committee and four employees from the factory. All of these committees were chosen by the employees in each factory by free vote.

### **6.8.1 The company management structure**

The organisational structure of company F has been modified many times throughout the history of its existence. Many changes have occurred in the formal structure since 1993. These changes were manifest in processes such as: 1) changing the inventory, storage facilities and export department to become a division within a trade department; 2) joining the training division with the planning division to become a department called the planning, training and information department; 3) joining the administration department with the financial department to become one combined department called the administration and finance and accounts department. The following is the current organisational structure of the company, as was ascertained through the semi-structured interviews with managers:

1. The superior management committee (top management level) includes the General Secretary of the company and the four members who are acting as chairmen of each factory. This committee is considered as a superior authority and could lead the process of any change in the company. This level also includes management information systems and internal auditing management.



2. The middle management level includes five general management groupings such as general management of production and technical affairs, commercial affairs, finance and accounting, administration and work-power production, and operating factories. The functions of these management groupings were mentioned by a key person in the company, when he made the following point: "...this management level is working as (a set of) intermediary instruments to process any information from the top management to lower management, follow up the activities and operation of all company departments, and make sure that these departments operate according to plan. It is also responsible for preparing all the necessary training programs for the company's employees and make sure that company employees strive to increase and improve production."
3. The lower management level consists of many departments and divisions. The production department has three divisions; i.e., planning and operating production and quality control in addition to R&D and a safety division. The departments of administration and finance and accounts include the following divisions: production affairs, training affairs, general accounts, costs and storage control, and budgeting. The commercial department consists of marketing, purchasing, and wholesale.
4. The factories: The company has four factories in different geographical areas. Each factory has its own management committee consisting of five members elected by employees (free vote). The committee selects one of its members as the General Secretary (chairman) of the factory's management committee who is considered to be a member of the superior Management Committee of the company. The role of the factory manager (chairman) is mainly concerned with production processes and day-to-day duties in the factories, such as coordination between the factory's departments, divisions and the general management departments in the entire company. Each of these factories has the following departments: planning and production control, quality control, financial and administration, internal auditing, purchases and storages, training, and safety and maintenance.

### **6.8.2 Production problems**

Company F failed to achieve its production targets from 1990 to 1997. This happened for many reasons, such as shortage of raw material and spare parts as well as poor maintenance, employee absence, and technical problems. The main reason for this shortage was because 40% of the company's raw material came from abroad. Therefore, company F depends heavily on how much hard currency it could get from the Central Bank. An insufficient amount of hard currency causes a shortage in raw material and spare parts, which causes stoppages in the factories and a shortage of the company's products in the market. As a manager in the commercial management insisted: "an insufficient amount of hard currency, and the delay of the company receiving it, is the reason for the shortage of raw material and spare parts, and I think this is the reason for most of the problems which face the company now." Furthermore, this creates a bad impression about the company with its suppliers because of delays in payment and no commitment to schedules.

### **6.8.3 The accounting practices in the company**

Company F did not prepare any financial statements for around five years apart from some reports which were prepared by general management of finance and accounts. Therefore, the evidence suggests that the accounting system of company F and, in particular, its external reporting, does very little to promote accountability and performance evaluation. At the beginning of 1999 it prepared its last financial statement for the fiscal year ending 31/12/1994. The delay in company F receiving the opening entries (of the 1989 fiscal year) from the combined factories which joined the company two years after its establishment is one of the reasons for the delay in approval of the financial statements by the government body. Therefore, the role of the external auditing of reports was very limited, because they were financial statements which were five years outdated.

Overall, company F has been incurring huge losses since 1993. There are many reasons for these losses, some of which are state policy and linked interference from governmental bodies in the company's affairs. For example, the sales price of company products is determined by the Ministry of Economic Affairs. The cost of



raw materials, spare parts, and operations requirements usually increases, while the sales prices remain fixed. To that end, company F seems not to have introduced any form of benchmarking. Managerial conflict, insufficient resources, and interference from government bodies seem to have stifled all innovative practices, including benchmarking (see chapter 7).

## **6.9 An overview of company G**

This company was established in accordance with law No. 22 dated 1976 with a capital of 10 million LD. The capital has increased, reaching 52 million LD today. The company is located on the east side of Tripoli. It was ranked as one of the largest LMOs in terms of number of employees, which exceeds 4000 people (see Table 6-1 in appendix-2). The company includes 25 combined factories and production units in different geographical areas. The company manufactures many kinds of goods. It achieved 57.6, 54.1, and 46.9 million LD in production output during the years 1998, 1999, and 2000 respectively (Central of industrial information, 2001).

### **6.9.1 The company management and structure**

This company evolved through three different types of management since it was established in 1976. The first management system consisted of a general manager of the company and two co-ordinations (e.g., technical and administration co-ordination) as well as company branch managers in different areas. All management committee members of the company are appointed by the government, which has the right to remove and dismiss the whole committee or any one of its members without giving any reason for such removal or dismissal. The second managerial type used was people's committee management (1982-1990). The committee consisted of the General Secretary of the committee and four members (as discussed before for company F).

The current "Management Committee" consists of the chairman and four other members. These members are not the chairmen of the factories as in the previous management structure (people's management Committee). The current committee

started in 1990 and was chosen by the Ministry of Industrial Affairs, while the general managers (chairmen) of the factories were chosen by the Management Committee, not by employees' free vote. This committee started in a difficult financial and administrative position. These difficulties included the following: 1) there was a shortage of ready money; 2) the company's bank account was overdrawn by 28.574 million LD in 31/12/1999; and, 3) the company was owed 48.220 million LD from its customers.

The management committee includes three hierarchical levels: the management committee level (top management), which includes 1) the office of legal affairs; 2) the office of committee affairs; 3) the office of quality control; 4) the office of research and development; and, 5) the office of auditing. At the middle and lower management levels there are many management/divisions, including management of administration, finance, costs and inventory control, purchasing, technical and production, marketing, and storage. Each of these managements includes several departments which are considered lower management and responsible for day-to-day operation in the company.

The company has 25 factories, and each factory has its own general managers and is accountable to the management committee in the company. Each of the factories has the following departments and divisions: administration and accounts, purchase and marketing, technical, and production. Each department includes 2-4 divisions and/or units and is responsible for preparing its accounts and financial statements and sending them to the company. Company G has a defined authority relationship, namely; top management, factory management; heads of departments, and heads of divisions.

### **6.9.2 Company problems**

The company's social culture has affected its day-to-day operations and performances. Many employees are appointed according to kinship and friendly relationships more so than ability or experience. Although the company and its factories suffer from an increasing number of employees, company management



itself cannot reduce the number of workers due to interference by government. This has had a significantly negative impact on the financial performance of the company. Managers described other problems: 1) there are 25 factories and production units in different geographical areas which makes it difficult for the company to manage them; 2) equipment upgrading and development are required, but the company is unable to do this because of the UN and US technological embargo; 3) lack of technical experts to undertake maintenance and control quality; 4) difficulty in marketing company products in local and external markets; 5) difficulty in acquiring enough money to continue its operations as scheduled, 6) the increasing cost of storage (e.g., raw material and finished products, etc.) which has reached 61.636 million LD; and, 7) the inability unable to collect its money (34.575 million LD) from government bodies. Due to these problems, there seem to be no practices that even resembled benchmarking in Company G (see chapter 7 for detail).

Having reviewed the historical industry background and brief description of the organisational context at the micro level, we now turn to a discussion of managers' responses to questions focused on the effectiveness of benchmarking for the seven mentioned companies.

### **6.10 Analysis of the effectiveness of benchmarking in LMOs**

The brief summaries of each of these companies is designed to provide some context in which greater understanding as to why companies have adopted any practices that resemble benchmarking. Due to a lack of a complete understanding of benchmarking in LMOs, most Libyan organisations find it difficult to employ the technique effectively. However, benchmarking is only loosely defined in general and, for that reason, it makes sense to view some of the practices in these LMOs as indicative of benchmarking. To that end, this section presents a brief discussion of managers' responses to six open-ended questions focused on the extensiveness of benchmarking-like practices inside their companies. The questions are numbers 36 through 41 of the questionnaire included in appendix-1.

### **6.10.1 The effectiveness of benchmarking types**

Question 36 was concerned with the type of benchmarking which seemed most effective. Responses to this question from the five companies demonstrate that managers in companies A (90%), B (100%), and D (70%) have identified “production benchmarking” as the most important type. At the same time, company B (80%) and D (50%) have considered “functional benchmarking” in addition to the production type. Almost all managers in company C (90%) and E (100%) indicated that “functional benchmarking” was the most common type in their organisation (see Table 6-3 in appendix-2).

### **6.10.2 Beliefs about factors that determine the effectiveness of benchmarking**

Question 37 concerned which parties understand benchmarking goals across organisational management levels (e.g., top management, top management and most middle management, every manager and supervisor, or just a few managers). The responses to this question by all respondents in terms of company A and D indicated “top management”. However, one of the respondents from company A indicated in the space provided for additional comments on the questionnaire that many managers from “middle management” gave priority to sales maximisation rather than to quality control, but “top management” gave priority to benchmarking quality control.

Managers’ responses in company B and E indicated that “top management” and “middle management” were leading the company in the practice in benchmarking. Managers from company B stated that in each weekly management meeting discussion frequently takes place to arrive at a clear picture of any new issues that improve the company’s performance. Respondents from company C indicated that only a few managers were in a position to understand the benchmarking goals. Many of the respondents indicated that their company has unclear objectives (see Table 6-3 in appendix-2).

Question 38 was designed to investigate the ‘strongest impact’ on the effectiveness of benchmarking in terms of “relevant organisational culture”, “unclear benchmarking goal”, “lack of benchmarking findings”, etc. The responses to this question show that



“lack of implementation of benchmarking findings” in company B (70%), C (60%) and E (50%) has been identified as one of the obstacles to effective benchmarking. However, “unclear benchmarking goal” has been ranked as having a strong impact on the effectiveness of benchmarking in companies A (60%), C (70%) and D (60%). “Relevant organisational culture change” was judged to have an important impact on the effectiveness of benchmarking in companies C (50%) and D (60%). This finding supports the body of literature (chapter 2 and 3) which suggests that the culture of an organisation is an important factor in implementing benchmarking effectively.

### **6.10.3 Measuring the effectiveness of benchmarking**

Questions (39, 40 and 41) helped investigate how respondents measure the effectiveness of benchmarking and how they perceive benchmarking as a management tool. The responses to question 39 show that all the respondents in companies A and B perceived that their benchmarking activities had achieved “moderately successful” results. Meanwhile, managers in companies C (30%), D (40%), and E (80%) indicated that their benchmarking of quality control had achieved “moderate success”. In addition to this, 60%, 60%, and 20% of respondents in these three companies respectively perceived that their benchmarking for productivity is “still in process” (see Table 6-3 in appendix-2).

The responses to question 40 show that “improved customer satisfaction” is viewed as the most important measurement for the effectiveness of benchmarking in companies C and E. Responses by all managers in companies A, B and D indicated that “improved process performance” is the most important component of the effectiveness of benchmarking (see Table 6-3 in appendix-2).

With regard to managers’ responses to question 41, it appeared that all managers in companies B and E considered benchmarking as “sooner or later” a useful management tool and recommended in the space provided for additional comments that it be used continuously. However, managers’ responses in companies A (100%), C (50%) and D (60%) indicated that benchmarking is “somewhat effective” as a management tool, while 40% of managers in both companies perceived that

benchmarking is “not effective” as a management tool (see Table 6-6 in appendix-2). One manager from company C indicated that “our company made some improvements in certain areas, but embracing benchmarking techniques assumes our company has a plan for allowing liberal information exchanges across companies, understanding our own performances, enough resources available, stability of the company’s environment, etc.” Such managerial comments support the notion that benchmarking is a complex process which assumes much about organisational stability (7.4.3.1). Such assumptions may be tenuous within the context of LMOs.

## 6.11 Summary

This chapter has provided a brief description of the organisational context of the seven Libyan organisations studied (6.3 to 6.9). This chapter has illustrated that these seven companies evolved through either two or three different managerial structures such as general representative, peoples’ management committee, and management committee. These management structures arise from either appointment by government bodies or by employees’ free vote. They are considered as the top management level in each company’s management structure. Many of the seven companies were not in a position to supply enough products to satisfy market demand. Companies occasionally had shortages in raw material and spare parts. This situation results from the UN and US embargoes which make it difficult for LMOs to spend the time, money and effort necessary to achieve “best practice.”

This chapter also addressed manager’s beliefs (6.10) about the effectiveness of and difficulties with benchmarking. Companies A, B, C, D and E have implemented benchmarking with moderate success in different areas, while companies F and G failed to do so. Further discussion of these difficulties will appear in section 7.6 of chapter 7.



## CHAPTER 7

### 7. General analysis and discussion of data results

#### 7.1 Introduction

This chapter addresses the fourth sub-objective of the study (1.3.4). It also analyses and evaluates the results of the testable hypotheses formulated in chapter 4. Thus, the main purpose of this chapter is to investigate the first (1.4.1), second (1.4.2), third (1.4.3), fourth (1.4.4), fifth (1.4.5) and sixth (1.4.6) research questions. It provides description and analysis of the overall characteristics of organisations attempting to implement benchmarking practices in the Libyan environment.

This chapter aims to provide significant insights into the questionnaire findings. The questionnaire was divided into five sections containing forty-one questions five of which were sub-questions. Questions about participants and their organisations were also included. Closed and opened-ended questions were analysed using descriptive statistical techniques.

The analysis of results of the questionnaire will be discussed under the following headings:

- 1- Personal and organisational information in LMOs (Companies A, B, C, D, E, F and G).
- 2- General information about benchmarking adoption in LMOs.
- 3- Characteristics of LMOs behaviours when benchmarking is implemented.
- 4- Characteristics of LMOs attempting to implement and adopt benchmarking.
- 5- Possible reasons for some LMOs not implementing benchmarking.
- 6- Comparison of the importance of each criterion level (see chapter 8).

Data analysis of personal and organisational information and comparison of the importance of each criterion level (heading number 6 mentioned above) will be discussed in chapter eight in section 8.3. The variables (heading numbers 1, 2, 3, 4 and 5) will be analysed in this chapter (sections 7.2, 7.3, 7.4, 7.5 and 7.6 respectively). In both this chapter and chapter eight, the author will develop an

explanation of how the unique context of Libyan organisations influences attitudes toward benchmarking implementation. The chapter will describe the findings in the following way.

## **7.2 Personal and organisational information**

The first heading consists of four questions and aims to provide actual information about the respondents (gender, education, place of study and job position) and their companies (implementation of benchmarking, model of initial of benchmarking, and benchmarking process reviewed). These questions were prepared in order to provide general information about managers and their organisations in a manner related to attitudes and beliefs about benchmarking (see section-I of the questionnaire in appendix-1).

Libyan companies depend mostly on men because of the infrequency with which women participate in work generally, and in managerial positions in particular. Although the Libyan government has given equal opportunities to both males and females in all levels of education and work, and have designed development programmes that are suitable for females in relation to their social and economic environment, females tend to work in activities which do not require much male-female interaction (e. g. education and health services).

With respect to the level of education of these seven LMOs, details are shown in Table (7-1 of appendix-3). It appears from this table that the a majority of managers in the seven companies are holders of university first (71.4%) or higher degrees<sup>(1)</sup> (14.5%), while the remaining managers are holders of secondary school (1.40%) or specialist diplomas (12.98%). This indicates that managers with university degrees and higher are considered to be important in the process of adopting any new change.

Furthermore, management attitudes in LMOs are in some cases influenced by employees' place of study.

With respect to managers' place of study in these seven companies, Table (7-2 of appendix-3) illustrates that managers in these companies accounted for 41.43% in



Libya, 25.71% in USA and Canada, 22.86% in Western Europe and 10% in Eastern Europe. These illustrations agree with the findings of Aghila's (2000) and Kilan's (1988) studies which indicate the direct transfer of USA and Canada or Western and Eastern Europe theory and/or ideas to many LMOs. As discussed in sections 2.5 and 3.3, culture differences such as education may mediate the desire for and ability to adopt Western practices such as benchmarking.

Regarding subjects' job position the selected subjects were general managers of the companies, deputy general managers, managers in accounts and finance, managers in marketing and purchasing, managers in production and research and development, engineering and foremen or supervisors, assistant managers and controller of accounts and finance. Table (7-3 in appendix-3) reveals that subjects' positions among these companies are 52.86 % in the category of manager and 47.14% (2.86 + 14.29 + 15.71 + 5.71 + 8.57) in all other categories. Libyan organisations have paid little attention to the management specialisation in general, because some of the Libyan managers in these organisations had graduated from overseas universities and from faculties with different specialisations (see details in Table (7-3 in appendix-3)).

### **7.3 General information about benchmarking adoption in LMOs:**

This heading was separated into several different questions in the questionnaire. The discussion of questions 5, 6, 8, 9, 10 and 12 was presented as a part of the actual information in mini case studies about the seven companies in chapter 6. This section presents questions 7, 11 and 13 which are related to general information about benchmarking implementation. The information obtained within each of five companies was examined to provide a better understanding of aspects related to the implementation of benchmarking in LMOs.

#### **Q7: Implementation of benchmarking**

The first question in this area of benchmarking was designed to provide information on whether these companies had introduced benchmarking, or if a decision had been

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<sup>(1)</sup> MSc or PhD degrees

taken not to introduce changes like benchmarking. Managers' responses are shown in Table (7-4 of appendix-3). Specifically, all managers in Companies A, B, C, D and E agreed that change has been adopted in different areas of benchmarking (see responses to question 9 in Table 6-2 in appendix-2), while managers in Companies F and G indicated that issues connected with changes like benchmarking had not been implemented. The reasons behind this response will be discussed in detail in section 7.6 of this chapter.

**Q11: Model of initial benchmarking**

Table (7-4) of appendix-3 also indicates that the initial benchmarking of these five companies was taken from large-sized (for company B, C, D and E) and medium-sized (for Company A). Further, as mentioned in the literature review (chapter 3) of this study, company size is an important issue affecting the adoption of more complex management systems such as benchmarking (Chenhall and Smith, 1998). Specifically, companies with large numbers of employees as well as large amounts of assets are more likely to embrace and implement benchmarking. Company B is an example of this.

**Q13: Benchmarking process reviewed**

This question considers how frequently the benchmarking process is reviewed, whether annually, semi-annually and/or quarterly. Information obtained from Company A stated that benchmarking process is reviewed quarterly so as to reduce defects and/or to achieve continual improvement on products. Meanwhile, information obtained from Companies C and D indicated that the process of benchmarking was annually reviewed (see Table 7-5 of appendix-3).

Table (7-5) of appendix-3 indicates that the benchmarking processes for companies B and E were annually reviewed within these two companies. The reasons for some managers not knowing the process or having different answers may be the multivariate character of items that are benchmarked within each company. For example, Companies B and E were applying benchmarking in two different areas



such as quality control and maximisation of sales (as discussed in question 9 area of benchmarking in section 7.3).

Apparently, Companies B, C, D and E may need to recalibrate benchmarking periodically (e. g. less than annually) to support continuous process improvements. This information tends to support the suggestion by Kharbanda, (1993) that it is necessary for firms to recalibrate benchmarks periodically to uphold continuous process improvements. To be fully effective, these companies must be kept up to date with current practices and the 'best-in-class' designation should be regularly reviewed.

What has been attempted so far is a general discussion of the nature and concepts related to personal and organisational information, and general information about benchmarking adoption in LMOs. In the next section, an analysis of the following variables is presented about the characteristics of LMOs behaviours when attempting to implement and adopt benchmarking. These variables include managers' behaviours in relation to information about benchmarking (see section 7.4.1) and variables related to the stability of organisational structure, management, leadership, and market conditions (see section 7.4.2).

#### **7.4 Characteristics of LMOs behaviours when benchmarking is implemented**

As is known from the psychology literature (Kim et al., 1995), even managers who belong to the same culture and environment are least likely to give the same attention to information about benchmarking performance inside and outside their organisation (Bramham, 1997). In this case, any information about company performance when implemented in LMOs needs to be adapted or based on information gained from multiple measures of performance through time. This is because objectives and strategies reveal different dimensions of performance across companies, and benchmarking exercises designed to identify "best practice" should be based on repeated measurements of each company's performance (Zimmerman, 1997). One aspect of this study is to discuss LMOs reactions toward information about benchmarking (see section 7.4.1). Another aspect is to examine LMOs for stability/instability when implementing benchmarking (see section 7.4.2).

Descriptive statistical analysis is used in this section to find the mean, standard deviation and frequency distribution as well as the Pearson product correlation coefficient<sup>(2)</sup>. Also, related research questions (1.4) and hypotheses (see section 4.5) were examined to discover to what degree the respondents agreed with characteristics related to organisations' behaviours when benchmarking is implemented. A set of variables has been developed to cover these questions and hypotheses under the following sub-headings:

#### **7.4.1 Managers' behaviours in relation to information about benchmarking**

To analyse the variables mentioned in question 14 and to test the hypotheses discussed in chapter 4, descriptive statistics were used to provide information about aspects of benchmarking implementation in a Libyan context. This section reports the results of the three testable hypotheses.

##### **7.4.1.1 Results of the first tested hypothesis**

The results of managers' behaviours to information about benchmarking were examined through the following hypothesis:

- *Managers are insensitive to the importance of information about employees' behaviour (statistical information)<sup>(3)</sup> through the implementation of benchmarking.*

This hypothesis tests managers' sensitivity to information about benchmarking implementation, and consists of four sub-scale variables (14.1, 14.2, and 14.5), as indicated in the questionnaire appendix-1.

These sub-scale variables or sub-questions were measured on a four-point scale (e.g. 'strongly disagree', 'disagree', 'agree' and 'strongly agree') to address and simplify the

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<sup>(2)</sup> This statistical test was used to compute the variables value and to show how these were related, and to examine the links between organisations behaviour related variables in the situation of benchmarking.

<sup>(3)</sup> For further discussion see section 4.2.



analysis of data presented in this thesis. Furthermore, to discover whether or not these variables reflect benchmarking decisions, analytical techniques were used. The results of frequency distribution, mean score and standard deviation are reported in Table (7-6 ) below.

Managers in Companies C and D indicated the highest mean scores of 2.60 and 3.10 with standard deviations of 1.10 and 0.47 respectively, corresponding to question 14.1 (see Table 7-6). However, a result of four 'agree' and two 'strongly agree' of managers in Company C and five 'agree' and 30% 'strongly agree' of managers in Company D indicated that their companies gave only high consideration to information about best performance. This reveals a high level of agreement that managers in these companies are more sensitive to general information about best performance through the implementation of benchmarking. Therefore, benchmarking practice was implemented less effectively into these companies. These results support the literature in which Nisbett and Ross (1980) indicated that managers' sensitivity and behaviour are much more influenced by salient (best) information than statistical information in situations of new adoption of process performance.

Managers in Companies A, B and E indicated the lowest mean scores of 2.0, 1.80 and 1.90 with standard deviations of 0.80, 0.79 and 0.99 respectively. This reflects a high level of disagreement across managers with the statement in question 14.1, which concerned managers' sensitivity only to general information about best performance. This finding is different from that in the literature which states that managers are more responsive to general information about best performance than information about employees' behaviours (Nisbett et al., 1980). Therefore, benchmarking implementation into these companies may be considered more effective of process performance.

**Table (7-6): Results of frequency distribution, mean and standard deviation for organisation behaviours related variables**

Questions		Companies																													
		A						B						C						D						E					
		Std	D	A	SA	$\bar{X}$	SD	Std	D	A	SA	$\bar{X}$	SD	Std	D	A	SA	$\bar{X}$	SD	Std	D	A	SA	$\bar{X}$	SD						
14.1	F	3	4	3	0	2.0	.80	4	4	2	0	1.8	.79	2	2	4	2	2.6	1.1	0	2	5	3	3.1	.47	4	4	1	1	1.9	.99
14.2	F	0	3	4	3	3.0	.87	1	1	4	4	3.1	.99	7	0	2	1	1.7	1.2	7	3	0	0	1.3	.48	1	1	5	3	3.0	.94
14.3	F	4	4	1	1	1.9	.99	3	5	2	0	1.9	.74	2	0	6	2	2.8	1.0	1	1	7	1	2.8	.79	5	2	3	0	1.8	.92
14.4	F	5	2	3	0	1.8	.92	5	4	1	0	1.6	.70	2	0	6	2	2.8	1.0	2	0	1	7	3.3	1.3	3	6	1	0	1.8	.63
14.5	F	9	0	1	0	1.2	.63	2	6	2	0	2.0	.67	.3	0	5	2	2.6	1.2	7	1	2	0	1.5	.85	1	4	4	21	2.5	.85
14.6	F	9	0	1	0	1.2	.63	2	5	3	0	2.1	.74	2	2	6	0	2.6	.97	8	0	2	0	1.4	.84	4	1	3	2	2.3	1.3
14.7	F	2	5	2	1	2.2	.92	4	4	2	0	1.8	.79	3	0	7	0	2.4	.47	7	1	0	2	2.9	1.5	3	4	2	1	2.1	.99
14.8	F	1	1	6	2	2.9	.88	0	1	8	1	3.0	.47	9	0	1	0	2.6	.84	2	1	5	2	2.7	1.1	3	1	4	2	2.4	1.2
14.9	F	6	1	2	1	1.8	1.1	4	4	0	2	2.0	1.2	2	1	3	4	2.9	1.2	2	1	4	3	2.8	1.1	3	0	2	5	2.9	1.3
14.10	F	2	2	4	2	2.6	1.1	2	1	5	2	2.7	1.1	3	6	0	1	1.9	.88	5	4	1	0	1.6	.70	5	3	1	1	2.0	.94

D: Disagree, Std: Strongly disagree, A: Agree, SA: Strongly agree,  $\bar{X}$  : The arithmetic mean, SD: standard deviation



Table (7-6) also provides a general indication that most managers in Companies A, B and E are sensitive both to information about best performance and employees' behaviour in situations of benchmarking adoption. Thus, the judgements for better decisions in these companies were available when implementing new adoptions such as benchmarking. This was confirmed by the highest mean scores of 3.0, 3.1 and 3.0 with standard deviations of 0.87, 0.99 and 0.94 in each of the three companies respectively. This result was also obtained from managers' responses to question 14.2. Specifically, seven, eight and eight of managers in companies A, B and E respectively recognise such a degree of agreement. This result supports the findings of the literature (Bramham, 1997; Zimmerman, 1997) that managers need to give full consideration to information about best performance and employees' behaviour, skills, and so on.

With regard to the same statement in question 14.2 for Companies C and D, managers seem not concerned about either information about best performance or employees' behaviour. The least mean scores of 1.70 and 1.30 with standard deviations of 1.20 and 0.48 within each of the two companies respectively reflect a low level of consensus on managers' sensitivity to both types of information (see Table 7-6). Therefore, benchmarking practice was implemented poorly into these companies.

According to managers' responses to the statement in questions 14.3 and 14.4, it appeared that Companies C and D were not giving much consideration to information about employees' behaviour. Also, they gave little weight to information about employees' behaviour compared with information about best performance (see statement in questions 14.3 and 14.4 in Table 7-6). This means that management in these companies is not fully aware of the importance of information in tasks related to benchmarking. However, the highest mean scores of 2.80, 2.80, 2.80 and 3.30 with standard deviations of 1.00, 0.79, 1.00 and 1.30 within each of the two companies, corresponding to question 14.3 and 14.4 respectively, confirm that these companies exhibit a lack of consideration and weight to information about employees' behaviour through the implementation of benchmarking. Therefore, benchmarking

implementation was introduced into these companies with poor understanding of best performance.

With respect to Companies A, B and E, managers' responses regarding their companies' consideration (14.3) and weight (14.4) given to information about employees' behaviour showed a high level of disagreement. This indicates that there is a reasonable consensus among surveyed managers concerning the degree of disagreement that their companies do not give enough consideration and weight toward information about employees' behaviour, as mentioned in question 14.3 and 14.4. Specifically, the least mean scores of 1.90, 1.90, 1.80, 1.80, 1.60 and 1.80 with standard deviations of 0.99, 0.74, 0.92, 0.92, 0.70 and 0.63 within each of the three companies mentioned (for question 14.3 and 14.4) respectively confirmed the degree of disagreement. Thus, benchmarking practice was introduced into these companies with better understanding about best performance.

#### **7.4.1.2 Results of the second tested hypothesis**

Variables of environmental factors will be tested under this hypothesis (the representative heuristic hypothesis) to yield some answers across managers surveyed in LMOs' operating environment in making judgements to implement benchmarking. The specific hypothesis and related sub-scale questions are important and need to be addressed, as follows:

*-The representativeness heuristic will influence managers' benchmarking decisions.*

Performance indicators under the representativeness heuristic are most likely to be related to causes having to do with managers (e. g. ability and effort) and their operating environment (e. g. easy/difficult task, luck and chance). In this case, the representativeness heuristic was tested through four sub-scale variables (14.5, 14.6, 14.7 and 14.8), as shown in the questionnaire appendix-1.

The analysis of this study shows the relevance of the representativeness heuristic to benchmarking in LMOs' operating environment as well as chance considerations.



These sub-scale variables were examined through managers' responses within each of the five companies to yield the following results:

In regard to Companies A, B and D, Table (7-6) provides general indications of all managers' responses for statements in questions 14.5 and 14.6. Results indicate a strong consensus among surveyed managers concerning their disagreement that management related manager's success or failure to adapt to any new adoption to the role of the operating environment rather than to ability and effort. These results were confirmed by low mean scores and standard deviations for both statements in questions 14.5 and 14.6 with each of the three companies (see Table 7-6). These findings tend to be similar to those of Arrington et al. (1985) claimed that work done by Weiner et al. (1972, 1974) to expand Heider's (1958) divisions suggested that managers' success or failure could be attributed to ability and effort rather than the operating environment.

However, most surveyed managers in Company C are in agreement with the statements in questions 14.5 and 14.6. However, there were conflicting responses (e. g. 50% disagree and 50% agree) across the managers in Company E, with respect to the same questions. These results were revealed by mean scores of 2.60 and 2.60 with standard deviations of 1.20 and 0.97 (for Company C) and mean scores of 2.5 and 2.3 with standard deviations of 0.85 and 1.3 (for Company E), which respectively confirmed that manager's success or failure was influenced by the role of the operating environment to adapt to new adoption (see Table 7-6).

The managers surveyed (for all five companies) gave their responses as to whether management places too much weight on the firm's operating environment compared with manager's ability or effort to adapt to any adoption (see questions 14.7 and 14.8 respectively). From Table (7-6) it can be seen that most managers in Companies A, B, D and E indicated their disagreement and agreement respectively with the statements in questions 14.7 and 14.8. The majority of managers within each of the four companies have given more priority to managers' ability and effort than company's operating environment (e. g. task difficulty, luck and chance) in situations

of benchmarking adoption. However, the results for question 14.7 were confirmed by low mean scores of 2.20, 1.80 and 2.10 with standard deviations of 0.92, 0.79 and 0.99 for Companies A, B and E respectively, and a high mean score of 2.90, with a high standard deviation of 1.50 for Company D. Also, the highest mean scores of 2.90, 3.00, 2.70 and 2.40 with standard deviations of 0.88, 0.47, 1.10 and 1.20 reveal the managers' agreement with question 14.8 respectively within each of the four companies. These results support the findings of Kahneman and Tversky (1982) who argued that people do not consider environmental factors to be more important elements than ability and effort in situations of new change adoption.

The results presented in Table (7-6) for Company C show that most managers moderately agree and strongly disagree with statements 14.7 and 14.8 respectively. On one side, seven of the managers surveyed indicated their agreement to give more priority to the company's operating environment than managers' ability and effort. On the other side, nine of the managers were in disagreement about assigning priority to managers' ability and effort than to the company's operating environment. The mean scores of 2.40 and 2.60 with standard deviations of 0.47 and 0.84 for both statements in questions 14.7 and 14.8 respectively reflect the managers' responses. This result is different from those of the literature, which states that management give more priority to manager's ability and effort than to the company's operating environment to implement changes like benchmarking

In relation to this study, the above argument was concerned about the first and second hypotheses and their related sub-scale questions to provide results of managers' behaviours and their operating environment in carrying out benchmarking practice. The following section addresses the third hypothesis and related sub-scale questions to determine which types of information managers are most responsive to in making judgements about best performance.

#### **7.4.1.3 Results of the third tested hypothesis**

Managers' reactions about the availability of information on best performance were tested through the following hypothesis:



*- The availability heuristic will influence managers' benchmarking decisions.*

The availability heuristic has been discussed in the theory chapter and its relation to making benchmarking decisions. Furthermore, the availability heuristic, which influences managers for benchmarking decisions, will be presented through two sub-scale variables (14.9 and 14.10), as shown in the questionnaire of appendix-1.

In regard to the availability heuristic hypothesis and the two sub-questions of 14.9 and 14.10, the findings of this study indicated that LMOs managers were affected by the availability heuristic in benchmarking decisions. At this point, most managers in Companies A and B were interested in information about best performance taken either from highly or less visible organisations. In contrast, the majority of managers in Companies C, D and E indicated that these companies were more responsive in making their judgements about best performance taken from high rather than less visible companies. Therefore, benchmarking practise was implemented in Companies C, D and E with less understanding about best performance. This result supports the argument of Kahneman et al. (1982) about the availability heuristic. This heuristic provides an effective judgement about best performance if well used, and leads managers to serious judgmental errors if misused. Specifically, the managers' responses of Companies A and B indicated their availability to information about best performance whether taken from a highly or less visible organisation. These findings were supported by least mean scores of 1.80 and 2.00 with standard deviations of 1.10 and 1.20 corresponding to question 14.9, and mean scores of 2.60 and 2.70 with standard deviations of 1.10 and 1.10 corresponding to question 14.10 (see Table 7-6). Therefore, most managers in these companies agreed to consider information about best performance taken from either a highly or less visible organisation in situations of benchmarking.

As indicated in Table (7-6), managers' sensitivity towards information about best performance adopted from a highly visible organisation was supported by seven of the managers within each Companies C, D and E. The mean scores are 2.90, 2.80 and 2.90 with standard deviations 1.20, 1.10 and 1.37 for the three companies respectively. This confirms that the managers' selections agreed with the statement in

question 14.9. Conversely, managers' replies (from the three companies) indicate that information about best performance taken from less visible organisations was less important than information taken from highly visible ones. However, the mean scores of 1.90, 1.60 and 2.00 with standard deviations of 0.88, 0.70 and 0.94 reflect a high level of disagreement across managers from the three companies (C, D and E) respectively in relation to question 14.10 (see Table 7-6).

#### **7.4.2 The relationships among organisational behaviour related variables**

In this section, the author examines the correlation coefficients for the organisational behaviour related variables (in sections 7.4.1.1, 7.4.1.2 and 7.4.1.3) to find the relationship between these variables. The correlations between these variables are set out in Tables (7-24, 7-25, 7-26, 7-27 and 7-28 of appendix-4) for Companies A, B, C, D, and E respectively. These tables provide a matrix of the correlations for ten variables. Underneath each correlation coefficient, the significance or non-significance value of the correlation and the sample size of respondents is listed. The findings in these tables show that there are perfect, moderate, weak or no significant relationships between the organisational behaviour related variables.

The first four scale variables in question 14<sup>(4)</sup> of the questionnaire (e. g. questions 14.1, 14.2, 14.3 and 14.4) were used to examine the manager's sensitivity to information about the implementation of benchmarking. These statements were concerned with the following: "managers are only sensitive to general information about best performance"; "managers are sensitive both to information about best performance and employees' behaviour"; "managers do not give enough consideration to information about employees behaviour"; and "managers give little weight to information about employee's behaviour". The correlation coefficients between these variables are reported in the tables mentioned above. Table (7-24) of appendix-4 for Company A indicates that these four variables are positively but moderately correlated ( $r = .210$  to  $.500$ ) with each other and statistically significant at  $p \leq .020$ . Similarly, Table (7-25) of appendix-4 for Company B exhibits that these

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<sup>(4)</sup> This question is concerned with organisation behaviour related variables which are shown in part 'D' of the questionnaire in appendix-1.



variables are positively correlated ( $r = .633$  to  $.757$ ) with each other and significantly correlated at  $p \leq .037$ . The correlation coefficients between these variables ranged in Table (7-26) of appendix-4 for Company C from largely negative ( $r = -.662$ ) to largely positive ( $r = .806$ ), and were statistically significant at  $p \leq .037$ . The findings obtained from Table (7-27) of appendix-4 for Company D indicate that there are positive and significant correlations between these variables, such as  $r = .333$  to  $.806$  at  $p \leq .030$ . Also, the correlation coefficient between these four variables is displayed in Table (7-28) of appendix-4 for Company E. This correlation was moderately positive and its value ranged from  $r = .301$  to  $.560$  at  $p \leq .040$  level of significance. The author concludes from the findings discussed above that the correlations between these variables within each of the five companies were positive (in Companies A, B, D and E) and negative (in Company C) correlated with each other in the situation of benchmarking implementation. This confirmed the findings obtained from the mean scores and standard deviations of managers' responses to the variables related to the first hypothesis.

An examination was made for the next set of variables in question 14 (e. g. question 14.5, 14.6, 14.7 and 14.8) using the Pearson correlation coefficients. These variables were related to the representativeness heuristic hypothesis which influences manager's benchmarking decisions. The correlation coefficients between these variables are set out in the following tables within each of five companies. Table (7-24) of appendix-4 for Company A indicates that these variables are positively (or negatively) and highly- correlated with each other ( $r = -.762$  to  $r = .962$ ) and are statistically significant at  $p \leq .030$ . There was weak correlation between variables 14.7 and 14.8 which are not significantly correlated because  $p > .050$ .

Table (7-25) of appendix-4 for Company B exhibited that there are largely positive and significant correlations ( $r = .562$  to  $.775$  at  $p \leq .044$ ) across these variables. Also, Table (7-26) of appendix-4 for Company C reported that there are largely positive and significant correlations between the variables of questions 14.5, 14.7 and 14.8 ( $r = .678$  to  $.680$  at  $p \leq .031$  as well as 14.6, 14.7 and 14.8 ( $r = -.723$  to  $0.740$  at  $p \leq .018$ ). No significant relationships are found between the variables of sections 14.5

and 14.6 and the variables of question 14.7 and 14.8, but they are moderately correlated. The findings obtained from Table (7-27) of appendix-4 for Company D, regarding the relationships between the variables, indicate that there are positive, negative and significant relationships ( $r = -.514$  to  $.952$  at  $p \leq .031$ ) across these variables. No significant relationship exists between the variables of questions 14.6 and 14.7 and those of questions 14.7 and 14.8 because of  $P > .050$ . However, they are moderately correlated with each other. Also, these variables in Table (7-28) of appendix-4 for Company E appear to be positively and significantly correlated with each other and with overall evaluation of  $r = -.424$  to  $.811$  at  $p \leq .018$ .

The author concludes from the results discussed above concerning about these variables and their significance that they are fairly correlated across all the five companies in situations of benchmarking implementation. These results support managers' responses for second hypothesis related variables about "ability and effort" which were given more consideration in Companies A, B, D and E than "operating environment", while "operating environment" was considered more important in Company C than "ability and effort" in benchmarking implementation.

The Pearson correlation coefficients were used to test the relationships between two variables related to the availability heuristic hypothesis. These were concerned with the following: "managers consider only information about best performance taken from a highly visible organisation"; and, "managers consider only information about best performance taken from less visible organisation". The findings of the correlations between these variables are exhibited in Tables (7-24), (7-25), (7-26), (7-27) and (7-28) of appendix-4 for Companies A, B, C, D and E respectively. These tables reported that the data yield a fairly moderate correlation coefficient ( $r = -.307$  to  $.516$ ) but are not significantly correlated because  $p > .050$  across the variables within each of the five companies.

From the above results, one may conclude that managers' responses for the third hypothesis related variables were to confirm that best performance taken from less visible organisations was less preferred in Companies C, D and E. To that end, the



preceding section investigated the correlation between organisational behaviour related variables within each of the five LMOs in benchmarking implementation. The following section discusses the stability or instability of an organisation's structure, managers, leadership and market conditions within each of the five companies in situations of benchmarking.

### **7.4.3 LMOs behaviours to stability/instability when benchmarking is implemented**

In this section, the author examines and discusses the variables mentioned in question 15<sup>(5)</sup> that may influence organisations in implementing benchmarking. These variables are relevant to the script and schema hypothesis (discussed in chapter 4) which will be tested to provide information about benchmarking in LMOs.

#### **7.4.3.1 Results of the fourth tested hypothesis**

This section concerns results about the role of script and schema theories to explain how managers consider stability/instability in which LMOs operate in situations of new adoption. With respect to this the following hypothesis is investigated.

- *The scripts and schemas theories influence managers' benchmarking decisions*

This hypothesis is relevant to benchmarking through such things as uncertainty of the market in which the organisation operates, stability of organisational structure, managers and leadership. Based on this hypothesis, there are four sub-scale variables indicated in the questionnaire appendix-1. These variables (or sub-scale questions) were computed on a four-point scale (e. g. once, twice, thrice and none) to provide results for data collected in this study. They were analysed to discover whether or not these variables influence benchmarking decisions under the script and schema hypotheses.

The results of these variables' analysis are found through managers' responses to each statement in questions (15.1, 15.2, 15.3 and 15.4) shown in Table (7-7). These results indicated that there is a high degree of stability of organisational structure (15.1) and

a number of changes for managers (15.2) across Companies A, B and E. However, most of the managers surveyed within each of the three companies indicated stable organisational structure through the last five years in situations of benchmarking implementation. Further, most managers with the same companies (A, B and E) indicated a high degree of stability for managers through the last five years. These results of managers' responses concerning stability of organisational structure were confirmed by a high mean score of 3.70 with standard deviations of 0.95 for all three companies respectively. Also, the results of managers' responses with respect to stability or no change for managers were also confirmed by the highest mean scores of 3.80, 3.70 and 3.60 with low standard deviations of 0.63, 0.95 and 0.84, confirming managers' responses that these three companies were stable. Furthermore, surveyed managers in Companies C and D stated that their companies were in unstable conditions with respect to organisational structure and number of changes for managers over the last five years. For example, all respondents of Company C and Company D selected the number of changes for the organisation's structure as 'once', and 'twice' respectively through the last five years when benchmarking was implemented. The lowest mean scores of 1.00 and 2.00 with standard deviations of zero reflected the degree of instability of organisation's structure for these two companies through the last five years. Overall, the managers of these companies feel this instability leads to difficulties, particularly in future planning (e. g. management training development), which is an important issue when using benchmarking. All of these findings are theoretically supported by Inkson et al. (1970) and Ezzamel and Hart (1987) who indicated that the more stable the firm with respect to organisational structure and managers, the easier it is to implement new change adoption.

Furthermore, a high number of managers featured in Companies A and B reported stability of leadership (statement in 15.3). However, the stability of leadership happens especially in the strategic organisation where the top management level of LMOs needs to implement any new adoption and intervenes in organisational issues as a high authority. However, the highest mean score of 4.00 with a standard deviation of zero within each of Companies A and B, corresponding to the statement

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<sup>(5)</sup> This question includes variables about the number of changes for organisation's structure,



in question 15.3, reveals total stability of leadership through the last five years when benchmarking was implemented. Specifically, all managers surveyed (for the two companies) reported 'none' in changes of leadership over the period of five years. Thus, benchmarking implementation in these companies has produced more effective strategy and managerial performance.

Moreover, responses to the same statement in question 15.3 indicated that all managers in Companies C, D and E reported instability in leadership through the last five years. This result was confirmed by the least mean scores of 2.00, 2.00 and 1.00 with standard deviation of zero within each of the three companies respectively. It also reflected the level of change for leadership: 'twice' in Company C and D 'once' in Company E over the last five years. The instability for leadership (frequent changes in top management) in these three companies led to changes at middle and lower management levels (see managers' responses for question 15.2 in Table 7-7). Accordingly, managers' performance and organisational efficiency were negatively influenced by the instability of the organisational environment. It has been pointed out by many researchers (Weiner and Mohoney, 1981; Smith et al., 1984; Mol and Vermeulen, 1988; Schein, 1985; Agnaia, 1996) that instability of leadership has an important influence on the effectiveness of the organisational performance in the situation of change adoption.

It is apparent from the same Table that, in general, Companies A, B, C, D and E went through instability in market conditions through the last five years. In this case, the lowest mean scores of 1.00, 1.10 and 1.30, with standard deviations of zero, 0.32 and 0.95, confirm that the managers selections were centred on change 'once' for market conditions through the last five years. Further, many of the managers surveyed in these companies added in the space provided for additional comments in the questionnaire that this instability influenced the firm's ability to understand the market environment (e. g. number and size of buyers, sellers and potential entrants) which was necessary to meet individual and organisational needs when benchmarking was implemented.

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managers, leadership and market conditions in the last five years.

**Table (7-7): Results of frequency distribution, mean and standard deviation for stability / instability of organisation related variables**

Questions	Companies																														
	A						B						C						D						E						
	ON	Tw	Thr	N	$\bar{X}$	SD	ON	Tw	Thr	N	$\bar{X}$	SD	ON	Tw	Thr	N	$\bar{X}$	SD	ON	Tw	Thr	N	$\bar{X}$	SD	ON	Tw	Thr	N	$\bar{X}$	SD	
15.1	F	1	0	0	9	3.7	.95	1	0	0	9	3.7	.95	1	0	0	9	3.7	.95	1	0	0	9	3.7	.95	1	0	0	9	3.7	.95
15.2	F	0	2	0	8	3.8	.63	1	0	0	9	3.7	.95	2	8	0	0	1.8	.42	4	6	0	0	1.6	.52	0	2	0	8	3.6	.84
15.3	F	0	0	0	10	4.0	0	0	0	0	10	4.0	0	0	10	0	0	2.0	0	0	10	0	0	2.0	0	0	10	0	0	1.0	0
15.4	F	10	0	0	0	1.0	0	9	1	0	0	1.1	.32	6	4	0	0	1.4	.52	7	3	0	0	1.3	.48	9	0	0	1	1.3	.95

ON: Once, TW: Twice, Thr: Thrice, N: None,  $\bar{X}$  : The arithmetic mean, SD: standard deviation

**Table (7-8): Results of frequency distribution, mean and standard deviation for organisation's used methods to implement benchmarking**

Questions	Companies																														
	A						B						C						D						E						
	N	ST	U	A	$\bar{X}$	SD	N	ST	U	A	$\bar{X}$	SD	N	ST	U	A	$\bar{X}$	SD	N	ST	U	A	$\bar{X}$	SD	N	ST	U	A	$\bar{X}$	SD	
16.1	F	0	0	3	7	3.7	.48	0	0	2	8	3.8	.42	9	1	0	0	1.1	.32	9	1	0	0	1.1	.32	0	0	2	8	3.8	.42
16.2	F	0	0	2	8	3.8	.42	0	2	8	0	2.8	.42	8	2	0	0	1.2	.42	8	2	0	0	1.2	.42	0	0	7	3	3.3	.48
16.3	F	10	0	0	0	4.0	0	9	1	0	0	1.1	.32	0	0	8	2	3.2	.42	0	2	8	0	2.8	.42	9	1	0	0	1.1	.32
16.4	F	0	10	0	0	2.0	0	0	10	0	0	2.0	0	0	7	3	0	2.3	.48	10	0	0	0	1.0	0	8	2	0	0	1.2	.42

N: Never, ST: Sometimes, U: Usually, A: Always,  $\bar{X}$  : The arithmetic mean, SD: standard deviation



The results for managers in Companies C and D concerning the number of changes for market conditions are summarised in Table (7-7 of appendix-3). All managers indicated high instability for market conditions. These results were confirmed by lowest mean scores of 1.40 and 1.30 with standard deviations of 0.52 and 0.48. Additionally, 50% of surveyed within each of the two companies reported to the researcher that the instability of market conditions influenced their companies' activities and operating environment. Thus, benchmarking implementation in these two companies was introduced less effectively.

Furthermore, the next section presents an analysis of variables about characteristics of LMOs attempting to implement and adopt benchmarking. These variables include methods used to encourage employees to accept benchmarking (7.5.1), and variables related to organisations applying benchmarking (7.5.2).

## **7.5 Characteristics of LMOs attempting to implement and adopt benchmarking**

The previous sections of this chapter analysed personal and organisation information, general information about benchmarking adoption, and organisational behaviours through benchmarking implementation in LMOs. This section discusses, in some detail, the results of the empirical analysis which support the arguments presented in this thesis. It begins by analysing the methods used to encourage employees to accept benchmarking, and then presents the results of analysing variables related to organisations attempting to implement benchmarking in the context of LMOs. In this case, various characteristics related to benchmarking implementation are discussed under the following sub-heading.

### **7.5.1 Methods used to encourage employees to accept benchmarking**

In light of the subjects' responses on the questionnaire, it was noticed that part of the influence on adopting benchmarking in LMOs might be caused by characteristics related to the methods of implementation (i.e., motivating, making, asking the employees to accept the new adoption and/or hiring new employees). Therefore, it was necessary to explore to what extent these characteristics could affect benchmarking in LMOs. In doing so, respondents

were requested to indicate the methods used by their companies to encourage employees to accept the new adoption. The main objective is to identify how different or similar the LMOs are in respect of these methods in implementing benchmarking. Further, Table (7-8) shows the frequency distribution for four methods, including means and standard deviations. The findings indicated that the following methods were used in order to implement benchmarking in their organisations.

Motivating the employees to accept benchmarking ranked as the first method to be used in Company A. However, seven and three of the managers indicated that this method was used as 'always' and 'usually' respectively in this area. Most managers ranked it at a mean score of 3.70 and standard deviation of 0.48. Making the employees understand the benefits of benchmarking was ranked at a mean score of 3.80 and standard deviation of 0.42. However, eight of the managers said that making the employees understand the benefits of benchmarking was the method that contributed to 'always' in this area, and two said 'usually'. Other methods (e. g. asking the employees to accept the new adoption whether they like it or not and hiring new employees) in which benchmarking contributions were ranked by most managers as 'never' and 'sometimes'. Thus, benchmarking was introduced into Company A with better understanding and effective process performance.

With regards to Company B, managers gave more consideration to the method of motivating the employees than to other methods to accept benchmarking. Eight out of ten managers indicated that this method was considered to be 'always' used when benchmarking has implemented. It was ranked at a mean score of 3.80 and standard deviation of 0.42. Another consideration given by managers was the method of making the employees understand the benefits of benchmarking. It was ranked to be used as 'usually' with a mean score of 2.80 and standard deviation of 0.42. In this case, these two methods mentioned (motivating and making the employees accept benchmarking) were the most common methods used in Company B to implement benchmarking. Therefore, benchmarking practice produced a highly effective level of process performance.



According to the managers' responses, asking the employees and hiring new employees were not considered as methods to encourage employees to accept benchmarking in this company. Specifically, asking the employees was ranked at a mean score of (1.10) and standard deviation of 0.32. Hiring new employees considered as 'sometime' and was ranked at a mean score of 2.00 and standard deviation of zero (see Table 7-8).

In respect to Company C, the priority in following up methods was given to asking the employees to accept benchmarking whether they like it or dislike it. This means that most managers indicated that this method was used 'always' (two managers) and 'usually' (eight managers). It was ranked at a mean score of 3.20 and standard deviation of 0.42. Meanwhile, hiring new employees was ranked at a mean score of 2.30 and standard deviation of 0.48 and agreed by seven of the managers 'sometimes', and three 'usually'. Other methods were ranked by managers at lower levels of evaluation; for example, motivating the employees to accept benchmarking and making them understand its benefits (see Table 7-8 of appendix-3). Accordingly, benchmarking implementation was introduced in Company C with poor understanding and the outcome was a less effective level of process performance.

In Company D, the method most used as indicated by managers, was to ask the employees to accept benchmarking whether they like or dislike it. This method was confirmed by two managers as being used 'sometimes' in this company and by eight managers 'usually', when benchmarking was implemented. Also, it was ranked at a mean score of 2.80 and standard deviation of 0.42. There was no attention given to hiring new employees as a method to be used to accept benchmarking.

As a result of the managers' responses shown in Table (7-8) for Company D, it was clear that managers paid very little attention to motivating the employees and consulting the employees to accept benchmarking when implemented. Therefore, the benchmarking process was introduced into this company with poor understanding and less effective level of performance.

In Company E, nearly the same priorities were given by managers as in Companies A and B to the method of motivating the employees to accept benchmarking as those given by managers in this company. The method of motivating the employees was ranked at a mean score of 3.80 and standard deviation of 0.42, and agreed to be used by eight and two of managers as 'always' and 'usually' respectively. The other method (making the employees understand the benefits of benchmarking) was evaluated at a mean score of 3.30 and standard deviation of 0.48. It was agreed to be used as a method to encourage employees to accept benchmarking by a reasonable number of managers: seven 'usually' and three 'always'. Also, there was very low concern regarding methods of hiring new employees and asking the employees to accept benchmarking whether they like it or dislike it. Nearly the same evaluations were given by managers for these two methods as 'never' to be used in this company in situation of benchmarking (see, Table 7-8). Therefore, benchmarking practice was introduced to Company E with better understanding and a more effective level of process performance.

After a considerable discussion about these four methods in LMOs and their implementation in the benchmarking area, , the author found that the most common method that LMOs used to implement benchmarking was motivating the employees. This method was agreed and prioritised by most managers of Companies A, B and E. The method of making the employees understand the benefits of benchmarking was also considered by Companies A, B and E but at a lower level of mean and standard deviation compared with the method of motivating the employees. However, they were both of very close concern to managers in these companies. Managers saw the contribution of these methods as increasing the employees' performance and the companies' efficiency.

Moreover, managers in Companies C and D concentrated on asking the employees and/or hiring new employees methods rather than on motivating and/or making the employees understand or encouraging them to accept benchmarking. Using the asking and hiring new employees methods demotivated employees which in turn led to low performance, because these



methods were based on an informal selection procedure to accept benchmarking.

### **7.5.2 Variables related to organisations applying benchmarking**

This section discusses some of the variables that are considered important to organisations attempting to implement benchmarking. The analysis of these variables or sub-scale questions (presented in the questionnaire) will be discussed next.

#### **7.5.2.1 Organisational environment related variables**

This sub-heading consists of three questions (17.1, 17.2 and 17.3) and aims to provide information about whether LMOs consider culture environment, economic factors and many dimensions of performance when benchmarking.

It may be recalled that the statement in question 17.1 was about considerations of culture and organisational environment. Libyan researchers have argued that many Libyan organisations have found difficulty in providing their employees with the appropriate kind of work environment that would encourage them to accept new change adoption (Aгнаia, 1996; Hafteri et al., 1994A); therefore, benchmarking practice was less effective in these organisations. Further, according to the analyses of managers' responses, culture and the organisational environment were considered differently across all five companies. However, most of the managers surveyed within each of the companies A, B, C, D and E indicated degrees of importance towards the statement in question 17.1 as 'somewhat important', 'important' and 'very important'. The mean scores of 3.60, 3.40, 3.00, 3.60 and 3.40 with standard deviations were 0.52, 0.70, 0.82, 0.52 and 0.84 within each of the five companies respectively, corresponding to the degree of importance that managers selected (see Table 7-9).

**Table (7-9): Results of frequency distribution, mean and standard deviation for organisation variables to benchmarking implementation**

Question s	Companies																														
	A				B				C				D				E														
	NI	SWI	I	NI	SD	NI	SWI	I	VI	$\bar{X}$	SD	NI	SWI	I	VI	$\bar{X}$	SD	NI	SWI	I	VI	$\bar{X}$	SD								
17.1	F	0	0	4	6	3.6	.52	0	1	4	5	3.4	.70	0	1	7	2	3.0	.82	0	0	4	6	3.6	.52	0	2	2	3.4	.84	
17.2	F	0	0	7	3	3.3	.48	0	0	6	4	3.4	.52	5	2	3	0	1.7	.82	5	1	4	0	1.9	.99	0	0	4	6	3.6	.52
17.3	F	0	2	6	2	3.6	.67	0	2	6	2	3.0	.67	5	1	4	0	1.9	.99	4	2	4	0	2.0	.94	1	2	3	3.0	1.1	
17.4	F	0	2	4	4	3.1	.72	0	1	7	2	3.1	.57	6	0	4	0	1.8	1.0	6	4	0	0	1.4	.52	4	2	4	2.0	.94	
17.5	F	0	2	5	3	3.1	.72	0	1	4	5	3.8	.70	4	6	0	0	1.7	.68	5	4	1	0	1.6	.70	4	3	3	1.9	.88	
17.6	F	0	1	6	3	3.2	.63	0	1	1	8	2.7	.67	0	0	8	2	3.2	.42	0	2	5	3	3.3	.74	0	2	2	3.4	.84	
17.7	F	0	2	3	5	3.3	.82	0	0	7	3	3.3	.48	0	0	7	3	3.3	.84	0	1	7	2	3.1	.57	0	2	4	3.2	.79	
17.8	F	0	0	3	7	3.7	.48	0	0	4	6	3.6	.52	0	2	4	4	3.2	.74	1	0	7	2	3.0	.82	0	2	5	3.1	.42	
17.9	F	0	2	3	5	2.6	.84	0	0	5	5	3.5	.53	5	4	1	0	1.6	.70	3	5	2	0	1.9	.74	0	4	3	2.9	.88	
17.10	F	0	0	3	7	2.8	.79	0	0	7	3	3.3	.48	5	2	3	0	1.8	.92	0	0	8	2	3.2	.42	0	0	8	3.2	.42	
17.11	F	0	1	7	2	3.1	.57	0	0	4	6	3.6	.52	0	0	3	7	3.7	.48	0	0	3	7	3.7	.48	0	0	5	3.5	.53	
17.12	F	0	1	7	2	3.1	.57	0	0	8	2	3.2	.42	0	1	5	4	3.3	.67	0	1	7	2	3.1	.57	0	3	3	3.1	.88	
17.13	F	1	1	3	5	3.2	1.0	0	2	5	3	3.1	.74	5	2	3	0	1.8	.42	5	4	1	0	1.6	.70	4	2	4	2.0	.94	
17.14	F	5	5	0	0	1.5	.53	0	5	5	0	2.5	.52	5	5	0	0	1.5	.53	5	5	0	0	1.5	.53	5	5	0	1.5	.53	

NI: Not important, SWI: Somewhat important, I: Important, VI: Very important,  $\bar{X}$  : The arithmetic mean, SD: standard deviation



It is noticeable from the above results that a high level of consideration was paid to culture and organisational environment across these companies. Discussions with many of the managers surveyed emphasised that culture and organisational environment were considered very important elements for benchmarking implementation in LMOs. They also added that the effects of these two elements on benchmarking implementation are very evident through their role in creating the appropriate atmosphere that assists in developing individuals who are then able to grasp any opportunity that helps them to achieve effective managerial performance. It has been shown in previous studies that the culture and environment of an organisation are considered as important factors because of their relation to the way in which the organisation is performing its business to implement new practices such as benchmarking (Bramham, 1997; Tutchter, 1994; Mason, 1993; Temporal, 1991).

Table (7-9) shows that most managers in Companies A, B and E agreed and in Companies C and D clearly disagreed with the statement in question 17.2. In general, most managers in Companies C and D paid insufficient attention compared with those of Companies A, B and E in setting priorities on the processes that are based on economic factors. The findings of Companies C and D tend to support the Nationwide Building Society initial conclusion to undertake benchmarking (Tutchter, 1994, p: 46)<sup>(6)</sup>. For Nationwide, resources were insufficient at the initial stage of benchmarking, and its priorities on the processes to be benchmarked were not based on economic factors. At this point, many managers surveyed mentioned that the structural changes in the Libyan economy are the main factors that have affected their companies in setting priorities to benchmark. In particular, those changes which are related to a drop in the oil price in the late 1970s and early 1980s caused declines in all development projects in their companies. Moreover, other managers surveyed indicated that their companies did not have a long-term production planning system, preferring instead a short-term operation programmes system. However, their companies faced difficulty in setting priorities on the processes to be benchmarked. For example, shortages in raw materials and spare parts were considered as the major reasons for the difficulty. They also mentioned that another reason for this shortage was that 80% to 90% of their companies' raw materials

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<sup>(6)</sup> In this paper: How Successful Companies Improve Through Internal Benchmarking.

came from abroad, with insufficient amounts of foreign currency available to import them. This result is consistent with the results found by Bait-Elmal (2000) which evaluated productivity with special reference to the National Mill Company, which is a Libyan animal food production company. Overall, many of the managers surveyed (for all five companies) indicated additional comments about the statement in question 17.2. They conclude that there have been direct and indirect effects of UN and USA sanctions against Libya on the attitudes within and performance of their companies. Sanctions have affected the country's economy and development policies for many years (see EIU report 1994).

In light of the above discussion and the mean scores with standard deviations exhibited in Table (7-9), Companies C and D received a low level of satisfaction and Companies A, B and E received a high level of satisfaction about the importance of setting priorities on the processes to be adopted, based on economic factors. However, all managers rank such importance to this statement within each company A, B and E and unimportance to the same statement for Companies C and D. Specifically, Companies C and D were attempting to benchmark too many items without consideration of economic factors. Therefore, Companies C and D paid less attention to the multivariate character of benchmarking on the processes to be benchmarked. This has led the two companies to less effective strategy formulation and managerial performance.

From Table (7-9), most managers surveyed in Companies A, B and E indicated that their companies have paid enough consideration to the statement in question 17.3 (due consideration is paid to many dimensions of performance) when benchmarking is implemented. However, the high mean scores of 3.00, 3.00 and 3.00 with standard deviations of 0.67, 0.67 and 1.10 for all three companies respectively reflected a high level of consideration paid to many items of performance (e. g. cost and quality control and sales maximisation) when benchmarking is implemented. In turn, Table (7-9) for Companies C and D reflect a low level of importance about consideration paid to many items of performance. These results will be discussed in more detail in chapter 8 through the Analytic Hierarchy Process (AHP).



With respect to the above discussion, the overall main criteria to be considered as a benchmark is quality control for Companies A, B and E. On the other hand, cost and quality control and sales maximisation were also considered as benchmarks with more or less the same priorities across the three criteria within Companies C and D. Therefore, these two companies were in a situation to benchmark too many criteria, and managers' decisions were influenced by different benchmarks. These companies also have difficulty in reaching the best standard for quality and cost control, sales maximisation and market share, because of lack of shared information. These results are consistent with the findings of Frost and Pringles (1993) on the search for industry best practice across the Western Australian public sector.

#### **7.5.2.2 Organisational size related variables**

This section discusses managers' consideration of firm size when selecting partners (question 17.4) and the firm size from which new model were adopted (question 17.5).

In the middle of the 1980s, LMOs started to deal with a change in the form of small, medium and large companies. The success of the partnership management model in some countries was one of the reasons which led the Libyan industry sector to take the decision to encourage alliances between two companies or more working in the same industry; such alliances are called partnership companies. These partnership companies had an opportunity to share information and/or discuss ideas before commencing any benchmarking activity. In this case, many LMOs gave proper consideration to company size in selecting benchmarking partners before the alliance was completed, and Companies A and B as an example of this. Other LMOs gave less consideration to whether it was important to choose partners of similar size. Companies C, D and E are examples of this. These examples are discussed below.

There was proper consideration given by most managers in Companies A and B in selecting a partner for benchmarking. However, eight and nine of all surveyed managers for the two companies respectively indicated such importance to the statement in question 17.4. Table (7-9) reflects the level of importance given by managers to the statement in question 17.4 in terms of mean scores and standard

deviations. In contrast, less consideration was indicated by most managers in Companies C, D and E to firm size in selecting a partner for benchmarking. This was confirmed by lowest mean scores of 1.80, 1.40 and 2.00 with standard deviation of 1.00, 0.52 and 0.88 corresponding to this statement. It has been pointed out in previous studies that partner selection is important because the extent of experience or knowledge is different within different group partner organisations (Elanathan and Kim, 1995). In general, it is essential for benchmarking organisations to give proper consideration in selecting the right partners in the situation of change adoption (Lau et al., 2001).

Company size is an important factor affecting the change to more complex management systems such as benchmarking (Macneil and Remmer, 1993). It has also an important effect on managers' choices and actions in new change adoption (Watts and Zimmerman, 1978). That may take place, in the case of the five LMOs. For instance, many respondents of the five surveyed companies paid insufficient attention to company size (see Table 7-9). For example, mixed results of managers' responses in each of Companies C, D and E indicated that their companies paid very little attention to the statement in question 17.5. The lowest mean scores of 1.70, 1.60 and 1.90, with standard deviations of 0.68, 0.70 and 0.88, confirm a high level of insufficient attention about the importance of the size of company upon which adoption was taken. Moreover, most of managers in Companies A (eight of ten) and B (nine of ten) indicated that their companies paid sufficient attention to the size of company upon which adoption was modelled.

From the literature review and from the review of the managers' responses to the statements in questions 17.4 and 17.5 (mentioned above) as well as their responses to the statements in questions 11 (for initial benchmarking model) discussed in section 7.3, it appeared that different levels of consideration were related to company size in selecting a partner or adopting an initial model of benchmarking across the five companies. This result means that Companies C, D and E failed to match the size in selecting partners and adopting initial models for benchmarking. Companies A and B



paid great attention to those factors. Therefore, benchmarking practice was introduced more effectively in Companies A and B than in Companies C, D and E.

### **7.5.2.3 Organisation resources related variables**

This section analyses managers' responses to questions 17.6 (employees' skills are upgraded to make the firm ready for benchmarking adoption), 17.7 (resources are fully deployed to embrace change) and 17.8 (accounting systems are used which provide more effective ways of motivating employees). Consequently, the arguments for all these statements across the five companies are presented next.

In general, the effectiveness of managers in implementing benchmarking is strongly dependent on appropriate decision-making procedures, and these depend on the skills and knowledge of the employees who make such decisions (Zairi, 1996). Employees need to acquire appropriate knowledge and skills to enable them to make their company ready for any new adoption (Zimmerman, 1997; Carroll, 1993). Skills need to be upgraded to meet certain standards or to improve their present performance. However, the increasing attention paid by many LMOs to employees' skills and knowledge (under Management Training and Development Programmes) during the 1970s and 1980s has not improved the quality of production as it should have done. For example, one study has indicated that the rate of quality production capacity used in several factories is no more than 50% of the predefined quality of production during the last five years of the 1980s (Seklani, 1991: 123).

Some LMOs have been able to create strategies in order to upgrade their employees' skills. This has led to positive results in terms of making these companies ready for the new adoption of benchmarking. In this context, most of the managers in five Companies surveyed (A, B, C, D and E) paid utmost considerations to the statement in question 17.6 (employees' skills). The high mean scores of 3.20, 2.70, 3.20, 3.10 and 3.40 with standard deviations of 0.63, 0.67, 0.42, 0.74 and 0.84 reflect the highest level of importance of this statement (see Table 7-9). Additionally, these results tend to support Bramham's (1997) suggestion that skilled employees are required to introduce the adoption of high performance and implement it with best practice.

With regard to the statement in question 17.7, which was about whether resources are fully deployed to embrace benchmarking, the managers' replies for all five companies are shown in Table (7-9). Many of the managers surveyed indicated in addition that the shortage of resources was considered one of the important obstacles affecting their company's ability to implement benchmarking. They also stated that the inadequacy of resources available significantly influences decision making by their management to adopt benchmarking. This is particularly true for the Libyan case in certain industries (e.g. Electrical and Engineering Industries and the Food Production Industry). The problems of lack of employees with necessary expertise, sufficient funds, relevant information and the availability of training (Andriopouls, 2001) all have an impact on quality.

The managers' replies in Table (7-9) indicate that the available resources are fully deployed to embrace benchmarking within each of the five companies. This was mentioned by eight managers in Companies A and E, ten managers in Companies B and C, and nine managers in Company D. The high mean scores of 3.30, 3.30, 3.30, 3.10 and 3.20 with standard deviations of 0.82, 0.48, 0.48, 0.57 and 0.79 corresponding to the statement in question 17.7, reveal a high level of satisfaction about the importance of resources being fully deployed to embrace benchmarking.

A review of the literature has revealed that the accounting culture in Libyan companies was initially highly British oriented. It is now highly American oriented. Libyan researchers, such as El-Jhemi et al. (1984), have suggested that Libyan companies are not paying enough attention to accounting compensation systems that can encourage employees to work and improve company performance. Also, Aghila (2000: 100) claims that many Libyan companies do not allocate compensations (rewards) according to performance but rather to qualifications and experience. However, incompetent employees are sometimes over rewarded and conversely competent ones are under-rewarded. These situations may cause difficulties and create low managerial performance which affects benchmarking implementation in LMOs. However, it has been suggested (Jensen, 1983) that management needs to adapt the firm for new change adoption and realise that the notion of an accounting compensation system is a



fundamental part of accounting practice that provides more effective ways of motivating employees in order to adopt benchmarking.

Furthermore, Table (7-9) indicates a high degree of importance among managers' responses within each of the five companies in ranking the statement in question 17.8. The results exhibited in Table (7-9) reveal a high level of importance given by most managers within each of the five companies to accounting systems used to provide more effective accounting methods of motivating employees through benchmarking implementation in terms of mean scores and standard deviations. However, these findings may cast light on the degree of importance placed by managers on the ability of accounting systems to provide the requisite performance needed for LMOs when benchmarking. It was further stated by Abusneina et al. (1993) and Kilani (1988) that accounting systems in Libya required more co-operation from economists, politicians, engineers and lawyers to provide more effective planning, implementation, control and performance evaluation systems.

#### **7.5.2.4 Prior consideration of benchmarking related variables**

This section presents managers' responses to the statement in questions 17.9 (understanding benchmarking before it is fully implemented), 17.10 (adopting large R&D programmes during benchmarking periods) and 17.11 (establishing an effective connection between the firm's products and market requirements), as discussed below.

Applying benchmarking taken from the 'best practice' of different organisations needs to be fully understood before it is implemented. In the light of the literature review of benchmarking and managers' responses to the statement in question 16.3 (discussed in section 7.5.1), it was noticed that part of the influence on benchmarking in Companies C and D was the method used (e. g. asking the employees to accept benchmarking whether they like it or dislike it) and the need for fully understanding benchmarking before it is implemented. So, Table (7-9) shows a low level of importance among managers to the statement in question 17.9 within Companies C and D. This result is not consistent with the findings of Zimmerman (1997) that it is necessary for the firm to understand the need for the adoption of benchmarking before it is fully implemented.

From the managers' responses in Table (7-9) for Companies A, B and E, the need for fully understanding benchmarking before it is fully implemented (statement in question 17.9) was ranked to be important by most managers. This was confirmed by high mean scores of 2.60, 3.50 and 2.90 with standard deviations of 0.84, 0.53 and 0.88, reflecting the level of importance to the same statement within each of the three companies. Overall, benchmarking practice was introduced more effectively in Companies A, B and E than in Companies C and D

Managers' responses regarding question 17.10 are shown in Table (7-9). However, before discussing these responses across the five companies, it is important to mention the Libyan research argument about lack of sufficient research and development (R&D) in general, and in LMOs in particular (Aгнаia, 1996: 314). The argument was in line with what has been indicated by Kilani (1988) that a lack of facilities and lack of encouragement impede R&D within the Libyan industrial sector. In addition, there was concern about insufficient R&D in both quantity and quality in Libyan companies in past periods. This could be related to the imported management systems which were not consistent with Libyan economy; before the 1970s it was an agriculture-based economy with very few investment projects and industry corporations, and this limited the role of R&D in country's organisations. However, Libyan companies, as public and private enterprises, are very sensitive to any change in the government's policies regarding economic, political, and social issues. In this case, R&D should be given more financial support, such as research facilities to be up-to-date, periodicals, financial compensation, the freedom of access to the necessary data, and so on, from both inside and outside the country's organisations. Thus, Zimmerman (1997) states that companies with large R&D investment have significant amounts of future growth options and can quickly adapt to any new processes such as benchmarking. Also, Tsipouri (2001) indicated that companies which invest in R&D are more likely to grow and become more competitive by benchmarking. Thus, it can be argued that the higher the investment for R&D, the higher the contribution to growth and implementation changes.



In relation to the above, managers' responses within each of the Companies A, B, D and E reflected their companies' selection about level of importance of adopting large R&D programmes during benchmarking periods. This result was supported by fair value of mean scores of 2.80, 3.30, 3.20 and 3.20 with standard deviations of 0.79, 0.48, 0.42 and 0.42 (see Table 7-9). In contrast, seven of the managers surveyed in Company C recognise the same statement in question 17.10 as less important; five and two of respondents respectively selected 'not important' and 'somewhat important', versus only three who selected important. No one selected 'very important'. The lowest mean score of 1.80 with standard deviation of 0.92 reveals a low level of importance to the statement for Company C to adopt large R&D programmes during benchmarking periods.

Furthermore, the level of importance given by managers for all five companies concerning question 17.11 (establishing an effective connection between the company and its products and market requirements) is reported in the preceding paragraph. The findings of question 17.11 indicate a high co-ordination between products and market requirements within each of the five companies. However, this statement received a high level of mean scores of 3.10, 3.60, 3.70, 3.70 and 3.50 with standard deviations of 0.57, 0.52, 0.48, 0.48 and 0.53 across Companies A, B, C, D and E respectively (see Table 7-9). This reflects positive results about the establishment of an effective connection between companies' products and their market requirements. In general, all the managers surveyed indicated their level of importance to this statement in question 17.11 across the five companies. These results can be seen as being consistent with the suggestion of Ford and Ryan (1981) that any benchmarking firm requires a good connection of the systems connecting a firm's products and market requirements.

Overall, according to discussion with managers surveyed across all the five companies, it appears that these companies do not face difficulties in marketing their products, as the demand for their products is great than the supply. However, the problem was that these companies sometimes could not provide their products because of shortages in raw materials and spare parts. They also added that in the middle of the 1990s these companies had difficulties related to importation issues because of restrictions which

the government put on the importation policy as a result of the embargo which the UN had imposed on Libya.

#### **7.5.2.5 Technological innovation and markets related variables**

Managers' responses to questions 17.12 (consideration is given to the time required for technological innovation), 17.13 (markets are well understood) and 17.14 (a clear understanding of the time required for benchmarking adoption) are examined and explained in this section. Consequently, this study indicates that strong considerations are given to the statement in question 17.12. These considerations were about the time required for technological innovation and the full adaptation of technology in situations of benchmarking implementation. One should bear in mind that technology is changing every day as a result of competition between manufacturing companies, so any company not following these changes will be far from the evaluation circle and then will face difficulty to function or to adopt benchmarking. Companies F and G are examples of this (see details in section 7.6).

Many Libyan companies are facing difficulties related to the following up of change in technology to facilitate the processes and procedures of benchmarking. This situation has been caused by economic problems and has increased sharply particularly since the UN and USA sanctions against Libya. This result was supported by the interviewed managers in Companies A, B, D, F and G when they indicated clearly that their companies were importing technology from USA, Canada and Western Europe. This leads to the importing systems and methods as well, and created difficulties in most LMOs, which resulted in their adapting their systems to imported technology.

From the above discussion it is clear that most LMOs import technology in order to implement benchmarking effectively. In this case, the level of technology which is used with each of Companies A, B, C, D and E has an important impact on the length of time it takes companies to implement benchmarking fully. This is because importing of new materials, equipment, processes and procedures are all necessary to speed up the rate of adoption of technological innovation for all five companies. At this point, Omta et al (1994) argued that two related factors, i.e. early adoption of benchmarking and new technology, can enable companies to become market leaders. In some



benchmarking cases, many technological innovations require a lengthy period (two years or more), from the time when they become available to the time when they are widely adopted (Zelkowitz, 1996). However, most managers' responses indicated that their companies gave a high level of consideration to the statement in question 17.12, which was about the time required to adopt technology fully for implementation of benchmarking. Most of the managers surveyed within each of the five companies considered the statement in question 17.12 to have a high level of importance. This result was confirmed by the highest mean scores and standard deviations about the importance of the statement in question 17.12 within each of the five companies (see Table 7-9).

Regarding the statement in question 17.13, the Libyan market operates under state control and planning to provide necessary services to the public at large as well as to guarantee the survival of the various manufacturing production companies. This was because most LMOs did not face any problems in marketing their products, as the demand for their products was more than the supply (The Secretariat of Industry 1996). Therefore, the difficulty was that many LMOs were sometimes unable to provide their products as a result of shortages. This was caused by shortages in raw materials and spare parts because of the UN and USA sanctions against Libya. Despite this, the development of LMOs' production in internal and external markets in the last three decades might have contributed significantly to such changes in the strategies of input, output and pricing decisions from time to time.

In relation to the above discussion, managers' responses revealed different percentages of ranking to the statement in question 17.13 across Companies A, B, C, D and E. The majority of managers within each of the Companies A and B indicated a high level of importance to this statement. The mean scores of 3.20 and 3.10 with standard deviations of 1.00 and 0.74 confirm a high level of importance to the notion that firms need to understand markets when applying benchmarking (see Table 7-9). These results tend to support the suggestion of Brickley et al. (1997) that firms must have an understanding of how markets work to make the best input, output and pricing decisions when applying benchmarking. The managers' responses to the same statement

of question 17.13 for Companies C, D and E are shown in Table (7-9). Accordingly, most managers indicated their companies' level of consideration to the same statement as having less importance. However, the mean scores of 1.80, 1.60 and 2.00 with standard deviations of 0.42, 0.70 and 0.94 reveal a low level of importance to understanding fully how markets work when applying benchmarking.

In light of the managers' responses about the time it takes to implement benchmarking (see Table 6-1 of appendix-2), it was felt that part of the influence on adopting benchmarking might be caused by different lengths of time for adoption across companies. Therefore, it was necessary for these five companies (A, B, C, D, and E) to speed up the rate of adoption in the benchmarking situation. This led to a discussion concerning managers' responses about clear understanding of the time required for successful adoption within Companies A, B, C, D and E. Thus, Table (7-9), which indicates the managers' responses to question 17.14, reveals very low consideration to understand clearly the time required for benchmarking adoption within Companies A, C, D and E. For instance, all managers surveyed within each of the four companies indicate very low or no consideration to the statement. This was confirmed by the mean score of 1.50 with standard deviation of 0.53 for all five companies. In turn, there was a reasonable level of concern given by most managers in Company B to the statement in question 17.14. All managers surveyed recognise such importance; five and five of the managers responded 'somewhat important' and 'important' respectively. However, a mean score of 2.50 with standard deviation of 0.53 indicates the company concern toward the time required for successful benchmarking adoption.

### **7.5.3 The relationship between organisational variables related to benchmarking implementation**

There are fourteen sub-scale variables related to organisations attempting to implement benchmarking. This section, therefore, tries to examine statistically the relationship between these variables within each of Companies A, B, C, D and E.

The correlation matrices of these fourteen variables are presented in Tables (7-29), (7-30), (7-31), (7-32) and (7-33) of appendix-4 for the five companies respectively. These



tables yield mixed results of positive and negative correlations. All these mixed results may be attributed to individual responses to the questions of organisational characteristics adopted from a different culture. Some of these correlations are statistically significant ( $p \leq .05$ ) and others are insignificant, as exhibited in the tables mentioned above. Specifically, many significant correlations are found between such variables as 17.1 and 17.12: “culture and organisational environment are fully considered”; and, “consideration is given to the time required for technology adoption”. The relationships between these variables are positively and significantly correlated with  $r = .227, .674, .403, -.227$  and  $.440$  at  $p = .040, .033, .048, .027$  and  $.005$  levels within each of the five companies.

Most of the correlations between these variables are average. For example, average significant correlations were obtained between the variable of question 17.3 and other variables such as 17.4, 17.10 and 17.13: “due consideration is paid to many items of performance”; “managers give proper consideration to firm size in selecting partners”; “the firm adopts a large R&D programme during benchmarking periods”; and “market well understood to facilitate effective pricing decisions” with ( $r = .423$  to  $.845$  at  $p \leq .044$ ;  $r = -.960$  to  $.653$  at  $p \leq .037$ ;  $r = -.584$  to  $.314$  at  $p \leq .047$ ;  $r = -.623$  to  $.719$  at  $p \leq .050$ ; and  $r = -.344$  to  $.603$  at  $p \leq .030$ ) for Companies A, B, C, D and E respectively.

There are also relationships between the variable of question 17.2 and other variables, such as 17.4, 17.6, 17.8, 17.9 and 17.12, as well as variables of question 17.3 and other variables of 17.11, 17.12, 17.13 and 17.14. These variables were concerned with “setting priorities on the process to be adapted”; “managers give proper consideration to firm size in selecting partners”; “employees’ skills are up graded”; “accounting systems provide effective ways of motivating employees”; “understanding benchmarking before it is fully implemented”; “consideration given to the time required for technology”, etc. Some of these variables are negatively and others positively significantly correlated with each other with a range from ( $p > .001$  and  $p \leq .050$ ) within each of the five companies.

Moreover, the important significant correlations are found between these: “managers give proper consideration to firm size in selection partners” and other related variables such as “due consideration is paid to many items of performance”; and “consideration given to time required for technology” with  $r = .845$  and  $.794$  at  $p = .002$  and  $.006$  level for Company A (see Table 7-29 of appendix-4). Other important negative and significant correlations are exhibited between the following: “managers give proper consideration to firm size in selecting partners” and “resources are fully deployed to embrace benchmarking”; also, there is significant correlation between “the need for understanding benchmarking”; and “markets are well understood to facilitate effective pricing decision” with  $r = -.422$  at  $p = .005$  and  $r = .714$  at  $p = .020$  level for Company B (see Table 7-30 of appendix-4). Third, important significant correlations are reported between these: “employees are upgraded to make the firm ready for benchmarking” and “resources are fully deployed to embrace benchmarking”; also, significant correlations exist between “resources are fully deployed to embrace benchmarking” and other variables such as “the size of firm upon which adoption will be modelled”; and “the need for fully understanding benchmarking” with  $r = .764$  at  $p = .010$ ,  $r = -.356$  at  $p = .012$  and  $r = .732$  at  $p = .016$  level respectively for Company C (see Table 7-31 of appendix-4). Fourth, important mixed results (negative and positive) of significant correlation are found between the following: “managers give proper consideration to firm size in selection partners” and another two variables: “due consideration is paid to many items of performance” and “consideration to the time required for technology”; also, significant correlation exists between these: “employees skills are up-graded to make the firm ready for benchmarking” and “accounting systems are used to provide ways of motivating employees”. This is in addition to the correlation between “the need for fully understanding benchmarking before its full implementation” and “markets are understood to facilitate well effective pricing decisions” with  $r = .361$ ,  $-.686$ ,  $.799$  and  $-.340$  at  $p = .005$ ,  $.008$ ,  $.006$  and  $.009$  level for Company D (see Table 7-32 of appendix-4).

The fifth, important significant correlations appeared between the following: “managers give proper consideration to firm size in selection partners” and “the need for fully understanding benchmarking before its full implementation”; and the



correlation between these: “resources are fully deployed to embrace benchmarking” and “consideration to the time required for technology.” Significant correlation emerged between these: “accounting systems are used to provide ways of motivating employees” and other two related variables: “managers give proper consideration to firm size in selection partners” and “establishment of an effective connection between the firm products and market” with  $r = .843, -.440, -.335$  and  $.799$  at  $p = .002, .009, .011$  and  $.006$  respectively for Company E (see Table 7-33 of appendix-4).

Furthermore, weak positive and negative correlations were found across many of the variables within each of the five companies (see Tables 7-29, 7-30, 7-31, 7-32 and 7-33 of appendix-4). All these mixed results may be attributed to individual responses to the questions of the organisational characteristics adapted from different cultures. This means that these variables are independent from the other scale variables in the organisational characteristics of the sub-scale variables benchmarking implementation.

## **7.6 Potential reasons why some LMOs did not implement benchmarking**

The previous section of this chapter analysed various characteristics of LMOs attempting to implement and adopt benchmarking. These results were about the extent to which these characteristics have influenced managers’ performance and how they affect the benchmarking decisions in LMOs. This section analyses managers’ responses related to the reasons why some LMOs have not introduced benchmarking. Furthermore, the analysed data were collected from surveyed managers who were responsible for benchmarking decisions, and these were based on the classification of data presented by Companies F and G, in order to investigate the difficulties experienced by these two companies when implementing benchmarking. However, Tables (7-10) show the frequency distribution for managers’ responses on a 4-point scale of ‘strongly disagree’, ‘disagree’, ‘agree’ and ‘strongly agree’ as well as mean scores, and standard deviations. The managers’ responses of difficulties in Companies F and G explaining why these companies have not introduced or have failed to implement benchmarking are discussed under the following sub-headings:

### **7.6.1 Insufficient considerations related variables**

Insufficient thought was given by managers in Companies F and G regarding questions 35.1 (insufficient consideration was given to many items of performance when

benchmarking implemented), 35.2 (insufficient trained manpower) and 35.3 (insufficient resources were available for R&D). However, there was high level of agreement across managers in Companies F and G, suggesting that these two companies have not introduced benchmarking because of managerial conflict. The reason behind this was mentioned by many managers in Companies F and G when they indicated conflicts in priorities across cost and quality control and sales maximisation. However, the required procedures, such as cost and quality control, to benchmark each of these criteria are not the same, and can conflict with each other. They added that these circumstances have limited the overall strategy of the companies' and precluded them from implementing benchmarking.

Table (7-10) provides a high indication of the agreement level of the managers and their ranks to the statement in question 35.1. Most managers within each Company F and G indicated their strong agreement. In this case, decision making was more difficult because there was a lack of agreement on the criteria to be benchmarked. Reasonably high mean scores of 3.20 and 3.10 with standard deviations of 0.92 and 0.74 reflect this result, implying that insufficient consideration was given to many criteria of performance when benchmarking was implemented.

Recently, many LMOs have been giving more attention to the managers responsible for the implementation of change in various areas. This attention has taken various forms and all of them seek to train and develop these managers to facilitate success related to any fields of economics and industry in both the private and public sectors. Despite this attention having been paid to training manpower in Libyan organisations, some organisations have been unable to identify in detail the knowledge and skills required by the employees (Aagnaia, 1996) in order to have a positive effect on the ultimate success of benchmarking implementation. This is an important issue that should be taken into account when Companies F and G implemented benchmarking. At this point, managers' responses in these two companies indicated their agreement with the statement in question 35.2, which was about insufficiently trained manpower. Eight managers in Company F and nine managers in Company G indicated that there was insufficient trained manpower in the situation of benchmarking. Also, the mean scores



of 3.10 and 2.80 with standard deviations of 0.74 and 1.00 reflect managers' responses to the same statement mentioned in question 35.2 (see Table 7-10). These findings are not consistent with the literature which states that well-trained manpower can improve the company's performance and make it ready for benchmarking (Lau et al., 2001; Bramham, 1997).

Regarding insufficient resources available for R&D in implementation of benchmarking, there is clear understanding in the literature review that these industrial companies have witnessed a clear growth in their investment, production (quantity and quality), and internal and external sales. Despite this growth and the huge resources which were invested in most manufacturing companies, the resources available for R&D are still very low, and Companies F and G are an example of this. These two companies were in situations of insufficient resources available for R&D which may have prevented them from any new adoption such as benchmarking. However, the empirical investigation of managers' replies to question 35.3 suggests a high level of agreement across managers (nine and eight) about insufficient resources being available for R&D in both Companies F and G respectively (see Table 7-10). This statement was ranked at mean scores of 3.50 and 3.00 with standard deviations of 0.71 and 0.82, which confirm the managers' positive responses to insufficient resources in preparation for R&D.

#### **7.6.2 Conflict of interest between managers**

This section presents managers' responses to questions 35.4 (conflict of interest with each item to be benchmarked across managers) and 35.5 (incompatibility with the structure of management compensation plans). These are discussed below.

It could be argued that the discussions with surveyed managers in Companies F and G showed conflict of interest arising across divisions to each criterion to be benchmarked. This conflict was difficult to resolve since cost and quality control divisions were interested in maximising their own utility. Both divisions wanted to increase their profit and the welfare of their units, but to decrease cost in the cost control division led the quality control division to offer poor quality in determining benchmarking. These

managers (e.g. managers in production and R&D) believed that circumstances across divisions were in conflict with different priorities.

Based on the above mentioned discussion, the author found that Companies F and G were in a situation not to introduce benchmarking because of conflict of interest across divisions for criteria to be benchmarked in addition to difficulties mentioned in mini case studies (chapter 6). This was supported by the responses of most managers to the statement in question 35.4 at a reasonably high level of agreement. For instance, nine and eight of the managers surveyed within each of Companies F and G respectively indicated their agreement with the same statement. The mean scores of 3.50 and 2.80 with standard deviations of 0.82 and 0.63 confirm a high level of agreement with the statement mentioned above (see Table 7-10).

Brickley et al. (1997) indicated that successful organisations develop rewards and performance evaluation systems that provide managers with appropriate incentives to accept new adoption. However, to compensate managers in the organisation, the rewards have to be fair and equitable, and this is based on the notion that if the manager receives an unexpected reward then he is going to change his behaviour according to that reward. Also, Marchington and Wilkinson (1996: 298) indicate that organisations should persuade their employees that effort will be recognised and rewarded. However, procedures of pay and compensation in many LMOs were not based on the assessment of performance and achievement, which led to difficulties regarding the relation of performance to equitable reward. This was related by El-Jhemi et al. (1984: 164) and Ejigu and Sherif (1994: 6) who claimed incompatibility with the structure of management compensation plans (e. g. efforts and rewards) in many LMOs. This result is in line with the results found with companies F and G, as discussed below.

Companies F and G demonstrate incompatibility with the structure of management compensation plans (including pay, promotion and direct and indirect remuneration) that firms use as performance measurement. In the case of Companies F and G, managers' responses indicated a high level of agreement with the statement in question 35.5, as shown in Table (7-10). This means that most surveyed managers indicated that



their companies' structure of management compensation plans was incompatible with performance measurement to implement benchmarking. Specifically, the high mean scores of 2.60 and 3.20 with standard deviations of 1.2 and .79 reflect the high level of agreement given by managers to the statement in question 35.5.

### **7.6.3 Market conditions and technology and skilled employees related variables**

As a result of today's developed and complex society, some of the LMOs are unable to create strategies to respond to changes in market conditions and technology (questions 35.6). Others have a shortage of skilled employees to implement benchmarking (questions 35.7).

In general, technology and market conditions are changing every day as a result of competition across manufacturing organisations, so any organisation not following these changes will be far from the evaluation circle. There were many Libyan companies at the beginning of the 1970s that adopted computer systems which at that time were considered modern. Other companies were unable to do so and continued to use typewriters and other facilities. These companies found themselves in the 1980s looking for more advanced technology. The level of technology which was required in order to implement benchmarking in many LMOs demanded the acquisition of new knowledge and highly qualified or trained managers. Companies F and G are examples of this. However, the effect of rapid development in technology and changes in market conditions led to expanding tasks and complicated processes in situations of benchmarking implementation. In relation to this, the empirical investigation of managers' responses in Companies F and G are shown in Table (7-10). There was a high level of agreement across managers with each of the two companies with the statement in question 35.6. Specifically, the mean score of 3.30 and 3.20 with standard deviation of 0.82 and 0.63 within Companies F and G reflect the level of agreement with the statement in question 35.6 (see Table 7-10).

This section deals with question 35.7 which is concerned with the shortage of skilled employees and behaviours to make the firm ready for adopting new process performance. Many Libyan organisations need to pay more attention to upgrading their employees' skills and behaviours because these drive organisational performance.

Therefore, it can be said that managerial work needs to be more sensitive to information about skills and behaviours for managers who are responsible for benchmarking implementation in their organisations. Companies F and G are an example of this. Furthermore, this study investigated whether there was a lack or shortage of skilled employees and behaviours when adopting benchmarking in Companies F and G. According to the data in Table (7-10), most managers surveyed in these two companies are in a high level of agreement with the statement in question 35.7. Eighty and seventy percent of managers within Companies F and G respectively indicated such agreement. Specifically, the mean scores of 2.90 and 2.70 with standard deviations of 1.00 and 1.10 reflect the level of managers' agreement with the same statement.

#### **7.6.4 Economic importance and firm's size related variables**

This study also examined the priorities of the processes to be adopted within Companies F and G, based on consideration of their economic importance (question 35.8), as well as investigating managers' awareness of the importance of a firm's size in selecting partners when benchmarking (question 35.9). These are discussed next.

Most managers surveyed in Companies F and G indicated their agreement with the statement in question 35.8. Specifically, Table (7-10) shows that priorities of process to be adopted in companies were not based on consideration of their economic importance. This response (as many participants indicated when they were interviewed) came as a result of the changes in circumstances <sup>(7)</sup> that have taken place over the last ten years. This is because country procedures have led to a policy of limiting imports to necessary raw material, which led to an increase in prices in general and in goods produced by Companies F and G in particular. Therefore, the priorities of processes to be benchmarked were not based on consideration of economic importance. The level of mean scores of 3.30 and 3.00, with standard deviations of 0.68 and 0.67 corresponding to the statement in question 35.8, reveal a high level of agreement that the priorities of processes to be adopted were not based on economic importance (see Table 7-10).

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<sup>(7)</sup> A result of the UN decision sanction to impose some restrictions on import policy, to freeze some Libyan overseas assets and stop the Libyan Arab Airline from flying outside the country.



In the previous section of this chapter, whether managers in LMOs give proper consideration to the firm's size in selecting a partner for benchmarking was discussed. As a result of managers' responses, the author found that Companies C, D and E did not give proper consideration to company size in selecting a benchmarking partner (see discussion of section 7.5.2 and Table 7-10). In addition to this, Companies F and G failed to match the size in selecting benchmarking partners (question 35.9). This was confirmed by high levels of agreement across managers surveyed within each of the two companies when they ranked the statement mentioned as either 'agree' or 'strongly agree'. Also, the mean scores of 3.00 and 2.80 with standard deviations of 0.81 and 1.00 reflect the level of agreement across managers in these two companies (see Table 7-10).

#### **7.6.5 Available resources and cultures and environments related variables**

This section presents managers' responses to question 35.10 (difficulties were experienced in allocating available resources) and 35.11 (absence of sensitivity to different organisational cultures and environments).

The findings of managers' responses regarding question 35.10 show difficulties in allocating available resources to benchmarking adoption. Many surveyed managers in LMOs felt that the resources allocated to implement benchmarking are inadequate. These resources were obtained from their operations which could be different from one company to another. The managers surveyed also added that shortage of resources was one of the factors affecting their companies' performance. This was supported by most managers in Companies F and G when they mentioned that one of the factors that influenced their performance was lack of financial support. Therefore, the shortage of financial support can be considered as one of the important obstacles facing benchmarking implementation in many LMOs. This is related to government financial restrictions caused by an economic embargo which was imposed on Libya by the UN and USA in 1990. These results support Agnaia (1996) which indicated lack of financial support as an obstacle to improving management training and development programmes in Libyan organisations.

In light of the above discussion and data in Table (7-10) for Companies F and G, managers' responses indicate that the resources allocated to implement benchmarking are difficult. This was mentioned by seven of the managers in Company F and by six of the managers in Company G. Also, the low mean scores of 2.80 and 2.70 and standard deviations of 1.30 and .95 reflect the high level of agreement across managers about difficulties experienced in allocating resources to new adoption in these two companies.

The literature review suggests that many benchmarks were taken from different organisations' "best practice" (Maull et al., 2001; Zairi et al, 1999; Bramham, 1997; Hoeckline, 1995). These benchmarks were adopted from various countries to another without understanding cultural and environmental differences (Awasthi et al., 2001; Chenhall & Smith, 1998; Temporal, 1991). In this case, problems arose if the organisation's culture and environment from which a benchmark was taken were not compatible with the organisation's strategy. Therefore it can be said that culture and environment will influence benchmarking implementation. These categories are discussed under statement of question 35.11.

Hofstede (1991) stated that cultural and environmental differences have been observed since time began. The world is full of confrontations between people, groups and nations that think, feel and act differently. In recent years, the idea of cultural and environmental differences has increased in importance in cross-cultural and environmental studies (Hofstede, 1991, 1993; Hoecklin, 1995; Redding, 1995). The adoption of benchmarking can face serious problems, if the adoption is implemented without paying sufficient attention to cultural and environmental conditions. Directly adopting processes from Western European and American capitalistic, free market economies and individualist societies to traditional, socialist societies such as Libya may have limited applicability in the context of LMOs. Companies F and G are an example of this. These two companies have attempted to adopt benchmarking from other countries without taking into account differences in culture and environment, which has led them to difficulties in applying new change adoption such as



benchmarking. This conclusion is confirmed by the managers' responses to the statement in question 35.11.

According to data in Table (7-10), eight and nine of the managers surveyed for Companies F and G respectively indicated their level of agreement with the statement in question 35.11. The high mean scores of 3.10 and 3.20 with standard deviations of 0.84 and 0.63 reflect a high level of agreement across managers with the statement in question mentioned above, which was about the absence of sensitivity to different organisational cultures and environments in situations of benchmarking adoption.

#### **7.6.6 The relationship between organisational variables affecting benchmarking**

This section examines the level of the relationship between eleven variables which have affected the benchmarking decisions in Companies F and G. These variables were discussed above and presented in section IV of the questionnaire in appendix-1.

The findings of the relationship between these variables are exhibited in Table (7-34) and (7-35) of appendix-4 for Companies F and G. The variables of questions 35.1, 35.2, 35.6 and 35.7 concerned the following: “insufficient consideration was given to many items of performance”; “insufficient trained manpower”; “difficulties facing management to follow the changes in market conditions and technology”; and “the shortage of skilled employees” correlate positively and significantly with each other and ranged from ( $r = .128$  to  $.697$  at  $p \leq .050$ ) for the two companies. Also, there are positive and significant correlations between variables of question 35.2 and other two variables such as 35.3 and 35.7 about “insufficient trained manpower”; “insufficient resources were available for R&D”; and “shortage of skilled employees” with overall evaluation ( $r = .214$  to  $.722$  at  $p \leq .050$ ) for Company F and ( $r = .318$  to  $.395$  at  $p \leq .050$ ) for Company G. In addition to this, a positive and significant relationship between variables of questions 35.5 and 35.10 about “incompatibility with the structure of management compensation plans” and “difficulties were experienced in allocating available resources” was found with overall evaluation ( $r = .683$  at  $p = .029$ ) for Company F and ( $r = .783$  at  $p = .038$ ) for Company G.

Furthermore, there varied results are shown in the two tables mentioned above within each of two companies. For example, variables of questions 35.4, 35.5, 35.8, 35.11 for Company F and G about “conflict of interest with each item to be adopted”; “incompatibility with the structure of management compensation plans”; “the priorities to the processes to be adopted were not based on consideration of their economic importance”; and “absence of sensitivity to different organisational cultures and environments” yield mixed results of positive and negative correlations but are not significantly correlated between each other and across other variables. He author concludes that many of these variables are either weak positive or negative correlation and non-significant correlations with each other across Companies F and G.

### **7.7 Summary**

Throughout this discussion of benchmarking in the literature review, several difficulties that confront organisations attempting to implement benchmarking practices were identified. This study examined these difficulties in a sample of seven LMOs. Five of these companies are currently practising benchmarking, namely Companies A, B, C, D and E. The remaining two companies, F and G, failed to practise benchmarking. The findings of this study indicate that the majority of managers who participated in this study hold a university or higher degree. There is a significant relationship between being responsible for implementing benchmarking and the level of management education in each of the seven LMOs. Also, most managers' educational background was gained from places of study such as the USA, Canada and Western and Eastern Europe. This suggests that new change adoption has been imported to Libyan organisations from different cultural environments, with many resulting problems. For example, the accounting system adopted by Libyan organisations was designed according to the needs and values of Western and American accounting companies. The accounting systems are not involved in the development of performance measures which are needed for any new practice such as benchmarking. The accounting system should be a system which aims at providing for the needs of the country, and its scope should include enterprise, government and social accounting.

Benchmarking has gone on for more than five years in Companies A, B, C, D and E. The author found, however, that Companies A, B and E paid more consideration to



quality control as a benchmarking criterion, while Companies C and D focused on cost control (the discussion of these results is shown in more detail in chapter 8 through the Analytic Hierarchy Process). This study also examined whether or not these five companies are sensitive to the importance of information about employees' behaviour when benchmarking was implemented. The findings of this study indicate that Companies A, B and E were sensitive both to information about performance and employees' behaviour, whereas Companies C and D were sensitive to information about best performance only.

Moreover, the stability of company structure, managers, leadership and market conditions for Companies A, B and E has been quite constant over the last five years. These factors led the companies to obtain positive effectiveness in their performance. Meanwhile Companies C and D were in an unstable condition with all these factors which led to a decrease in their performance and resulted in difficulties in implementing benchmarking. This study also identified and discussed characteristics related to benchmarking implementation with respect to different cultural and organisational environment, setting priorities on the criteria to be benchmarked, employees' skills and behaviour, accounting systems, market conditions, etc. All of these characteristics have directly or indirectly influenced the effectiveness of benchmarking implementation in LMOs. Consequently, one may also conclude that Companies C and D have paid insufficient attention to the multivariate character of benchmarking compared with Companies A, B and E. These two companies were in a situation to benchmark quality and cost control at the same time without considering the priority of each criterion. Therefore, Companies C and D were in difficulty as a result of conflict between different benchmarks.

The findings of this study revealed that these five companies have been able to develop strategies in order to upgrade employees' skills, deploy required resources, and operate accounting practices which link compensation to measures of company performance. On the other hand, these five companies demonstrated lack of sufficient R&D programmes in both quantity and quality during change periods. They have also exhibited difficulties in marketing their products as a result of shortages. This was caused by shortages in raw materials and spare parts because of UN and US sanctions

against Libya. Furthermore, The author concludes that many LMOs in general and these five companies in particular have been plagued by USA sanctions, a situation which was made worse in the 1990s. These restrictions caused difficulties related to following up continued changes in technology which these companies might use to facilitate the process of benchmarking.

It is worth mentioning that Companies F and G failed to implement benchmarking as a result of managerial conflict across departments on which criterion should be benchmarked. The absence of management ability to perceive in detail information about the knowledge and skills required created difficulties in these two companies in determining benchmarking. Also, inadequate resources decreased the employees' performance and companies' efficiency to implement benchmarking. All these problems have a profound effect upon companies, as the author observed during his fieldwork in Libya.

After considerable discussion of characteristics related to benchmarking implementation in LMOs, the priorities given by managers to benchmarked criteria (e.g. cost and quality control, sales maximisation and market share) and related sub- and specific sub-criteria within each of the Companies A, B, C, D and E will now be discussed. The analysis of these priorities will be shown in detail in chapter 8 through application of the Analytic Hierarchy Process (AHP).



## CHAPTER 8

### **8. An analysis and discussion of findings related to the comparison of importance of each criterion**

#### **8.1 Introduction**

The purpose of this chapter is to address the fifth research objective (1.3.5). This objective was to describe the view of the managers in terms of the relative importance of the criteria to be benchmarked in LMOs. This chapter also presents and investigates the seventh research question (1.4.7), which asked how the responsibility of managers (subjects) to settle upon organisational goals cause the firm to be concerned more with some benchmarking criteria and less concerned with others. Therefore, this chapter provides a discussion of priorities of the criteria of the managers as exhibited in the hierarchy of Figure 5-2, in order to gain a deeper understanding of the importance of each criterion, sub-criterion and specific sub-criterion in determining benchmarking best practice in LMOs (companies A, B, C, D and E). Also in this chapter, the author discusses pairwise comparisons at the criteria level, based on data obtained from fieldwork. The AHP methodology (discussed in chapter 5) is used in this study for the five LMOs who have implemented benchmarking. The goal is to understand the structure of benchmarking rationales in these organisations.

This chapter provides a discussion of the results of the judgements of the subjects about the importance of various criteria of benchmarking. These results and the results mentioned in chapters 6 and 7 provide unique evidence on the factors which shape benchmarking in LMOs. No previous research has attempted to provide an explanation of the structure of benchmarking practices in LMOs. The research focuses on four criteria described in chapter 5. It examines the views of the subjects about the relative importance of criteria and sub-criteria which influence benchmarking judgements and processes.

Since AHP is viewed as a structured way of building prioritised criteria across four main criteria, the process of benchmarking was structured in four levels. As shown in Figure 5-2, the top level of the hierarchy represents the ultimate goal of determining “the best benchmarking” dimensions. The second level reflects the main criteria considered important in measuring the well-being of the organisation such as cost and quality control, sales maximisation and market share. At the third level, these criteria are subdivided into twelve sub-criteria. These are further classified into twenty-four specific sub-criteria and identified to determine the well-being of the organisation. In such a scenario, Schmoldt et al. (2001) suggested that the performance structure elicited by AHP aid in choice selection is useful in subsequent analyses, and offers a glimpse into the belief systems that govern the world view of the decision managers.

## 8.2 Sample profile

A demographics section has been discussed in the research methods chapter where each subject was asked to provide details on their position, gender, place of education, and general information about new management tools and techniques aimed at improving organisation performance. The subjects were questioned about information related to many dimensions of performance when benchmarking was implemented in their organisations. The fifty subjects<sup>(1)</sup>, who belong to five different manufacturing organisations, were well educated and had significant experience in their positions within their organisations. Most of them stated that they were aware of the concept of benchmarking and indicated that they believed it was a useful, new management tool.

## 8.3 Results of comparison priorities of each criterion level

In this section, the decision hierarchy (Figure 5-2) having been constructed and the relevant judgements from the fifty subjects obtained, the next step is concerned with

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<sup>(1)</sup> Each of the fifty subjects (managers) was required to make thirty pairwise comparisons (e.g., 6, 12 and 12 pairwise comparisons across criteria, sub-criteria and specific sub-criteria respectively). Accordingly, the researcher obtained seventeen matrices and principle eigenvalue ( $\lambda_{\max}$ ) for each subject within each of the five companies.



the prioritisation of all the criteria in the hierarchy. Before discussing the results of the priorities of each criterion level, it is important to emphasise that the judgements presented here are specific to the respondents at a particular point of time. Furthermore, the validity of the aggregation and averaging of the priority weights of the respondents rests on the assumption that each subject is of equal importance and that their responses are all equally valid. Nevertheless, the weightings of criterion in each level deserve to be studied in depth in order to make some useful and desirable comparisons. The results of comparison elements in respect to weightings<sup>(2)</sup> of importance of elements dimensions, arithmetic mean, ranking and consistency measurements ( $\lambda_{\max}$ , C.I and C.R) will be discussed as follows:

### **8.3.1 Level of benchmarking criteria with respect to determination of the well-being of the organisation**

Various criteria have been identified on the questionnaire (appendix-1) in order to achieve consistency in responses and to reduce ambiguity over the meaning of criteria. The decision hierarchy (discussed in chapter 5) depicts the four distinct main criteria of the well-being of the organisation (e.g., cost control, quality control, sales maximisation and market share) in the Libyan context. Subjects began by assessing the relative strength and influence of these four dimensions in shaping and directing the relative importance of sub-dimensions and specific sub-dimensions. Further, the subjects within the five LMOs were required to work through six paired comparisons of the four benchmarking criteria; this was conditional on the assumption that they were concerned with determining the well-being of the organisation. Consequently, these four criteria were integrated into one set of priorities by considering the relative strength of the well-being of the organisational dimensions, as discussed below.

#### **8.3.1.1 Priorities of benchmarking criteria within the five companies**

The noticeable feature of many LMOs is the low rate of return on investment (Ejigu and Sherif, 1994, Abusneina, 1991). Several investment decisions and development

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strategies were not revised or updated at different phases of construction (Tarbaghia, 1995; Abusneina et al., 1993; Abusneina, 1991) because of the shortage of well-trained personnel to implement the new changes. As a result, investment and development strategy costs tended to be high (Committee Of Evaluation the Industrial Companies' Situation, 1994). In spite of that many LMOs have been raising the level of industrial production in quantity, kind and quality since the late 1970s (Aagnaia, 1996). It was indicated in the United Nation Report of 1994 that priorities regarding what to manufacture, produce and/or the sites of projects seem to be heavily influenced more by political and social factors than economic ones (Ejigu and Sheriff, 1994).

From data collected through the fieldwork and AHP's analysis of managers' views, this study investigates the relative priorities of each criterion to be benchmarked. Consequently, the evaluation of benchmarking cost and quality control, sales maximisation and market share across subjects within each of the companies A, B, C, D and E is explained below.

### **Company A**

This company (as discussed in 6.3) was established in 1968 to manufacture an array of widely used chemical goods. It includes four combined factories and production units. This company appears to be one of the LMOs which has carried out benchmarking practice for many years. This section reports the results of the managers' responses.

One subject perceived cost control and quality control as having a priority weight of 0.31, with sales maximisation and market share having lower weights of 0.14 and 0.24 respectively. This subject's priority responses for this particular level are dissimilar to the other subjects' responses in this company. The results from the ten subjects are summarised in Table (8-1) of appendix-6. The majority of the subjects

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<sup>(2)</sup> Tables 8-2 to 8-111 of weightings of importance of criteria, sub-criteria and specific sub-criteria given by participants for items are mentioned in Figure 5-2, and ranking, arithmetic mean and mean ranking for the five companies are available on request.



believed that quality control was the most important criterion in determining the well-being of the organisation (best practice benchmarking). These subjects indicated that their company was spending resources on improving performance aspects to meet customers' needs for quality, while the remaining subjects rated quality control as the second and third most important criteria. However, some of them suggested that the quality quest at their company was just a "fad" or an attempt at a "quick fix" designed to lower costs. Further, three subjects rated cost control as the most important and another four rated it as the second most important criterion. Across subjects, the rating of sales maximisation and market share were third and fourth to quality control respectively. These two criteria appeared to be less important in determining the well-being of the organisation. The key persons in the sales department indicated that their company does face difficulties in sales maximisation because of the lack of productive ability. This is a result of shortages in raw materials and spare parts caused by some restrictions which the government put on import policy. In general, the phenomenon of increase in the costs of industrial products is considered one of the main problems encountered in many of LMOs (Bengarbia, 1994). As a key person in top management indicated:

*"...the main reasons for the rise in company costs are: the high cost of importing raw materials and spare parts; the rise in the cost of manpower because of the greater number of employees in the company's factories (see 6.3); reduction in actual production and the failure to use cost accounting and budget systems for many years."*

The overall conclusion is that there was general consensus that quality control (1.40) is ranked more important than cost control (2.30), sales maximisation (2.90) and market share (3.10) in benchmarking. Therefore, the company is positioned to drive quality control and to provide goods of high quality in the company's market area (see Table 8-1 of appendix-6).

## Company B

As mentioned in section 6.4, this company is considered to be one of the largest manufacturing companies in Libya in the field of basic metallurgical industries. It owns eight factories and production units. The company has carried out benchmarking in quality control for many years. Consequently, the interviews and the analysis of documents showed that the plethora of oil revenues during the 1980s deceived the policy makers in many LMOs, and led them to go into large industrial projects which require huge amounts of economic resources that are not available. In addition to this, several investment decisions appear to have been made without adequate feasibility studies (Tarbaghia, 1995; Abusneina, 1991). The lack of economic resources had a detrimental effect on the economy as a whole (Abusneina et al, 1993). This idea was asserted by one of the managers in charge in Company B, when he said:

*“The industrial sector policy during the 1980s was to create an industrial environment in many LMOs. The economic situation in the country at that time was suitable for this to happen and as a result many industrial companies were established. However, some industrial projects were set up without adequate feasibility studies, and because of the difficult economic situation the country has faced since the mid 1980s, this company has found it difficult to manage many of these projects.”*

The investigation of this company presents results from the ten<sup>(3)</sup> subjects. Across subjects, there was general agreement that quality control is the most important criterion in determining benchmarking. The importance of cost control and sales maximisation is unclear, but it was generally accepted that cost control and sales maximisation are the second and third most important criteria respectively in determining the well-being of the organisation. Overall, the results indicated there was general agreement that quality control (1.60) is ranked more important than cost control (2.50), sales maximisation (2.40) and market share (2.6) (see Table 8-1 of



appendix-6). Further, one subject rated the four criteria as having the same importance in determining benchmarking. This subject stated (in the space provided for additional comments on the questionnaire):

*"...the four criteria should be regarded as having the same importance in the company. However, the requirements to benchmark cost control can have a negative impact on quality control. In some cases, the company cannot benchmark cost control unless it reduces the quality of the item. For example, our company allows low-skilled workers (with low rate payment) to complete complicated tasks which require high-skilled workers (with high rate payment) as a method to control cost. This procedure cannot help to benchmark quality control that is in accordance with customers' expectation."*

Furthermore, this subject (deputy general manager in Company B) believed that "each of the four criteria was equally important in determining the well-being of the organisation". Overall, while the preferences across subjects are less inconsistent, quality control appears to be regarded as the most important criterion.

### **Company C**

This company was established in 1972 to manufacture food production. It owns two factories and production units (see 6.5). This company is trying to achieve multiple and conflicting objectives. Also, the empirical analysis showed that Company C is attempting to benchmark too many items at the same time (see 7.5.2.1). At this point, investigation revealed that to a large extent many LMOs could not achieve their expected objectives (Aagnaia, 1996; Ejigu and Sherif, 1994; Kilani, 1988; Naur, 1986). This was for many reasons, including the following: lack of qualified personnel; lack of appropriate administrative and accounting systems; absence of comprehensive planning; and unclear roles of authority and responsibility of company management (Agnia, 1996; Fadal and El-kmmushe, 1994; Ejigie and Sheriff, 1994).

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<sup>(3)</sup> Some subjects ranked different criteria as joint first. This will be seen in later comparisons for the

Despite the conflicting objectives, this company demonstrates a consensus across subjects regarding cost control and quality control. On one hand, seven of the ten subjects indicated that cost control is, in relative terms, the most important criterion. Many of these subjects indicated that economic circumstances influenced the company with respect to the facilities, planning, production redesigning, new technology, etc., and also influenced the motivation level of the employees. All of these circumstances have directly or indirectly influenced the effectiveness of the company to benchmark quality control. On the other hand, six<sup>(4)</sup> of the ten subjects believed quality control to be the most important criterion. They mention that there is insufficient awareness by top management of the role of benchmarking quality control as a basic approach to the success of the various activities of the company. There is also general agreement across four subjects concerning cost control, quality control and sales maximisation. They indicated that they believed these three criteria were equally important when determining benchmarking. There was consensus across eight subjects concerning market share. They believed it to be of lower importance when determining benchmarking. However, in terms of mean ranks, there was quite a difference between quality control, sales maximisation and market share reflected by the importance rankings by the ten subjects. There is a great deal of variance across the importance rating composition of the subjects. One of managers from quality division pointed out the fact that:

*“...our company is attracted to the numerous benefits associated with benchmarking quality. It adopts the quality programme without realizing that success depends on first establishing a quality infrastructure. However, failing to build a bridge over the quality control ensures that great effort is expended without a realistic possibility of achieving the goal of world-class quality.”*

Overall, it appears that quality control, sales maximisation and market share are generally regarded as being less important in determining benchmarking than is cost

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criteria, sub-criteria and specific sub-criteria.

<sup>(4)</sup> The same subjects ranked both cost control and quality control as their number one choice.



control. The mean ranks confirms that cost control (1.30) was clearly considered as the most important criterion as shown in Table 8-1 in appendix-6.

### **Company D**

As discussed in section 6.6, this company is ranked as the second of seven companies in Libyan's basic chemical industry. It consists of two large factories, 23 service centres and four operation centres. During its first decade of working, this company (established in 1967), was regarded by managers within the large company group as a poor performer in terms of operating efficiency, financial results and the nature of performance measures. At this point, the drive to benchmarking adoption commenced to reduce costs and increase productivity. A previous study carried out by Bengharbia (1994) showed that the reasons for the high cost and low level of production capacity of many LMOs are unavailability of the raw materials and the other requirements for operations, the majority of which are imported. Other reasons included poor maintenance, absenteeism of employees, the stoppage hours<sup>(5)</sup>, and technical problems also contributed to these difficulties (The Office Of Production Affairs, 1996; Bengharbia, 1994; Abusneina, 1991).

In particular, the empirical investigation through AHP for this company presents a general consensus across subjects regarding the importance of cost control in determining best practice benchmarking. Seven of the subjects believed that cost control is the most important criterion when assessing benchmarking. In turn, five subjects rated quality control as the most important criterion. At this point, the general manager of planning stated that "their company faced difficulties in settling priorities on the processes to be benchmarked (see 7.5.2.1). This is related to shortage in raw materials (80% of the company raw materials come from abroad) and spare parts. These were considered as the major reasons for the difficulty. However, I can say that unavailability of enough raw materials caused this company to be more concerned with some benchmarking criteria and less concerned with others." Obviously, the investigation into sales maximisation and market share were considered across subjects as the third and fourth most important criteria. Across

subjects, therefore, a general conclusion can be drawn. Cost control was regarded as the most important criterion according to the mean ranks. It was ranked more important (1.30) than quality control (1.50), sales maximisation (3.45) and market share (3.20) in determining benchmarking, as shown in the Table 8-1 of appendix.

Moreover, many of managers surveyed mentioned that structural changes in the Libyan economy are the main issues that have affected their company priorities to benchmark cost control and/or quality control. These changes, which are related to the falling oil price, caused a decline in many development projects in their company. Also, the amount of hard currency necessary to import raw materials and spare parts was not made available by the industrial sector and Central Bank to the company. Therefore, the cost of some industrial products still requires to be reduced, and the company has difficulty competing in the market.

### **Company E**

This company was established in 1979 to manufacture food. It is a large company and includes five combined factories and production units. Each of the five factories has its own Factory Management Committee and is accountable to the general management committee in the company (see 6.7).

In this company, it appears difficult to generalise about the subjects' responses and, in the case of determining benchmarking, there appears little consensus, if any, over the relative importance of cost control and market share. However, a majority of the subjects believed cost control and market share to be the third and fourth most important criteria respectively (see Table 8-70 in appendix-6). Regarding this, a key person from middle management said:

*“There is a lack of co-ordination between cost control and marketing divisions in matters of providing information to upgrade and market the company's goods. This problem has arisen because of the frequent changes in top management in the company, which has led to change in heads of departments as well.”*

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<sup>(5)</sup> The stoppage hours in many of LMOs were caused by shortage in raw materials.



Furthermore, the results on sales maximisation are mixed. Four of the ten subjects viewed it as the most important criterion, while a majority of six subjects disagreed, ranking sales maximisation as the least, third or second least important criteria respectively. This response came as a result of the changes in circumstances that have taken place over the last decade, because government procedures have led to a policy of limiting the imports of many semi-raw materials, and this has caused an increase in the prices of goods in general. Additionally, the embargo imposed on Libya caused an increase in the sales' prices of goods produced (Gnieder et al., 1996). Overall, quality control is generally viewed as being particularly important in a judgement over sales maximisation, cost control and market share. The mean ranks confirm that quality control (0.406) was clearly regarded as the most important criterion compared with the mean ranks for sales maximisation (0.322), cost control (0.165) and market share (0.108).

### 8.3.1.2 Consistency analysis

In light of the above discussion the author examined the consistency of responses across subjects within each of the five companies with respect to benchmarking criteria of cost and quality control, sales maximisation and market share. He found that  $\lambda_{\max}$  (principle eigenvalue) is very close to  $n$  (number of elements in the matrix). It has been suggested by Saaty (1980, 1995) and Zahedi (1986) that the closer the value of computed  $\lambda_{\max}$  to  $n$ , the more consistent in performing pairwise comparisons of criteria (or elements). In fact,  $\lambda_{\max}$  is equal to 4.06, 4.03, 4.01, 4.06 and 4.02 within each of the companies A, B, C, D and E respectively. This consistency is considered satisfactory because the value of the consistency index (C.I) and consistency ratio (C.R) was less than 0.10 within each of five companies as shown in Table (8-1A) in appendix-5. For example, C.I= 0.02 and C.R= 0.03 for Companies A and D, C.I= 0.01 and C.R= 0.01 for Companies B and C, and C.I= 0.01 and C.R= 0.01 for Company E. This confirms studies by Lee et al. (2002), Hafeez et al. (2002), and Saaty (1995, 1980) who have indicated that the value of CR is desirable if it is less than 0.10.

### **8.3.2 Level of benchmarking sub-criteria with respect to the determination of benchmarking criteria**

This section describes the derivation of priorities associated with the determination of benchmarking sub-criteria<sup>(6)</sup>. Accordingly, subjects were asked to indicate, through three paired comparisons of cost control, quality control, sales maximisation and/or market share, sub-criteria, dependent on the assumption that they were concerned with determining the best benchmarking practice. Subjects were therefore required to decide the relative importance of each sub-criterion with respect to determination of cost control, quality control, sales maximisation and/or market share.

#### **8.3.2.1 Priorities of labour, material and overhead cost sub-criteria with respect to determine benchmarking in cost control**

The first step in determining the priority of cost control is to assess the relative importance of three sub-criteria: labour cost, material cost, overhead cost. The results from the ten subjects are discussed below.

##### **8.3.2.1.1 Priorities of cost control sub-criteria in Company A**

As result of radical changes in the Libyan economy which affected most kinds of organisations in their activities in terms of productivity and quality of services, it is estimated that through the 1980s, at least 75% of the Libyan labour force were employed by the private and public sector organisations, which means that they were salaried workers (Bait-Emal, 2000; Mogherbi, 1998). Consequently, Company A, which is an example of these organisations, employed more than 1000 employees in the company central management and factories. According to the study carried out by one of the company divisions to investigate the finance and administration of this company in the 1990s, there are over 300 surplus employees. However, owing to their limited authority, the managers of the factories, cannot fire or discipline any

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<sup>(6)</sup> There are four sets of sub-criteria related to the main criteria used in this study. For example, *a)* labour, material and overhead cost [to determine cost control], *b)* new technology, production redesigning and R&D [to determine quality control], *c)* advertising, marketing and new product development [to determine maximise sales], and *d)* distribution, pricing and new product development [to determine market share] (see Figure 5-2 in chapter 5).



employee without involving the company's central management. Furthermore, the top management of central management itself cannot always take action against employees to decrease the number because of state policy regarding employment regulations and nepotism.

The above discussion shows how Company A is subject to the impact of its environment. However, the analysis of this company, in determining cost control sub-criteria, revealed that the company had no clear consensus across subjects regarding three sub-criteria (labour, material and overhead cost). In fact, six of the subjects believed that material cost was the most important sub-criterion in benchmarking cost control, while six subjects believed labour cost to be the second and third most important when benchmarking cost control. Across subjects, overhead cost appears to be the third most important sub-criterion. The mean ranks indicate that material cost (1.60), labour cost (1.80) and overhead cost (2.40) were believed to be the most, second and third most important sub-criteria respectively in benchmarking cost control (see Table 8-2 in appendix-6). Overall the least and most important sub-criteria on average were overhead cost and material cost respectively.

#### **8.3.2.1.2 Priorities of cost control sub-criteria in Company B**

As indicated earlier (chapter two), during the 1980s the Libyan's economy was severely restricted by the effect of the low price of oil resulting from the global oil glut. Revenue from sales of petroleum declined seriously from \$23.2 billion in 1980 to \$5 billion in 1988 (see 2.2.3). Decreasing revenues caused serious cash flow problems and necessitated progressively deeper cuts in the development plans in many LMOs (Fisher, 1995; The Middle East Economic Handbook, 1986).

The researcher has also observed (from his interview with two managers from the top management) that there are certain of problems that Company B is facing in addition to the above-mentioned problem. With regard to this, one of these top managers said:

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*“...the remarkable increase in local market prices has increased the cost of production; frequent delays in authorising capital budgets by the industrial sector for several months harms the company and delays its capital projects; business travel costs and expenses of training abroad have increased dramatically because of US and UN sanctions against Libya for more than a decade. The top management manager concluded that these situations have had direct and indirect effects on the attitudes of cost control and performance of their companies.”*

Based on the above-mentioned discussion, this study now turns to the subjects' responses to determine cost control sub-criteria in Company B. At this point, the subjects indicate some general consensus over the importance of sub-criteria when benchmarking cost control. For example, material cost was regarded as most important, on average, for seven of the ten subjects (see Table 8-2 in appendix-6). Three subjects regarded material cost as second and third most important. Therefore, it appears that there is general consensus over the importance of the material cost when benchmarking cost control. There is little consensus over the importance of labour cost when benchmarking cost control. Of the ten subjects, five believed that labour cost was most important, while five believed it second and third most important. Regarding this, a general (senior) manager reported:

*“...the concept of employment is viewed by the Libyan community as a gift given to the citizen. Many employees in this company receive this gift with no effort required from them apart from attendance at certain hours without paying the least attention to the nature of effort required to fill these hours. Additionally, the political willingness of the industrial sector to achieve full employment, has contributed to this negative attitude and put pressure on the company to employ a certain number of people each year regardless of the real capacity of the company. However, our concern now is to reduce the employment cost by limited contract, in order to keep only those whose performance is high and whom the company is in desperate need of”*



Moreover, a majority of the subjects believed that overhead cost is the least important sub-criterion when benchmarking cost control. Overall, the mean ranks confirm that material cost (1.40) was clearly regarded as the most important sub-criterion compared with labour (1.70) and overhead (2.30) cost as shown in the Table mentioned above.

### 8.3.2.1.3 Priorities of cost control sub-criteria in Company C

As mentioned in chapter six (section 6.3), Company C's main objective is seen as contradictory and ambiguous to many employees in this company. However, a head of a department (from general management of production) gave his opinion of the company's major objective, saying that:

*“It seems that top management is keeping this objective to itself, and does not try to make it the general objective of the company, which needs support and co-operation from all departments which are involved if the objective is to be achieved.”*

Furthermore, the contradiction and ambiguity in the company objectives support the perception that the social systems are different from the physical systems in terms of their objectives, and that they are characterised by vague and ambiguous objectives (Checkland, 1972). This idea was also emphasised by a factory manager when he said:

*“The top management makes decisions for the whole of the company's operations, and our task (as factories) is to implement the top management's instructions, and produce products according to our factories' capabilities. So we (factory managers) do not know what top management is thinking and planning to do. The company's objective is not clear to us, and if there is a clear objective that means we should have heard about it, and the top management should have discussed it with us as managers with responsible positions in the company.”*

From the above discussion, this section analyses the subjects' responses in determining the cost control sub-criteria in Company C. There appears to be general consensus across subjects regarding the importance of labour, material and overhead cost with respect to the determination of cost control (see Table 8-2 in appendix-6). Nine of the subjects believed that material cost is the most important sub-criterion when assessing cost control, and eight of the subjects viewed labour cost as being one of the two most important sub-criteria in benchmarking cost control. In this concern, a key person in the financial department stated:

*“The phenomenon of increase in the production cost is considered one of the company's main problems. This is as a result of lack of availability of raw materials, the high cost of importing raw materials and spare parts and the rise of manpower cost as a result of the greater number of workers in the company.”*

Investigation revealed that the overhead cost was considered by five subjects as the third most important sub-criterion. Overall, there appears to be general agreement across subjects that material cost (1.10) is the most important sub-criterion when benchmarking cost control. Furthermore, labour cost (1.70) is generally viewed by most subjects as more important than overhead cost (2.10).

#### **8.3.2.1.4 Priorities of cost control sub-criteria in Company D**

This company faces low skill levels in the local and national labour force. Most of the labour force, especially the technical one, requires a high rate of payment, and is made up of foreigners, the majority of whom came from neighbouring countries, such as Egypt, Tunisia, and Sudan together with others who came from European countries. In the light of this, a key person from the middle management pointed out:

*“...this situation (the mixture of foreign workers force) created different attitudes towards cost control sub-criteria in terms of priorities. Moreover, this situation has led to an administrative environment characterised by various situations resulting from a lack of harmony between the members of such a nationality mixture.*



*Therefore, there was a lack of clear priority and continuing development of performance in terms of operating and efficiency and financial results.”*

As indicated earlier in chapter six (section 6.6.4), and from subjects' responses to determine priorities for cost control sub-criteria to be benchmarked, Company D is concerned to reduce cost to satisfy its customers. At this point, the company was giving clear priority between labour, material and overhead costs with respect to the determination of cost control. Seven subjects indicated that overhead cost is relatively unimportant, while only three subjects agreed, ranking it as the most and second most important sub-criterion. All but two of the subjects agreed that labour cost was the most important sub-criterion in benchmarking cost control. At the same time, subjects evaluated material cost as most, second and third most important sub-criteria. Across subjects, in terms of mean ranks and arithmetic means, there was a great deal of variance between the three sub-criteria reflected by the importance ranking by the ten subjects. For example, subjects perceived labour cost, material cost and overhead cost to be the most (1.30), second (1.70) and third (2.30) most important sub-criteria respectively in determining benchmarking over cost control (see Table 8-2 in appendix-6).

#### **8.3.2.1.5 Priorities of cost control sub-criteria in Company E**

As mentioned earlier in section (6.7.2), management accounting systems in this company play a vital role in the company's day-to-day operation. However, the cost accounting system is unable to meet the company's and its factories' divisions' needs to control costs or reflect any interest in the day-to-day operation of factories. For example, the company has not been able to use the accounting system, except for some reports about the factories expenses which come out from the cost divisions in the factories from time to time, and reports the input and output of inventory as well as labour costs. The reason behind this is the attitudes of the company's managers which reflected their total lack of interest in financial matters. Therefore, the potential benefits of a cost control system were simply not considered, let alone

understood. Also, there was a shortage in the quantity and quality of accounting in the company (especially in the factories). Therefore, an accountant from the finance department asserted that:

*“...besides the lack of cost analysis, the calculation of unit costs is very questionable; in many cases, communication between warehouses, production lines, purchasing department, cost department, etc. is weak or absent.”*

Consequently, the researcher perceives from the interviews with some managers and the analysis of subjects' responses to determine priority for cost control sub-criteria, that subjects in Company E (see Table 8-2 in appendix-6) viewed overhead cost as the least important sub-criterion, although two subjects rated it as most important. There is also general agreement over the second most important sub-criterion, as five of the ten subjects believed labour cost to be the second most important factor in benchmarking cost control. The other five subjects rated labour cost only second and third in terms of importance. In addition, evaluations of overhead cost and labour cost revealed that these sub-dimensions were regarded as less important than material cost. However, some general conclusions can be drawn. The material cost was regarded as the most important sub-criterion across subjects according to the mean ranks.

### **8.3.2.2 Consistency analysis**

The findings mentioned above for the five companies were examined through three consistency measurements to provide the level of consistency across subjects' responses with respect to determination of benchmarking sub-criterion of labour, materials and overhead costs. Concerning this, the findings shown in Table (8-1A) of appendix-5 regarding  $\lambda_{\max}$  (principle eigenvalue), C.I and C.R indicate very good consistency across subject responses in determining cost control sub-criteria within each of the five companies. Specifically, the value of  $\lambda_{\max}$  (e.g., 3.04 for Company A, B and E and 3.01 for Companies C and D) is very close to  $n$ . Also, the value of C.I



and C.R is less than 0.10 (e.g., C.I= 0.02, C.R= 0.04 for Companies A, B and E, C.I= 0.01, C.R= 0.01 for Company C, and C.I= 0.01, C.R= 0.01 for Company D).

### **8.3.2.3 Priorities of new technology, R&D and production redesign sub-criteria with respect to the determination of quality control**

Quality control relates to quality in products or services to pre-specified standards for both qualitative and quantitative factors. It is also the effort to ensure that products and services meet customer requirements. Further, quality in products or services is not what the organisation puts in. It is what the customer gets out and is willing to pay for (Lee et al., 2002; Druker, 1993). Therefore, quality is the foundation on which customer satisfaction is considered. It is not surprising then that most people agree that quality is vital and that organisations need to have a well designed programme in place for R&D improvement, production redesigning and increased productivity (Lee et al., 2002). In light of this discussion, this section gives the results of subjects' responses to priorities for each of the three sub-criteria when benchmarking quality control using the AHP approach, as discussed below.

#### **8.3.2.3.1 Priorities of quality control sub-criteria in Company A**

Managing quality in many LMOs is considered a significant task since success depends heavily on quality becoming part of the organisational culture and environment. Successful quality requires greater empowerment of line workers, adequate resources, new technology, R&D programme, etc. Without these, enhanced quality cannot be made. At this point, many subjects who were interviewed) from Company A indicated that these issues have influenced benchmarking implementation in quality. As shown in Table (8-3) of Company A in appendix-6, all but three subjects believed that new technology was the most important sub-criterion in determining quality control, while the remaining subjects evaluated new technology as the second and third most important sub-criterion. Five subjects rated production redesign as the second most important sub-dimension, while three of the ten subjects rated it the most important sub-dimension when determining quality control. With respect to research and development (R&D), five subjects rated it as

the least important sub-dimension, but five subjects believed it to be the most and second most important sub-dimension when determining quality control. Overall, the results suggest that, in determining quality control, the subjects believe that new technology is considerably more important than production redesign and R&D in benchmarking quality control. This was confirmed by the mean ranks as, shown in the table mentioned above.

#### **8.3.2.3.2 Priorities of quality control sub-criteria in Company B**

As mentioned in chapter six, this company has implemented benchmarking in quality to improve the quality level of its products. This company, as Tarbaghia (1995) indicated, has a great market demand for its products in terms of quality and cost when the price of the company products was comparable with those of imported products. This success for the company's products has been affected by political issues which started in the 1990s, when the UN imposed an economic and political embargo against Libya. Because of this event, two senior managers from general management described some of the difficulties which the company has faced over the last ten years when they said:

*"...the US and UN embargos on Libya have put more pressure on and increased the work of purchasing management in LMOs. Our company's procuring machinery, original spare parts, general maintenance services, and many others have been substantially affected by these embargos, which in turn have placed this management in difficulties because it became impossible to find the fixed prices. Additionally, there have been recent problems regarding the difficulties of company participation in international conferences, the stopping of journals and books which used to come regularly to the company, and the shortage in qualified personnel for research and development. All the above circumstances have made it difficult for the company to follow the rapid evaluation of management sciences in the world, including quality and management training and R&D."*



It is clear from the above discussion that the economic circumstances influenced this company with respect to R&D, costs, production issues, management training etc., and all of these have influenced the effectiveness of quality. However, the analysis of managers' responses in this company in determining quality control sub-criteria are discussed below.

Table (8-3) for Company B in appendix-6 summarises the priority weights produced by the ten subjects. These results show that there was general agreement among subjects that R&D was the most important sub-criterion when benchmarking quality control. Five subjects rated new technology as the third most important sub-criterion, and five of the ten subjects rated it as the least or second least important sub-criterion. In turn, production redesign is believed to be less important than new technology and R&D. Across subjects, the mean ranks suggest that R&D (1.60) was clearly regarded as the most important. Production redesigning (2.10) seems to be rather more preferred by the majority of the subjects - more than new technology (2.20) in benchmarking quality control. This result is consistent with the suggestion of Tsipouri (2001) that academic thinking and empirical evidence converge, indicating that there is a correlation between R&D and levels of development quality. Thus, it can be argued that the higher the privately performed R&D in the company, the higher the contribution to quality improvements when carrying out benchmarking.

#### **8.3.2.3.3 Priorities of quality control sub-criteria in Company C**

Through the interviews and analysis of documents, it appears to the that Company C has difficulty in closing the gap between the quality performance and the high level of quality demanded by well-informed, information-leveraged global customers. The fact that two directors of the quality division of this company indicated that their company is still facing difficulty in embracing the new responsibilities of a quality culture and environment, when one of them said:

*“...the quest for quality requires both time and serious resource dedication (e.g., training programme, purchase of developed devices,*

*R&D programme, and the initiation of supplier development efforts) before the positive return is achieved. They further added that middle management is often a road-block, commenting that 'resistance is formidable' among middle managers. Middle managers set the tone for day-to-day operations and signal the importance of quality through both commitment to quality initiatives and their management style. Unfortunately, some middle managers demonstrate a lack of commitment to key business goals, including quality improvement. These managers hinder the development of quality training programmes and impede the use of quality-oriented measurement systems. They concluded that front-line workers often lack the 'motivation' and the 'discipline' to make a quality programme successful."*

In relation to the above discussion, one of the Libyan researchers highlighted the fact that many Libyan companies found difficulties in providing the requirements for quality. This was the result of lack of the resources needed for training, inability to buy new equipment, lack of managerial understanding, lack of motivation and too many managerial priorities reduced focus on quality (Hafteri et al., 1994A). Therefore, the researcher's investigations to determine priorities of quality control sub-criteria (new technology, production redesigning and R&D) in Company C revealed that there was little consensus across subjects regarding the three sub-criteria. It appears difficult to generalise about subjects' responses and, in the case of determining R&D and production redesign, there is no consensus across subjects concerning these two sub-criteria. In fact, eight subjects indicated that they believed that production redesign was either the second or third most important sub-criterion, but, across subjects, the relative importance of R&D is one of the two least important sub-criteria. Overall, a majority of the subjects believed that new technology was the most important criterion by assigning high weights, while the remaining subjects rated it as the second most important sub-criterion. This was confirmed by mean



ranks for new technology (1.50) when compared with R&D (1.90) and production redesign (2.20) (see Table 8-3 for Company C in appendix-6).

#### **8.3.2.3.4 Priorities of quality control sub-criteria in Company D**

As discussed earlier (6.6.2), the company's production target has not been achieved during the last six years. This was as a result of shortages of hard currency causing resultant shortages in new materials and spare parts and the involvement of various governmental bodies in the company's policies and management. These all happened following the embargo placed on the Libyan economy which meant that the company could not procure, replace and maintain its machinery within reasonable time. The substantial decline in oil revenues (see chapter two) has aggravated and increased the company's problems. In terms of benchmarking, the company will be unable to achieve its previous high standards.

Moreover, the empirical investigation through the AHP for this company presents difficulties in settling priorities on the sub-criteria (new technology, production redesigning and R&D) to be benchmarked. Accordingly, Table (8-2) for Company D in appendix-4 summarises the results of multicriteria decision making for each of the ten subjects for the three sub-criteria in benchmarking quality control. However, the results on new technology, R&D, and production redesign are mixed. Three subjects viewed each of the three sub-criteria as equally important when benchmarking quality control. With respect to production redesign, six of the subjects indicated their evaluation and they ranked this sub-dimension as the most important, clearly before R&D and new technology. It was also suggested by Zemke (1990) that manufacturing organisations that have made a success of their quality-improvement initiatives know that everything hinges on effective production redesigning. However, the importance of the production redesign, compared with new technology, across subjects is unclear. Six subjects believed that it was the most important determinant, before R&D. However, the strength of priority for new technology and R&D appear relatively low when compared with production redesign. Across

subjects, therefore, there was general consensus that production redesign (1.60) is ranked more important than new technology (1.70) in determining quality control.

#### 8.3.2.3.5 Priorities of quality control sub-criteria in Company E

This company belongs completely to the public sector (see section 6.7), therefore, any changes in the country's policies and laws or any economic crises<sup>(7)</sup> may influence negatively the company activities, in terms of financial support, future plans, R&D programme, new technology, etc. Despite these difficulties, the researcher has observed that this company was giving clear priority to quality as an important criterion to be benchmarked (see 6.7.3). Consequently, as a factory manager said:

*“...the operation programmes in our company were concerned about sufficient R&D in both quantity and quality within the last five years. In this case the R&D programme was given more financial support by the top management in terms of research facilities to be up-to-date, the access to necessary data was allowed and financial compensation was considered.”*

In relation to the above, subjects' responses in this company in assessing the priority weights of the three sub-dimensions with respect to the determination of quality control are shown in Table 8-3 in appendix-6. Three subjects indicated that production redesign is relatively unimportant. Four subjects agreed that new technology was one of the most important sub-dimensions in determining quality control, while five subjects viewed it as the third most important sub-dimension. Also, there were two kinds of agreement across subjects over the relative importance of R&D: four subjects ranked it as the most important sub-dimension while six of the other subjects considered R&D to be the second most important sub-dimension. Overall, there appears general agreement that new technology and production redesign are not particularly important in determining quality control. Also, R&D is

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<sup>(7)</sup> For example, the downturn in oil revenues has put the country into a recessionary spiral which has eventually been translated into severe budget cuts and has tightened many Libyan organisations' capital investments or stopped them completely from operating their activities (Gazema, 1999)



generally viewed as being particularly important by most subjects. Thus, the findings in this company indicated by subjects' responses regarding R&D can be seen as being consistent with those of Tsipouri (2001) and Zimmerman (1997), that if an organisation pays more attention to R&D investment it will be able to implement benchmarking in quality more effectively.

#### **8.3.2.4 Consistency analysis**

An examination was made of the consistency of subjects' responses in determining quality control sub-criteria within each of the five companies, using  $\lambda_{\max}$ , C.I and C.R. The findings in Table (8-1A) in appendix-5 show a strongly consistent principle eigenvalue (e.g.,  $\lambda_{\max} = 3.02, 3.05, 3.01, 3.01$  and  $3.01$  for Companies A, B, C, D and E respectively) to  $n$  (number of elements in the matrix). Further, this result is consistent with that of Saaty (1994, 1977). The deviation of the principal eigenvalue from  $n$  is the measure of departure from consistency. Also, the overall consistency of subjects' judgements by means of C.I and C.R is considered satisfactory (e.g., C.I= 0.01 and C.R= 0.02 for Company A, C.I= 0.03 and C.R= 0.05 for Company B, C.I= 0.01 and C.R= 0.01 for Companies C, D and E).

#### **8.3.2.5 Priorities of marketing, advertising and new product development sub-criteria with respect to determination sales maximisation**

It appears from the fieldwork that many Libyan organisations do face difficulties in sales maximisation because of lack of productive ability. This is a result of shortages in raw materials and spare parts caused by some restrictions which the government put on importation policy because of UN and US sanctions against Libya. Consequently, the low level of production might sometimes be attributed to factors beyond the control of the management of many LMOs (Bengharbia, 1994), and the frequent delay in authorising capital budgets for several months harms essential investment<sup>(8)</sup> for operations, and delays capital projects and programmes in many LMOs (Gzeama, 1999). Generally, this section reports the results of subjects' priorities in marketing, advertising and new product development sub-criteria to

determine benchmarking in sales maximisation within each of the five companies as discussed below.

#### 8.3.2.5.1 Priorities of sales maximisation sub-criteria in Company A

Deriving the priorities structure for sales maximisation requires development of relative importance weights for marketing, advertising and new product development. The responses of the ten subjects from Company A indicate that there is mixed consensus over the importance of the three sub-criteria when determining benchmarking over sales maximisation (see Table 8-4 in appendix-6). Of the ten subjects, seven subjects believed that marketing was the most important, three believed new product development was most important, while one subject considered advertising the most important sub-criterion. At this point, it appears difficult to generalise about the subjects' responses when benchmarking sales maximisation. This matter was asserted by key manager in company's factories when he said:

*"...the top management asks us to prepare the company's sales' budgets or plans on the basis that our factories would be working at a high capacity (80% of their capacity) and if the factories cannot do this, we just need to justify the reasons for this difficulty. At other times we just discuss the situation with the top management, or in the general meeting with the industrial sector top management. We cannot do more than this, because we realised that in most cases (e.g., sales maximisation), the problem is outside the control of company top management, and sometimes outside the control of the industrial sector top management. We can say that our company is restricted by the economic circumstances of the country."*

Furthermore, a majority of subjects believed that advertising is the least important sub-criterion. Nine subjects rated it as second and third most important, while seven subjects believed that new product development was either the second most important or third most important sub-criterion. However, evaluations of marketing

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<sup>(8)</sup> For example, delays in financial procedures lead to difficulties in buying technological facilities,



revealed that this sub-dimension was regarded as slightly more important than advertising and new product development. The mean ranks indicated that marketing (1.30) was clearly regarded as the most important, new product development (2.20) as second most important, and advertising (2.40) as the third most important sub-dimension in determining benchmarking over sales maximisation.

#### 8.3.2.5.2 Priorities of sales maximisation sub-criteria in Company B

As mentioned earlier, Company B's main objective is to increase the level of production capacity and improve the quality level of its products along with sales maximisation. However, during the 1990s many LMOs were operating at less than 70% of their production capacity because of the shortage of raw materials, spare parts and sundry items (The Secretariat of Planning, Economic and Trade, 1997). This difficulty is attributed to the fact that not enough hard currency is allocated to these areas because of the UN sanction imposed on Libya in 1992. These have led to a lower level of production in a number of LMOs, and indeed production stopped for a long time in others. The reason for this was the reliance of most of those industries on importing the raw materials and spare parts from abroad (The Secretariat of Planning, Economic and Trade, 1997; Abusneine et al., 1993; The Economic Research Center, 1992). For example, Company B has been affected by the restrictions<sup>(9)</sup> on the procurement system owing to unavailable funds. As the manager in the sales department stated:

*“...more than 50% of stoppages hours in the company factories through 1996 – 2000 were due to shortage in raw materials, most of which came from abroad, because of the shortage in hard currency. This reduced productivity and increased the costs of production, which in turn had a great effect on sales maximisation and reducing returns from the company operations.”*

Therefore, many managers in this company indicated that the economic circumstances influenced the company operations with respect to production

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and/or leasing the required equipment and buildings.

<sup>(9)</sup> The government established several decisions and regulations during the 1980s to determine the use of hard currency by different organisations in the country.

abilities, facilities and sales maximisation. Further, the AHP analysis of subjects' responses in this company in determining sales maximisation sub-criteria is presented below.

According to subjects' views for three sub-dimensions (advertising, marketing and new product development) when benchmarking sales maximisation for Company B, the majority of the subjects agreed that new product development was the most important sub-dimension, while the remaining three subjects rated it as the least important sub-dimension (see Table 8-4 in appendix-6). At this point, a key manager in the company said:

*“...the economic embargo imposed on the country has influenced the new product development programme in the company in many ways, such as by restricting opportunities for importation of modern facilities, invitation to foreign experts for consultation and participation in international conferences about new products. In our company there is not enough attention given by top management to a continuous plan for following up the product development programme and establishing an effective management training development programme.”*

Furthermore, the results on sales maximisation sub-criteria are clear: there was little consensus among subjects that marketing (e.g., setting the price and delivery time) is much more important than advertising but is considerably less important than new product development. Six subjects rated marketing as the most or the second most important sub-criterion, while advertising was considered second or third in terms of importance by all but three of the subjects. Overall, the subjects under these sub-dimensions appeared to believe that new product development (1.60) is strongly more important than marketing (1.80) and advertising (2.20).

#### **8.3.2.5.3 Priorities of sales maximisation sub-criteria in Company C**

Many managers in this company indicated that the economic factor has influenced the company's production and its marketing. Gnieber et al. (1996) stated that the



embargo imposed on Libya also caused an increase in the costs of raw materials, which led to an increase in the prices of goods produced by many LMOs. This in turn influenced the effectiveness of productivity and reduced sales in many companies and Company C was an example of this. Consequently, from the analysis of subjects' responses in determining sales maximisation sub-criteria in this company, the results presented in Table (8-4) in appendix-6 for Company C indicate that there is general consensus across subjects over the importance of the three sub-dimensions when benchmarking sales maximisation. First, advertising appears to be relatively unimportant in benchmarking sales maximisation, as seven subjects believe it to be the least important sub-dimension, but three subjects evaluate it as second most important. Second, there was general agreement across subjects regarding the importance of marketing. Seven subjects ranked marketing as the most important sub-dimension, and only three of the ten subjects ranked it as second and third most important. At this point, the marketing function is the area where the interference of the industrial sector in LMOs policies is very obvious. According to industrial policy decision, the company has to sell its products to specific customers (e.g., public markets and/or national markets). The employees in this company also feel that they do not have authority over their marketing function, as everything comes down from the industrial policy. An accountant in the financial department at the top management pointed out:

*“The company sometime does not have any role in marketing its products.”*

Moreover, the evaluations of new product development revealed that this sub-dimension was clearly regarded as less important than marketing but considerably more important than advertising. Overall, there was a large degree of variance across the subjects' priorities compositions indicating the diversity of mean ranks over the three sub-criteria (marketing = 1.30, advertising = 2.70 and new product development = 2.00).

#### 8.3.2.5.4 Priorities of sales maximisation sub-criteria in Company D

In the 1980s, Libya's economy was severely restricted by the effects of low prices for oil (Fisher, 1990). This created a decline in development spending and led to the delay or cancellation of many new development projects since the middle of the 1980s as a result of the decline in oil revenues during the 1980s and 1990s (Fisher, 1995, 1985; The Arabic Economy Report, 1994, Elfeituri, 1992; Ghanem, 1987). Furthermore, declining revenues have caused financial difficulties for some companies and Company D was an example of this. A manager in top management confirmed this when he said:

*"...our company faces difficulty in achieving its production targets and cost reduction on targets for many years. This occurred as result of shortages in raw materials and spare parts, which were considered the main problems."*

As mentioned earlier (chapter 6), Company D has not had a long-term production planning system to enable sales maximisation for more than five years. It practises a short-term operation programme system because of shortages in raw materials and spare parts. Further, the empirical investigation through AHP for this company presents general consensus across subjects regarding the importance of the sub-criteria with respect to determination of the sales maximisation (see Table 8-4 in appendix-6). In fact, there is consistency across the responses concerning the importance of new product development, with nine subjects indicating this to be the most important sub-criterion. Seven of the subjects mentioned that they believed marketing to be the second most important, while the remaining subjects evaluated it as the most and third most important sub-criterion. Moreover, this company has two factories which were fully responsible for marketing and selling its products, and there was no intervention from the top management and the industrial policy. However, after 1993 the role and intervention from top management and the industrial policy became very obvious and everything became centralised. However, two factory' managers mentioned that they do not have control over marketing and selling their factories' products because of the intervention of government bodies



such as the industrial sector. In some cases, the top management has a weak role in marketing its factory products because of clear intervention by the industrial policy in this function as result of economic factors.

To that end, in determining the importance of advertising, six subjects believed that this was the second most important sub-dimension, behind new product development, while the remaining subjects ranked advertising as the most or third most important. Overall, the mean ranks for advertising (2.20) appears relatively less important when compared with new product development (1.10).

#### **8.3.2.5.5 Priorities of sales maximisation sub-criteria in Company E**

The company as mentioned previously was giving clear priority to quality control and sales maximisation as the most important criteria to be benchmarked. Since this company did not face any difficulties in marketing its products, the demand for its products was more than the supply (The secretariat of industry, 1996). In this case, as a key person from sales department said:

*“...the problem was that this company sometimes could not provide its products in the company’s market areas because of shortages in production levels, which happened for many reasons, for instance, shortages in raw materials and spare parts. This caused an increase in the selling of this company’s products on the black market.”*

Through the analysis of subject’s responses, it appears that the relative importance of priorities assigned to new product development, marketing and advertising with respect to determination of sales maximisation for Company E is shown in Table (8-79) in appendix-6. There is very high agreement among subjects regarding the lower importance of advertising. All but one of the subjects agreed that advertising was the least important sub-dimension in benchmarking sales maximisation. Across subjects, there was less consensus over the relative importance of marketing, but three subjects believed it to be the most important, while seven of the ten subjects evaluated marketing to be the second most important sub-dimension. However, marketing

activity is the sub-dimension of sales maximisation where the interference of the industrial sector in the company's policies is very obvious. Managers in this company feel that they do not have adequate authority over their marketing function, as everything comes down from the industrial policy. An accountant in the financial department at top management level indicated:

*“...the company does not have enough role in marketing its products. It only implements the industrial sector's instructions.”*

Consequently, a majority of the subjects believed that new product development was the most important sub-dimension in determining benchmarking over sales maximisation, while the remaining subjects considered it as the second or third most important sub-dimension. Overall, the subjects from this company appeared to believe that new product development (0.494) was clearly considered as the most important, marketing (0.406) second most important, and advertising (0.091) least important sub-dimensions in benchmarking sales maximisation.

#### **8.3.2.6 Consistency analysis**

The findings of this study indicate significant consistency across subject responses within each of the five companies in determining sales maximisation. For example, the value of the principle eigenvalues (e.g.,  $\lambda_{\max} = 3.06, 3.05, 3.03, 3.00$  and  $3.03$  for Companies A, B, C, D and E respectively) is very close to  $n$ . Also, there is strong consistency across subjects' responses by means of C.I and C.R (e.g., C.I= 0.03 and 0.06 for Company A, C.I= 0.02 and C.R= 0.05 for Company B, C.I= 0.02 and C.R= 0.03 for Companies C and E, and C.I= 0.00 and C.R= 0.00 for Company D) which were less than 0.10 within each of five companies, as shown in Table (8-1A) in appendix-5.

#### **8.3.2.7 Priorities of new product development, pricing and distribution sub-criteria with respect to determination of market share.**

As mentioned previously (see chapter six), many LMOs did not face any difficulties in marketing their products, as the demand for their products was more than the



supply (The Secretariat of Industry, 1996). However, the difficulty was that some industrial companies could not provide their products in the companies' market areas because of shortages in production levels. This happened for many reasons: for example, shortages in raw materials and spare parts, the calls on many companies personnel for military deployment caused shortages of experienced operators which consequently effected the level of productivity in industrial companies. Furthermore, the last part of this level (see level 3 of the hierarchy in figure 5-2) requires paired comparisons of the three sub-dimensions with respect to market share. Subjects were therefore required to rank the relative importance of the three sub-dimensions with respect to the determination of market share.

#### **8.3.2.7.1 Priorities of market share sub-criteria in Company A**

As indicated before this company includes four factories and production units. The marketing department of this company was fully responsible for marketing and selling its products, and there was no intervention from the central management and industrial policy. However, after the 1980s the role and intervention from central management and the industrial policy became clear and everything became centralised. As the manager of one factory said:

*"We do not have any influence over the marketing function of the factory; everything comes down from company management. Our job is only to implement their instructions and commands."*

The central management of the company also has a weak role in marketing its factories and the products of its production units because of the clear intervention by the industrial policy in this function. This was as a result of the difficult financial conditions which the company has been faced with since the beginning of the 1990s, and the industrial policy believes that this centralisation will help the company to control its function. To that end, this section presents AHP's analysis of managers' views about the relative priorities of each sub-criterion to be benchmarked, in terms of distribution, pricing and new product development across subjects.

The responses of the ten subjects from Company A indicate that there is unanimity over the importance of the three sub-dimensions when determining market share (see Table 8-5 for Company A in appendix-6). Of the ten subjects, nine rated new product development as most important and only one subject believed it to be the second most important sub-dimension. A majority of the subjects consider that pricing is the second most important sub-dimension. A key person in the marketing department mentioned this when he said:

*“The prices of products in this company (according to industrial sector policy) must cover the cost production plus a small profit margin (5% or more). However, our company has been unable to do this since the 1990s because of the high cost of raw material and spare parts which was caused by the sanction put against Libya.”*

In general, there is also consistency across the responses concerning the importance of distribution, with seven subjects indicating this to be the third most important sub-dimension, while the remaining subjects rated it as the second most important sub-dimension in benchmarking market share. Overall, there appears to be general agreement that distribution is not particularly important in determining market share. Also pricing (2.00) is generally viewed as the second most important in a judgement over market share after new product development (1.10) as confirmed by mean ranks.

#### **8.3.2.7.2 Priorities of market share sub-criteria in Company B**

The judgements of subjects over the relative importance of the three sub-dimensions with respect to market share indicates that there is little agreement among respondents (see Table 8-5 Company B appendix-6). In determining the importance of new product development and pricing, five subjects believed that these were either the most important or second most important elements; however, across subjects, the relative importance of new product development and pricing is unclear. Further, one of the top managers of production affairs of this company in discussion concerning the process of new product development, said:



*“Our company is ranked one of the largest industrial companies in terms of number of employees, which exceeds 5000 people. At this point, our company gets bigger in its number of employees and the need for more management training development programmes increases. This requires more support in terms of money, trainers and facilities. Further, as a result of economic and political crises that have taken place in the last decade, this kind of support has decreased. Therefore, our company was trying to give more attention to this matter which is related to the need for more employees to be trained, and consequently, new production could be developed.”*

With respect to the distribution, five of the ten respondents indicate that they ranked this sub-dimension as the least important, clearly behind pricing and new product development. However, the importance of pricing, compared to distribution, across subjects is mixed, but it was generally suggested that distribution is relatively unimportant in benchmarking market share. Overall the results suggest that, in determining market share, the subjects under these sub-criteria believe that pricing is considerably more important than distribution. In turn, new product development (1.60) is seen as only slightly more important than pricing (1.70) in benchmarking market share in terms of mean ranks.

#### **8.3.2.7.3 Priorities of market share sub-criteria in Company C**

It was admitted by several managers who were interviewed that various economic factors have influenced the company's products and its marketing. Another uncontrollable factor which was very influential on their day-to-day work was the embargo on Libya. The embargo has made it difficult for the company to procure, replace and maintain its machinery within reasonable time, effort and cost. The embargo has caused the company to pay higher prices and invest more money. Therefore, the problem was that this company could not provide its products because of shortages in production development levels. To that end, this section presents the

analysis of subjects' responses in determining market share sub-criteria in company C, as discussed below.

The results presented in Table (8-5) for Company C in appendix-6 indicate that there is general consensus across subjects over the importance of the market share sub-dimensions. Pricing appears to be relatively unimportant in a judgement over market share, as four subjects believe this to be the least important, while the remaining rated it as the most and second most important sub-dimension. Evaluation of distribution revealed that this sub-dimension was regarded as slightly more important than pricing, but considerably less important than new product development. In respect to new product development, it appears that there is a general agreement amongst subjects that it is the most important sub-criterion in a judgement over market share. In turn, one subject regarded new product development as second most important. The overall results indicate that new product development (1.10) is regarded by subjects as the most important sub-dimension compared with distribution (1.60) and pricing (2.00) in terms of mean ranks.

#### **8.3.2.7.4 Priorities of market share sub-criteria in Company D**

Abusneina (1991) and Bait-Elmal (2000) indicated that industrial policy does not encourage LMOs to export their products. This is the result of the rise in value of exported oil products, the low production of LMOs products, and the inability to satisfy the needs of the local market. In addition, the high cost of some LMOs products makes it difficult to compete in international markets. Further, the US technological embargo and the 1992 UN embargo on Libya have created difficulties for this company and many other Libyan organisations to procure, replace and maintain their machinery with reasonable time, effort and cost. Therefore, Company D's production during the 1990s was low and did not match the quality standard level.

A key manager from top management (see chapter 6) noted that Company D frequently failed to achieve its production target (e.g., 1998, 1999). This was as a



result of shortages in raw materials and spare parts, and was considered the major reasons for the failure. This company did not have a long-term production planning system during 1995. The reason for this was that the company depends heavily on the amount of hard currency it can obtain and how much raw material it can import. Thus the company is not in a position to provide for the needs of its market area unless it works to its capacity and introduces new product development.

The empirical investigation through AHP presents the subjects' responses to determine market share sub-dimensions in the company. Subjects' priority responses for these sub-dimensions are dissimilar when benchmarking market share. The results from the ten subjects are summarised in Table (8-5) in appendix 6. The responses of the ten subjects indicate that there is little consensus over the importance of new product development in a judgement over market share. All but three of the subjects agreed that new product development was one of the two most important sub-dimensions. However, there was less consensus over the relative importance of pricing, but three subjects believed it to be the most important sub-criterion, while seven of the other subjects considered pricing to be the second most important sub-criterion. As two of these seven subjects pointed out:

*“...although the company has changed its prices for its products many times during the 1990s, the company still sold its products at a loss. We think one of the main reasons for this is because the prices are based on the assumption that the company and its factories will work to high capacity (90% of its capacity), according to industrial policy instruction, and because the budget agreement regarding hard currency is not carried out completely, resulting in the company and its factories low working capacity. Therefore, the unit cost of production increases, and the sale price becomes less than the cost. Other reasons include the continual increase in costs of raw materials and operational requirements, whilst the selling prices are difficult to change. Subsequently the prices of some products are lower than the cost.”*

Moreover, five subjects generally agreed that distribution is relatively unimportant. In turn five subjects viewed it to be the most and second most important sub-criterion. Overall, the relative importance of new product development and pricing appears to come somewhere between the two. In this case, the mean ranks means confirm that new product development (1.50) was clearly regarded as the most important sub-criterion compared with pricing (1.70) and distribution (2.30) in determining market share.

#### **8.3.2.7.5 Priorities of market share sub-criteria in Company E**

This company is in the food production industry. It is government financed, managed, and monitored. The company does not face any difficulties in marketing its products, as the demand for its products is more than the supply. Therefore, the difficulty was that the company sometimes could not provide its products in the company's market area because of a shortage in raw materials and spare parts. As Bengharbia (1995) indicated this situation created an increase in the number of LMOs' products being supplied on the black market. Further, the marketing function is another place where the interference of the government bodies in the company's policies and the interference of the company top management in its factories' business are clear. Many managers surveyed also felt that they did not have enough authority over their marketing function as everything came down from the industrial policy. As one of these surveyed managers in the marketing division mentioned:

*“Our problem is centralisation. Our role as a marketing division is simply to follow procedures and commands of the industrial sector and the top management by making sure that their orders are completely implemented.”*

The above discussion shows how Company E is subject to the government bodies' interference in marketing its products. However, the investigation for this company presents findings from surveyed subjects which are summarised in Table (8-83) in appendix-6. There was consensus across subjects over the relative importance of new product development with respect to determination of market share. Six of the ten



subjects rated new product development as the most important sub-criterion, while the remaining subjects viewed it as the second most important criterion. However, there was little consensus over the relative importance of pricing, but three subjects believed it to be the most important sub-criterion, while five of the other subjects considered pricing to be the second most important sub-criterion. Seven subjects regarded distribution as the least important sub-criterion, but three of the ten subjects indicated that they viewed it as most and second most important sub-criterion. Overall, the mean ranks indicate that new product development (1.50), pricing (1.70) and distribution (2.50) were believed to be the most, second most, and third most important sub-criterion respectively in determining market share.

### **8.3.2.8 Consistency analysis**

The findings of the above section relate to consistency of subjects responses in determining market share within each of five companies, by considering  $\lambda_{\max}$ , C.I and C.R to reflect the subjects judgement over market share sub-criteria (see Table 8-1A in appendix-5). This means that the value of the principle eigenvalue is close to dimension of  $n$  (e.g.,  $\lambda_{\max}$  is equal to 3.03, 3.04, 3.02, 3.02 and 3.02 for Companies A, B, C, D and E respectively). Also, the overall consistency of subjects' judgements is high with respect to market share sub-criteria using C.I and C.R values are less than 0.10 (e.g., C.I= 0.01 and C.R= 0.03 for Company A, C.I= 0.02 and C.R= 0.04 for Company B, C.I= 0.01 and C.R= 0.02 for Companies C and D, C.I= 0.01 and C.R= 0.02 for Company E). This means that there was perfect consistency across subjects' responses within each of the five companies.

### **8.3.3 Level of benchmarking specific sub-criteria (dimensions) with respect to the determination of sub-criteria**

In this level subjects are required to make paired comparisons between the two specific sub-criteria with respect to their relation to sub-criteria at the level above. Furthermore, subjects are asked to work through twelve paired comparisons for all sub-criteria conditional on the assumption that they were concerned with judgement over the well-being of the organisation. Once this was achieved, priorities were then

derived from the point of view of determining the best practice benchmarking of specific sub-criteria.

This study analysed the results of twelve-paired comparison across the twenty-four specific sub-criteria<sup>(10)</sup> within each of the five companies under the determination of sub-criteria (e.g., labour, material and overhead cost, new technology, etc). The result of all the paired comparisons of specific sub-criteria made by fifty subjects across Companies A, B, C, D and E are presented, along with a detailed discussion of paired comparisons for the following specific sub-criteria:

- 1- Amount used and price with respect to determination of material cost.
- 2- Retraining and recruiting employees with respect to determination of production redesigning.
- 3- Selling price and delivery with respect to determination of marketing.
- 4- R&D and promotion support with respect to determination of new product development.

The detailed discussion of the specific sub-criteria mentioned above are followed for all twenty four specific sub-criteria used in this study.

### **8.3.3.1 Priorities of amount used and price specific sub-criteria with respect to the determination of material cost**

Regarding the influence of the economic situation, many managers surveyed within the five companies mentioned the problem of prices increasing for raw materials every year, especially after the country faced the UN embargo. The Central Bank has also imposed more restrictions on foreign exchange which companies use to import semi-raw materials, spare parts and other types of materials which are considered

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<sup>(10)</sup> Such as: time and payment (to determine labour cost), amount used and price (to determine material cost), absorption rate and amount incurred (to determine overhead cost), upgrading and replacing machines (to determine developed devices), retraining and recruiting employees (to determine production redesigning), raw material and product testing (to determine R&D), resources and media (to determine advertising), selling price and delivery (to determine marketing), R&D and personal (to determine new product development), retail and wholesale (to determine distribution), pricing and costing structure (to determine pricing), and R&D and promotional support (to determine new product development) (see Figure 5-2).



basic requirements for the production process in each of the five companies. As a result, many imports are limited, and the imports of some raw materials have been stopped altogether. This has led to an increase in the costs of many raw materials and consequently costs of manufacturing goods within many of the LMOs.

#### **8.3.3.1.1 Priorities of material cost specific sub-criteria in Company A**

As mentioned earlier many of the raw materials that Company A used are imported from abroad and all the spare parts and operational requirements for the company's factories are also imported from abroad. Thus, all this requires a large amount of hard currency which is not available. One participant indicated that "the insufficient amount of hard currency creates a bad impression to our company with its suppliers because of delays in payment and no commitment to schedules. This meant the company had to pay high prices for raw materials because it obtained the agreement for hard currency at unsuitable times."

The next paragraph reviews the subject's responses to determine material cost specific sub-criteria in Company A (see Table (8-6) in appendix-6). With respect to amount used there was general agreement among subjects that this element is much more important than price in judgement over material cost. This was confirmed by seven of the ten subjects who indicated that they believed amount used was the most important specific sub-criterion when benchmarking material cost. There is also some general consensus over the least important specific sub-criteria, as six subjects believe price to be relatively unimportant compared with amount used when benchmarking material cost. Overall, the mean ranks confirm that amount used (1.30) was regarded as the most important specific sub-criterion compared with price (1.60).

#### **8.3.3.1.2 Priorities of material cost specific sub-criteria in Company B**

The structural changes in the Libyan economy in the last two decades are the main factors that have affected the LMOs' operations in terms of cost productivity, the price of materials used, and the quality of services. One of these changes is related to

falling oil prices in the 1980s which caused a decline in many development projects for Libyan organisations in general (Fisher, 1990) and for Company B in particular. Additionally, a general manager of financial accounts and commercial affairs stated that “the UN and US embargo put on Libya created huge increases in the price of raw materials and semi-raw materials, and this in turn increased the costs of production”. However, the empirical investigation through AHP for Company B summarises the results of the priority weights for each of the ten subjects for amount used and price in the determination of material cost (see Table (8-6) in appendix-6). The results show that there is a general agreement among subjects regarding the importance of the amount used and price specific sub-criteria. However, seven of the ten subjects indicated that they believed price to be the most important, while the remaining three subjects ranked price as the least important specific sub-criterion. Evaluation of amount used revealed that this specific sub-dimension was regarded as slightly less important than price. Indeed, six of the ten subjects viewed the amount used as the least important, while the remaining subjects believed it to be the most important specific sub-dimension in benchmarking material cost. The importance of price (1.30) over amount used (1.60) was confirmed by mean ranks.

#### **8.3.3.1.3 Priorities of material cost specific sub-criteria in Company C**

Company C is one of the LMOs which has been affected by several decisions that industrial policy and the Central Bank made during the 1980s to determine the use of hard currency (Elfeitori, 1992). Accordingly, the company was unable to achieve its production targets every year as a result of the high cost of importing raw materials from abroad (The Office Production Affairs, 1995 and 1996).

The author’s interviews with certain managers showed that increases in raw materials costs are considered one of the main problems for Company C. This resulted in the company paying high prices for raw materials used. This in turn has led to an increase in the cost of production and made it difficult for the company to provide its products at reasonable prices and without making a loss. In light of this, the analysis of subjects’ responses in determining material cost specific sub-criteria in this company is presented below.



In determining material cost, a high degree of consensus emerges across subjects regarding the two specific sub-criteria (see Table 8-6 in appendix-6). Specifically, all but one of the subjects agreed that amount used was one of the most important. There was little consensus over the relative importance of price. Four subjects considered price to be the most important specific sub-dimension, but six of the ten subjects disagreed, ranking price as the second most important specific sub-dimension in benchmarking material cost. Results also indicated that three of the ten subjects believed that each of the two specific sub-dimensions was equally important. Overall, the mean ranks for amount used (1.10) is considered to be significantly greater than the mean ranks for price (1.10).

#### **8.3.3.1.4 Priorities of material cost specific sub-criteria in Company D**

This company has used a short-term operation programmes system since 1990s. Therefore, the company sets its operation programmes according to how much raw material it obtains to achieve its production target for that period. However, many of the managers surveyed indicated that this company sometimes faces difficulty in providing its products in the company's market because of a shortage in raw materials. This has caused the company to pay high prices for raw materials in order to fulfil the needs of its market. Moreover, the empirical investigation for this company presents subjects' responses to their priorities on material cost specific sub-criteria to be benchmarked.

In general, the results from the ten subjects shown in Table (8-6) in appendix-6 suggest that price is most important when assessing material cost. Seven of the ten subjects believed price to be the most important, while the remaining subjects rated it as the least important specific sub-dimension. In relation to the determination of material cost, subjects generally agreed that amount used is relatively less important than price. However, five of the ten subjects assigned high priority weights for amount used, while the remaining subjects assigned low priority weights. Also, three subjects regarded amount used and price as being equally important when

benchmarking material cost. In fact, the mean ranks for price (1.30) are higher than the mean ranks for amount used (1.50).

#### **8.3.3.1.5 Priorities of material cost specific sub-criteria in Company E**

According to the author's interviews with many surveyed managers, the management of Company E feels that it has inadequate authority over the price and material function because all procedures to import raw materials are controlled by the industrial policy. This interference by a government body into the company's policies to import raw materials caused an increase in the price of goods produced.

In the light of the above discussion, Company E is subject to the impact of its environment. However, the empirical investigation for the company shows difficulties in determining priorities on the specific sub-criteria of material cost in the situation of benchmarking. In the case of evaluation priority weights for amount used and price to determine material cost, there appears to be general consensus over the relative importance of price (see Table 8-6 in appendix-6). Two of the ten subjects viewed price as the least important while the remaining subjects ranked price as the most important specific sub-dimension. Six of the subjects indicated amount used as being most important, but another four subjects considered it to be the least important specific sub-dimension. Overall, the mean ranks for price (1.20) are more significant than the amount used (1.70).

The study also investigated the priority of time and payment when benchmarking labour cost across the five companies. Many of the managers surveyed within the five LMOs indicated that during the official working hours little attention is paid to the importance of time that employees spend for meeting their visitors, which is considered a form of socialisation. Employees in many LMOs do not observe official working hours, which results in a delay in the performance of their duties. They arrive late in the morning, absent themselves during the day, and leave before the end of the working day. This influences LMOs when benchmarking cost control in labour cost. Consequently, the result of empirical investigation exhibited in Table (8-6) in



appendix-6 for Companies B, C and D reveals that time was more important than payment. The majority of the subjects, as indicated in Table (8-6), considered payment to be more important than time in determining labour cost. Other managers surveyed added that the concept of employment is viewed by Libyan society as a gift given to the citizen. The political willingness for the industrial policy to achieve full employment without paying the least attention to the value of payment and time required by LMOs, may have contributed to a negative attitude and put pressure on these organisations to employ certain numbers of people each year regardless of the real capacity of the organisation.

The findings of this study also evaluated absorption rate (time used by employees for production based on overhead costs) as more important than amount incurred (cost incurred by indirect labour, materials, etc.) when judging overhead cost within Companies A and E (see Tables 8-6 in appendix-6). At the same time, subject responses confirmed that the amount incurred was clearly regarded as the most important specific sub-criterion in benchmarking overhead cost for the three companies.

### **8.3.3.2 Priorities of retraining and recruiting employees specific sub-criteria with respect to the determination of production redesigning**

In benchmarking quality, companies consider new change adoption in production redesigning. This sub-criterion relates to procedures that the company uses to improve quality by recruiting or retraining its employees. Quality improvement programmes without new technology enhanced quality training cannot be implemented. Moreover, as a result of the economic and political crises which have faced the country in the 1990s, many LMOs found it difficult to respond to all these requirements. Thus, many subjects who were interviewed from the five companies indicated that these two issues have influenced benchmarking implementation in quality, as discussed below.

### **8.3.3.2.1 Priorities of production redesigning specific sub-criteria in Company A**

From the fieldwork it appears that this company faced difficulties in production redesigning to improve quality because of the lack of highly skilled employees and perfect technology. This is as a result of political issues which started in 1992, when the UN imposed an economic and political embargo against Libya. Therefore, the economic circumstances influenced this company with respect to production redesigning, new technology and R&D in terms of quality improvement. However, the analysis of subjects' responses through AHP in determining quality control specific sub-criteria is presented below.

Within this company, there appears to be complete unanimity among subjects regarding the importance of retraining and recruiting employees with respect to the determination of redesigning production (see Table 8-7 for Company A in appendix-6). Most subjects agreed that retraining employees was the most important specific sub-criterion. However, nine of the ten subjects believed that recruiting employees was the least important specific sub-criterion in benchmarking the redesigning of production. As one of the participants in charge of technical department pointed out, this company is no longer able to send employees on management training development programmes to increase their performance and to improve organisational production redesigning to adopt quality change. This is caused by some restrictions that the government put on training programmes policy because of UN and US sanctions. Consequently, the overall conclusion in terms of subjects' priorities between retraining (1.00) and recruiting (1.90) employees to determine production redesigning is confirmed by mean ranks.

### **8.3.3.2.2 Priorities of production redesigning specific sub-criteria in Company B**

In spite of the satisfactory contribution that industrial policy has made towards improving management training development programme by helping employees to acquire knowledge, abilities and skills, this company still faces some difficulties in quality implementation. According to the author's interviews with the managers of two factories, many production units depend upon imported skilled employees. Obviously, this dependency on imported skilled employees was associated with both



the economic and the political problems that affected many LMOs during the 1980s and 1990s. In the light of the preceding section, the empirical investigation of subjects' responses for this company presents the priority weights produced by the ten subjects as discussed below.

The results summarised in Table (8-7) for Company B in appendix-6 show that there was high agreement across subjects that retraining and recruiting employees were the most and least important specific sub-criteria respectively in judgements about benchmarking the redesigning of production. However, two of the ten subjects rated retraining employees as the least important factor. In general, the large degree of difference across subjects in terms of mean ranks between these two specific sub-criteria confirm that retraining employees (1.20) was clearly regarded as being more important than recruiting employees (1.80) in benchmarking the redesigning of production.

#### **8.3.3.2.3 Priorities of production redesigning specific sub-criteria in Company C**

Although many surveyed managers in this company indicated that their company tries to reserve more resources for training development programmes to increase staff performance. This company still faces difficulty in obtaining agreement from government bodies to send employees abroad to become qualified and to meet individual's needs. This was owing to the decrease in financial support for plans and programmes from government bodies to many LMOs, as a result of the country's economic circumstances. Further, these circumstances have influenced the management training development policies and the effectiveness of the company to benchmark quality. This confirms other research into LMOs (Fituri, 1990). Moreover, this section summarises the results of subjects' priorities on retraining and recruitment specific sub-criteria to determine benchmarking in the redesigning of production in this company.

The empirical investigation through AHP for Company C reports the results from the ten subjects as shown in Table (8-7) in appendix-6. There was very high consensus across subjects that retraining employees is the most important specific sub-criterion.

However, the results on recruiting employees are mixed. Five of the ten subjects indicated that they believed recruiting employees as the most important, while the other five subjects viewed it as the least important specific sub-criterion in benchmarking the redesigning of production. Also, each of these specific sub-criteria was ranked as being equally important by four subjects. Overall, the mean ranks indicated more priority to retraining employees (1.10) than to recruiting employees (1.50) when benchmarking the redesigning of production.

#### **8.3.3.2.4 Priorities of production redesigning specific sub-criteria in Company D**

As indicated earlier, managers in this company suggested that the structural changes in the Libyan economy have affected their company's benchmarking of quality. These changes, which are related to low prices for oil created difficulties in many LMOs with respect to the adoption of new change. For example, a key person in production department of this company said:

*"...these changes created a decline in development spending on local management training development programmes and led to a delay or cancellation of other training programmes for employees since the 1980s. These changes also led to an increase in employee turnover, because the employees who were dissatisfied with these changes usually looked for a job with another company. This in turn caused an imbalance between meeting employees' needs and the company's plan to adopt change to improve quality."*

The empirical investigation for this company required the subjects to rank the relative importance of the two sub-dimensions with respect to the determination of redesigning of production. Within this company, the relative importance of retraining and recruiting employees with respect to the determination of redesigning of production is summarised in Table (8-7) for Company D in appendix-6. There is a great deal of consistency across the responses concerning the importance of retraining employees, with all subjects indicating this to be the most important specific sub-criterion. Seven of the ten subjects indicated that they believed recruiting



employees to be the least important, while the remaining three subjects believed it to be most important specific sub-criterion in benchmarking the redesigning of production. In general, the mean ranks across subjects indicated that priority was given to retraining employees (1.00) over recruiting employees (1.70).

#### **8.3.3.2.5 Priorities of production redesigning specific sub-criteria in Company E**

During the end of the 1970s and the beginning of 1980s many LMOs spent a great deal of money on management training development programmes. This included technical training courses for employees outside the country, and buying technical facilities to assist in local training development programmes (Agniaia, 1996). A manager from the top management indicated that “Company E was recruiting as many Libyan employees as possible to replace foreigners. Therefore, there was a need for qualified and trained employees to participate in the implementation of new adoption which would improve quality. As a result of this a considerable amount of money was allocated for investment in this field.”

In light of the above mentioned paragraph and reviewing the subjects’ responses to determine quality control specific sub-criteria in this company, Table (8-7) for Company E appendix-6 shows the relative importance of retraining and recruiting employees. Nine of the ten subjects decided to give the highest weights to retraining employees. There was also very high consistency across subjects in ranking recruiting employees to be the second most important specific sub-criterion in judgement benchmarking over the redesigning of production. In addition, mean ranks confirm retraining employees (1.10) to be much more important than recruiting employees (1.90).

In addition to what was mentioned above about the priority of production redesigning specific sub-criteria, there is also priority of new technology specific sub-criteria of benchmarking quality control. However, many managers within the five companies indicated that economic circumstances influenced their company’s adoption of new technology. This in turn influenced the effectiveness of many LMOs to benchmark

quality. According to this, there is agreement across subjects within each Company A, B, C and E that upgrading machines is more important than replacing machines in judgement over new technology. However, the subjects' responses in Company D reveal that replacing machines was ranked more highly than upgrading machines (see Table 8-7 in appendix-6).

The results mentioned in chapter seven of this study reflect the concern of Agnaia (1996) and Kilani's (1988) about the lack of sufficient resources available for R&D in Libyan organisations in general, and in LMOs in particular. These results provide some insights into insufficient R&D in both quantity and quality in LMOs. At this point, the analysis of subjects' responses within the five companies to determine the priority of raw material and product testing to determine R&D (sub-criteria of quality control) is presented in this way. There appears to be general consensus among subjects regarding the importance of raw materials over product testing within Companies C, D and E. At the same time, a majority of subjects in Companies A and B agreed that product testing was the most important specific sub-criterion compared with raw material to determine benchmarking in R&D (see Tables 8-7 in appendix-6).

### **8.3.3.3 Priorities of selling price and delivery specific sub-criteria with respect to determination of marketing**

Many LMOs do not face any difficulties in marketing their products (The Secretariat of Industry, 1996). However, the difficulty was that many LMOs were sometimes unable to provide their products as a result of shortages. This was caused by shortages in raw materials and spare parts because of UN and US sanctions against Libya. Generally, this section reveals the results of subjects' priorities in terms of selling price and delivery specific sub-criteria to determine benchmarking in sales maximisation within the five companies as presented below.

#### **8.3.3.3.1 Priorities of marketing specific sub-criteria in Company A**

In spite of the difficult environment for export, the industrial sector has, since the end of the 1980s, encouraged many of LMOs to export their products (Bait-Elmal, 2000),



and one of these was Company A. This was to gain hard currency that company may use to purchase some of the basic needs that cannot be obtained from the local market. This matter was asserted by one of the key managers in top management when he said:

*“The prices of our products cannot compete with the prices of the products in the international markets. However, we export for a particular reason, that is to obtain hard currency and to use it to fulfil the needs of the company. This is because the budget of hard currency through the Central Bank is not adequate for fulfilling the needs for industrial operation programme in our company.”*

Moreover, the above discussion shows how Company A is subject to the impact of economic circumstances which have influenced the company decisions with respect to marketing. The analysis of subjects' responses in determining priorities between selling price and delivery in benchmarking marketing is clear. It appears that subjects are more concerned with selling price than with delivery (see Table 8-8 for Company A in appendix-6). All but two of the subjects agreed that the selling price was relatively the most important specific dimension in benchmarking marketing. Again, the lack of consensus is illustrated by the fact that seven subjects believed that it was the least important specific sub-dimension, while the remaining three subjects regarded delivery as being the most important. However, there was a large degree of variance across the respondents' scale compositions, indicating the diversity of opinion over importance of specific sub-criteria when benchmarking marketing. The mean ranks indicate that delivery (1.70) is believed to be less important than selling price (1.20) when benchmarking marketing.

#### **8.3.3.3.2 Priorities of marketing specific sub-criteria in Company B**

Regarding the influence of the economic situation, many of the managers surveyed in this company mentioned that “the problem of the prices going up every year for imported raw materials became worse after the country faced the embargo imposed by the UN. They added that the Central Bank has also imposed more restrictions on

foreign exchange which were used by the company import semi-raw materials and other types of materials which were needed for the production process in this company. This in turn increased the cost of production and the selling price.”

Consequently, the analysis of subjects responses’ in terms of priority weights between selling price and delivery is unclear when determining benchmarking over marketing. The results from all subjects are summarised in Table (8-8) in appendix-6. Six of the subjects viewed selling price as the most important specific sub-dimension, but the remaining four subjects considered it as the second most important. Meanwhile, responses of the ten subjects indicated that there is little consensus over the importance of delivery. Seven subjects generally agreed that delivery is the most important, but the remaining three subjects viewed it as the second or least important specific sub-dimension in benchmarking marketing. In general, the mean ranks confirm that delivery (1.30) is slightly more important than selling (1.40).

#### **8.3.3.3 Priorities of marketing specific sub-criteria in Company C**

As mentioned elsewhere in this chapter, many managers were aware that the company paying high prices for the raw materials used for its production. This made it difficult for the company to introduce its products into the market at a reasonable price and without losses. Further, a key person from the marketing department indicated that:

*“...since the 1990s the selling prices for our company products were dictated by government bodies (e.g., Ministry of the Economy) rather than being determined according to economic and marketing criteria. As a result, many products in this company have been priced at levels lower than their cost. This has caused the company to continue incurring losses.”*

The empirical investigation through AHP for this company presents the priority weights indicated by subjects for selling price and delivery with respect to



determination of marketing (see Table 8-8 for Company C in appendix-6). The subjects' priority responses for these specific sub-dimensions are mixed. Six subjects ranked the selling price as the most important, while four of the ten subjects viewed it to be the least important specific sub-dimension. At the same time, six subjects believed that delivery is the most important element when assessing marketing, and four of the ten subjects viewed it as the least important. A further two subjects indicated that they believed that selling price and delivery were equally important when benchmarking marketing. Overall, the mean ranks confirm that delivery is slightly more important than selling price.

#### **8.3.3.3.4 Priorities of marketing specific sub-criteria in Company D**

Since the 1990s the intervention from the government bodies in the day-to-day operations, selling price, etc. for many LMOs has increased. This was asserted by a key person in the top management of Company D:

*“...we do have limited authority regarding decisions related to our company, including operation, selling price and marketing. Prices of the company products are sometimes subject to industrial sector policy, which in our company may not be related to the cost of the products. Therefore, the company income hardly meets operational costs.”*

Moreover, the drive to benchmarking adoption in marketing is the ability to compete on delivery (Tispouri, 2001) and selling price. In this case, the analysis of subjects' responses in terms of priority weights given by all subjects for selling price and delivery indicated a great deal of agreement toward these two specific sub-criteria (see Table 8-8 for Company D in appendix-6). In general, it appears that there is a complete consensus across subjects concerning these two specific sub-criteria. However, all subjects agreed that selling price was the most important specific sub-dimension in benchmarking marketing. In fact, there was less consensus over the relative importance of delivery, while two of the other subjects considered delivery to be the most important specific sub-dimension. Overall, in terms of mean ranks,

selling price (1.00) was considered the most important element compared with delivery (1.80) in benchmarking marketing.

#### **8.3.3.3.5 Priorities of marketing specific sub-criteria in Company E**

The impact of the environmental factors (e.g., state involvement) on the functioning of manufacturing organisations was pointed out by one of managers in Company E when he said:

*“We, in the management committee, are dealing with the company day-to-day operations under pressure of various political, economic, social, culture and legal restrictions which we cannot ignore. For example, the state involvement influences the operation and function of selling prices in the company. This restricted many procedures in the company and its factories in terms of selling price, markets and the function of control systems.”*

In general, decisions regarding the selling prices and delivery of products in this company are influenced by political and economic circumstances. However, the evaluations of selling price and delivery given by subjects to determine benchmarks in sales maximisation specific sub-criteria are presented in Table 8-8 for Company E in appendix-6. Consequently, these evaluations show a high degree of agreement among subjects regarding the importance of selling price. Specifically, eight subjects ranked the selling price as the most important, with one of the remaining subjects believing that it was the least important. There is also general agreement over the least important specific sub-dimensions, as eight subjects believe delivery to be relatively unimportant in benchmarking marketing. The other two subjects rated delivery as the most important. Overall, it appears from the mean ranks that selling price (1.10) is more important than delivery (1.80).

Furthermore, many managers within the five companies mentioned that a shortage of resources was one of the obstacles which affected many LMOs' ability in determining benchmarks in sales maximisation specific sub-criteria. However, the



difficulties of inadequate resources related to insufficient funds and relevant information influenced benchmarking adoption for advertising in LMOs in terms of sales maximisation. Correspondingly, the findings of this study indicated that the majority of subjects believe that resources are the most important element compared with media in benchmarking advertising within each of the five companies. This was confirmed by mean ranks, as exhibited in Table (8-8) in appendix-6, within each of the five companies.

A further investigation reveals complete unanimity among subjects that R&D was the most important specific sub-criteria compared with personnel in benchmarking new product development within each of the Companies A, B, C, D and E (see Table 8-8 in appendix-6). Moreover, Libyan researchers stated that the training programmes established for personnel were unable to provide companies with qualified personnel (Aгнаia, 1996; Ghiad, 1986). Therefore, in order to promote training programmes for personnel, more attention should be given to this in the context of benchmarking sales maximisation.

#### **8.3.3.4 Priorities of R&D and promotional support specific sub-criteria with respect to determination of new product development**

One of the most important difficulties that faced the development of many LMOs' was the shortage of skilled employees. Regarding this difficulty many managers said that they faced high employee turnover. This affected many LMOs' plans to send employees abroad to management training development programmes that could improve the organisations' new product development. Also, the managers interviewed indicated that the reward system which was imposed by law 15/1981 for many LMOs, is unsatisfactory and outdated. In many LMOs, little attention was paid to the link between managers' salary and rewards, and their position, authority, responsibility and performance. This poor reward system or promotional support is perceived by managers to be a substantial factor that could enhance the organisation's ability to implement changes more effectively. Therefore, the managers felt that what they give to their companies (e.g., time and effort) is more than what they received (e.g., salary, motivation, achievement) and this may lead to a

decrease in their performance. This has prevented many organisations from recruiting or retraining skilled employees that would be more creative and productive to meet market share requirements. Furthermore, this section reports the results of subjects' views of new product elements to determine benchmarks in market share for all five companies.

#### **8.3.3.4.1 Priorities of product development specific sub-criteria in Company A**

A key issue here is the point of view of surveyed subjects from which contribution to R&D and promotional support are considered in the context of benchmarking new product development. At this point, R&D and promotional support for employees should be given greater priority from both inside and outside the industrial policy's organisations. Subjects in this company were therefore required to indicate through paired comparisons of R&D and promotional support to the determination of benchmarking in the specific sub-criteria of market share.

In general, the priority structure for new product development is based on the relative importance of the two specific sub-dimensions R&D and promotional support. The results from the ten subjects from Company A are summarised in Table (8-9) in appendix-6. The responses reveal a relatively high degree of consensus. All but two of the subjects agreed that R&D was the most important when benchmarking new product development. There was also general agreement that promotional support is relatively unimportant, with seven subjects viewing it as the second most important behind R&D in benchmarking pricing. Overall, the mean ranks confirm that R&D (1.20) is more important than promotional support (1.70) in benchmarking new product development (the sub-criterion of market share).

#### **8.3.3.4.2 Priorities of product development specific sub-criteria in Company B**

There is a correlation between investing in R&D and the level of production development in the organisation. Organisations are more likely able to adopt change and become more competitive independently of the direct R&D outcome (Tsipouri, 2001). Thus, it can be argued that the higher the performed R&D the higher the



contribution to production development. However, the empirical investigation through AHP for this company reports the results of R&D and promotional support priority for each of the ten subjects to the determination of new product development (see Table 8-9 for Company B in appendix-6). The results show general agreement among subjects regarding the importance of R&D. The majority of the subjects believed that R&D was the most important element in benchmarking new product development, while the remaining subjects rated R&D as the second most important element. These results support the suggestions of Tsipouri (2001) and OECD (2000b) that are based on the evidence of many organisations that R&D has a positive and significant effect on productivity and production development. Therefore, the role of R&D in production development and the need for promotional support for new change adoption are broadly recognised across many organisations. Overall, R&D (1.30) was regarded more important than promotional support (1.50) according to the mean ranks when benchmarking new product development.

#### **8.3.3.4.3 Priorities of product development specific sub-criteria in Company C**

The managers surveyed in this company indicated that the economic situation regarding the restrictions imposed on the import of machinery and materials, and increases in prices and costs, decreases the chances of production development. They also added that their company lacks training facilities and sufficient research establishment in general, and the existing R&D studies are very poor in quantity and quality. Concerning this, the study analysed the results of comparison between R&D and promotional support under the determination of new product development. However, there was little agreement in relation to R&D and promotional support among subjects in this company (see Table 8-9 for Company C in appendix-6). Promotional support was ranked by five subjects as the most important specific sub-dimension, while the remaining five subjects viewed promotional support as the least important in judgement benchmarking over new product development. However, five of the ten subjects agreed to assign similar priority weights to these specific sub-dimensions, and considered them as equally important in benchmarking new product development. In turn, all but one of the subjects indicated that they believed that

R&D was most important when benchmarking new product development. The mean ranks across subjects generally regarded R&D (1.10) as more important than promotional support (1.40) when benchmarking new product development.

#### **8.3.3.4 Priorities of product development specific sub-criteria in Company D**

Many managers in this company indicated that there have been problems regarding participation in international conferences and attending training and development programmes abroad because of the UN and US embargos. This has made it difficult for this company to follow the rapid evaluation of management development in international organisations, including management training development and R&D. Therefore, this company finds it difficult to achieve its objectives properly. In this context, subjects within this company gave relative importance to two specific sub-criteria, R&D and promotional support, when carrying out benchmarking in new product development.

In relation to the above discussion, there appears to be little consensus across subjects regarding the importance of these two specific sub-criteria (see Table 8-9 for Company D in appendix-6). Eight subjects stated that they believed R&D to be the most important, while the remaining two subjects rated it as the least important element in benchmarking new product development. In turn, there is consistency across respondents concerning the importance of promotional support with eight subjects indicating this to be the most important element, but the remaining two subjects viewed it as the least important element when benchmarking new product development. Three managers of the company service centres indicated that “reward systems and/or promotional support of our company has not been updated to provide the facilities and motivation level required to improve the company performance. They added that many skilled employees were totally dissatisfied with reward system and, therefore, many of them left the company.” However, despite the results discussed here, six of the subjects indicated that they believed R&D and promotional support were equally important in benchmarking new product development. Overall,



the mean ranks confirmed that R&D (1.10) is slightly more important than promotional support (1.20).

#### **8.3.3.4.5 Priorities of product development specific sub-criteria in Company E**

Many interviewees in this company indicated that “the work environment of their company in last decade had been characterised by an unstable environment, with many new laws and regulations and that the organisational structure had changed many times. The interviewees added that government bodies’ intervention influences their day-to-day operations in terms of organisational structure, authorized budgets, motivations, compensation systems, international training, R&D and promotion.” Therefore, the instability of Company E’s work environment is considered by the interviewees to be one of the obstacles in implementing benchmarking effectively.

In light of the above paragraph, the AHP’s analysis of subjects’ views about assigning priority weights with respect to R&D and promotional support in benchmarking new product development is summarised in Table (8-9) for Company E in appendix-6. The results are unclear, but it was generally accepted that R&D is relatively more important in benchmarking new product development. Specifically, seven subjects viewed R&D to be the most important element, while the remaining three subjects ranked it as the least important. Another seven of the subjects evaluated promotional support as the most important element, but the remaining three subjects believed this to be the least important specific sub-dimension in benchmarking new product development. One of interviewed managers indicated that “the wages and work incentive systems in our company are poor and need to be changed. Since 1981, all the wages in this company have been calculated according to law no 15 in 1981. The problem of this is that this law has not changed or been adjusted (even for inflation) since it was established about two decades ago. All of this has surely affected the reward system and thus the employees’ performance in this company.” Further, another three subjects evaluated each of these two specific sub-dimensions as equally important when benchmarking new product development. Overall, across subjects, mean ranks support the notion that R&D (1.20) was

generally believed more important than promotional support (1.40) in benchmarking new product development (the sub-criteria of market share).

This study also found that subjects' priority responses for retail and wholesale specific sub-criteria are unclear across subjects in Companies A, B, C, D and E. In general, the findings suggest that, in benchmarking distribution, subjects viewed that wholesale is considerably more important than retail in terms of mean ranks (see Table 8-9 in appendix-6).

Furthermore, key managers in the surveyed organisations indicated that "the product prices of their organisations have been changed many times since the end of the 1980s. They added that in some cases their companies sold their products at a loss. This is because the prices are based on the assumption that companies will work to high capacity (90% of their capacity). Therefore, in many years, the unit cost of production has increased and the sale price has become less than the cost. In addition to this, the financial accounting system in LMOs was established to provide financial information to the top management when carrying out the adoption of new change. But, in many cases, decisions regarding pricing and cost structures were not based on accounting data and instead were influenced by political and economical factors imposed on LMOs by the government." To that end, the priorities indicated by surveyed subjects for pricing and costing structures when benchmarking pricing the sub-criteria of market share are mixed across the five companies. Results do suggest that the costing structure is relatively more important than pricing structure in terms of mean ranks within each of the five companies when benchmarking pricing (see Table 8-9 in appendix-6).

#### **8.3.3.5 Consistency analysis**

From the above discussion about priorities of benchmarking specific sub-criteria (e.g., time, payment, amount used, price, upgrading machines, etc.) to determine benchmarking sub-criteria (e.g., labour cost, material, new technology, etc.), and



from results of consistent matrices shown in Table (8-1A)<sup>(11)</sup> in appendix-5, it appears that there are perfect consistencies across the subjects' responses within each of the five companies. Specifically, the value of  $\lambda_{\max}$  is equal to 2 which is exactly the same number of elements ( $n$ ) in each specific sub-criterion matrix across all five companies. The overall consistency of judgements across subjects concerning C.I and C.R is generally considered satisfactory in determining benchmarking specific sub-criteria with respect to the sub-criteria of cost and quality control, sales maximisation and market share. In fact, the values of C.I and C.R are equal to zero for each specific sub-criterion across the five companies.

#### **8.4 An illustration of the composition of responses in the analytic hierarchy process**

For all subjects in this study there are four stages in the composition process. As an illustration of this process, all thirty of the pairwise comparisons made by one of the fifty subjects are presented, along with a detailed explanation of the stages which are followed for all respondents.

**Stage (1)** derives the [A] paired comparison of the main criteria of the well-being of the organisation (best benchmarking practice):  $C_1$ ,  $C_2$ ,  $C_3$  and  $C_4$ . The normalised eigenvector [a] which corresponds to the maximum eigenvalue of [A] indicates the perceived importance scaling of the well-being of the organisation.

$C_1$  = cost control

$C_2$  = quality control

$C_3$  = sales maximisation

$C_4$  = market share

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<sup>(11)</sup> This table includes results of principle eigenvalue ( $\lambda_{\max}$ ), C.I and C.R for compared priorities of each two specific sub-criteria in determining benchmarking sub-criteria. The results of the three consistency measurements are similar across the specific sub-criteria used in this study. For example the principal eigenvalue is equal to  $n$  ( $\lambda_{\max} = n = 2$ , within each matrix of specific sub-criteria). At this point, C.I and R.C equal to zero for all specific sub-criteria within the five companies.

**Stage (2)** derives the  $[Y_i]$  for  $i = 1, \dots, 4$  paired comparison matrix of the well-being of the organisation sub-criteria  $s_1, \dots, s_3$  under  $c_1$  criterion,  $s_4, \dots, s_6$  under  $c_2$  criterion,  $s_7, \dots, s_9$  under  $c_3$  criterion and  $s_{10}, \dots, s_{12}$  under  $c_4$  criterion. Compute the  $[b_i]$  normalised eigenvector corresponding to the maximum eigenvalue of  $[Y_i]$  for  $i = 1, \dots, 4$ . Let  $[B]$  depict the matrix composed of all  $[b_i]$  column vectors.

$S_1 =$  labour cost

$S_7 =$  marketing

$S_2 =$  material cost

$S_8 =$  advertising

$S_3 =$  overhead cost

$S_9 =$  new product development

$S_4 =$  new technology

$S_{10} =$  distribution

$S_5 =$  research and development

$S_{11} =$  pricing

$S_6 =$  production redesigning

$S_{12} =$  new product development

**Stage (3)** derives the  $[Z_i]$  for  $i = 1, 12$  paired comparison of the well-being of the organisation specific sub-criteria  $ss_1, ss_2$  under  $s_1$  criterion,  $ss_3, ss_4$  under  $s_2$  criterion,  $ss_5, ss_6$  under  $s_3$  criterion,  $ss_7, ss_8$  under  $s_4$  criterion,  $ss_9, ss_{10}$  under  $s_5$  criterion,  $ss_{11}, ss_{12}$  under  $s_6$  criterion,  $ss_{13}, ss_{14}$  under  $s_7$  criterion,  $ss_{15}, ss_{16}$  under  $s_8$  criterion,  $ss_{17}, ss_{18}$  under  $s_9$  criterion,  $ss_{19}, ss_{20}$  under  $s_{10}$  criterion,  $ss_{21}, ss_{22}$  under  $s_{11}$  criterion,  $ss_{23}, ss_{24}$  under  $s_{12}$  criterion. Compute the  $[c_i]$  normalised eigenvector corresponding to the maximum eigenvalue of  $[Z_i]$ . Let  $[C]$  depict the matrix composed of all  $[c_i]$  column vectors.

$ss_1 =$  time

$ss_{13} =$  resources

$ss_2 =$  payment

$ss_{14} =$  media

$ss_3 =$  amount used

$ss_{15} =$  selling price

$ss_4 =$  price

$ss_{16} =$  delivery

$ss_5 =$  absorption rate

$ss_{17} =$  R&D

$ss_6 =$  amount incurred

$ss_{18} =$  personal

$ss_7 =$  upgrading the machines

$ss_{19} =$  retail

$ss_8 =$  replacing the machines

$ss_{20} =$  wholesale



ss<sub>9</sub> = retraining the employees

ss<sub>21</sub> = pricing structure

ss<sub>10</sub> = recruiting new employees

ss<sub>22</sub> = costing structure

ss<sub>11</sub> = raw material

ss<sub>23</sub> = R & D

ss<sub>12</sub> = product testing

ss<sub>24</sub> = promotional support

**Stage (4)** computes the final composite vector of main criteria, sub-criteria and specific sub-criteria level from the product of [C], [B] and [a].

In light of the above illustration for four stages in the composition of responses in the AHP, a detailed computational method for one subject (from Company A) is shown in appendix-7. This subject was required to work through thirty paired comparisons of the main criteria. This subject believed that C<sub>1</sub> and C<sub>2</sub> (cost control and quality control) were the most important criteria followed by C<sub>4</sub> (market share), and C<sub>3</sub> (sales maximisation) when all criteria, sub-criteria and specific sub-criteria were jointly and simultaneously evaluated. This subject had a very low importance rating for sales maximisation (C<sub>3</sub>). He also indicated the priorities for cost control sub-criteria to be material, labour and overhead cost as the most, second and third important elements respectively. Specifically, he believed that absorption rate was the most important specific sub-criteria compared with time, payment, price and amount incurred in benchmarking cost control. At the same time, he rated new technology as the most important quality control sub-criteria in judgement over quality control. A further view by this subject was that with respect to the quality control specific sub-criteria, raw material, retraining the employees and upgrading the machines were the most important (benchmarking) elements respectively. With respect to sales maximisation sub-criteria and specific sub-criteria, this subject appeared to believe that marketing and delivery were the most important sub-criteria and specific sub-criteria respectively in benchmarking sales maximisation. In turn, the market share sub-criteria (e.g., distribution, etc.) and specific sub-criteria (e.g., retail, pricing structure, R&D, etc.) are generally viewed as being particularly important in benchmarking over market share.

### **8.5 Multivariate composition for benchmarking criteria for the ten subjects in each of the five companies with respect to the determination of the well-being of the organisation**

Using the AHP composition procedure which has been illustrated for one subject in Company A, the multivariate importance ratings for each subject in this study were derived. These results are presented in Table 8-1 in appendix-6 for Companies A, B, C, D and E respectively. The main criteria are located on the first intermediate level of the hierarchy (see Figure 5-2 in chapter 5).

The results which appear in Table (8-1) of appendix-6 for Company A indicate that seven of the ten subjects are in agreement over the importance of quality control when determining benchmarking. Furthermore, sales maximisation and market share were generally believed to be of lower importance. The mean ranks confirm that quality control was clearly regarded as the most important criterion in determining benchmarking. Overall, it appears that a majority of subjects in Company A gave more priority to quality control than cost control, sales maximisation and market share.

In relation to the preceding paragraph, one subject stated that his company had been active in benchmarking practice in quality control for many years. Its strategy when benchmarking quality control was to encourage managers to focus on the relationship between production and administrative costs to control quality and to avoid negative effects such as the impact of cost reductions on quality.

The results for Company B are also summarised in Table (8-1) in appendix-6. These results indicate that five subjects rated quality control as the most important criterion, while the remaining five subjects evaluate it as the second and third most important criterion in determining benchmarking. However, the priority of quality control across subjects is unclear, but the findings of arithmetic means and mean ranks confirm that quality control is more important than cost control, sales maximisation and market share. In turn, two subjects stated (when they were interviewed) that these four criteria were given the same priorities in determining benchmarking, but their required strategies and dimensions were different inside and outside the company.



They also indicated that over the last five years the company's strategy was concentrated to give more consideration to quality control than the remaining three criteria. Accordingly, company resources, time and effort were organised and prepared to provide best practice in determining benchmarking over quality control. As a result, the company became able to meet customer requirements and create products that could sell.

Table (8-1) in appendix-6 for Company C indicated that cost and quality control were the most important criteria, followed by sales maximisation and a very low rating for market share. Specifically, the importance of cost control compared with quality control, across subjects is unclear in determining benchmarking. In terms of arithmetic means, there was a slight difference between these criteria. Four subjects declared (when interviewed) that it was possible over the last three years to determine whether cost control was regarded as being more important in determining benchmarking than quality control. They indicated that the company has been succeeding in the implementation of benchmarking in quality control for many years. But, over the last few years, the strategy has been changed as the company has conceded priority to cost control in addition to quality control. Since then, different priorities across subjects have been assigned in respect to cost control and quality control. This procedure did not help the company to reduce defects on products to meet customer satisfaction and to achieve continual improvement.

Furthermore, the same Table for Company D indicates results of sales maximisation and market share as of lower importance. There is little variance across respondents' importance rating composition with respect to cost and quality control. It appears that cost control is generally regarded as being more important in determining benchmarking than is quality control. Overall, the mean ranks and arithmetic means further reinforce the conclusion that the subjects are generally indifferent to cost control when determining benchmarking. Three subjects indicated that this company has successfully been doing benchmarking practice in cost control for five years. This approach was extended over the last two years to benchmark quality control in order

to reduce defects on the company's products. Because of this, additional costs were added to improve quality control. This created conflict between managers in order to reduce costs for one item and to improve quality for another.

The results in Table (8-1) in appendix-6 for Company E summarises the priority for each of the ten subjects for four criteria when determining benchmarking. The results suggest that a majority of the subjects believe that cost control and market share are the least important criteria in determining benchmarking. However, the results on quality control and sales maximisation are mixed. Clearly, most of the subjects appeared to believe that quality control is slightly more important than sales maximisation. The mean ranks and arithmetic means indicate that quality control was rated to be the most important criteria. Two subjects indicated (when they were interviewed) that in the past four years this company had attempted to consider more priority to sales maximisation than to any other criteria. But the procedures of this strategy were not clear, owing to lack of dimensions of performance used, such as new product development, R&D, advertising and so on. In this case, the company decided over the last few years to set priorities on the processes to be benchmarked and conceded highest priority to quality control which seemed to be preferred by a majority of subjects.

### **8.6 Multivariate composition for benchmarking sub-criteria\* in the determination of benchmarking main criteria\*\***

The results in Table (8-10) in appendix-6 for Company A indicate that a majority of the subjects evaluated new technology as the most important quality control sub-criteria (in the second intermediate level of the hierarchy exhibited in Figure 5-2 chapter 5) when determining benchmarking, followed by production redesigning and R&D respectively. The other sub-criteria in this level were regarded as less important than quality control sub-criteria.

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\* Such as labour cost, material cost, overhead cost, new technology, R&D, production redesign, marketing, advertising, new product development, pricing and distribution.

\*\* Such as cost control, quality control, sales maximisation and market share.



With respect to Company B, the results in Table (8-10) in appendix-6 suggest that R&D and new technology are the most and second most important quality control sub-criteria in the second intermediate level of the hierarchy. In addition, degree of production redesigning appeared to be regarded as relatively unimportant. However, it must be emphasised that, apart from the low rating given to the sales maximisation, market share and cost control sub-criteria, there was little consensus over the relative importance of these three sub-criteria in determining benchmarking.

Table (8-10) in appendix-6 for Company C also indicates that there is general consensus over the importance of cost control, quality control and sales maximisation sub-criteria when determining benchmarking. For example, for cost control, nine of the subjects gave material cost their highest rating. Meanwhile, new technology (sub-criteria of quality control) and marketing (sub-criteria of maximise sales) are considered to be second most important after material cost in determining benchmarking.

Concerning Company D, the results in Table (8-10) in appendix-6 provide the priority weights produced by the ten subjects. These results show unanimity among subjects that labour cost (sub-criterion of cost control) was the most important factor on this level. Furthermore, other considerations were taken across subjects in respect of quality control sub-criteria. These included new technology and production redesigning, which were regarded as relatively important after labour cost in determining benchmarking over quality control.

The results presented in Table (8-10) in appendix-6 for Company E do suggest the relative importance of quality control and sales maximisation sub-criteria. The majority of subjects believed that R&D (the sub-criteria of quality control) was the most important factor in the second intermediate level of the hierarchy. These results also indicate that general agreement across subjects in ranking marketing (the sub-criteria of sales maximisation) as one of the most important factors in the second intermediate level.

## **8.7 Multivariate composition for benchmarking specific sub-criteria in determination of benchmarking sub-criteria**

As discussed in this chapter, Company A has been practising benchmarking in quality control (the first intermediate level in the hierarchy exhibited in figure 5-2) for several years. However, the new technology (the sub-criteria of quality control) was considered one of the most important sub-criteria (in the second intermediate level) when determining benchmarking over quality control. Furthermore, across subjects, the results in Table (8-12) in appendix-6 indicate that upgrading machines (specific sub-criteria of quality control) was regarded as the most important element in judgement benchmarking over quality control. At the same time, this company also gave consideration to amount used, resources, and wholesale (the specific sub-criteria of cost control, sales maximisation, and market share respectively) in terms of mean ranks (see Tables 8-11, 8-13 and 8-14 in appendix-6).

During the past five years the most important benchmarking criteria and sub-criteria for Company B appeared to be quality control and production redesigning respectively. In addition to this finding, retraining employees (the specific sub-criteria of quality control) was also viewed as the most important element in determining benchmarking over quality control (see Table 8-12 in appendix-6). Other results across subjects suggested that the priority was given to price, R&D, and wholesale specific sub-criteria for cost control, sales maximisation and market share respectively in terms of mean ranks when determining benchmarking (see Tables 8-11, 8-13 and 8-14 in appendix-6).

Regarding the finding mentioned previously in this chapter for Company C, when change was introduced to benchmarking cost control instead of quality control was considered most important over the last three years. In other words, the findings showed that subjects were considering more priority to cost control and material cost (the sub-criterion of cost control) than to quality control and its sub-criteria when determining benchmarking. Also noteworthy are the findings reported in Table (8-11) of appendix-6 for this company: that subjects regarded the amount used (the specific



sub-criteria of cost control) as the most important factor in determining benchmarking over cost control. In turn, the findings in Tables 8-12, 8-13 and 8-14 in appendix-6 showed that subjects gave priority to upgrading machines, resources and wholesale (the specific sub-criteria of quality control, sales maximisation, and market share respectively) in terms of mean ranks when determining benchmarking.

In regard to Company D from its benchmarking activity over the last seven years, the findings demonstrated that this company had successfully implemented benchmarking in cost control with specific consideration to labour cost and payment in the first five years when determining benchmarking over cost control (see Table 8-11 in appendix-6). But, over the last two years, the priority given to the processes to be benchmarked was changed to quality control and its sub-criteria (e.g., new technology). Also, the findings in Table (8-12) in appendix-6 for this company showed the relative importance of upgrading machines and retraining employees as specific sub-criteria when benchmarking quality control. Across subjects, there was also a higher consideration given regarding payment, R&D and wholesale (the specific sub-criteria of cost control, sales maximisation and market share respectively) in terms of mean ranks benchmarking (see Tables 8-11, 8-13 and 8-14 in appendix-6).

This builds on the previous findings for Company E which has implemented programmes for quality control and sales maximisation over the last four years. However, its strategy was changed to benchmarking only one item owing to lack of available resources. In this case, the company placed more priority on quality control and its sub-criterion (production redesigning). In addition, this conclusion Table (8-12) in appendix-6 showed that retraining employees was viewed as the most important specific sub-criterion when determining benchmarking over quality control. Furthermore, the results in Tables 8-11, 8-13 and 8-14 in appendix-6 suggested that price, R&D, and wholesale (the specific sub-criteria of sales maximisation, market share and cost control respectively) were relatively important in terms of mean ranks.

## 8.8 Summary

This study used Saaty's Analytic Hierarchy Process as a procedure for modelling individuals' importance ratings for four main criteria and their sub-criteria and specific sub-criteria as functions of various multiple attributes. The results provided in this chapter are specific to the subjects under study; and, while they could be considered as representative of larger groups of experts, important insights into subjects' judgements over the relative importance of four main criteria, twelve sub-criteria and twenty four specific sub-criteria have been identified for the five LMOs. It is difficult to generalise from the results, when these results, follow from the fact that respondents in these companies may concentrate on their own performance measures over the four criteria and their sub-criteria and specific sub-criteria in determining benchmarking. However, it has been possible to highlight some areas where respondents seemed to hold the same beliefs across the five LMOs. At this point, the findings in Companies A, B and E indicate that a majority of the subjects in these three companies had launched a more structured procedure to quality control. Meanwhile, cost control was seen as the most important criterion to be benchmarked in Companies C and D. This related to the economic circumstances of these two companies with respect to facilities, production redesigning, new technology, etc. which affected the success of the various activities of the companies. The empirical investigation indicated that subjects within the five companies concentrated on and exerted themselves in setting their priorities to benchmark certain sub-criteria such as new technology (in company A), production redesigning (in companies B and E), material cost (in Company C), and labour cost (in Company D). Further, these companies also have focused to give relative importance of various specific sub-criteria such as upgrading machines (in Company A), retraining employees (in companies B and E) and amount used, and amount incurred (in companies C and D) when determining benchmarking.

There were major differences between these five companies according to the length of time companies were active in benchmarking practice, the areas of implemented benchmarking, and the size of companies from whom benchmarking was taken.



However, it was indicated by several subjects that in some cases companies were not able to implement benchmarking for two criteria (e.g., cost and quality control) at the same time because these tended to be in conflict and have different dimensions and strategies across companies. These findings are similar to the Nationwide Building Society findings by Tutchter (1994). These findings also tended to support the suggestion by Zimmerman (1997) that determining benchmarking in cost control is likely to create negative effects on cost reduction in quality control.

The judgements of subjects over the relative importance of cost and quality control, sales maximisation and market share with respect to determination of benchmarking criteria, sub-criteria and specific sub-criteria indicated valuable findings across the five LMOs. These findings suggest that cost control and quality control are the superior criteria, while sales maximisation or market share seem less important. Under the Analytic Hierarchy Process, the responses of each subject in the five LMOs were synthesised to produce priority weights for elements at each level of the decision hierarchy compared with the level above. For example, the lower level (e.g., specific sub-criteria level) was compared with the level above or second intermediate level (e.g., sub-criteria level) to determine benchmarking specific sub-criteria, then comparisons were made between the second intermediate level and the first intermediate level (e.g., main criteria level) to determine benchmarking sub-criteria. Finally, the first intermediate level was compared with the first level or upper level (the well-being of the organisation) to determine benchmarking criteria.

The results of synthesising respondents' judgements over the importance of cost control, quality control, sales maximisation and market share when determining benchmarking across the five LMOs suggest that this area of assessment is highly individualistic. This study did not aim to address the question of why subjects believed some criteria, sub-criteria and specific sub-criteria to be more important than others. It is hoped that further research may establish whether subjects were correct in their beliefs. Therefore, while the findings here are unique to the ten subjects in each company who participated in this study, they nonetheless provided a

basis from which testable hypotheses over how and why subjects form their beliefs may be produced.



## CHAPTER 9

### **9. Summary, implications, contribution, limitations and directions for future research**

#### **9.1. Introduction**

The overall aim of this study was to understand and explain benchmarking problems in LMOs within their environmental context. Having provided in the previous chapters the theoretical perspectives (chapter 4), the methodology, and data collection methods adopted in this study (chapter 5), as well as the mini case studies and empirical investigations of the questionnaires, the main task in this chapter is to summarise the research findings and conclusions drawn in chapters six, seven and eight. In addition to the original objectives and the related questions investigated, this study also presents the implications of its research contribution to knowledge. Other implications, based on the literature review, theory, research methods and methodology and the findings of this study, are also suggested for Libyan organisations and society. The limitations of the study and suggestions for further research in this area are also included in this chapter.

This chapter is organised as follows: section 9.2 provides a summary of the thesis, research objectives, questions and methods. Section 9.3 is devoted to a brief discussion of main research results and conclusion. The implications of the findings of the study are presented in section 9.4. Contribution to knowledge, in terms of understanding the nature of benchmarking implementation alongside problems, and suggestions for Libyan organisation and society are discussed in section 9.5. Finally, limitations and directions for further research are provided in sections 9.6 and 9.7 respectively.

#### **9.2. Summary of the thesis, research objectives, questions and methods**

##### **9.2.1 Summary of the thesis**

The aim of this study, as mentioned in the previous chapters, was to understand and explain the surrounding environment in which LMOs are operating in relation to benchmarking implementation. The study has proposed that there are two aspects of

benchmarking (benchmarking is an exogenous process and a multivariate practice for organisation) that have created several problems in organisations practising benchmarking. This study has dealt with these problems through a case-specific illustration of difficulties (see chapter 3) and managers' responsiveness (see chapters 6, 7, and 8).

Moreover, in order to achieve the research objectives (1.3) and answer the research questions (1.4) shown in chapter one, an explanation of these benchmarking problems, together with the theoretical perspectives adopted, is provided in chapters 3 and 4. These perspectives are relevant to benchmarking theories that influence managers in making judgements under complex benchmarking situations (see chapter 4). This study discussed whether managers' sensitivities and behaviours are influenced more by general information about best performance than by employees' specific behaviours when benchmarking was implemented (4.2). It has also described two simple judgemental heuristics that influence managers' judgments: representativeness and availability heuristics (4.3). This is in addition to the descriptions of script and schema theory (4.4) that managers use in determining and understanding information about stability of organisational structure, managers, leadership and market conditions.

AHP (discussed in chapter 5) was used to analyse data collected for this study. This methodology provides a framework and model for the determination of several activities operating within the organisations. The adopted framework of AHP was used to describe decision-related priorities in a hierarchy through judgements elicited under a nine-point response scale (Saaty 1980, 1994, 1995; Min et al., 1997; Hafeez et al., 2002; Lee et al., 2002). For example, AHP was used to identify priorities across criteria, sub-criteria and specific sub-criteria for five LMOs who employ benchmarking. In addition to AHP, semi-structured interviews were conducted with certain managers to collect general information and to provide a richer context of analysis of results.



The responses of all the participants (except those in section three and five of the questionnaire) were analysed through the statistical packages for the social sciences (see chapter 7). Responses to section three analysed through AHP provide an explanation of the structure of benchmarking practices while also presenting subjects' views about the relative importance of the criteria, sub-criteria and specific sub-criteria which influence the benchmarking judgement and process in LMOs (see chapter 8). Responses to section five were used in part to present important information in the mini-case studies of the seven companies to provide descriptive analysis about benchmarking adoption in LMOs within their environmental development context.

### **9.2.2 Research objectives**

Based on the motivation for this research detailed in chapter one, the main objectives of carrying out this research were:

1. To understand and explain the surrounding environment in which LMOs are operating in relation to benchmarking implementation.
2. To identify aspects of benchmarking that lead to implementation problems.
3. To examine organisations' reactions and considerations to benchmarking implementation.
4. To examine the view of managers in terms of the relative importance of the criteria which influence benchmarking judgments and processes.

The main approach to meeting these objectives is described as follows:

- i) The historical background of the Libyan economy in relation to oil exploration, and the effects on the industrial sector was studied to provide necessary information which enhances understanding benchmarking practices in LMOs. A related discussion was developed to evaluate the analysis of the organisational context at macro and micro levels, and cultural differences and transferability of Western cultures into the Libyan context to show that concepts and management

theories cannot be applied without understanding cultural differences (chapters 2 and 6).

- ii) The existing research into benchmarking practices, with a primary focus on organisational and national culture, was reviewed to provide significant insights to the way in which organisations are performing their business (chapter 3). This was in addition to theoretical perspectives on benchmarking that formalised the research hypotheses to test the sensitivity and behaviour of managers to information about benchmarking when it is implemented (chapter 4).
- iii) The analysis of managers' views in terms of relative importance of criteria to benchmarking was investigated to provide an explanation on the factors which shape benchmarking in LMOs (chapter 8).

The next section summarises the research questions investigated to address the general research objectives stated above.

### **9.2.3 Research questions**

The main empirical research questions of this study (1.4) were the following:

- i. Do LMOs understand benchmarking in advance of its full implementation?
- ii. Do firms need to give consideration to culture and environmental factors in benchmarking implementation?
- iii. Does the nature of the accounting systems in LMOs provide enough information when implementing benchmarking?
- iv. Does the firm consider criteria or set priorities in terms of the process to be adopted based on economic factors and/or the relevant importance of performance measures?
- v. Does the selection of organisational goals by managers cause the firm to be more concerned with some benchmarking criteria and less concerned with others?

The empirical research questions were examined in chapters 6, 7 and 8.



### 9.2.4 Research methods

The main research methods employed by this study were the following:

- The questionnaire has been adopted as a major part for collecting data.
- Seven mini-case studies of LMOs.
- Semi-structured interviews.

## 9.3 Main research results and conclusion

The main research findings and conclusion are presented in the following section:

1. Culture and organisational environment issues relevant to benchmarking (9.3.1).
2. The effectiveness of benchmarking (9.3.2).
3. Applicability of benchmarking theories (9.3.3).
4. Priorities of benchmarking criteria within LMOs (9.3.4).

### 9.3.1 Culture and organisational environment issues relevant to benchmarking

This study indicates that much consideration is given to culture and organisational environment across LMOs. These two elements create the appropriate atmosphere to assist LMOs in implementing effective functional benchmarking (chapter 3). According to the analyses of managers' responses, culture and the organisational environment were considered differently across all five companies. Results showed that these two elements were clearly important in Companies A, B and E, and less important in Companies C and D. Therefore companies A, B and E were more prepared for understanding benchmarking implementation (7.5.2). These results support Bramham's (1997) argument about the importance of these two elements when implementing benchmarking. The results are also consistent with Temporal's (1991) suggestion that it is important for companies to consider fundamentally the organisational culture and environment in adopting benchmarking.

Moreover, many management theories and practices concerning best performance are Western and American notion and based on Western and American assumptions and values (chapter 2). Investigations showed that these management theories and practices have been transferred to LMOs without taking into account differences in

the cultural and social environment. LMOs are not characterised by the same aspects of culture and organisational environment, which means that there are different forms of organisational structure, employee's rights, attitudes and behaviours, authority and duties. Overall, it is found that different cultures can result in different motivations and attitudes towards carrying out benchmarking processes in LMOs (7.5.2.1).

The overall conclusion of these investigations is that, in spite of motivational differences between Libyan and Western and American cultural assumptions, management theories and practices in the latter may still be applicable in the context of Libyan organisations. This is because the education system adopted by the Libyan authorities is designed according to Western and American educational values, and the source of curriculum techniques, facilities, etc. is mostly drawn from Western and American educational systems.

In the light of the research investigations, this study shows that organisational accounting culture and practices in Libyan companies have been influenced by British and American accounting culture and practices. At this point, the evidence from the seven mini-case studies indicates that accounting practice may not match the inherent conditions existing in Libyan organisations. Further, the accounting practices have a lack of significant roles in the day-to-day management operations in many Libyan organisations. This may result from the incompatibility of the accounting function with the Libyan economy and social structure. Therefore, it became evident to the researcher, however, that accounting practices in many Libyan organisations do not provide enough information to evaluate management efficiency, effectiveness and performance fully. The accounting systems are not involved in the development of performance measures which are needed for any new adoption such as benchmarking. In this respect, results were more like those of previous research studies which claim that the need for changes in accounting system is very real. The accounting systems in Libya required more co-operation from economists, politicians, engineers, sociologists and lawyers to provide a more effective way of planning, implementation, control and performance evaluation systems.



The findings also demonstrate that the adoption of benchmarking can face serious problems if the adoption is implemented without paying sufficient attention to cultural and environmental conditions. For instance, directly adopting processes from Western European and American capitalistic, free market economy and individualist societies to traditional, socialist societies such as Libya may have limited applicability in the context of LMOs. Companies F and G are an example of this. These two companies have attempted to adopt benchmarking from other countries without taking into account differences in culture and environment, which has led them to difficulty in adopting new practices such as benchmarking.

### **9.3.2 The effectiveness of benchmarking**

The cultural work environment of Libyan organisations was empirically investigated (chapter 6). It was found that the work environment for these organisations is different from that of Western and American companies' practice management in several dimensions (e.g. responsibility, promotion, pay, company policy and work conditions). These dimensions are the main sources for encouraging managers to implement benchmarking in their organisations. The results revealed that these dimensions were not considered by some LMOs (e.g. Companies C and D); however, they contributed towards reducing managers' expectations of achieving their tasks, and led to poor performance.

Results indicate that most Libyan organisations have undergone various changes related to management and structure (chapter 6). Changes in Libyan political systems have affected economic and social life. Investigations showed that the organisational management and structure have been changed many times throughout the history of the seven companies. Political history reveals that different managerial systems, such as management by general representative, people's management committee, and management committee, have been used. This has had a significantly negative impact on the financial performance of LMOs, thereby creating difficulty in benchmarking implementation.

It is clear for the mini-case studies that the production system influenced the overall functioning of the organisation. Production information in general has been used

extensively in driving important decisions (e.g. in determining sales maximisation) within most LMOs. As mentioned in chapter two, Libya is a socialist country and measures organisation performance by the physical value of production rather than quality and profits. The findings indicated that in spite of relative improvement in the value and quantity of many LMOs products (e.g. Companies B and E), their productivity and contribution to the national income are still low. Many LMOs have failed to achieve both their product targets and their sales targets. This has happened for many reasons, such as a shortage in raw materials, spare parts, poor maintenance as well as the technology as a result of the boycotts imposed by the UN and US.

The interview findings show a lack of clarity of objectives at many LMOs headquarter levels, and no clear assignment of responsibility between them and the operating factories. As a result, most managers work in an atmosphere of uncertainty because they do not know exactly the objectives they are seeking and the decision criteria they should be following. This absence of clear objectives is one of the main problems within managerial processes, leading to lower profitability within many LMOs such as Companies A, C, D, F and G. The findings also indicate that the overall goals in many LMOs have rarely been clear to most people, although there is a degree of difference in the level of awareness of these goals. It appears that there were contradiction and ambiguity within the policy coming from the state to LMOs in determining their objectives. Many LMOs seem to be required to achieve multiple and conflicting goals. This contradiction and ambiguity created difficulties in practising benchmarking more effectively. It also has led the companies to internal conflict situations. Companies C and D are example of this.

This study also identified and investigated characteristics related to benchmarking implementation with respect to different cultural and organisational environments, setting priorities on the criteria to be benchmarked, employees' skills and behaviour, accounting systems, and market conditions. All of these characteristics have directly or indirectly influenced the effectiveness of benchmarking implementation in LMOs. Consequently, one may also conclude that companies C and D have paid insufficient attention to the multivariate character of benchmarking compared with companies A,



B and E. These two companies were in a situation to benchmark quality and cost control at the same time without considering the priority of each criterion.

### 9.3.3 Applicability of benchmarking theories

The theoretical perspectives of benchmarking were discussed and evaluated in chapter four. Their applicability to understand the implementation of benchmarking problems was also discussed. These theoretical perspectives were employed to formalise hypotheses (4.5) tested by statistical analysis (chapter 7).

Some anticipation of the usefulness of benchmarking theories could be derived from the indications provided by the level of agreement or disagreement of managers' responses to the 10 independent variables specified in the questionnaire (see Part D of the questionnaire in appendix-1). The 10 independent variables tested by the quantitative analysis of this study were hypothesised by certain theoretical frameworks. The empirical findings and interviews suggested that managers' benchmarking decisions within LMOs are influenced by the sensitivity of managers to available information, two simple judgemental heuristics (representativeness and availability heuristics), and knowledge structures of script and schema theories about best performance of benchmarking decisions (see 7.4.1 and 7.4.3). In general, the findings of five LMOs' sensitivity to available information about benchmarking revealed that most of these organisations (e.g. companies A, B and E) are sensitive both to information about best performance (vividness information) and employees' behaviours (statistical information) in carrying out new change adoption. The application of benchmarking theories was further investigated by representativeness and availability heuristics that could lead managers to choose best performance or make better judgements with little effort in the situation of change adoption. This was in addition to using the concept of script and schema to investigate a way of understanding behavioural expectancies towards benchmarking adoption in the context of LMOs. A synthesis of the main conclusion is presented as follows:

Research findings with respect to the representativeness heuristic indicated that management in most LMOs place more consideration on the ability and effort of managers than on the companies' operating environments in adapting to new

changes. A possible reason for that could be related to the instability of the LMOs' operating environment that influences organisations' efficiency and performance. Moreover, these findings supported the previous studies which identified that organisations could carry out benchmarking more effectively if they considered manager ability and effort rather than the role of the operating environment. Interviews indicated that most LMOs are subject to government control, although they retain their own management which is responsible for their decisions and policies. However, many managers in LMOs are appointed according more to kinship and friendly relationships than to ability or effort. This has created a negative impact on the profitability and performance of the company.

The research also investigated the availability heuristic application within LMOs. The findings showed that a few LMOs (e.g. Companies A and B) were interested in information about best performance taken either from highly or less visible organisations. At the same time, the findings indicated that the majority of LMOs (e.g. Companies C, D and E) were more interested in obtaining information about best performance taken from high rather than less visible organisations. The consideration of information about best performance taken from highly visible organisation led these companies into poor judgements about best performance (7.4.1.3). Therefore, benchmarking practice was implemented in companies C, D and E with less understanding about best performance. Overall, the application of availability heuristic within LMOs can provide an effective judgement about best performance if it is well used, and can lead them to serious judgemental errors if it is misused.

The knowledge structure of the industrial environment of Libyan organisations is not stable and is sensitive to internal socio-political and economic changes as well as international changes. However, the research analysis conclusion of script and schema application in those LMOs which the researcher has studied demonstrated that reasonable levels of stability were found in Companies A, B and E with respect to company structure, managers and leadership. This was partially supported by mini-case studies (chapter 6) which investigated the management system within



these companies; these were entitled “Company Management Committees”, appointed by government to serve as a point of contact between the company and the Ministry of Industry. Each of these company management committees is considered the supreme authority and could introduce policies within the company. The stability of company structure, managers and leadership within these organisations has increased their performance and effectiveness in times of benchmarking implementation (7.4.3). These findings support the literature which states that these factors are considered to be the prime elements of environmental conditions when implementing new change adoption. In contrast, the research findings of script and schema application within Companies C and D indicated that there were very low levels of stability across the company structure, managers, leadership and market conditions, which decreased their effectiveness in benchmarking implementation. These conclusions lead further to some of the implications discussed in 9.4.1.

#### **9.3.4 Priorities of benchmarking criteria within LMOs**

This study used Saaty’s Analytic Hierarchy Process as a procedure for modelling individuals’ importance ratings for four main criteria and their sub-criteria and specific sub-criteria as functions of various multiple attributes. The results provided in this research are specific to the subjects under study; and, while they could be considered as representative of larger groups of experts, important insights into subjects’ judgements over the relative importance of various elements have been identified for the five LMOs. It is difficult to generalise from the results, when they follow from the fact that respondents in these companies may concentrate on their own performance measures over the four criteria and their sub-criteria and specific sub-criteria in determining benchmarking. However, it has been possible to highlight some areas where respondents seemed to hold the same beliefs across the five LMOs. At this point, the findings in Companies A, B and E indicated that a majority of the subjects in these five companies had launched a more structured procedure to quality control. Meanwhile, cost control was seen as the most important criterion to be benchmarked in Company C. This is related to economic circumstances that influenced many LMOs in general and Company C in particular, with respect to the facilities, production redesigning, new technology which affected the success of various activities of this company. In this respect, subjects within the five companies

concentrated on and exerted themselves in setting their priorities to benchmark certain sub-criteria, such as new technology (in Company A), production redesigning (in Company B), material cost (in Company C) and labour cost and new technology (in Company D). Further, these companies also have focused on giving relative importance to various specific sub-criteria, such as upgrading machines (in Company A), retraining employees (in Company B), amount used (in Companies C) and payment and upgrading (in Company in D) when determining benchmarking.

This study shows that structural changes in the Libyan economy have affected the priorities of many Libyan organisations to benchmark cost or quality control. These changes, for example, created difficulties in developing local and international management training and development programmes, and in achieving the company's production target for many years in company D. These changes also led to a shortage of imported raw materials and spare parts. This was related to some restrictions set by the central Bank of Libya to obtain hard currency for the industrial operation programme in company D. Consequently, the findings of this study reveal that Company D is benchmarking both cost control and quality control. This created conflicts between those managers concerned about reducing costs and those concerned about improving quality. Clearly, labour cost and new technology are the most important sub-criteria in carrying out benchmarking in cost control and quality control respectively in Company D. This company may be adopting benchmarking for too many items, creating difficulties caused by conflict across managers.

Overall, the judgements of subjects over the relative importance of cost and quality control, sales maximisation and market share, with respect to determination of benchmarking criteria, sub-criteria and specific sub-criteria, indicated valuable findings across the five companies. The empirical evidence indicated that managers felt that the UN embargo of 1992 had made it difficult for LMOs to upgrade, replace and maintain their machinery within reasonable cost boundaries. The sanctions caused the companies to pay higher prices for investment in quality products. Consequently, the analysis of subjects' responses through AHP demonstrates that cost and quality control are the most important criteria being benchmarked in LMOs,



while sales maximisation or market share seem less important. The results of synthesising respondents' judgements over the importance of cost control, quality control, sales maximisation and market share when determining benchmarking across the five companies suggest that this area of assessment is highly individualistic. Theoretically, the results of the AHP model indicate each subject's cognitive processes in their determination of benchmarking criteria, sub-criteria, and specific sub-criteria within each of the five companies. These conclusions lead further to some of the implications discussed in 9.4.2.2.

## **9.4 Implications of research findings**

The implications of this study lie in the potential effect of its research findings. This section explains the implications of the findings of the research in terms of theory, research methods and methodology issues. The implications for theory are explained next, followed by the implications for research methods and methodology.

### **9.4.1 Implications for theory**

This study has adopted aspects (e.g. managers' sensitivity to available information, two simple judgmental heuristics, and script and schema theories) relevant to benchmarking theories, and has indicated the ways in which these aspects influence benchmarking decisions. The discussion of managers' inferences about benchmarking was the main theoretical framework for this study (see chapter 4). From the analysis, the theoretical implications of the findings reported in this thesis can be summarised as follows.

The theoretical and empirical analysis stages of this study provide an understanding that managers in many organisations in general and LMOs in particular are giving more consideration to vividness than statistical information when adopting new change. This means that these companies have paid insufficient attention to available information about new change adoption, such as benchmarking. In particular, some of the LMOs' decisions which were taken for new change adoption have faced difficulties in making the change successful. The reasons for this, as the interviews indicated, are that these difficulties are related to a lack of good preparation by these organisations to embrace the new change, and the knowledge and the strategies that

managers do not possess to choose and adopt best performance. Therefore, the aspect of managers' sensitivity to available information is considered the optimal way to implement changes, such as the adoption of benchmarking within LMOs.

The findings from the quantitative study and mini-case studies also have implications for studying the two simple judgemental heuristics (representativeness and availability). It appears that only a limited number of organisations in Libya are well informed about benchmarking. This could be related to a lack of complete understanding of benchmarking implementation within many Libyan organisations. However, previous studies (Abosnana et al., 1993) indicated that many investment decisions and change adoption within Libyan organisations were made without adequate feasibility studies to investigate the level of stability of operating environment and the ability and effort of employees. Therefore, it is more appropriate to consider the theoretical frameworks related to representativeness and availability heuristics to explain the operation of benchmarking implementation within Libyan organisations (chapter 4). These have been discussed in 9.3.2. Overall, this study has provided useful insights into the level of consideration which Libyan organisations have placed on available information about best performance, operating environmental factors and employees' ability and effort in situations of change adoption.

From theoretical point of view, the empirical evidence of this study stressed the need for script and schema concepts to explain the occurrence of particular event changes. These changes are influenced by the stability or instability of the organisation structure, managers, leadership and markets in which the organisation operates. This study suggests that the environment in which LMOs operate has a huge impact on the organisations' efficiency and performance to implement change. Moreover, previous research studies argued for the necessity of script and schema frameworks to explain how managers consider background information about the stability or instability of organisational environment in situations of benchmarking implementation. At this point, the research study used the application of these theoretical frameworks as tools for understanding the process of benchmarking



implementation problems in LMOs. Thus, it is appropriate to use the concepts of script and schema to explain and improve benchmarking decisions in LMOs.

#### **9.4.2 Implications for research methods and methodology**

Based on the literature and analysis, the implications for research methods and methodology of the findings of this study are presented below.

##### **9.4.2.1 Research methods**

The study discussed the difficulty experienced by the researcher in obtaining access to participants and in collecting data from the seven companies because of the attitudes of Libyan managers toward interviews in particular and research in general. Despite this, the study carried out a questionnaire survey and semi-structured interviews with managers in order to gain a wider understanding of benchmarking adoption in LMOs. The instruments used in this study pertain to the variables in the framework. Accordingly, the questionnaire was the main research tool used in this study. In addition, the researcher drew upon his own experience and cultural background to enhance the understanding of benchmarking adoption in LMOs. The mini-case studies provide the opportunity for a more holistic understanding of the nature, contexts and processes of benchmarking implementation in LMOs from the point of view of the participants who were interviewed in the seven companies. Therefore, a wide range of issues is covered in this study.

This study has offered managers an opportunity to express their thoughts and feelings towards their work environment, and to explain general information about benchmarking adoption in LMOs. The seven mini-case studies, questionnaire and semi-structured interviews with managers in this research provide an opportunity to investigate the interrelationship between benchmarking implementation in LMOs and their environmental contexts. Moreover, the mini-case studies of LMOs suggested that governmental bodies (e.g. the Ministries) were major players in the control of operations in Libya, and the seven LMOs were no exception to this (see chapters 2 and 6). This study indicated that there are many problems in LMOs, including political and social appointments, and the misuse of organisations' resources. These organisational problems associated with socio-economic and political factors have been ignored in traditional work. This perspective failed to

explain not only the internal problems of LMOs but also the impact of external factors on organisations and the significance of state interventions.

#### **9.4.2.2 Research methodology**

This study supports the belief of previous researchers who view AHP as a flexible technique that can be used in many diverse situations for benchmarking practices (Korpela et al., 1996). The study demonstrates that AHP is a procedure for modelling preferences and relations between benchmarking criteria sub-criteria and specific sub-criteria in organisations. In particular, this study has highlighted useful insights into the relationships among managers' priorities, selection criteria in processing benchmarking implementation (see chapter 8). AHP was considered suitable in this study for guidance in the analysis of the data, and it enabled the researcher to understand the phenomenon of benchmarking implementation at a deeper level of meaning and consequence in LMOs.

In addition to the above implications, this study uses the AHP technique to evaluate managers' views about the selection process of benchmarking criteria in LMOs in an effective way. It also suggests that AHP can be a viable approach to determine benchmarking criteria as well as to improve the quality of decisions concerning benchmarking implementation. This study indicates that AHP, with its framework of testing benchmarking implementation, is transferable into LMOs where decisions are made in very traditional ways. Further, this study reinforces Saaty's findings (1983, 1995) that the success of AHP use rests with the ability of the decision maker to express his/her preferences within an accessible hierarchical structure. Thus, the AHP analyses for this study were obtained not in absolute terms but relative to the actors (organisational participants) from organisations, their objectives and other criteria included in the hierarchy.

This study also reinforces the earlier emphasis from social science researchers that there needs to be a consistency between the purpose of research and its theoretical, methodological and methodical choices. A commitment to understanding benchmarking implementation problems in their historical, socio-economic and political contexts requires a reflexive and reflective process of negotiated interaction



between the researcher and the researched. This is in keeping with researchers who employ and adopt an approach in which theory and empirical investigation are interwoven.

## **9.5 Contributions to knowledge and suggestions of this study for Libyan organisation and society**

This study contributes some important aspects to the literature. It contributes to the knowledge and understanding of the nature of benchmarking problems that confront LMOs. Also, it makes some suggestions to Libyan organisations and society. These contributions and suggestions will be discussed in the following sections.

### **9.5.1 Contribution to knowledge of understanding benchmarking implementation problems**

By meeting the research objectives (1.3) and questions (1.4) this study contributes to the researcher's knowledge by explaining the nature of the surrounding environment in which LMOs are operating. From the descriptive analysis of the organisational context and discussion of the general findings within the seven companies, the contributions of the findings reported in this study can be summarised as follows.

First, the study suggests that the environment in which LMOs are operating is very problematic and has a huge negative impact on organisational performance. The study illustrates environmental and organisational problems through the investigation into the way that the LMOs' environment impedes progress. These difficulties are largely exogenous (e.g. sanctions). The seven mini-case studies offered an opportunity to investigate this environment more richly than a questionnaire can accommodate.

Second, the study suggested that the accounting systems of many Libyan organisations do not provide enough information to evaluate fully management efficiency, effectiveness and performance. The accounting systems are not involved in the development of performance measures which are needed for any new techniques, such as benchmarking. In this respect, the study reinforces the assertions of previous research studies by Kilani (1988) and Bait-Elmal (2000) which claim that the need for changes in accounting information systems is very real. This thesis also supports previous research which claims that many Libyan companies do not allocate

compensation according to employees' performance. This creates low managerial performance which impedes benchmarking implementation. Therefore, accounting compensation systems have to be adopted for use in the context of LMOs.

Third, from the researcher's point of view, it is suggested that this study contributes to the literature by providing a general outline for the two aspects of benchmarking that lead to many benchmarking problems. Consequently, the findings support previous research (Maul, 2001; Bramham, 1997; Kim et al., 1995; Tutchter, 1994; Mason, 1993) which claims that problems with implementing benchmarking can occur in the absence of sensitivity to different organisational cultures. The study strengthens the argument that organisational culture helps to explain many organisational phenomena and can aid or hinder organisational effectiveness in processing benchmarking implementation.

Fourth, the study has been concerned with the importance of understanding the environmental aspects which have a huge impact on employees' values, attitudes, behaviour, and performance within organisations. Culture is one of the environmental aspects and refers to an integrative part of the overall environment which is composed of such social variables as beliefs, attitudes, language, education and shared patterns of learned behaviour, which formulate a way of life within a society. Each nation has certain characteristics in its culture. Accordingly, it is more important than ever to try to understand cultural differences and their influence on the way people do business. For instance, the direct transfer of Western and American management knowledge and theories to developing countries such as Libya, without understanding cultural differences, may produce difficulties. Therefore, this study can claim that the cultural dimension has to be taken into account whenever one wants to adopt practices such as benchmarking which are borrowed from alien societies. Management theories and practices are created by people, and peoples' ideas are culturally relative.

Fifth, this study reveals that companies C and D are paying attention only to information about best performance and not to information about employee



behaviour, skills, experiences, etc. In addition, these two companies were in an unstable position concerning organisational structure, managers, leadership, and market conditions. This instability decreased the companies' efficiencies and impeded benchmarking implementation.

Moreover, the benchmarking implementation within many LMOs was perceived to be influenced negatively by the lack of managerial leadership, sufficient legislation, and clear objectives. This also includes top management instability, different leadership styles, lack of equipment and skilled staff, etc. (see chapter 6). These difficulties may exist because of economic crisis, political instability, and adopting public enterprises rather than private ones.

Sixth, the study reinforces recent calls for Libya's need for more research and development. Thus the researcher argues for adopting adequate R&D programmes within each of the LMOs to facilitate the process of any managerial innovation.

Finally, the study showed that conflict of interests exists across divisions within many LMOs. This conflict is difficult to resolve since cost and quality control divisions are interested in maximising their own utility. LMOs may be in a situation of benchmarking too many items. An analogy can be drawn to evidence about the Nationwide Building Society's benchmarking problems identified by Tutchter (1994). Also, this strengthens the argument of Zimmerman (1997) that a focus on cost control is likely to create negative effects on quality control and vice versa.

Having the contribution to the knowledge and the understanding of the nature of benchmarking implementation in LMOs having been outlined, attention may now be focused on suggesting some implications for Libyan organisations and society.

### **9.5.2 Suggestions for Libyan organisations and society**

Although this thesis has focused on seven manufacturing companies, the findings may be relevant to all LMOs. Some practical suggestions regarding problems of benchmarking practices in LMOs are explained below.

The mini-case studies reveal many issues, such as state involvement, global economic factors, and socio-cultural aspects, which impede the functioning of LMOs. Much more research into these impediments is needed not only with regard to benchmarking but also across the entire spectrum of business activities.

This thesis also shows that objectives in many LMOs have been unclear, inconsistent, and in conflict with each other. Contradictions and ambiguities across the objectives arise from governmental interventions in corporate strategies. These bodies are given the right to issue general directions to management committees and factory managers in matters which concern the Ministries and affect national interest. Company management should perhaps participate more in these decision processes. This participation must be actual participation, however, and high level government bodies have to consider managerial suggestions seriously. This participation in the management process of the companies may motivate managers to work seriously and to carry out their duties in order to achieve the objectives of both their organisations and the government.

This study suggests that accounting systems should provide a range of information to help managers in the development of performance measures needed for LMOs in planning and implementing any new techniques. In the context of developing countries such as Libya, accounting information should not only be accurate, it should be clear to everyone who uses it, bearing in mind that some managers are not educated. Accounting information systems (as discussed in chapter 2) need to have the capacity to provide information relevant to both the country's social and economic development planning, and to the decision making process for any change adoption. As mentioned earlier, Libya has continued to rely on Western knowledge of accounting practices and education. The accounting systems of Libyan organisations bear little resemblance to the nature of the organisations. Accordingly, changes which are consistent with the local practices and difficulties must be effected to accounting education. This study reinforces recent calls (by Bait-Elmal, 2000; Kilani, 1988) to set up training systems which would include the study of local accounting practices and control problems.



This study also suggests that LMOs should recognise the advantages that they can obtain from rewarding employees for achieving organisational goals. These organisations should understand more about the rewards that encourage employees to work more effectively to perform their jobs. The findings of this study (in chapter seven) have shown that rewards are important factors that influence employee behaviour and results. Employees regarded the existing rewards systems as inadequate and as a source of demotivation, and not related to performance. Therefore, this study strengthens the argument for review and improving the accounting reward systems in LMOs as they relate to job performance.

The study also strengthens the argument that the role of organisational culture is important in carrying out benchmarking. Directly adopting Western and American management knowledge (e.g. benchmarking) without understanding cultural differences may produce difficulties in implementing benchmarking effectively (see chapters 2, 3 and 6). Therefore, this research suggests that a cultural dimension has to be taken into account whenever one wants to adopt ideas from one society to another. It is always necessary to adopt and modify these ideas to make them applicable in the context of LMOs.

This study recommends that more training opportunities should be given to every employee within LMOs, because training is an important factor in improving the employee's skills, abilities, and willingness to accept change. In this respect, managers should be encouraged, motivated and empowered to solve problems of inefficiency and mismanagement in their organisations. However, lack of managing skills in many LMOs has contributed to the existence of mismanagement in Libyan organisations and in turn will adversely affect the implementation of benchmarking.

This study suggests support for adopting multiple techniques (triangulation approach) as a research strategy for understanding more about benchmarking and its implementation in the context of LMOs. The triangulation approach can be a way of validating and improving the accuracy of empirical data, thus enabling the richness

and complexities of data to be captured. This strategy can make substantial contributions to the study of benchmarking in LMOs.

This study proposes that LMOs should provide an appropriate atmosphere in order to embrace benchmarking implementation. For example, more attention needs to be given to the company plan for allowing liberal information exchanges across companies, understanding the level of existing performance, provision of enough resources, stability of the company's environment, and the appropriate management method to encourage employees to accept benchmarking practices.

## **9.6 Limitations of the study**

This section summarises the limitations of the study presented in this thesis. The main limitations<sup>(1)</sup> of the empirical study are as follows:

- Lack of literature on implementation of benchmarking in Libyan organisations, relevant practical methods (case studies, questionnaires, etc.) and statistical information related to benchmarking practices.
- The sample is limited to Libyan industrial companies and in particular to seven different manufacturing companies.
- The limitations imposed by the unavailability of data for some companies are recognised.
- The limitations are imposed by the unavailability of specific information about best practice performance frameworks for Libyan organisations.

## **9.7 Directions for future research**

While the findings of this thesis are specific to seven LMOs, they do nonetheless provide a useful point of departure for future research. The findings should be useful in guiding future empirical research, validating results obtained, and generating hypotheses about benchmarking practices. The present study was conceived as an initial investigation into an area of benchmarking problems in LMOs, but obviously it cannot deal with all of the ramifications of these problems. Therefore, more research into this topic is essential in order to explore the problems further. The

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<sup>(2)</sup> For further discussion see section 1.6



evidence in this study, as in most studies, is just too thin to draw sweeping generalisations.

One of the potential problems of this kind of study is that results cannot be easily generalised. Accordingly, one major direction for further research could be towards extending the sample of companies in the research population. For example, further study can be undertaken to understand the implementation of benchmarking problems in other industrial companies in Libya. This would extend the findings of the current study and would also contribute towards wider generalisations.

Although the instruments and measurements of selected variables were carefully selected and treated with extreme caution, a certain degree of measurement error could not be avoided. These errors resulted from the use of Western metrics in a different environment or culture. Difficulty was experienced particularly in attempting to review and understand LMOs in the context of benchmarking. Difficulty was also encountered for methods used to encourage employees to accept benchmarking adoption, selecting organisational processes to be benchmarked, and deficits in available resources for benchmarking within the environment of LMOs. Thus, any future research of this type should enhance the results of the present study and perhaps improve the validity of its measurements by attending to the difficulties encountered in this study.

Moreover, many ideas and questions were encountered, such as how this research could be improved and extended by further study. For example, would the findings of this study be the same if the study were replicated over time? Would the findings of this study be the same for other Libyan service companies? Would the findings of this study be the same if it were replicated using multiple techniques (e.g. triangulation approach)? In this respect, further research is still required, much work remains to be done, and many questions need to be answered.

Another interesting and important area of research might be to apply the same theoretical perspectives and framework adopted in this thesis in investigating in

depth other benchmarking problems, including the issue of why managers in LMOs believed criteria, sub-criteria and specific sub-criteria to be more important than others. Thus, the author believes that this study can be very useful as a guide to testable hypotheses about how and why managers form their beliefs.

The present study suggests that further empirical studies on the effects of environmental factors and differences in cultural concepts adopted in Libyan organisations would present more meaningful views of benchmarking practices. It is important to suggest that the implementation of benchmarking should be surveyed from time to time and workable strategies developed that make the implementation of economic progress in developing countries a reality rather than an empty promise.



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## **APPENDICES**



**University of Strathclyde  
School of Business  
Department of Accounting and Finance**

Dear Sir/Madam

**(Questionnaire to Manufacturing Organisations in Libya)**

I am currently carrying out research in the Department of Accounting and Finance at the University of Strathclyde in benchmarking problems. The main purpose of this research is to provide a better understanding of the difficulties that many organisations may face when implementing or adopting change.

There are many factors to consider when searching for best industry practices that lead to superior performance. Also in the 'real world' where you function, there are many factors to consider.

In this study I will ask you some questions about organisations attempting to implement a new adopting process. As you complete this experimental task, please remember that we are studying an important set of factors, a set nonetheless viewed as quite significant. I have enclosed a questionnaire and I should be very grateful if you could kindly spare time to complete and return it to me.

Please answer all questions as accurately as possible. All information provided will be treated confidentially and will be used for the purpose of this study only. Furthermore, the results of the questionnaire are strictly confidential and the researcher guarantees that the identity of the respondents will not be disclosed to any one at any time.

Please do not hesitate to contact me if you need any help about this questionnaire.

Thank you very much for your co- operation

Yours Sincerely

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## **The Task- the Determination of the Well Being of the Organisation (Benchmarking Best Practice)**

**You** are asked to assume that the organisations under study are Libyan based and are listed with the Libyan manufacturing organisation. Your task is to assess 'benchmarked' criteria (items) which an organisation has adopted for 'change' in its business life. In order to determine these, comparisons of various criteria (e. g. cost control, quality control, market share and maximise sale) and their dimensions must be made. Contained below is a list of definitions and further information.

### **1) 'Benchmarking'**

Defined as the change introduced into the organisation. Specifically, it is the change that helps structure your organisation to improve quality, reduce costs, maximise sales, or lead to market share. Also, 'benchmarking' is defined as process (or change) that organisations seek to implement to obtain superior performance.

### **2) 'Cost control'**

Use of procedures that help ensure that all costs of products, services, or processes of the organisation maximise the value of the organisation.

### **3) 'Quality control'**

Defined as a control of quality for product or service to prespecified standards for both qualitative and quantitative factors. It is also the effort to ensure that products and services meet customer requirements. Organisations around the globe have adopted formal quality management programs. It has become apparent that improvements in quality lead to reduced cycle time and increased productivity.

### **4) 'Maximise sales'**

Relates to the relation between a firm's product and market designed to increase the amount of sales.

### **5) 'Market share'**

Relates to percentage of total market sales which is controlled by a particular company at a particular time.

### **6) 'Labour and material costs'**

Relate to those costs that are easily traced to the product or service.

### **7) 'Overhead costs'**

Include indirect labour and indirect material costs as well as other types of general manufacturing costs that cannot be directly traced to items being produced, such as maintenance, depreciation, insurance, and cost of purchasing.

### **8) 'Developed devices'**

Relates to developing technology that organisations use to improve their process and to achieve improvements in productivity and reliability of their products.

### **9) 'Production redesigning'**

To reduce defects, firms redesign their products to require fewer different parts, making it easier to maintain tighter controls on the quality of their suppliers. Production redesigning seeks large improvements in productivity; cost reductions of successful redesigning programs exceed the attrition rate. The detailed planning and engineering are making the product according to design and manufacturing specifications.

### **10) 'Research and development'**

Relates to the generation of, and experimentation with, ideas related to new products, services, or processes.

### **11) 'Marketing'**

Defined as the process by which individuals or groups learn about and value the attributes of products or services and purchase those products or services.



**12) 'Advertising'**

Relates to sufficient/insufficient expenditures that can be available for advertising to maximise sales. One of the methods that firms use to improve advertising to maximise sales is to charge retail subcontractors an advertising fee and have the firm be responsible for advertising.

**13) 'New product development' (or quality)**

Relates to quality that affects the market's demand for goods and services. In attempting to improve new products, managers must grapple with what quality means and how to improve it. Quality can refer to 'high mean', 'low variance', or 'meeting customer expectations'.

**14) 'Distribution'**

Defined as the mechanism by which products or services are delivered to the customer.

**15) 'Pricing'**

Firms frequently face decisions on the pricing of their products. In this case, firms always examine pricing problems through the eyes of their customers. A price increase may cause a customer to reject the firm's product and choose one from a competitor.

**16) 'Time'**

The time taken for employees to develop and bring new products to market, the time at which an organisation needs to complete tasks faster than in the past in order to reduce labour cost (or increase customer satisfaction).

**17) 'Payment'**

Relates to standard price used to calculate the value of hours spent in order to produce product.

**18) 'Amount used'**

Relates to material required to make a product

**19) 'Price'**

It is the standard price used to buy raw materials.

**20) 'Absorption Rate'**

Relates to overhead costs that are allocated to products based on an overhead absorption rate (The costing rate considers all factory overheads to be product costs that become an expense in the form of manufacturing costs).

**21) 'Amount incurred'**

Relates to indirect overhead costs incurred by the firm (e.g. indirect labour, materials, management salaries, so forth).

**22) 'Upgrading the machines'**

It is a choice for firm to develop its machines to improve product quality as well as to speed up operations and eliminate delays.

**23) 'Replacing the machines'**

It is a choice for firm to replace its machines with more developed ones to improve productivity and quality of the products.

**24) 'Recruiting employees'**

It is a choice for firm to hire new employees for production redesigning in order to improve quality.

**25) 'Retraining employees'**

Relates to making the firm's employees well trained to complete their tasks with high quality.

**26) 'Raw material'**

Relates to raw material that is inclusive of any materials input into a product. Also, it relates to those materials that become an integral part of a firm's finished product and that can be conveniently traced into it.

**27) 'Product testing'**

It relates to a philosophy of improving the provision of product quality.

**28) 'Delivery'**

It is related to the procedure and the time of the delivery of products to the markets.

**29) 'Selling Price'**

Firm must determine the price of its products that is best for its situation to maximise sales.

**30) 'Resources'**

Resources are the means available to a firm to fulfil its function. Resources relate to funds, equipment and personnel.

**31) 'Media'**

Relates to TV, Radio and Newspaper, which are important for advertising to be considered when the firm markets its product.

**32) 'Personnel'**

Relates to the firm's personnel resources that are available to generate a variety of information for product development in order to maximise sales.

**33) 'Promotional support'**

Relates to approach that firm uses to encourage employees for acquisition of new skills and to make them more creative and productive in order to meet market requirements.

**34) 'Pricing structure'**

An important form of market share is to estimate the price that potential customers will be willing to pay. This estimate is based on an understanding of customers' perceived value for a product and responses of competitors.

**35) 'Costing structure'**

Relates to costs that are classified as variable or fixed costs to estimate price for product.

**36) 'Retail'**

Relates to procedure of distributing firm's products at retail prices to customers.

**37) 'Wholesale'**

Relates to procedure of distributing firm's products at wholesale prices to customer.



## Questionnaire to Manufacturing Organisations In Libya

There are no correct or incorrect answers to the items included in this questionnaire. Although some items and questions may appear similar to others, they express differences which are important to this study. Please respond to all questions.

Responses to all questions will be strictly confidential. The thesis will not name any individuals or companies participating in the survey.

Your co-operation in carefully completing this questionnaire is greatly appreciated.

To help the researcher interpret the research questions and statistical analysis of the data please give the following information:

### Section I

#### Part:(A)

#### Personal information

1- Are you: (please tick)

1.1- Male [   ]

1.2- Female [   ]

2- What is your educational background? (Please tick more than one box if applicable)

2.1- Secondary School [   ]    2.2- Undergraduate Degree [   ]

2.3- Postgraduate Degree [   ]    2.4- Specialist Diploma [   ]

3- Place of study (please tick more than one box if applicable).

3.1- Libya [   ]    3.2- Arab Countries [   ]

3.3- USA or Canada [   ]    3.4- Western Europe [   ]

3.5- Eastern Europe [   ]    3.6- Others ( please state) ..... [   ]

#### Part(B)

#### General information about the organisation

4- Your job position (please tick).

4.1- Manager [   ]    4.2- Foreman / Supervisor [   ]

4.3- Accountant [   ]    4.4- Engineer [   ]

4.5- Administrator [   ]    4.6- Other (please state)..... [   ]

**5- What is the approximate number of employees in your organisation?**

5.1- Less than 500 [ ] 5.2- 500 – 999 [ ]

5.3 1000 – 1499 [ ] 5.4- 1500 – 1999 [ ]

5.5- More than 2000 [ ]

**6- How long has your organisation been in business?**

6.1- Years 1 - 5 [ ]

6.2- Years 6 – 10 [ ]

6.3- More than 10 years [ ]

## **Section II**

### **Part(c)**

#### **General information about new changes (e.g., benchmarking) adopted in your organisation**

In this section, you will be asked to provide general information about your organisation in adopting a change.

**7- Change -has been recognised as one of the new management tools and techniques aimed at improving organisation performance. Please indicate which of the following statements is most applicable to your organisation.**

7.1- Change has been introduced [ ]

7.2- It is intended to introduce a change [ ]

7.3- Some consideration is being given to introducing change [ ]

7.4- A decision has been taken not to introduce change\* [ ]

\*If you have “ticked” this answer please proceed to QUESTION (35) in SECTION IV on PAGE (18) of the questionnaire.

**8- If you have introduced a change, please indicate for how long your organisation has been active in the new change practice.**

8.1- One year [ ]

8.2- 2 – 4 years [ ]

8.3- 5 – 10 years [ ]

8.4- 11 – 15 years [ ]

8.5- More than 15 years [ ]



**9-** In what areas of the organisation has benchmarking adoption been introduced? (Please tick more than one box if necessary).

9.1- Cost control  2.2- Quality control

9.3- Sales maximisation  9.4- Market share

**10-** How long on average did it take your organisation to fully implement changes (like benchmarking)?

10.1- Less than one year

10.2- 1 – 2 years

10.3- More than 2 years

**11-** Was the model for your initial adoption taken from:

11.1- Large organisations

11.2- Small organisations

11.3- Medium sized organisations

11.4- Unknown

**12-** It is now well understood that most large organisations are more likely to adopt changes because of their ability to commit more resources. Please indicate the evaluation of your organisation's assets.

12.1- Under 50 million Dinars

12.2- 50 – 100 million Dinars

12.3- 101 – 250 million Dinars

12.4- 251 – 500 million Dinars

12.5- More than 500 million Dinars

**13-** Please indicate how frequently the change adoption process is reviewed in your organisation?

13.1- Monthly  13.2- Quarterly

13.3- Semi- annually  13.4- Annually

## **Part:(D)**

### **Organisation Behaviour**

**14-** With regard to the organisation for which you currently work, please indicate the extent of your agreement or disagreement with each of the following statements.

1- [SD] means strongly disagree.

2- [ D ] means disagree:

3- [ A ] means agree.

4- [SA] means strongly agree.

	1	2	3	4
	[ SD ]	[ D ]	[ A ]	[ SA ]
<b>14.1</b> Managers are only sensitive to general information about best performance through the implementation of benchmarking	[ ]	[ ]	[ ]	[ ]
<b>14.2</b> Managers are sensitive both to information about best performance and employees' behaviour through the implementation of benchmarking.	[ ]	[ ]	[ ]	[ ]
<b>14.3</b> Managers do not give enough consideration to information about employees' behaviour to adapt to change	[ ]	[ ]	[ ]	[ ]
<b>14.4</b> Managers give little weight to information about employees' behaviour compared to information about best performance in change adaptation	[ ]	[ ]	[ ]	[ ]
<b>14.5</b> Management relates manager's success to adapt to any change to the role of operating environment (e.g., easy task, luck and chance) than manager's ability and effort at the moment of action	[ ]	[ ]	[ ]	[ ]
<b>14.6</b> Management relates manager's failure to adapt to any change to the role of operating environment (e. g., task difficulty, luck and chance) than manager's ability and offer at the moment of action	[ ]	[ ]	[ ]	[ ]
<b>14.7</b> Management places too much weight on the firm's operating environment (e. g., task difficulty, luck and chance) than managers' ability and effort to adapt to any change	[ ]	[ ]	[ ]	[ ]
<b>14.8</b> Management places too much weight on managers' ability and effort rather than on the firm's operating environment (e. g., task difficulty, luck and chance) to adapt to any change	[ ]	[ ]	[ ]	[ ]
<b>14.9</b> Managers consider only information about best performance taken from a highly visible organisation (e. g., IBM Computers Company)	[ ]	[ ]	[ ]	[ ]
<b>14.10</b> Managers consider information about best performance taken from less visible organisations (e. g., Viglen Computers company)	[ ]	[ ]	[ ]	[ ]
<b>15-</b> How often has management, leadership, organisation's structure and market conditions been changed at your organisation in the last five years? Please choose one of the four alternative answers for each of the following statements.				
1- [ON] Means once.				
2- [TW] Means twice.				
3- [THR] Means thrice.				
4- [N] Means none.				
	1	2	3	4
	[ ON ]	[ TW ]	[ THIR ]	[ N ]
<b>15.1</b> Number of changes for organisation's structure when adopting benchmarking through the last five years	[ ]	[ ]	[ ]	[ ]
<b>15.2</b> Number of changes for managers when benchmarking is implemented through the last five years	[ ]	[ ]	[ ]	[ ]
<b>15.3</b> Number of changes for leadership when benchmarking is implemented through the last five years	[ ]	[ ]	[ ]	[ ]
<b>15.4</b> Number of changes for market conditions when adopting benchmarking through the last five years	[ ]	[ ]	[ ]	[ ]



**Part:(E)****Characteristics of organisations attempting to implement and adopt change like benchmarking**

**16-** When your organisation prepares to implement changes, what methods does it rely on to encourage employees to accept them. For each characteristic please state to what extent it is displayed in your organisation?

- 1- [N] Never  
 2- [ST] Sometimes  
 3- [U] Usually  
 4- [A] Always

	1	2	3	4
	[ N ]	[ ST ]	[ U ]	[ A ]
<b>16.1</b> By motivating employees to accept the change	[ ]	[ ]	[ ]	[ ]
<b>16.2</b> By making the employees understand the benefits of the change	[ ]	[ ]	[ ]	[ ]
<b>16.3</b> By asking the employees to accept the change whether they like or dislike it	[ ]	[ ]	[ ]	[ ]
<b>16.4</b> By hiring new employees	[ ]	[ ]	[ ]	[ ]

**17-** In this section you will find several characteristics (variables) that are related to organisations attempting to implement change. Please read each statement carefully, and choose one of the four alternative answers, which characterises your organisation, by placing (x) in the appropriate box (corresponding with your answer):

- 1- [NI] means not important  
 2- [SWI] means somewhat important  
 3- [I] means important  
 4- [VI] means very important

	1	2	3	4
	[ NI ]	[ SWI ]	[ I ]	[ VI ]
<b>17.1</b> Culture and organisational environment are fully considered when adopting benchmarking	[ ]	[ ]	[ ]	[ ]
<b>17.2</b> Setting priorities on the processes to be adopted are based on economic factors	[ ]	[ ]	[ ]	[ ]
<b>17.3</b> Due consideration is paid to many dimensions (items) of performance when benchmarking is implemented	[ ]	[ ]	[ ]	[ ]
<b>17.4</b> Managers give proper consideration to firm size in selecting partners for the new adoption process	[ ]	[ ]	[ ]	[ ]
<b>17.5</b> The size of firm upon which adoption will be modelled matches the size of your firm	[ ]	[ ]	[ ]	[ ]

	1 [ NI ]	2 [ SWI ]	4 [ I ]	4 [ VI ]
17.6 Employees' skills are up graded to make the firm ready for any change	[ ]	[ ]	[ ]	[ ]
17.7 Resources are fully deployed to embrace a change (or adoption)	[ ]	[ ]	[ ]	[ ]
17.8 Accounting systems are used which provide more effective ways of motivating employees	[ ]	[ ]	[ ]	[ ]
17.9 The need for fully understanding change before its full Implementation	[ ]	[ ]	[ ]	[ ]
17.10 The firm adopts large Research and Development programs during change periods	[ ]	[ ]	[ ]	[ ]
17.11 The firm has established an effective connection between its products (e.g., price, cost, and quality) and market requirements	[ ]	[ ]	[ ]	[ ]
17.12 Consideration is given to the time required for technological innovation until benchmarking is completely implemented	[ ]	[ ]	[ ]	[ ]
17.13 Markets are well understood so as to facilitate effective input, output and pricing decisions	[ ]	[ ]	[ ]	[ ]
17.14 There is clear understanding of the time required for successful change adaptation	[ ]	[ ]	[ ]	[ ]



## Section III

Please read the instructions below carefully to help you complete this section.

### Instructions

For each criterion, sub-criterion, and specific sub-criterion given below, rate how important each one is, when compared to the other criteria. For example when you are asked; in determining the well being of your organisation (benchmarking best practice) to what extent is COST CONTROL more or less important than QUALITY CONTROL, the question will appear as:

**Comparison of the importance of characteristics with respect to determination of THE WELL BEING OF YOUR ORGANISATION (BENCHMARKING BEST PRACTICE)**

\_\_\_\_\_ Cost Control : Quality Control \_\_\_\_\_

In responding to the question you should use the following scale:

<i>Intensity of Importance</i>	<i>Definition</i>	<i>Explanation</i>
1	Equal importance	Two activities or items contribute equally to the objective.
3	Weak importance of one over another	Experience and judgement slightly favour one activity or item over another
5	Essential or strong importance	Experience and judgement strongly favour one activity over another.
7	Demonstrated importance	An activity or item is strongly favoured and its dominance is demonstrated in practice.
9	Absolute importance	The evidence favouring one item over another is of the highest possible order of affirmation.
2, 4, 6, 8	Intermediate values between the two adjacent judgements	When compromise is needed.

For example, if, in responding to the sample question, you believe that **COST CONTROL** has 'demonstrated importance' over **QUALITY CONTROL**, then you should complete the questionnaire as follows:

**Comparison of the importance of characteristics with respect to determination of THE WELL BEING OF YOUR ORGANISATION (BENCHMARKING BEST PRACTICE)**

\_\_\_\_\_ 7 \_\_\_\_\_ Cost Control: Quality Control \_\_\_\_\_

Alternatively, if you believe that, in determining the well being of your organisation, **QUALITY CONTROL** is of 'essential or strong importance' over **COST CONTROL** then the questionnaire should be completed as follows:

**Comparison of the importance of characteristics with respect to determination of THE WELL BEING OF YOUR ORGANISATION (BENCHMARKING BEST PRACTICE)**

\_\_\_\_\_ Cost Control: Quality Control \_\_\_\_\_ 5 \_\_\_\_\_

**Part:(F)**

**The pairwise comparison criteria**

**18- Comparison of the importance of characteristics with respect to determination of THE WELL BEING OF YOUR ORGANISATION (BENCHMARKING BEST PRACTICE)**

\_\_\_\_\_ Cost Control: Quality Control \_\_\_\_\_

\_\_\_\_\_ Cost Control: Maximise Sales \_\_\_\_\_

\_\_\_\_\_ Cost Control: Market Share \_\_\_\_\_

\_\_\_\_\_ Quality Control: Market Share \_\_\_\_\_

\_\_\_\_\_ Quality Control: Maximise Sales \_\_\_\_\_

\_\_\_\_\_ Market Share: Maximise Sales \_\_\_\_\_

**19- Comparison of the importance of characteristics with respect to determination of COST CONTROL**

\_\_\_\_\_ Labour Cost: Material Cost \_\_\_\_\_

\_\_\_\_\_ Labour Cost: Overhead Cost \_\_\_\_\_

\_\_\_\_\_ Material Cost: Overhead Cost \_\_\_\_\_

**20- Comparison of the importance of characteristics with respect to determination of QUALITY CONTROL**

\_\_\_\_\_ Developed Devices: Production Redesigning \_\_\_\_\_

\_\_\_\_\_ Developed Devices: Research and Development \_\_\_\_\_

\_\_\_\_\_ Production Redesigning: Research and Development \_\_\_\_\_



**21- Comparison of the importance of characteristics with respect to determination of  
MAXIMISE SALES**

\_\_\_\_\_ Marketing: Advertising \_\_\_\_\_  
\_\_\_\_\_ Marketing: New Product Development (Quality) \_\_\_\_\_  
\_\_\_\_\_ Advertising: New Product Development (Quality) \_\_\_\_\_

**22- Comparison of the importance of characteristics with respect to determination of  
MARKET SHARE**

\_\_\_\_\_ New Product Development (Quality): Pricing \_\_\_\_\_  
\_\_\_\_\_ New Product Development (Quality): Distribution \_\_\_\_\_  
\_\_\_\_\_ Pricing: Distribution \_\_\_\_\_

**23- Comparison of the importance of characteristics with respect to determination of  
LABOUR COST**

\_\_\_\_\_ Time: Payment \_\_\_\_\_

**24- Comparison of the importance of characteristics with respect to determination of  
MATERIAL COST**

\_\_\_\_\_ Amount Used: Price \_\_\_\_\_

**25- Comparison of the importance of characteristics with respect to determination of  
OVERHEAD COST**

\_\_\_\_\_ Absorption Rate: Amount Incurred \_\_\_\_\_

**26- Comparison of the importance of characteristics with respect to determination of  
DEVELOPED DEVICES**

\_\_\_\_\_ Upgrading the Machines: Replacing the Machines \_\_\_\_\_

**27- Comparison of the importance of characteristics with respect to determination of  
PRODUCTION REDESIGNING**

\_\_\_\_\_ Recruiting New Employees: Retraining the Employees \_\_\_\_\_

**28- Comparison of the importance of characteristics with respect to determination of RESEARCH AND DEVELOPMENT**

\_\_\_\_\_ Raw Material: Product Testing \_\_\_\_\_

**29- Comparison of the importance of characteristics with respect to determination of ADVERTISING**

\_\_\_\_\_ Resources: Media \_\_\_\_\_

**30- Comparison of the importance of characteristics with respect to determination of MARKETING**

\_\_\_\_\_ Delivery: Selling Price \_\_\_\_\_

**31- Comparison of the importance of characteristics with respect to determination of NEW PRODUCT DEVELOPMENT (QUALITY)**

\_\_\_\_\_ Research and Development: Personnel \_\_\_\_\_

**32- Comparison of the importance of characteristics with respect to determination of DISTRIBUTION**

\_\_\_\_\_ Retail: Wholesale \_\_\_\_\_

**33- Comparison of the importance of characteristics with respect to determination of PRICING**

\_\_\_\_\_ Pricing Structure: Costing Structure \_\_\_\_\_

**34- Comparison of the importance of characteristics with respect to determination of NEW PRODUCT DEVELOPMENT(QUALITY)**

\_\_\_\_\_ Research and Development: Promotional Support \_\_\_\_\_



## Section IV

### Part: (G)

Please answer this section *only* if your organisation has not considered implementing or adopting a change.

35- Your organisation recently has not implemented new change or failed to do so. Please indicate to what extent you agree with the following reasons as to why your organisation has not introduced (or failed to implement) a change.

1- [SD] means strongly disagree.

2- [ D ] means disagree.

3- [ A ] means agree.

4- [SA] means strongly agree.

	1	2	3	4
	[SD]	[ D ]	[ A ]	[SA]
35.1 Insufficient consideration was given to many dimensions (items) of performance when benchmarking was implemented	[ ]	[ ]	[ ]	[ ]
35.2 There was insufficient trained manpower	[ ]	[ ]	[ ]	[ ]
35.3 Insufficient resources were available for Research and Development	[ ]	[ ]	[ ]	[ ]
35.4 Conflict of interest with each item to be adopted made Managers hesitant to share information with each other and created difficulty to adapt to any change	[ ]	[ ]	[ ]	[ ]
35.5 Incompatibility with the structure of management compensation plans that the firm uses as performance measurement and evaluation to encourage managers to adopt process	[ ]	[ ]	[ ]	[ ]
35.6 There were difficulties facing management in following up changes in market conditions and technology	[ ]	[ ]	[ ]	[ ]
35.7 There was a lack or shortage of skilled employees to make the firm ready for any change	[ ]	[ ]	[ ]	[ ]
35.8 The priorities which were assigned to the processes to be adopted were not based on consideration of their economic importance	[ ]	[ ]	[ ]	[ ]
35.9 Managers did not give proper consideration to the firm's size in selecting partners for a new adoption	[ ]	[ ]	[ ]	[ ]
35.10 Difficulties were experienced in allocating available resources to the change	[ ]	[ ]	[ ]	[ ]
35.11 There was absence of sensitivity to different organisational cultures and environments	[ ]	[ ]	[ ]	[ ]

**Thank you for your co-operation**

**University of Strathclyde  
School of Business  
Department of Accounting and Finance**

Dear Manager

**(Questionnaire)**

Please answer all questions presented in this questionnaire. Your co-operation is greatly appreciated. The questionnaire includes only six open ended questions which concerned the effectiveness of benchmarking in Libyan manufacturing organisations.

All information and evaluations provided will be treated confidentially and will be use for the purpose of this study only. Indeed, the result of these evaluations will not be disclosed to any one at any time. Please do not hesitate to contact me if you need any help about this questionnaire.

**Thank you for your co-operation**

Yours sincerely,

Mohamed Salem

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## Section VI

### The effectiveness of benchmarking in LMOs

#### Part: (H)

Please read the following questions carefully and mark an (x) in the appropriate box. Please indicate any further comments or information relevant to your organisation in understanding the effectiveness of benchmarking in the space below.

36- Which type of benchmarking do you think is the most effective one? (Please tick more than one box if necessary).

- 36.1- Product benchmarking [    ]
- 36.2- Function / process [    ]
- 36.3- Best practice [    ]
- 36.4- Strategic [    ]

\* Any other comments (please specify)

.....  
 .....  
 .....

37- Who understands the benchmarking goal(s) in your organisation?

- 37.1- Top management [    ]
- 37.2- Top and most middle management [    ]
- 37.3- Every manager and supervisor [    ]
- 37.4- Few managers [    ]

\* Any other comments (please specify)

.....  
 .....  
 .....

38- Why was benchmarking not as effective or successful as you expected? (Please tick more than one box if necessary).

- 38.1- Relevant organisational culture change [    ]
- 38.2- Unclear benchmarking goal [    ]
- 38.3- Lack of implementation of benchmarking findings [    ]
- 38.4- Other [    ]

\* Any other comments (please specify)

.....  
 .....  
 .....

**39- How successful were your benchmarking activities? (Please tick more than one box if necessary).**

39.1- Completely successful [ ]

39.2- Very successful [ ]

39.3- Moderately successful [ ]

39.4- Still in the process of benchmarking [ ]

\* Any other comments (please specify)

.....  
.....  
.....

**40- How does your organisation measure the effectiveness of benchmarking? (Please tick more than one box if necessary).**

40.1- Profitability [ ]

40.2- Increased competitive advantage [ ]

40.3- Improved customer satisfaction [ ]

40.4- Improved process performance [ ]

\* Any other comments (please specify)

.....  
.....  
.....

**41- How do you perceive benchmarking as a management tool?**

41.1- Very effective [ ]

41.2- Sooner or later [ ]

41.3- Somewhat effective [ ]

41.4- Not effective [ ]

\* Any other comments (please specify)

.....  
.....  
.....

**Thank you for your co-operation**



## Appendix 2: Distribution of managers' responses to questions in the questionnaire

**Table (6-1): General formation about LMOs attempting implement benchmarking**

Criteria		Companies						
		A	B	C	D	E	F	G
1	Number of employees	100 - 1499	>2000	1500 - 2000	1500 - 2000	>2000	>2000	>2000
2	Years active in benchmarking	11 - 15	5 - 10	11 - 15	5 - 10	5 - 10	N/A	N/A
3	Years to implement benchmarking	>2	>2	>2	>2	1 - 2	N/A	N/A
4	Assets of company (million dinars)	<50m	>500m	50 - 100m	50 - 100m	<50m	N/A	N/A

**Table (6-2): Distribution of managers' responses about areas of benchmarking**

Question (9)	Area of benchmarking to be implemented	Companies										All companies	
		A		B		C		D		E			
		F	%	F	%	F	%	F	%	F	%	F	%
9.1	Cost control	4	40	4	40	7	70	7	70	3	30	25	26
9.2	Quality control	9	90	9	90	7	70	6	60	8	80	39	40
9.3	Maximise sales	3	30	4	40	6	60	5	50	5	50	23	24
9.4	Market share	0	0	2	20	2	20	3	30	2	20	9	9.4

**Table (6-3): Type, factors and measuring the effectiveness of benchmarking in LMOs**

Survey questions		Companies									
		A**		B*		C**		D*		E*	
		F	%	F	%	F	%	F	%	F	%
36	1	9	90	10	100	-	-	7	70	-	-
	2	-	-	8	80	9	90	5	50	10	100
	3	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-
37	1	9	90	-	-	-	-	10	100	-	-
	2	-	-	10	100	-	-	-	-	10	100
	3	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	9	90	-	-	-	-
38	1	-	-	-	-	5	50	6	60	-	-
	2	6	60	-	-	7	70	6	60	-	-
	3	-	-	7	70	6	60	-	-	5	50
	4	6	60	8	80	8	80	7	70	5	50
39	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	9	90	10	100	3	30	4	40	8	80
	4	-	-	-	-	6	60	6	60	2	20
40	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	9	90	-	-	10	100
	4	9	90	10	100	-	-	10	100	-	-
41	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	10	100	-	-	-	-	10	100
	3	9	90	-	-	5	50	6	60	-	-
	4	-	-	-	-	4	40	4	40	-	-

F: frequency of managers' responses, \*: means 10 managers' responses, \*\*: means 9 managers' responses



## Appendix 3: Results of frequency distribution, mean and standard deviation

Table (7-1): Distribution of managers according to level of educational background

Q U E S. (2)	Qualifi- cation	Companies														All Cs		
		A		B		C		D		E		F		G		F		
		F	%	F	%	F	%	F	%	F	%	F	%	F	%			
2.1	Secondary school	0	0	0	0	1	10	0	0	0	0	0	0	0	0	0	1	1.43
2.2	Special diploma	2	20	0	0	3	30	1	10	0	0	2	20	1	10	9	12.86	
2.3	Graduated	4	40	7	70	6	60	8	80	10	100	6	60	9	90	50	71.43	
2.4	Post-graduate	4	40	3	30	0	0	1	10	0	0	2	20	0	0	10	14.29	
<b>Total</b>		10	100	10	100	10	100	10	100	10	100	10	100	10	100	70	100	

QUES. Means questions

Table (7-2): Distribution of managers according to place of study

Q U E S. (3)	Place of study	Companies														All Cs	
		A		B		C		D		E		F		G		F	%
		F	%	F	%	F	%	F	%	F	%	F	%	F	%		
3.1	Libya	5	40	5	50	3	30	5	50	2	20	5	50	4	40	29	41.43
3.2	USA and Canada	3	30	2	20	4	40	3	30	3	30	1	10	2	20	18	25.71
3.3	Western Europe	2	20	3	30	2	20	2	20	4	40	1	10	2	20	16	22.86
3.4	Eastern Europe	0	0	0	0	1	10	0	0	1	10	3	30	2	20	7	10.00
<b>Total</b>		10	100	10	100	10	100	10	100	10	100	10	100	10	100	70	100

QUES. Means questions

**Table (7-3): Distribution of participants according to job position**

Q U E S (4)	Subjects position	Companies														All Cs	
		A		B		C		D		E		F		G		F	%
		F	%	F	%	F	%	F	%	F	%	F	%	F	%		
4.1	Manager <sup>1</sup>	4	40	7	70	5	50	6	60	5	50	4	40	6	60	37	52.86
4.2	Foreman- <sup>2</sup> supervisor	1	10	0	0	0	0	0	0	0	0	1	10	0	0	2	2.86
4.3	Accountant/finance <sup>3</sup>	1	10	1	10	1	10	2	20	1	10	3	30	1	10	10	14.29
4.4	Engineer	2	20	0	0	3	30	1	10	3	30	1	10	1	10	11	15.71
4.5	Administ- rator	1	10	0	0	0	0	0	0	0	0	1	10	2	20	4	5.71
4.5	Other <sup>4</sup>	1	10	2	20	1	10	1	10	1	10	0	0	0	0	6	8.57
<b>Total</b>		10	100	10	100	10	100	10	100	10	100	10	100	10	100	70	100

QUES. Means questions

- (1) This includes the general managers, deputy general managers, managers in accounts and finance, marketing and purchasing, production and research and development.
- (2) Such as assistant managers.
- (3) Such as controller of accounts and finance.
- (4) This includes expertises.

**Table (7-4): Information about the seven companies to whether or not introduced benchmarking and model of their' initial adoption**

Explanation		Companies						
		A	B	C	D	E	F	G
1	Benchmarking introduced <sup>(1)</sup>	yes	yes	yes	yes	yes	-	-
2	Decision not to introduce benchmarking	-	-	-	-	-	yes	yes
3	Size of benchmarking model company chosen	medium sized	large	large	large	large	-	-

- (1) Many managers indicated that their companies are intending to benchmark another item in addition to the existing one.



**Table (7-5): Benchmarking process is reviewed**

Question (13)	Frequently benchmarking process is reviewed	Companies										All companies	
		A		B		C		D		E			
		F	%	F	%	F	%	F	%	F	%	F	%
13.1	Quarterly	10	100	0	0	0	0	0	0	0	0	10	20
13.2	Semi-annually	0	0	3	30	0	0	0	0	5	50	8	16
13.3	Annually	0	0	7	70	10	100	10	100	5	50	32	64
Total		10	100	10	100	10	100	10	100	10	100	50	100

**Table (7-10): Results of frequency distribution, mean and standard deviation for organisation variables effect benchmarking implementation**

Questions		Companies											
		F						G					
		Std	D	A	SA	$\bar{X}$	SD	Std	D	A	SA	$\bar{X}$	SD
35.1	F	0	2	4	4	3.2	.92	0	2	5	3	3.1	.74
35.2	F	0	2	5	3	3.1	.74	0	1	3	6	2.8	1.0
35.3	F	0	1	3	6	3.5	.71	0	2	4	4	3.0	.82
35.4	F	1	0	2	7	3.5	.97	0	2	8	0	2.8	.63
35.5	F	3	0	5	2	2.6	1.2	0	2	4	4	3.2	.79
35.6	F	0	2	3	5	3.3	.82	0	2	6	2	3.2	.63
35.7	F	2	0	5	3	2.9	1.0	3	0	5	2	2.7	1.1
35.8	F	0	1	6	3	3.3	.68	0	2	6	2	3.0	.67
35.9	F	0	3	4	3	3.0	.81	0	3	5	2	2.8	1.0
35.10	F	3	0	4	3	2.8	1.3	0	4	6	0	2.7	.95
35.11	F	0	2	5	3	3.1	.84	0	1	6	3	3.2	.63

D: Disagree, Std: Strongly disagree, A: Agree, SA: Strongly agree,  $\bar{X}$ : The arithmetic mean, SD: standard deviation.

## Appendix 4: Results of Pearson Correlation Coefficients

Table (7-24)<sup>(1)</sup>: The correlation between organisation behaviours related variables (10 variables) for company A:

Variables*	First hypothesis related variables				second hypothesis related variables				third hypothesis related variables	
	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	14.10
14.1	1 . 10	.500 P=.020 10	.210 P=.001 10	.296 P=.010 10	.634 P=.049 10	.132 P=.022 10	.740 P=.014 10	.898 P=.000 10	.371 P=.000 10	.271 P=.000 10
14.2	.500 P=.020 10	1 . 10	.333 P=.010 10	.334 P=.014 10	.000 P=1 10	.000 P=1 10	.444 P=.198 10	.155 P=.668 10	.120 P=.742 10	.000 P=1 10
14.3	.210 P=.001 10	.333 P=.010 10	1 0 10	.440 P=.000 10	.035 P=.923 10	.035 P=.923 10	-.340 P=.336 10	-.013 P=.972 10	-.512 P=.131 10	.166 P=.646 10
14.4	.296 P=.010 10	.334 P=.014 10	.440 P=.000 10	1 . 10	.459 P=.182 10	.459 P=.182 10	.645 P=.044 10	-.442 P=.201 10	.064 P=.801 10	.247 P=.491 10
14.5	.634 P=.049 10	.000 P=1 10	.035 P=.923 10	.459 P=.182 10	1 . 10	.962 P=.000 10	.680 P=.030 10	-.762 P=.010 10	-.248 P=.490 10	-.196 P=.587 10
14.6	.132 P=.022 10	.000 P=1 10	.035 P=.923 10	.459 P=.182 10	.962 P=.000 10	1 . 10	.678 P=.031 10	-.762 P=.010 10	-.248 P=.490 10	-.196 P=.587 10
14.7	.740 P=.014 10	.444 P=.198 10	.340 P=.336 10	.645 P=.044 10	.680 P=.030 10	.678 P=.031 10	1 . 10	.166 P=.647 10	.711 P=.021 10	-.022 P=.951 10
14.8	.898 P=.000 10	.155 P=.668 10	-.013 P=.972 10	-.442 P=.201 10	-.762 P=.010 10	-.762 P=.010 10	.166 P=.647 10	1 . 10	-.246 P=.493 10	.662 P=.037 10
14.9	.371 P=.000 10	.120 P=.742 10	-.512 P=.131 10	.064 P=.801 10	-.248 P=.490 10	-.248 P=.490 10	.711 P=.021 10	-.246 P=.493 10	1 . 10	.473 P=.167 10
14.10	.271 P=.000 10	.000 P=1 10	.166 P=.646 10	.247 P=.491 10	-.196 P=.587 10	.196 P=.587 10	.022 P=.951 10	.662 P=.037 10	.473 P=.167 10	1 . 10

\* Variables related to question 14 of questionnaire consists 10 sub-scale questions.  
(Pearson correlation coefficients / 2-tailed significance respondents).  
. is presented if a coefficient cannot be computed.

<sup>(1)</sup> There are eleven tables (e. g., 7-25, 7-26, 7-27, 7-28, 7-29, 7-30, 7-31, 7-32, 7-33, 7-34, 7-35) in addition to Table (7-24) carrying results of the correlation between the variables. These tables are available with the author on request.



Appendix 5: Results of three consistency measurements ( $\lambda_{max}$ , C.I. and C.R)

**Table (8-1A): The results of three consistency measurements ( $\lambda_{max}$ , C.I and C.R) for priorities of criteria\*, sub-criteria\* and specific sub-criteria\*\* in determining the well-being of the organisation**

Explanation	Companies														
	A			B			C			D			E		
	$\lambda_{max}$	C.I	C.R	$\lambda_{max}$	C.I	C.R	$\lambda_{max}$	C.I	C.R	$\lambda_{max}$	C.I	C.R	$\lambda_{max}$	C.I	C.R
All main criteria <sup>(1)</sup>	4.06	.02	.03	4.03	.01	.01	4.01	.01	.01	4.06	.02	.03	4.02	.01	.01
All sub-criteria <sup>(2)</sup> of cost control	3.04	.02	.04	3.04	.02	.04	3.01	.01	.01	3.01	.01	.01	3.04	.02	.04
All sub-criteria <sup>(3)</sup> of quality control	3.02	.01	.02	3.05	.03	0.5	3.01	.01	.01	3.01	0.01	.01	3.01	.01	.01
All sub-criteria <sup>(4)</sup> of maximise sales	3.06	.03	.06	3.05	.02	0.05	3.03	.02	.03	3.00	.00	.00	3.03	.02	.03
All sub-criteria <sup>(5)</sup> of market share	3.03	.01	.03	3.04	.02	.04	3.02	.01	.02	3.02	.14	.02	3.02	.01	.02
All specific sub-criteria <sup>(6)</sup> of cost control	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00
All specific sub-criteria <sup>(7)</sup> of quality control	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00
All specific sub-criteria <sup>(8)</sup> of maximise sales	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00
All specific sub-criteria <sup>(9)</sup> of market share	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00	2.00	.00	.00

$\lambda_{max}$  (Lamda) = principle eigenvalue, C.I = consistency index, C.R = consistency ratio.

\* There are four tables analysing the participants' responses in determining the benchmarking criteria and sub-criteria using the three consistency measurements ( $\lambda_{max}$ , C.I and C.R). These tables are available on request.

\*\* There are twelve tables analysing the participants' responses in determining the benchmarking specific sub-criteria criteria using the same three consistency measurements.

(1) Total average of priorities of cost and quality control, maximise sales and market share.

(2) Total average of priorities of labour and material cost and overhead cost.

(3) Total average of priorities of new technology, production redesigning, R&D.

(4) Total average of priorities of marketing, advertising and new product development.

(5) Total average of priorities of new product development, pricing and distribution.

(6) Total average of priorities of time and payment, amount used and price, and absorption rate and amount used.

(7) Total average of priorities of upgrading and replacing the machines, retraining and recruiting employees, and raw material and product testing.

(8) Total average of priorities of retraining the employees and resources and media, selling price and delivery, and R & D and personal.

(9) Total average of priorities of retail and wholesale, pricing structure and costing structure, and R & D and promotional support.

## Appendix 6: Results of pairwise comparison criteria, sub-criteria and specific sub-criteria

**Table (8-1): Ranks given by respondents to criteria tested to determination of the well-being organisation (benchmarking best practice)\***

Explanation	Companies				
	A	B	C	D	E
Cost control	2.30	2.50	1.30	1.30	2.70
Quality control	1.40	1.60	1.60	1.50	1.70
Maximise sales	2.90	2.50	2.00	3.45	2.10
Market share	3.10	2.60	3.80	3.20	3.20

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-2): Ranks given by respondents to sub-criteria tested to determination of cost control\***

Explanation	Companies				
	A	B	C	D	E
Labour cost	1.80	1.70	1.70	1.30	1.90
Material cost	1.60	1.40	1.10	1.70	1.40
Overhead cost	2.40	2.30	2.10	2.30	2.30

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-3): Ranks given by respondents to sub-criteria tested to determination of quality control\***

Explanation	Companies				
	A	B	C	D	E
New technology	1.50	2.20	1.50	1.70	2.1
R & D	2.30	1.60	1.90	1.80	1.50
Production redesigning	1.80	2.10	2.20	1.60	2.20

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-4): Ranks given by respondents to sub-criteria tested to determination of maximise sales\***

Explanation	Companies				
	A	B	C	D	E
Marketing	1.30	1.80	1.30	2.10	1.70
Advertising	2.40	2.20	2.70	2.20	2.90
New product development	2.20	1.60	2.00	1.10	1.40

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-5): Ranks given by respondents to sub-criteria tested to determination of market share\***

Explanation	Companies				
	A	B	C	D	E
Pricing	2.00	1.70	2.00	1.70	1.70
Distribution	2.70	2.20	1.60	2.30	2.50
New product development	1.10	1.60	1.10	1.50	1.50

\*This table shows the average of the main ranking for the participants' responses within each company.



**Table (8-6): Ranks given by respondents to specific sub-criteria tested to determination of sub-criteria (labour, material and overhead cost)\***

Explanation	Companies				
	A	B	C	D	E
Time	1.40	1.30	1.10	1.20	1.70
Payment	1.30	1.60	1.20	1.20	1.20
Amount used	1.30	1.60	1.10	1.50	1.40
Price	1.60	1.30	1.60	1.30	1.20
Absorption rate	1.40	1.70	1.30	1.50	1.30
Amount incurred	1.50	1.40	1.20	1.30	1.70

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-7): Ranks given by respondents to specific sub-criteria tested to determination of sub-criteria (new technology, R & D and production redesigning)\***

Explanation	Companies				
	A	B	C	D	E
- Upgrading the machine	1.30	1.10	1.10	1.40	1.40
- Replacing the machine	1.60	1.60	1.30	1.30	1.60
- Retraining the employees	1.00	1.20	1.10	1.00	1.10
- Recruiting new employees	1.90	1.80	1.50	1.70	1.90
- Raw material	1.60	1.40	1.20	1.30	1.10
- Product testing	1.30	1.20	1.50	1.10	1.90

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-8): Ranks given by respondents to specific sub-criteria to tested determination of sub-criteria (marketing, advertising and new product development)\***

Explanation	Companies				
	A	B	C	D	E
Selling price	1.20	1.40	1.40	1.00	1.10
Delivery	1.70	1.30	1.30	1.80	1.80
Resources	1.00	1.30	1.00	1.30	1.20
Media	2.00	1.60	2.00	1.30	1.80
R & D <sup>(1)</sup>	1.20	1.30	1.00	1.10	1.00
Personal	1.60	1.60	1.30	1.70	2.00

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-9): Ranks given by respondents to specific sub-criteria tested to determination of sub-criteria (pricing, absorption rate and new product development)\***

Explanation	Companies				
	A	B	C	D	E
Retail	1.40	1.50	1.20	1.50	1.60
Wholesale	1.20	1.30	1.10	1.20	1.20
Pricing structure	1.70	1.50	1.70	1.70	1.60
Costing structure	1.30	1.30	1.30	1.00	1.30
R & D	1.20	1.30	1.10	1.10	1.20
Promotional support	1.70	1.50	1.40	1.20	1.40

\*This table shows the average of the main ranking for the participants' responses within each company.

**Appendix 6: Results of pairwise comparison criteria, sub-criteria and specific sub-criteria (Cont.)**

**Table (8-10): Ranks obtained by respondents to sub-criteria tested with the respect to the main criteria in the next highest level to determination of the well-being organisation (benchmarking best practice)\***

Explanation	Companies				
	A	B	C	D	E
<b>1. Cost control</b>					
- Labour cost	1.70	1.70	1.70	1.30	1.90
- Material cost	1.60	1.40	1.10	1.70	1.40
- Overhead cost	2.40	2.20	2.30	2.60	2.60
<b>2. Quality control</b>					
- New technology	1.50	2.00	1.60	1.60	1.90
- Production redesigning	2.00	2.20	1.70	1.60	2.30
- R & D	2.30	1.60	2.30	1.80	1.40
<b>3. Maximise sales</b>					
- Marketing	1.20	1.80	1.30	2.10	1.60
- Advertising	2.60	2.20	2.60	2.10	2.60
- New product development <sup>(1)</sup>	2.00	1.40	2.00	1.10	1.50
<b>4. Market share</b>					
- Pricing	1.90	1.90	1.70	1.70	1.70
- Distribution	1.10	1.60	1.20	1.50	1.50
- New product <sup>(2)</sup> development	2.50	2.20	1.80	2.20	2.50

\*This table shows the average of the main ranking for the participants' responses within each company.

(1) This item is one of the sub-criteria for maximise sales.

(2) This item is one of the sub-criteria for market share.



**Table (8-11): Ranks given by respondents to specific sub-criteria tested with respect to sub-criteria (labour, material and overhead cost) in the highest level to determination of the well-being organisation\***

Explanation	Companies				
	A	B	C	D	E
Time	1.40	1.30	1.10	1.20	1.70
Payment	1.30	1.60	1.20	1.20	1.20
Amount used	1.30	1.60	1.10	1.50	1.40
Price	1.50	1.30	1.60	1.30	1.20
Absorption rate	1.40	1.60	1.30	1.50	1.30
Amount incurred	1.50	1.40	1.40	1.30	1.70

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-12): Ranks given by respondents to specific sub-criteria tested with respect to sub-criteria (new technology, R & D and production redesigning) in the highest level to determination of the well-being organisation\***

Explanation	Companies				
	A	B	C	D	E
Upgrading the machine	1.30	1.10	1.10	1.40	1.40
Replacing the machine	1.60	1.60	1.30	1.30	1.60
Retraining the employees	1.00	1.20	1.10	1.00	1.10
Recruiting new employees	1.90	1.80	1.50	1.70	1.90
Raw material	1.60	1.40	1.20	1.30	1.10
Product testing	1.30	1.20	1.50	1.10	1.90

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-13): Ranks given by respondents to specific sub-criteria tested with respect to sub-criteria (marketing, advertising and new product development) in the highest level to determination of the well-being organisation\***

Explanation	Companies				
	A	B	C	D	E
Selling price	1.20	1.30	1.40	1.80	1.10
Delivery	1.60	1.50	1.40	1.00	1.80
Resources	1.00	1.30	1.00	1.30	1.30
Media	2.00	1.60	2.00	1.30	1.70
R & D <sup>(1)</sup>	1.20	1.30	1.10	1.10	1.00
Personal	1.60	1.60	1.40	1.75	2.00

\*This table shows the average of the main ranking for the participants' responses within each company.

**Table (8-14): Ranks given by respondents to specific sub-criteria tested with respect to sub-criteria (pricing, absorption rate and new product development) in the highest level to determination of the well-being organisation\***

Explanation	Companies				
	A	B	C	D	E
Retail	1.40	1.40	1.20	1.50	1.60
Wholesale	1.20	1.30	1.10	1.20	1.20
Pricing structure	1.70	1.50	1.70	1.70	1.50
Costing structure	1.30	1.30	1.20	1.00	1.40
R & D <sup>(2)</sup>	1.20	1.20	1.10	1.20	1.20
Promotional support	1.70	1.60	1.40	1.30	1.40

\*This table shows the average of the main ranking for the participants' responses within each company.

## Appendix 7: A computational method for one subject from company A (The calculation of eigenvalue and normalized eigenvector)

This is an example to explain the calculation of eigenvalues and normalised vectors for one matrix. This calculation is followed by each respondent.

One subject paired comparison responses of the importance of benchmarking criteria (see figure 8-1 below).

**(Figure 8-1)**

<u>Criteria</u>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
[A] = C <sub>1</sub>	1.00	1.00	3.00	1.00
C <sub>2</sub>	1.00	1.00	3.00	1.00
C <sub>3</sub>	0.33	0.33	1.00	1.00
C <sub>4</sub>	1.00	1.00	1.00	1.00

The first is to synthesize respondents judgement to get an approximate estimate of the relative priorities of these criteria. To do so, we add the values in each column for matrix in figure (8-1). This gives the matrix shown in figure (8-2).

**(Figure 8-2)**

<u>Criteria</u>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
[A] = C <sub>1</sub>	1.00	1.00	3.00	1.00
C <sub>2</sub>	1.00	1.00	3.00	1.00
C <sub>3</sub>	0.33	0.33	1.00	1.00
C <sub>4</sub>	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>
Column Total	<u>3.33</u>	<u>3.33</u>	<u>8.00</u>	<u>4.00</u>

Then, we divide each entry in each column of matrix shown in figure 8-1 by total of that column to obtain the normalized matrix (see figure 8-3 below).

**(Figure 8-3)**

<u>Criteria</u>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
[A] = C <sub>1</sub>	1.00/3.33	1.00/3.33	3.00/8.00	1.00/4.00	.300	.300	.375	.250
C <sub>2</sub>	1.00/3.33	1.00/3.33	3.00/8.00	1.00/4.00	= .300	.300	.375	.250
C <sub>3</sub>	0.33/3.33	0.33/3.33	1.00/8.00	1.00/4.00	.099	.099	.125	.250
C <sub>4</sub>	1.00/3.33	1.00/3.33	1.00/8.00	1.00/4.00	.300	.300	.125	.250



From the normalized matrix mentioned above we average the rows by adding the values in each row of that matrix and dividing the rows by number of entries in each row.

$C_1$  average row sum (normalized eigenvector):  $(0.300+0.300+0.375+0.250)/4 = 0.31$

$C_2$  average row sum (normalized eigenvector):  $(0.300+0.300+0.375+0.250)/4 = 0.31$

$C_3$  average row sum (normalized eigenvector):  $(0.099+0.099+0.125+0.250)/4 = 0.14$

$C_4$  average row sum (normalized eigenvector):  $(0.300+0.300+0.125+0.250)/4 = 0.24$

After this, we obtain normalized eigenvector or the overall priority (see figure 8-4).

**(Figure 8-4)**

	<u>Criteria</u>	$C_1$	$C_2$	$C_3$	$C_4$	<u>Normalized Eigenvector</u>
[A] =	$C_1$	1.00	1.00	3.00	1.00	0.31
	$C_2$	1.00	1.00	3.00	1.00	0.31
	$C_3$	0.33	0.33	1.00	1.00	0.14
	$C_4$	1.00	1.00	1.00	1.00	0.24

From the above we can establish priorities to obtain Consistency Index (CI) and then to obtain Consistency Ratio (CR). This can be obtained by multiplying the first, second, third and fourth columns of the original matrix in figure (8-1) with the relative priority (normalized eigenvector) of 0.31, 0.31, 0.14 and 0.24 respectively (see figure 8-5).

**(Figure 8-5)**

	<u>Criteria</u>	$C_1$ (0.31)	$C_2$ (0.31)	$C_3$ (0.14)	$C_4$ (0.24)
[A] =	$C_1$	1.00	1.00	3.00	1.00
	$C_2$	1.00	1.00	3.00	1.00
	$C_3$	0.33	0.33	1.00	1.00
	$C_4$	1.00	1.00	1.00	1.00

Then, the total entries in the rows is shown in the figure (8-6).

**Figure (8-6)**

	<u>Criteria</u>	$C_1$	$C_2$	$C_3$	$C_4$	<u>Row Totals (priorities)</u>
[A] =	$C_1$	0.31	0.31	0.42	0.24	1.28
	$C_2$	0.31	0.31	0.42	0.24	1.28
	$C_3$	0.10	0.10	0.14	0.24	0.58
	$C_4$	0.31	0.31	0.14	0.24	1.00

Consequently, we take the column of raw totals (priorities) and divide each of its entries by the corresponding entry (normalized eigenvector) of figure 8-4 as it exhibits in figure 8-7 below.

**Figure (8-7)**

<u>Row Totals (priorities)</u>		<u>Normalized Eigenvector</u>		<u>Total value of <math>\lambda_{\max}</math></u>
1.28		0.31		4.13
1.28	÷	0.31	=	4.13
0.58		0.14		4.14
1.00		0.24		4.17

From figure 8-7 we can calculate the average of the three entries in the last column to obtain  $\lambda_{\max}$  (lambda max) as follows:

$$\lambda_{\max} = (4.13 + 4.13 + 4.14 + 4.17) \div 4 = 4.16$$

The value of  $\lambda_{\max}$  is a way to find consistency index as follows:

$$\begin{aligned} \text{Consistency Index (C.I.)} &= (\lambda_{\max} - n) \div (n - 1) \\ &= (4.14 - 4) \div (4 - 1) \\ &= 0.05 \end{aligned}$$

Then can find the Consistency Ratio as follows:

$$\begin{aligned} \text{Consistency Ratio (C.R.)} &= \text{C.I.} \div \text{Random Consistency Index}^{(1)} \\ &= 0.05 \div 0.89 \\ &= 0.052 (5\%) \end{aligned}$$

---

<sup>(1)</sup> The random consistency index (R.C.I.) as given by lee et al (2002) and Saaty (1995, p: 83) for different size of matrices as follows:

R.C.I. is zero for size of matrix one element.

R.C.I. is zero for size of matrix two elements.

R.C.I. is 0.52 for size of matrix three elements.

R.C.I. is 0.89 for size of matrix four elements.

R.C.I. is 1.11 for size of matrix five elements.

R.C.I. is 1.25 for size of matrix six elements.

R.C.I. is 1.35 for size of matrix seven elements.

R.C.I. is 1.40 for size of matrix eight elements.

R.C.I. is 1.45 for size of matrix nine elements.

R.C.I. is 1.49 for size of matrix ten elements.



This result is less than 10% which is considered to be a good consistency. In fact, the value of consistency ratio should be 10% or less. For example, the consistency ratio can be 5% for a 3 by 3 matrix, 9% for a 4 by 4 matrix and 10% for a large matrix (Saaty 1982 and 1995).