UNIVERSITI PUTRA MALAYSIA

CRITICAL SUCCESS FACTORS IN THE IMPLEMENTATION OF QUALITY SYSTEMS IN THE DISTRIBUTION SECTOR OF THE OIL INDUSTRY IN MALAYSIA

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In the name of God, Most Gracious, Most Merciful

Praise and Glory to Prophet Muhammad Peace be Upon Him.

Blessings are from Allah for guiding me throughout the period of my enquiry for knowledge. This work is dedicated to my daughter Azza bte Mohd Yusof who was born at 1146hrs, May 2nd 1989. My initial hand-written proposal was temporarily misplaced in her crib, No. 263, at Pantai Hospital that day.

I would like to thank UPM for giving me the opportunity to complete my school work. I would also like to thank my loved ones who have supported me throughout the duration of my school work. Special mention must be made of my supervisor, Associate Professor Dr. Zainal Abidin Mohammed and En. Ahmad Shokri Othman who have spent precious moments with me. Also I would like to express my sincere appreciation to Professor Dr. Mohd Ismail Ahmad, Professor Dr. V. Anantaraman and Associate Professor Dr. Rushami Zien Yusoff for all their guidance and encouragement.

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LIST OF ABBREVIATIONS

ANOVA	-	Analysis of Variance
CSF	-	Critical Success Factors
ISO	-	International Organisation for Standardisation
PCA	-	Principal Component Analysis
PROC GLM	-	Procedure General Linear Model
SAS	-	Statistical Analysis System
SIRIM	-	Standards and Industrial Research Institute of Malaysia

Abstract of dissertation presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirements for the degree of Doctor of Philosophy.

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August 1998

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The distribution sector of the oil industry in Malaysia, encompassing a sample of nine distribution worksites, was studied to investigate what the Critical Success Factors (CSFs) in the implementation of quality systems to ISO 9000 were. The data sought would be the CSFs and the leadership qualities that consistently determine the success of the implementation. One hundred and nine-three staff at nine locations were observed.

The study was carried out in two phases. The first phase was spent identifying the CSFs in the implementation of quality systems through readings and observation. The second phase was spent validating and testing the reliability of the hypothesis at eight distribution worksites.

Results of the baseline assessment were statistically analysed utilising the SAS software. Descriptive statistics were derived from the

observed data. The multivariate statistical procedures of principal component analysis (PCA) and factor analysis were adopted.

Through the PCA the identified seventeen leadership qualities [adapted from Jameson and Soule ('91)] were reduced to twelve. They were: ability to organise, resolution of complaints, leadership among peers, helpfulness, written ability, open-mindedness, respect/consideration for others, diplomacy and tact, situation handling, positive influence on others, respect from co-workers and dealing with issues.

The PCA also reduced the ten identified CSFs to five. They were: sense of urgency, sense of co-operation, team work, cohesiveness and participation consciousness.

Only factors with positive eigenvalues were considered because that would explain one hundred percent of the total variance in the data.

To recapitulate, the hypothesis for the research is that the successful implementation of quality systems is a function of the degree of existence of these CSFs and of the leadership qualities of the worksite managers. The CSFs and leadership qualities were, therefore, valid because certification was awarded to each distribution worksite each time identified gaps from the baseline assessments at each site (against the CSFs and leadership qualities) were remedied.

Abstrak disertasi yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah.

FAKTOR KEJAYAAN KRITIKAL DI DALAM MELAKSANAKAN SISTEM KUALITI DI SEKTOR PENGEDARAN INDUSTRI MINYAK DI MALAYSIA

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Sektor pengedaran industri minyak di Malaysia, yang merangkumi sembilan kawasan pengedaran contoh telah dikaji bagi menyelideki apakah faktor kejayaan kritikal (CSF) di dalam melaksanakan sistem kualiti ISO 9000. Data yang dicari ialah CSF dan kualiti kepimpinan yang secara konsisten menentukan kejayaan perlaksanaan. Pemerhatian telah dibuat ke atas seratus sembilan puluh tiga kakitangan di sembilan buah lokasi.

Kajian dijalankan dalam dua fasa. Fasa yang pertama melibatkan kerja mengenalpasti CSF di dalam melaksanakan sistem kualiti menerusi catatan dan pemerhatian. Fasa kedua melibatkan kerja mengesah dan menguji keboleh harapan hipotesis tersebut di lapan logi pengedaran.

Satu penganalisisan statistik telah dijalankan terhadap keputusan taksiran asas dengan mengikuti perisian SAS. Statistik perihalan telah diperloehi daripada data yang diperhatikan. Prosedur statistik

Penganalisisan Komponen Utama (PCA) yang bersifat multivariat dan penganalisisan faktor telah digunakan. Menerusi PCA tujuh belas kualiti kepimpinan yang di kenal pasti [diadaptasi dari Jameson dan Soule (91)] telah dikurangkan menjadi dua belas. Ia terdiri daripada: keupayaan mengelola, menyelesaikan aduan, kepimpinan di kalangan rakan sekerja, sikap tolong menolong, keupayaan menulis, sikap fikiran terbuka, sikap menghormati/pertimbangan terhadap orang lain, sikap diplomasi dan bijaksana menyelesaikan masalah tanpa meyinggung, bijaksana mengendalikan situasi, mempengaruhi orang lain secara positif, dihormati dan disegani oleh rakan sekerja dan bijaksana mengedalikan sebarang isu.

PCA juga telah mengurangkan sepuluh CSF yang dikenalpasti menjadi lima, iaitu: meyedari hakikat segera, mengamalkan sikap bekerjasama, bekerja dalam kumpulan/pasukandan meyedari betapa pentingnya perpaduan dan penglibatan.

Hanya faktor-faktor yang mempunyai nilai eigen yang positif telah dipertimbangkan kerana ia akan menerangkan seratus peratus data yang terkandung.

Sebagai rumusan, hipotesis bagi penyelidikan menunjukkan bahawa kejayaan perlaksanaan sistem kualiti adalah fungsi darjah kewujudan segala CSF dan Kualiti Kepimpinan pengurus-pengurus kawasan. Oleh itu, CSF dan kualiti kepimpinan adalah faktor yang sah kerana pensijilan telah diberikan kepada setiap kawasan pengedaran setiap kali pembetulan dilakukan terhadap sebarang jurang perbezaan yang dikenalpasti berdasarkan taksiran asas di setiap kawasan (berbanding dengan CSF dan Kualiti Kepimpinan).

CHAPTER I

INTRODUCTION AND DEFINITION OF RESEARCH

Introduction

The research intends to study the implementation of quality management systems based on the ISO 9000 Quality Management Series (International Organisation for Standardisation, 1994).

Setting up a quality system is one way of streamlining the business process (Oakland, 1989). Embedded within a quality system is the concept of continuous improvement (Juran, 1988). To continually improve the business is a race without a finishing line (Schmidt, 1992).

> "You need to investigate when you have no idea to what is going on. The mind can see only what it is prepared to see."
>
> (de Bono, 1991)

The need to investigate as stated in the quotation means there is a need for an in-depth look at how to make things happen (Warren, 1966) or how to get things implemented. This can be done through literature reviews, reading and/or observations.

This research intends to look at the implementation of ISO 9000 Quality Systems through an in-depth study of the distribution sector of the oil industry in Malaysia.

The ISO 9000 Quality Assurance Systems and the Sistem Akredatasi Makmal Malaysia were initiated in the Shell Malaysia Oil Products sector in October 1989 and a masterplan was prepared. The term of reference of the ISO 9000 Masterplan was to obtained ISO 9002 and the Sistem Akreditasi Makmal Malaysia certification for the core downstream business - distribution worksites, refineries, testing laboratories, petrol stations and selected head office departments.

Research on corporate planning in industrialised countries has been widely documented. However, research on corporate planning in developing countries is limited, especially research on Malaysia. Corporate planning in Malaysia is, therefore, "insubstantial" and "unknown" in the sense that there is an absence of documented proof of its practice (Mohammed, 1988).

It is this lack of documentation and the requirement to execute the masterplan (and in the process trying to get things done in a simple, fast and implementable manner) that prompted this research.

Research Focus

The title of the research is "CRITICAL SUCCESS FACTORS IN THE IMPLEMENTATION OF QUALITY SYSTEMS IN THE DISTRIBUTION SECTOR OF THE OIL INDUSTRY IN MALAYSIA". The underlined words indicate the focus of the research. These are briefly described below, and detailed discussions will be carried out in the appropriate and subsequent chapters in the text.

Critical Success Factors

This research is intended to specifically find out the high value patterns or Critical Success Factors that could lead to the smooth implementation of a Quality System (based on the ISO 9000 series) which is, in fact, the design of a management system that will enable a business to efficiently provide its product to its customers - its *raison d'être* (Simon, 1985).

The process of identifying the Critical Success Factors (CSFs) utilises the concept of finding the strategic window - the ability to decide where to concentrate scarce resources in the present for future gain. This concept is akin to Euclid's complexity compression. Chester Bernard arrived at a very similar conclusion that, no matter how complex a managerial problem, it is usually possible to identify a small number of strategic variables which determine the essential shape of the solution (Ansoff, 1979).

However, according to Pankaj Ghemawat of the Harvard Business School, commitment is the solitary contributor and sustainer of actions. "The success factors approach lacks generality because it implicitly assumes that success factors are under- valued". (Ghemawat, 1991)

Implementation

As far as this research is concerned, the term "implementation" is part of Strategic Quality Management (Steiner, 1982). This is an area of management that was developed in the early sixties. In the late eighties and

early nineties, "quality" was added to it (Quinn, 1988). The research, however, is confined only to the systems and process aspects of Strategic Quality Management.

Success in the implementation of quality systems will be measured by the Standards and Industrial Research Institute of Malaysia (SIRIM) awarding a company the quality system certification.

Quality systems

As defined in the International Standards Quality Management and Quality Assurance Vocabulary (ISO 8402).

> "Quality Systems are organizational structure responsibilities, procedures, processes and resources needed to implement quality management. Quality management is all activities of the overall management function that determine the quality policy, objectives and responsibilities and implement them by means such as quality planning, quality control and quality improvement within the quality system".

Distribution Sector of the Oil Industry

The distribution sector of the oil industry basically consists of storage facilities for refined hydrocarbons, such as diesel and motor gasoline. The key processes in the distribution sector of the oil industry consists of receiving refined hydrocarbons from the oil refineries, storing and selling them to customers.

This sector falls in the category of mature industries, and both its products and its technology are deemed more stable. Innovations are more likely to centre around cost savings and improving performance thus,

encouraging creative effort in manufacturing efficiencies and work methods (Moss Kanter, 1985). Commitment to new people, environmentally sensitive plant designs and modification of older facilities is a norm, and cost savings through innovation in manufacturing is a part of its competitive advantage. Because of this, the setting up of quality systems in this sector of the economy shall assist in providing a structured framework for continuous improvement. The rationale for the selection is explained in Chapter Three.

Malaysia

There is a full chapter on Malaysia vis-à-vis quality assurance and government objectives as well as the role of the Standards and Industrial Research Institute of Malaysia (SIRIM) in the practice and "promotion" of Quality Standards and Assurance Systems. Malaysia is also actively pursuing and rapidly approaching industrialisation. The concept of Quality - doing it right the first time, understanding customers' requirements and commitment towards work and family - is being placed in the forefront.

Exploratory and Conclusive Study

This details the methodology of the research. While more explanation will be offered on the research methodology, such a technique is felt to be the most appropriate for an area of study that is still unclear and under-reported and documented (Kinnear, 1991). Nevertheless, it is an area of study that is recognised as important in the business world.

The study will also take a look at the reaction of employees who have to implement a new management system over and above the demands of their normal work environment.

Objectives of the Research

The overall objective of the research is to investigate what the critical success factors (CSFs) are in the implementation of quality systems in the distribution sector of the oil industry in Malaysia.

The human element is the prime mover in the successful implementation of the quality system. According to Schein (1980), the human element is the Achilles Heel of strategy formulation and implementation. Henceforth the identification of the human element or "CSFs" will be the focus of the research.

The area of interest in the research will be in determining how much human resistance will be encountered, and why and how it will be overcome. This interest will be looked at from the concept of defensive routine. Defensive routines are defined as actions that are designed to reduce the individual or organisational pain. When used effectively, these actions prevent correcting the causes of pain. Defensive routines also reduce pain and simultaneously inhibit learning. They block out the process of meaningful change (Argyris, 1993).

The research will attempt to identify and rank the CSFs in accordance to its contribution to facilitating the process of implementing the

ISO 9000 Quality Systems. The research will also attempt to find the gaps that exist and hinder the successful implementation of quality systems, and take the appropriate corrective action to facilitate such an implementation (Lawrence, 1967).

Justification of the Research

Findings from the parameters of the research will add to the knowledge and understanding of the subject, especially with regard to its application in Malaysia. As Malaysia actively pursues an industrialisation programme, producing quality, made-in-Malaysia goods is one of the many goals the government has set for itself.

At this vital stage of the country's development, there is a need to find the best possible means to set in place quality systems in the manufacturing and service environment that will enable Malaysia to remain a cost-effective and innovative competitor in the world.

The findings of this research should be valuable to :

a) Quality systems or management practitioners who are trying to apply such tools in their respective organisations as the literature indicates that there are several components that need to be looked into;

b) Managerial staff in general as the study will provide information in relation to its application and this will enable the appreciation of problems that are being faced by management;

c) Senior managers as the research will provide a variation in the usual management practice as there is no single right way of implementing the quality systems;

d) Academicians and students especially in Malaysia as it will add a new source of local reference on the local situation;

e) Multinationals as a way of understanding of such practices by Malaysians. The study may be advantageous to them when running operations in the country; and

f) Government administrators and politicians since the study will highlight some of the factors that could smoothen the implementation process in dealing with parallel or similar activities within the government structure.

Layout of the Thesis

The thesis is made up of a total of five chapters as listed below.

Chapter 1 describes the background and sets the foundation for the research undertaking.

Chapter 2 reviews the related literature on the state of affairs of quality assurance in Malaysia, the strategic management process and implementation models.

Chapter 3 describes the research methodology and design. The research will be conducted in two phases.

a) The first phase of the research will be exploratory.

b) The second phase of the research will be spent validating and testing the reliability of the data that will be collected and recorded on the observation forms.

Chapter 4 will describe the first and second phase findings.

Chapter 5 will describe the findings and conclusion of the research.

Limitations of the Study

The study is limited to nine distribution worksites and 193 staff. It is also limited by the strategic and implementation models being considered. Therefore, the critical success factors identified, if needed to be applied in other situations, have to be viewed cautiously as the organisational environments differ.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

This chapter is divided into three sections. Section one describes the status of quality management in Malaysia. Section two describes the literature review on the strategic management process and implementation models. Section three describes the literature review on the research methodology.

State of Affairs of Quality Management and Quality Assurance in Malaysia

The aim here is to understand government initiatives in industrial standardisation and total quality management, and the level of understanding of quality management and quality assurance in the country. Recognising the advantages of promoting quality consciousness in the country, the Malaysian Cabinet had, in October 1991, approved a paper entitled "Strategies to Improve Quality through Standards and Certified Products", as part of its efforts to lead the nation towards industrialisation, in line with its Vision 2020 policy.