A FRAMEWORK FOR TOTAL QUALITY CULTURE DEVELOPMENT

by

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ABSTRACT

The development of a culture that complements the principles and practices associated with Total Quality Management (TQM) is a problem experienced by many organisations. This research set out to provide a clearer understanding of the issues concerned with cultural development and set out a framework to assist culture change.

A literature review identified the vital role culture plays in the overall TQM operations of organisations. It was also suggested that the concept of culture was not fully understood primarily because of its non-technocratic nature. Elements of quality culture were identified, from TQM literature, as senior management leadership, employee involvement and empowerment, customer focus, supplier partnership, teamwork, effect of chief executive and an open corporate culture.

Factors which may influence culture change were identified from behavioural sciences, organisational theory and total quality literature. These factors were classified into five groups of 'change agents' - motivation, reward, organisational policy and values, environment and organisational structure. The research methodology was designed to evaluate the effects of the change agents on the identified quality culture elements. The research methodology consisted of a postal questionnaire survey of 166 companies and structured interviews at 21 companies at various levels of quality culture development. The structured interviews served to both validate questionnaire findings and to elicit in-depth information on cultural change.

Results from the questionnaire survey and the structured interviews formed the basis for the development of the quality culture framework. The framework known as the Objective-Agent-Task (OAT) Framework is a three-tier structure that presents the important change agents and operational activities associated with successful cultural change. A self-assessment document to assist in the administration of the framework is also provided.

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CHAPTER 1 - INTRODUCTION

1.1 The Need for Research

A growing number of organisations world-wide are adopting and implementing Total Quality Management systems in their daily operations. Bergman & Klefsjo argued quality is a requirement for successful competition in contemporary global market, [Bergman & Klefsjo, 1994]. The changing scope of quality was captured by Dean & Evans who stated that quality in the twentieth century has developed from 'traditional' focus on control and inspection activities to one that integrates all aspects of business, [Dean & Evans, 1994]. Since the implementation of Total Quality Management is generally regarded as vital to the survival of modern organisations, [Cullen & Hollingum, 1987] [Juran, 1985] considerable literature has been devoted to methods, tools and procedures for the implementation of effective quality systems.

Many quality practitioners including Juran & Gryna and Dean & Evans have noted that in recent times, there has been an increasing recognition and acceptance of the importance of the culture of an organisation in sustaining any quality effort [Juran & Gryna, 1986] [Dean & Evans, 1994]. However available literature is unable to give a comprehensive insight into how to go about developing this critical culture. Reasons for this might not be unconnected with an observation by Atkinson that culture has a rather 'vague' and non-technical nature [Atkinson, 1990]. Dean & Evans stated that quality practitioners and many companies implementing Total Quality (TQ) agree that there is a gap to be filled in the development of the appropriate culture for quality [Dean & Evans, 1994]. There is a need to research present and desired approaches to culture development and create a framework to assist in the attainment and sustenance of the much postulated TQ culture. This view is supported by organisational theorists and [Williams et al, 1993] wrote,

'Despite the growing awareness of cultural issues, comparatively little attention has been paid to the practical, day-to-day processes involved in creating, managing and changing organisational culture'.

The need for research into the development of a 'Quality Culture' is as follows:

- Companies implementing TQ are generally unaware of what constitutes and affects the culture inherent in their organisations. This is the first issue to be tackled if there is any conviction as regards the vital role of culture;
- there is a marked difference in the amount of literature available on the cultural development aspect of TQ in comparison to other aspects;
- many organisations, especially new and potential subscribers to TQ are unaware of the importance of culture and how the absence of an appropriate culture could compromise their quality efforts;
- there is not only a need to let interested organisations know the elements of culture they should ideally develop, but they also need to be given guidelines on how to create culture change. To date, this latter issue has not been researched qualitatively or quantitatively;
- many organisations that are experiencing or have experienced problems with their quality efforts are unaware that such problems may be of a cultural nature;
- it is vital to know the culture that presently exists an organisation. It is not enough to describe where we want to be. We need to know where we are before we can decide how to move ahead.

1.2 Why Culture?

After the Second World War, the Japanese experienced many quality problems during the efforts to revive their industries. They were however, very susceptible to quality control and improvement ideas from the west [Bergman & Klefsjo, 1994]. An important reason for the great successes of many Japanese companies is the strategic role quality has played. Cullen & Hollingum noted that the Japanese adopted the

principles of TQ with a thoroughness which strongly contributed to their success in world markets [Cullen & Hollingum, 1987].

During the late 1970s and early 1980s, many businesses in the West lost significant market share to other global competitors, Japan in particular. The consequence of the market imbalance as noted by Dean & Evans is that the West began to realise the importance of quality and many major companies embarked on extensive quality improvement campaigns [Dean & Evans, 1994]. Lots of quality improvement tools and techniques were available for organisations to implement. Research by Mann into quality implementation noted that large numbers of consultancies offered implementation methods varying from Deming, Crosby and Juran approaches to their own tailored and proprietary approaches [Mann, 1992]. Quality awards such as the Malcolm Baldrige Award[1987] in the U.S. and the European Quality Award[1992] were established and became an important focus for quality conscious organisations. It was not only fashionable but also extremely vital for organisations to be registered to standards including the globally accepted ISO 9000 series. The sudden influx of quality tools and techniques led to quick and readily noticeable improvement in the overall quality performance of the participating organisations. Smith et al and Atkinson argue that success however, did not last in spite of all the money time and effort that was invested [Smith et al, 1993] [Atkinson, 1990]. In a study by McKinsey, [The Economist, 1992] two-thirds of the quality programmes that had been in place for more than two years came to a halt because of their failure to produce the hoped-for result. In another survey by Kearney, [The Economist, 1992] only a fifth of the 100 British firms surveyed believed that their quality programmes had achieved tangible results. The significant decrease in quality progress left many companies bewildered and in some cases resulted in the abandonment of the quality program. The affected organisations noticed they had implemented the same tools and systems that resulted in steady progress for their more quality successful counterparts but the results were not the same.

Further investigation of the situation revealed that the problems had not to do with tools and systems but with people. The attitudes and values of the people in the

organisation had not been altered. Cullen & Hollingum believed that it was not enough to bring in new technologies without attempting to change the values of the people expected to operate the new technologies [Cullen & Hollingum, 1987]. People naturally tended to resist change. Only then did quality practitioners realise that for any quality program to be successful, the culture in the organisation had to change [Atkinson, 1990] [Juran & Gryna, 1986] [Dean & Evans, 1994]. But the important question was how to change culture. There were no ready-made packages to change the attitudes of people or the way they work. Culture differs from organisation to organisation and as stated by Dean & Evans, each organisation must examine its peculiar culture and decide what needs to change [Dean & Evans, 1994]. In attempting to examine ways of changing work culture, it will be necessary to examine human behaviour. This however goes beyond attitude change. Williams et al [1993] wrote:

'If we wish to link cultural change to a change in behaviour it is insufficient to change employee attitudes or values. One also needs to address aspects of the social and technical systems that impinge upon behaviour.'

Thus it is vital to also consider the effects of organisational theory on culture change. The relationship between these subjects would be vital in developing guidelines to assist organisations willing to embark on cultural change that complements quality improvement. Until now such an appropriate or relevant framework has been unavailable.

1.3 Research Aim and Objectives

Aim: The aim of this research is to develop a framework for quality culture development. The framework would link quality culture development and appropriate change agents.

Objectives: The objectives in support of this aim are:

1. to model existing culture - representative of current development and practices;

2. to identify the elements of TQ culture - representative of desired development and practices;
3. evaluation of culture change agents - which should serve as the link between current and desired development and practices.

The hypothesis to be tested in this research is that a quality culture framework can be developed to incorporate organisational activities, required quality culture and culture change agents. Organisational activities represent basic day to day activities that are carried out in companies.

1.4 Research Benefits

The study will be of benefit to the following:

- **Industry:** TQ practising and TQ interested organisations will have a clearer understanding of culture problems. TQ failed organisations will have an idea of where they may have gone wrong;
- **Academia:** The relationship between quality culture and organisational activities would be understood. In addition, the relatively unexplored field of quality culture can be viewed from a new perspective;
- **Quality consultants:** Information from the study will be useful when attending to organisations experiencing culture problems as well as those intending to implement TQM.

1.5 Method of Research

The selection of methodology was made based on the nature of the research and the results of the literature search. Factors considered were the volume and depth of information to be collected as well as available resources and the geographical spread over which data was to be generated. Methodologies of recent and current research in similar fields also contributed to the selection of the methodology for the research. It was decided that data would be collected from respondents in two stages. The first

stage involves the use of postal questionnaire while the second involved both company visit and personal interview.

1.5.1 Questionnaire Method

The purpose of the postal questionnaire was to obtain information about the level of quality development and the use of certain activities by the respondent organisations. Advantages of this method of data collection as identified by Nachmias & Nachmias [1992] include:

- *Cost.* The postal questionnaire only entails the cost of planning, sampling, duplicating, mailing and providing self-addressed envelopes for the responses;
- *Reduction in biasing error.* The postal questionnaire reduces the chances of biasing error that are likely to occur as a result of personal characteristics and variability in skills of interviewers;
- *Anonymity.* Postal questionnaires give an assurance of anonymity;
- *Consultation.* Respondents have the flexibility and time to consult documents or other people before answering questions to which they do not have ready responses or that involves issues that are outside their functional involvement;
- *Accessibility.* Wide geographical contact can be achieved in reasonable time and with minimal constraint to both parties.

Potential shortcomings of the postal questionnaire are:

- *Simplicity.* Questions must be simple and straightforward enough to be understood solely on the basis of printed instructions;
- *Probing.* The method does not give the opportunity to probe beyond the given answer or clarify ambiguous answers and unreplied questions;
- *Lack of control.* There is no assurance that the appropriate person completes the questionnaire;
- *Response rate.* Questionnaires tend to have significantly low rates of response in comparison with other methods;

- *Reliability.* There is a possibility that respondents will not give information which reflect their situation under ordinary settings.

1.5.2 Personal Interview

For this research, the personal interview was used to complement the questionnaire. It was intended to obtain information on issues identified in the literature review as well as validate questionnaire findings. It also gives the opportunity for respondents to state other issues or observations that might be related to the study. Advantages of the personal interview as identified by Nachmias & Nachmias [1992] and Williamson et al [1977] are:

- *Flexibility.* There is greater flexibility in the questioning process and unclear terms can immediately be clarified;
- *Control.* There is greater control over the interviewing situation and the sequence in which issues are addressed;
- *High response rate.* Response rates from personal interviews are significantly higher than for postal questionnaires;
- *Supplementary information.* Supplementary information about the respondent organisation can be easily collected

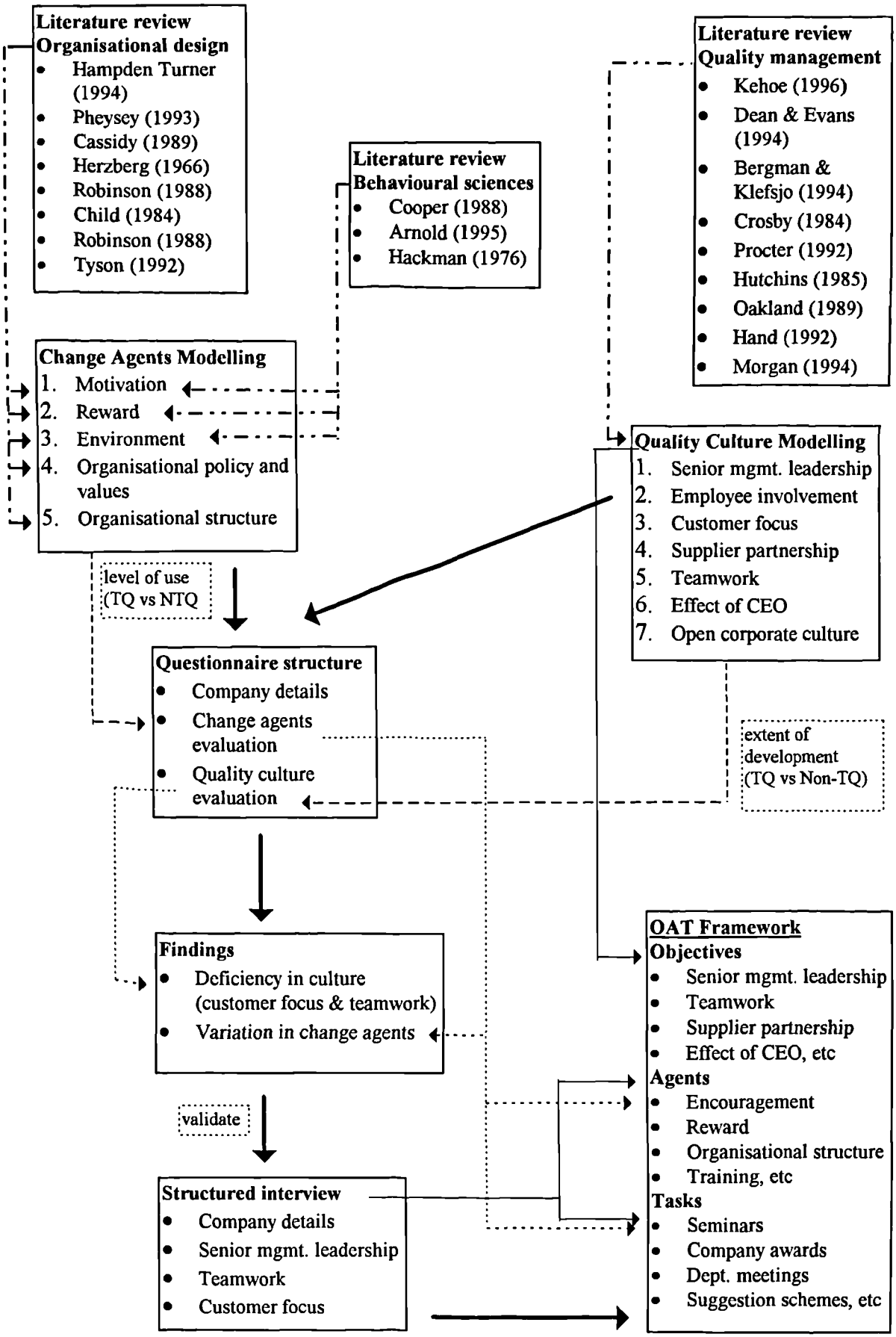
Disadvantages noted with the personal interview method are highlighted below:

- *Interviewer bias.* The physical presence of an interviewer can create bias;
- *Cost.* The cost of gathering information by this method is significantly higher than alternative methods;
- *Anonymity.* The interview lacks the anonymity of the postal questionnaire.

1.5.3 Research Methodology Framework

Fig 1.1 shows the research methodology framework. Individual elements of this framework are as follows:

Figure 1.1 Research Methodology



Literature Review

Literature review was the starting point of the research. This facilitated an understanding of the concept of Total Quality Management and an evaluation of the present state of quality perception in industry. It also allowed for a review of recent research in TQM.

Various research hypotheses were developed and considered. It was however apparent from literature that quality culture was a major problem in TQM implementation and practice. It was an important but largely unexplored area. There was a pressing need to develop a quality culture framework. The proposed framework would identify and integrate all relevant aspects of quality culture, organisational activity and current industrial approaches. Such a framework to assist organisations develop a culture that would complement TQM was not found in literature. This then led to the next stage of the research which was the design of the research programme. Literature study was however continuous throughout the research period.

Questionnaire

Pilot and Survey 1

The proposed questionnaire was first discussed with members of the academia and research colleagues and later sent to personal contacts in industry. They were requested to indicate details of questions they found unclear or ambiguous. They were also to note the amount of time it took to complete the questionnaire. Furthermore, they were to suggest whom they felt would be in the best position to complete the questionnaire in addition to any other observation or suggestion that may be beneficial to the researcher.

Following the discussions, some amendments were made to the questionnaire contents. The revised questionnaire was then sent out on a pilot survey. The aims of the pilot survey were:

- to test the ability of the questionnaire to collect information that would be relevant to and indeed fulfil the research hypothesis;
- to have an idea of the response rate to be expected;
- to determine which of the three groups of addressees was most likely to complete the questionnaire;
- to build a 'start-up' database for the research programme;
- to act as an extensive pilot survey for subsequent information gathering;
- to give an indication of how the findings were to be analysed.

Results from pilot survey indicated the need to make some modifications to the questionnaire and the desirability of expanding the questionnaire to elicit even more information. The expansion was carried out after more literature study and discussion with the research supervisor. The modified version of the questionnaire was then sent out on an extensive industrial survey (survey 1) which was to be the major data collection process. The design, administering and results of survey 1 are discussed in Chapters 3 and 5.

Survey 2

The results from survey 1 indicated that there was no need for further amendments to the questionnaire. The questionnaire was then sent to a wider range of companies in survey 2.

Personal interview

The structured interview was designed based on findings from the postal questionnaire. The interviewees were selected from respondents to the postal questionnaire. Most of the companies were selected based on their level of quality culture development and a few were selected at random. The interviewees were contacted and their support was solicited before interview arrangements were made.

1.6 Structure of the Thesis

The literature review is covered in Chapter 2. It gives a general literature review on TQM before focusing on Quality culture literature. The chapter also examines culture change agents which were primarily derived from behavioural sciences and organisational theory literature. Chapter 3 describes the planning and design of the postal questionnaire while Chapter 4 describes the design of the structured interviews. Results from the questionnaire survey and structured interviews are presented in Chapters 5 and 6 respectively. These results are discussed in Chapter 7. The OAT Quality Culture Framework is presented in Chapter 8 and Chapter 9 concludes the thesis.

1.7 Summary

In this chapter the need for research has been identified as promotion of the awareness of quality culture, its importance and associated problems. There is also a need to provide guidelines for cultural change. To achieve this, existing culture will be modelled and required quality culture and culture change agents will be identified. The culture change agents will serve as the link between current and desired culture. The research methodology consists of the use of a postal questionnaire survey and structured interviews.

CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

A review of literature was undertaken and is presented in this chapter. The literature is divided into three parts:

1. General literature review (Section 2.2) - a review of general Quality literature and a discussion of the culture problem;
2. Quality Culture (Section 2.3) - focuses on culture identified as vital to TQ implementation;
3. Culture change (Section 2.4) - focuses on the mechanisms for addressing a change of culture.

2.2 General Literature Review

A review of general literature was undertaken to determine the:

- quality and TQM history;
- nature of TQM;
- significance of culture;
- modelling of culture.

2.2.1 Quality

The definitions and historical development of Quality will be discussed here. Bergman & Klefsjo [1994] noted that although it is commonly agreed that quality is an important means of competition in world markets, there are many definitions of the word and some are not very complete.

Definition

Denyer [1992] contends that quality can be analysed from three entirely different points of view:

- Aesthetic quality - compliance to need;
- Functional quality - compliance to need;
- Durability - compliance to expectation.

These different perspectives make an absolute definition somewhat difficult as different quality practitioners, customers and industrialists will favour definitions based on their own view or perceived as relevant to their market. Additional views from which some people view quality include serviceability, reliability, features, perceived or comparative quality.

Some of the common definitions of quality are:

- "Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs" [ISO 9000 and ISO 8402,1986];
- "fitness for use" [Juran,1979];
- "conformance to requirements" [Crosby,1979];
- "the losses of society caused by the product after its delivery" [Taguchi,1979];
- "The quality of a product is its ability to satisfy the needs and expectations of the customers" [Bergman & Klefsjo,1994];
- "Quality is meeting or exceeding customers expectations" [Dean & Evans,1994];
- "an effective system for integrating quality improvement efforts of the various groups of the organisation, so as to provide products and services at levels which will allow customer satisfaction" [Feigenbaum,1983];
- "delighting the customer by consistently meeting and continuously improving on his requirements" [Hand,1992];

- "Quality is a predictable degree of uniformity and dependability, at low cost and suited to the market" [Deming].

History

Over the years, there have been transformations in the application of quality. Concepts that have been used include Quality control, Quality assurance, Total Quality Control and the contemporary Total Quality Management. Fortuna [1992] stated that although quality gained prominence in the west during the 1980's, the concept had existed long before that time. Flood [1993] saw quality as being a pressing issue during the first world war. This led to the formation of the Technical Inspection Association in 1919. In the USA Harold F. Dodge (1893-1976) initiated the concept of statistical acceptance sampling in the 1920's while working at Bell Laboratories. His colleague H.G. Romig (1900-1989) continued with this work. The British Standards Institute published their first standard on quality control in the 1930's. However, the Second World War destabilised industry - although statistics and operations research grew in this period, priority was given to meeting delivery dates at the expense of standards in the product [Flood, 1993].

The first post-war quality initiative was from the Japanese. It was introduced in the form of statistical quality control (SQC) in the period 1946 to 1950 [Ishikawa, 1985]. Dr W. E. Deming is credited with the export of the quality concept to Japan. The years 1951-4 saw a further development of SQC and the establishment of the Deming Prize in 1951. In 1954, Juran introduced the concept of Company Wide Quality Control to the Japanese and 1962 saw the introduction of Quality Circles [Hutchins, 1985]. Over the years Quality Control and the quality of products made progress in Japan.

Although the Japanese are credited with success in quality control, the concept started in the West. Hutchins notes that the concept of Company Wide Quality Control was developed in the U.S.A. but never introduced. The need for large-scale industrialisation at the turn of the century led to the development of semi-automatic machines and the need for greater supervision and monitoring. This form of inspection

later developed into Statistical Quality Control. Shewhart is credited with the development of statistically-based process control charts.

In the West, developments in quality during the Second World War were taken up by the industries after the war and most manufacturers believed Quality control was an inspection activity which increased overhead. Hutchins [1985] stated that during the 1950's and 1960's:

'the majority of firms concentrated on productivity and almost completely ignored their obligations to quality and reliability'.

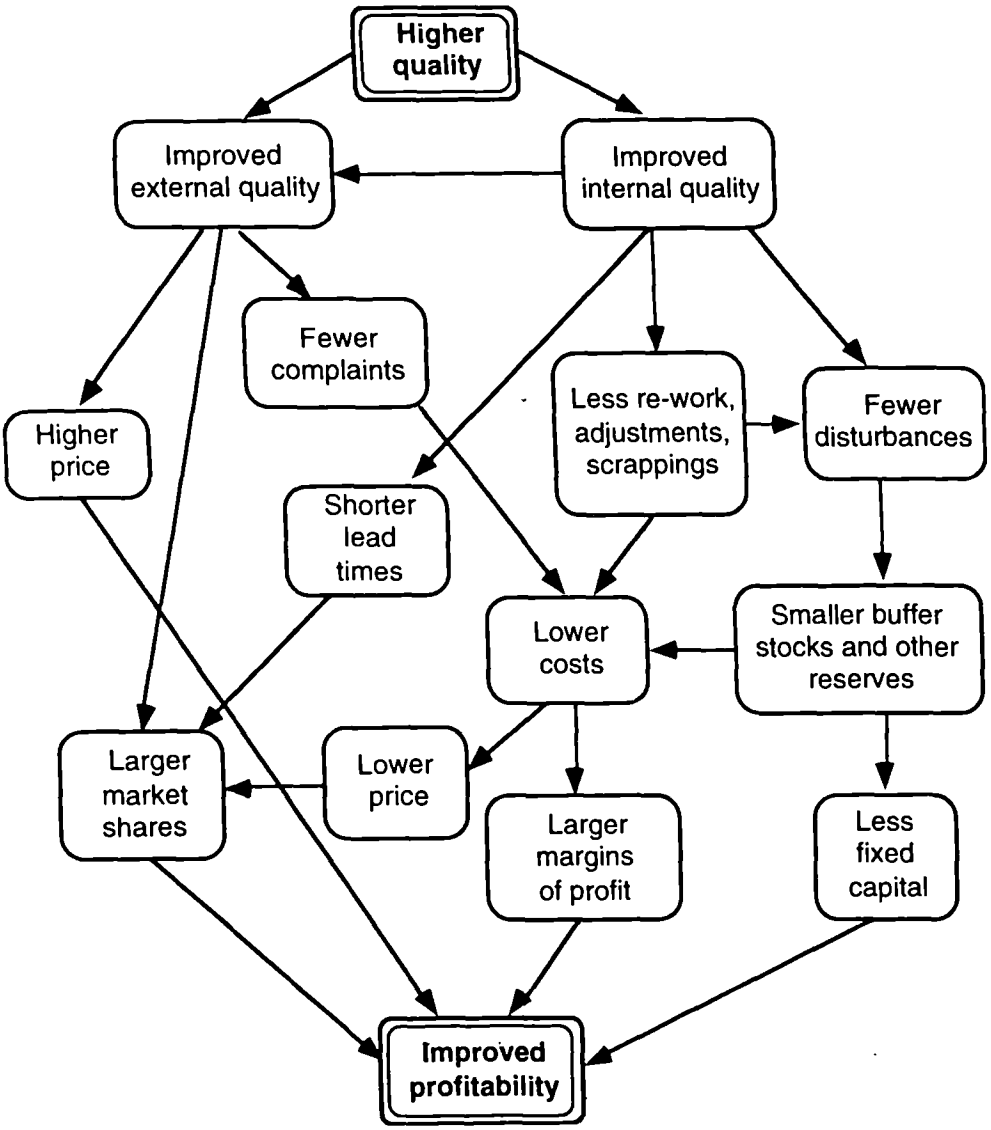
The Japanese quality revolution enabled them to dominate World trade and the late 1970's and early 1980's saw many western businesses lose their market share [Dean & Evans, 1994]. Western companies began to focus on quality in the 80's and many embarked on quality improvement programs [Dean & Evans, 1994] [Flood, 1993]. In the US, the Malcolm Baldrige Award was established in 1987 and the European Foundation for Quality Management (EFQM) established the European Quality Award (EQA) in 1992.

The International Standards known as the ISO 9000 series was introduced in the 1980's although some of the earlier published standards include the 'Defence Standards' in 1972. These earlier standards dictating quality control system requirements for industry were based on NATO quality requirements specification. The 1990's have seen Total Quality Management (TQM) become a widely accepted management philosophy. Dean & Evans [1994] stressed that quality in the 1990's has evolved from a narrow focus on control to one that involves all aspects of business enterprise.

Importance of Quality

The importance of quality for the development of companies cannot be over-emphasised. Figure 2.1 shows the relationship between improved quality and

Fig 2.1 Relationship between improved quality and profitability (Bergman, 1994)



profitability. Flood [1993] and Coleman [1992] contended that Japan's success is evidence of the direct link between quality and the viability of organisations while Dean & Evans [1994] argued that quality is a requirement for successful competition in the global market. Feigenbaum [1987] referred to a survey in which customers indicated that quality is becoming more important. Bergman & Klefsjo [1994] noted that the PIMS (Profit Impact of Market Strategy - created by General Electric as guidance to company reconstruction) database supports a statement that customers are prepared to pay more for a product of higher quality than the costs of achieving this higher quality. A survey by Devlin & Partners and reported by Ploman [1992] indicated that many companies had responded to the threat of low competitiveness by initiating quality improvement programmes. This result can be seen to support Deming's prediction that there will be only two types of companies in the future - those that embrace quality and those that are out of business [Cullen & Hollingum, 1987].

Flood [1993] stated that TQM is the key to success. The EFQM [1992] stated that:

"In the 1980's companies began to realise that their only way of surviving in business was to pay much greater attention to quality".

The department of Trade and Industry in 1986 stated that:

"It is becoming widely accepted that quality is a crucial factor, affecting the profitability of all manufacturing and service industries".

Peters & Waterman [1982] asserted that several studies have shown that quality has tremendous strategic importance to a firm. Quality was seen as being as relevant to service industry as it is to the manufacturing industry [Hand, 1992] [Cullen & Hollingum, 1987]. Morgan and Murgatroyd [1994] examined the importance of quality to the public sector while Zain [1993] stated that TQM is regarded as important in the construction industry.

Juran [1951] proposed the concept of the cost of quality (COQ), the costs incurred because of poor quality. Fortuna [1992] stated that COQ allows for the isolation of costs that are typically buried in cost accounting practices. COQ is typically divided into four categories:

- internal failures - cost of things gone wrong before reaching the customer;
- external failures - cost due to problems detected after reaching the customer;
- appraisal costs - costs for formal evaluation of quality and for determining and maintaining the degree of conformance required by company standards;
- prevention costs - the costs incurred for activities undertaken to reduce failure and appraisal costs and to ensure first-time quality.

Fortuna [1992] argued that COQ is an effective way of communicating quality in financial terms to senior management. It is also very useful in planning as well as assessing progress made in quality.

2.2.2 Total Quality Management (TQM)

Literature available on TQM is extensive. Although this makes for readily available material, it also increases the incidence of conflicting views. Mann [1992] asserted that there is no universally agreed definition of TQM but classes the various definitions into two main types:

1. definitions which describe TQM in terms of its ultimate goal, and;
2. definitions that describe TQM in terms of the activities or functions that need to be addressed to achieve its objective.

Some of the definitions of TQM are given below:

- "Total Quality Management is a corporate business management philosophy which recognises that customer needs and business goals are inseparable." [BQA's TQM Executive committee];

- "Total Quality Management is a strategic approach to producing the best products and services through a process of continuous improvement of every aspect of a company's operation." [Hand, 1992];
- "TQM is a total organisational approach for meeting customer needs and expectations that involves all managers and employees in using quantitative methods to improve continuously the organisation's processes, products and services" [American Federal Office of Management and Budget Circular, 1990];
- "TQM is a way of managing an organisation so that every job, every process, is carried out right, first time and every time. It affects everyone." [Morgan & Murgatroyd, 1994];
- "Total Quality embraces not only the quality of the specific product or service which the end-user or the customer purchases or receives but everything an organisation does internally to achieve continuing performance improvement." [Morgan & Murgatroyd, 1994];
- "A system of activities to ensure the quality of products and services, in which products and services of the quality required by the customers are produced and delivered economically." [Deming Prize Committee, 1986];
- "An approach for continuously improving the quality of goods and services delivered through the participation of all levels and functions in the organisation." [Pfau, 1989];
- "A way of managing the effectiveness, flexibility and competitiveness of business as a whole." [Department of Trade and Industry, 1991];
- "A strategic approach to producing the best product and service possible - through constant innovation." [Atkinson, 1990];
- "A concept, the principles on which to develop a total quality culture, a journey which has no end, and quality improvement is the enabling mechanism which must be continuous and companywide." [Newall & Dale, 1991].

The various definitions given to TQM affect the way it is perceived and implemented by different people. To understand the concept of TQM better, it is necessary to review literature in greater detail in order to determine its prime elements. This review is now examined.

TQM Elements

Cullen & Hollingum [1987] described the two aims of TQM as:

1. to make things right first time;
2. to work for continual improvement.

To achieve these, there must be progress in the three basic dimensions of TQM which are listed by Kehoe [1996] as:

- people;
- systems;
- techniques.

Many quality practitioners have listed various elements that are basic to TQM - for example Mann [1992] listed the elements as:

- quality leadership ;
- companywide quality commitment;
- measurement and reporting system;
- customer and supplier focus;
- education and training.

Kehoe [1996] listed elements applicable to TQM as:

- senior management leadership;
- improvement orientation;
- customer focus;
- company-wide involvement;
- commitment to training and education;
- ownership of the process;

- emphasis on measurement and review;
- teamwork.

Dean & Evans [1994] identified the elements as:

- customer focus;
- strategic planning and leadership;
- continuous improvement and leadership;
- empowerment and teamwork.

The European Foundation in its assessment criteria for the European Quality Award [1993] examined the following in the participating organisations:

- leadership;
- people management;
- policy and strategy;
- resources;
- processes;
- people satisfaction;
- customer satisfaction;
- impact on society;
- business result.

Mann [1992] listed the elements as defined by other quality practitioners and these are shown in Figure 2.2.

Benefits of TQM

Zain [1993] observed that little research had been performed on the quantification of TQM benefits. Reasons advanced for this included confidentiality, lack of proper measuring systems and the inability to isolate and identify TQM effects as a result of

Fig 2.2 TQM Elements as defined by Quality Practitioners (Mann, 1992)

Pfau [145, 1989]
- Long Term Perspective,
  Upper Management Commitment,
  Employ a System Approach,
  Training and Tools,
  Participation,
  New Measurements & Reporting Systems,
  Cross-Organisational Communication,
  Leadership.

Feigenbaum [67, 1982]
- Quality Leadership,
  Company Wide Introduction,
  Continuous Motivation,
  Education,
  Measurement.

Oakland [133, 1989]
- Management Commitment,
  Quality Management System,
  Tools (SPC),
  Teamwork.

Millar [126, 1991]
- Top Management Commitment,
  Goal of Customer Satisfaction,
  Continuous Improvement,
  Quality Belongs to Everyone,
  Cost of Quality.

Crosby [29, 1979] (14 Steps)
- Management Commitment,
  Quality Improvement Teams,
  Measurement,
  Cost of Quality,
  Quality Awareness,
  Corrective Action,
  Zero Defects Plan,
  Quality Education,
  Zero Defects Day,
  Goal Setting,
  Error Cause Removal,
  Recognition,
  Quality Councils,
  Repeat.

Shores [167, 1989]
- Customer Focus,
  Management Commitment,
  Total Participation,
  Systematic Analysis.

Hutchins [94, 1990]
- Systems,
  Processes,
  Management,
  People.

Harvey [86, 1988]
- People Aspects,
  Technology Aspects,
  Methodology Aspects.

Cullen [31, 1991]
- Leadership from the Top,
  Effective Management of Cost of Quality,
  Focus on Customer Satisfaction,
  Continuous Improvement in all Operations,
  Everyone Involved in Quality Improvement.

Baldridge [189, 1992] (Core Values & Concepts)
- Customer-Driven Quality,
  Leadership,
  Continuous Improvement,
  Full Participation,
  Fast Response,
  Design Quality & Prevention,
  Long-Range Outlook,
  Management by Fact,
  Partnership Development,
  Public Responsibility.

Juran [59, 1991]
- Identifying customers & their needs,
  Establishing optimal quality goals,
  Creating measurements of quality,
  Planning processes of meeting goals,
  Producing continuing results in improved market share, premium prices & reduction of errors.

Deming [47, 1986] (14 Points)
- Create constancy of purpose for improvement of product and service,
  Adopt the new philosophy,
  Cease dependence on mass inspection,
  End the practice of awarding business on price tag alone,
  Improve constantly and forever the system of production and service,
  Institute training and retraining,
  Institute leadership,
  Drive out fear,
  Break down barriers between staff areas,
  Eliminate slogans, exhortations and targets for the workforce,
  Eliminate numerical quotas,
  Remove barriers to pride of workmanship,
  Institute a vigorous programme of education and retraining,
  Take action to accomplish the transformation.

TQM being part of an overall business policy. The literature is not however, devoid of examples.

Coleman [1992] reported achievements of Rank Xerox quality strategy as:

- enhanced focus on satisfying external customers' requirements;
- completion of large numbers of problem solving and quality improvement projects;
- increased levels of co-operation through teamwork;
- improvement in key managerial and operational processes;
- winning of several national quality awards;
- improved levels of customer satisfaction;
- reduction of product development cycle times;
- reduction of unit manufacturing costs;
- reduction in inventory levels;
- improvement in return on assets;
- regain of market share from competitors.

Flood [1993] in analysing Cosalt's success in its supplier partnership programme listed the following achievements:

- financial savings;
- supplier commitment;
- management commitment;
- cohesive corporate culture.

The Ford Motor Company invited Deming to help transform its operations and within a few years achieved the highest earnings in automotive industry. Dean & Evans [1994] quoted Ford CEO, Donald Petersen as saying in 1992:

> "The work of Dr Deming has definitely helped change Ford's corporate leadership.....What stands out is that he has helped me crystallize my ideas

concerning the value of teamwork, process improvement and the pervasive power of the concept of continuous improvement."

Mann [1990] surveyed 43 TQM companies and found that 66% believed TQM had increased their market share while 43% believed it had increased their export market. More than 50% had achieved annual turnover increase of 8% while 37% had established a new customer base.

Wedge [1989] described Rolls Royce's TQM benefits as:

- changed attitudes;
- climate for continuous improvement;
- elimination of waste;
- enhanced supplier performance;
- efficient communication;
- customer satisfaction.

The above are a few of the examples of TQM successes. They are generally representative of the benefits found in literature. They define the benefits in both internal and external contexts and it is noteworthy that all cases cited were from organisations that actually noticed the listed successes as opposed to 'theoretical' benefits.

TQM Implementation problems

The previous section examined the benefits to be gained from TQM and cited examples of companies that have implemented successful quality programmes. However there have been organisations that have failed to reap any benefits or marginal benefits from TQM. Atkinson [1990] noted that initial successes in TQM soon became stagnated and organisations began to reap less than the full benefits from their efforts.

A study by Develin & Partners(1989) into the effectiveness of quality improvement programmes in British business found that although awareness of TQ was high and much importance was attached to it the average level of improvement was low. The study also found that profitability was only marginally improved.

Kearney [1991] surveyed 100 British companies and reported that only 20% of these companies believed that their quality programmes had achieved tangible results. An article in *The Economist* [1992] reported:

"Of 500 US manufacturing and service companies, only a third felt their TQ programmes had significant impact on their competitiveness" [A. D. Little]

"Of those quality programmes that have been in place for more than two years, two-thirds simply grind to a halt because of their failure to produce hoped-for results" [McKinsey]

A study by Smith et al [1993] indicated that TQ is likely to fail or run out of steam 18-24 months into the endeavour irrespective of whether companies buy off-the-shelf TQ products from consultancies of use a 'DIY' approach.

The lack of success was initially baffling but it became increasingly clear that the problems were within the organisations themselves. A lot of financial effort and time had been spent introducing new quality systems, tools and techniques but nothing had been done to change the nature and attitudes of people within the organisations. Quality practitioners were quick to point out that there was a cultural problem. Quality practitioners assert that if the TQ effort is inconsistent with the organisational culture, it will be undermined [Dean & Evans, 1994] [Atkinson, 1990] [Juran & Gryna, 1986].

The survey by Develin and Partners (1989) also cited culture change and change in management behaviour as the key factors to obtaining a successful implementation of total quality. Kehoe [1996] declared that motivating individuals and creating culture change are possibly the most significant management challenge on the road to quality.

Zain [1993] examined problems with TQ implementation and identified them as:

- cultural change;
- management behaviour;
- finding the time;
- wrong service levels;
- can't measure result;
- poor communications;
- no tangible benefits;
- poor inter-departmental relationships;
- lost momentum, and;
- timescale too long.

Zain then concluded that:

"Many of the above problems are closely related to one another. In the author's opinion, by addressing the culture of the organisation, at least 8 of them can probably, to a large extent be resolved".

Although the culture problem had been identified, addressing it was not as easy. Smith et al [1993] found that most people agree about changing quality culture, but exactly what this means or how it should be approached has been unclear. One of the reasons for this was advanced by Atkinson [1990] when he pointed out that culture is not a technocratic issue - it stands out but is difficult to pin-point. This view was supported by Kehoe [1996].

Organisations determined that while they could easily find documentation on quality tools and techniques, methodologies for culture change were not readily available. This view is supported by Kehoe [1996] in writing:

"Developing quality systems and quality techniques are relatively straightforward management challenges when compared to managing the cultural change associated with motivating people for quality. The dimensions of systems and techniques are rich with methods and guidelines; however, progress in the third dimension, people, is much less mechanistic or prescriptive and in general is much slower."

Another reason for poor culture development, and which partly accounts for the shortage of culture change guidelines is about the nature of the organisations themselves. Each company must embark on its unique journey. This point was supported by Fortuna [1992] when he suggested that there is no step-by-step 'cookbook' that applies to all company situations and cultures. Such views were also expressed by Dean & Evans [1994].

2.2.3 Modelling of Culture

In the preceding section, culture was identified as a significant problem in the implementation of quality initiatives. In order to determine the model of culture that would best complement quality improvement, it is necessary to define what culture is and examine the nature of culture from different perspectives. Smith et al [1993] had noted that companies did not really know what culture was or consisted of.

Kehoe [1996] identified the difficulty in precisely defining or measuring culture but gives a simple definition as:

"The shared values and norms of behaviour of the individuals within the organisation" .

Some other definitions of culture are as follows:

- "The way we do things around here." [Deal & Kennedy, 1992];
- "The totality of ways of doing things in a social system." [Jaques, 1989];
- "The fabrics of meaning with which human beings interpret their experience and guide their actions." [Geertz, 1973];

- "The commonly shared beliefs, values and characteristic patterns of behaviour that exist within an organisation." [Margulies & Raia, 1978];
- "Culture is the commonly held and relatively stable beliefs, attitudes and values that exist within an organisation." [Williams et al, 1993];
- "A pattern of basic assumptions invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration that has worked well enough to be considered valid, and to be taught to new members as the correct way to perceive, think, and feel in relation to these problems." [Schein].

Ploman [1992] summarised culture as the historical development of the company since the day it started and the influence it has on all its employees and Hand [1992] described culture as the way things get done. Crosby [1984] believed that an organisation's present culture was caused by the organisation's activities and the important thing was to define a desirable future.

Although Hand [1992] believed that culture differentiates a total quality organisation from others, the nature of culture makes it somewhat paradoxical to define an 'ultimate' quality culture. This is because, as Trought [1995] argued, culture is unique and cannot be copied and Hand [1992] believed that each organisation has its own values which has played significant roles in the development of its culture. A similar view is adopted by organisational development practitioners and Williams et al [1993] stated:

'Culture must ultimately be a strategic issue and any culture change must be dictated by the strategic needs of the organisation.'

To gain a greater appreciation of the concept of culture and model the elements of culture relevant to the quality problem, culture will be viewed from three major perspectives:

- Behavioural sciences;

- Organisational theory, and;
- Quality management.

Behavioural sciences model of culture

Extensive study by Williams et al [1993] led them to conclude,

'Very few commentators have approached the subject of organisational culture from a specifically human resources point of view'.

Behavioural science theorists are more likely to examine the nature of individual beliefs, attitudes and values and how these are formed. They also view roles and relationships and how these affect culture development in organisations.

From a psychological point of view Arnold et al [1995] identified five approaches to work personality. These are:

1. *The Psychoanalytical approach* developed by Freud and focuses on unconscious drives and conflicts as determinants of behaviour;
2. *The Trait approach* which is concerned with personal psychological characteristics of which the five major ones identified by Digman(1990) are extroversion, emotionality, agreeableness, conscientiousness and intellect;
3. *The Behaviourist approach* which is concerned only with observable behaviour and the situations which elicit particular behaviours;
4. *The Phenomenological approach* which emphasis how personality is shaped by a person's individual interpretations, experiences and choices;
5. *The Social cognitive approach* which focuses on thought processes are used to interpret social interaction.

In examining culture, work psychologists often mention the concept of organisational commitment which is defined by Mowday et al [1979] as:

'the relative strength of an individual's identification with and involvement in an organisation'

Griffin and Bateman [1986] stated that this concept has three components:

- A desire to maintain membership of an organisation;
- Belief in and acceptance of the values and goals of the organisation;
- A willingness to exert effort on behalf of the organisation.

Other concepts which are associated with work behaviour and motivation and identified by Arnold et al [1995] include the following theories:

1. *The Need Theory* - based on the idea that there are psychological needs which lie behind human behaviour;
2. *The Expectancy Theory* - originally proposed by Vroom[1964] and aims to explain how people choose which of several courses of action they will pursue;
3. *Justice Theories* - similar to expectancy theory but suggest that people are motivated to obtain what they consider fair return for their efforts rather than getting as much as they can;
4. *Goal-setting theory* - originally suggested by Locke et al, this approach concentrates on how performance targets can affect a person's work strategies and performance.

Current research at Loughborough University of Technology has identified different behaviour categories including 'leading by vision', 'respecting/supporting', 'taking responsibility', 'communicating openly', 'generating participation' and 'developing others'. The study has also identified behaviour patterns which it categorises into prosocial and defensive behaviour patterns. Generally, these behaviours can either be beneficial (e.g. complying with organisational values and suggesting improvements) or detrimental (e.g. absenteeism and low commitment) to the organisation. Perhaps more significantly these patterns not only affect the person who acts them out but also

affects colleagues and even people outside the organisation and can play a significant part in determining the culture within the organisation.

Other behavioural scientists such as Goldstein [1993] have looked at the effects of training on the personality while Cooper et al [1988] examined the causes of work stress and the effect they have on work relationships and personality .

After considering culture from a behavioural sciences point of view, the subject was not considered as a suitable representation or model of a culture that affects the TQ problem. The major reasons for this are:

1. The nature of the information is general and is not specifically targeted to quality working;
2. The literature focuses more on how attitudes and personalities are developed and transmitted than on identifying the elements of an organisation's culture;
3. Behavioural sciences focus largely on the person rather than the organisation. Although it is recognised that individual personalities can significantly affect the general behaviour of others, this concept may not comprehensively represent the culture of an organisation;
4. Factors such as organisational structures which may affect culture are not comprehensively addressed.

This view is partly supported by Pheysey [1993] who wrote:

'Organisational behaviour researchers have produced evidence for the existence, but evidence of linkages from personal temperaments to societal cultures is patchy. Without a group of some kind there cannot be a culture, since, by definition, it is shared.'

However, it was recognised that much of the literature from the behavioural sciences may be useful in the consideration of culture change especially where a change of

attitudes and values is concerned. Consequently, a sizeable amount of behavioural sciences factors are considered in the modelling of culture change agents (Section 2.4).

Organisational design model of culture

Culture is one of the prominent areas of organisational theory and design. Daft [1989] argued that a strong culture can be a positive force when used to support the strategy of a company and gives this as the reason why senior executives often try to influence culture to be consistent with corporate culture. Williams et al [1993] listed the elements of culture as:

- Beliefs;
- Attitudes and values;
- Behaviours.

This view is shared by Schein [1985] who classified them into three levels. Beliefs (or basic assumptions) are at an invisible and preconscious level, attitudes and values have a greater level of awareness while behaviours (or creations) are at a visible and often decipherable level.

Pheysey [1993] presented a framework based on the work of Hofstede [1980] and Skinner & Winkler [1980] which suggested that a culture is developed based on the goals (economic, ideological, etc.) of the society or group concerned. Harrison [1987] identified four types of organisational cultures:

1. a **role** culture which assumes that people work effectively when they have relatively simple, clearly defined and measurable task;
2. an **achievement** culture which assumes that 'people actually enjoy working at tasks which are intrinsically satisfying';
3. a **power** culture in which certain people are dominant and others are subservient and leaders are expected to be all-knowing and all-powerful;

4. a **support** culture which assumes that 'people will contribute out of a sense of commitment to a group or organisation of which they feel themselves to be truly members and in which they believe they have a personal stake'.

Other organisational design researchers have attempted to define the characteristics of organisational culture. Hampden-Turner [1994] believed that cultures embody the needs and aspirations of a group's members and will discourage sentiments and information that are inconsistent with their beliefs. He also stated that cultures can learn and are patterns which can provide their members with continuity and identity. Williams et al [1993] believed that culture is partly unconscious and historically based. Furthermore, they believed culture is both an input and an output.

Williams et al [1993] also suggested observation, interaction and communication as the processes underlying the formation of culture and lists the major determinants of organisational culture as:

- impact of external environment;
- impact of organisational structures, systems and technology;
- impact of the founder;
- impact of the manager, and;
- impact of the work group.

These issues are widely agreed upon and a lot has been written about each of these elements although others such as Handy [1985] and Pheysey [1993] have also associated culture with motivation.

The organisational design literature on culture provides a clear insight into the nature of culture, how it is formed and how it can be managed and changed. Equally important, it states that culture must be harmonious with the goals and aspirations of the organisation. However, the information is of a general nature and the literature makes no mention of the factors that would be relevant to an organisation that wishes to develop a culture that complements quality improvement. Thus no model for such a

culture can be extracted from organisational design and theory. However information from this area was likely to be valuable in the consideration of culture change agents. This is examined in greater detail in Section 2.4.

Quality management model of culture

The failure of TQ in many organisations led quality practitioners to examine the cultural aspects of quality. In doing this, many of them came up with different cultural models of what a TQ organisation should look like. A list of TQM components developed at IBM Rochester (which won the Baldrige award in 1990) included such cultural factors as leadership, employee empowerment, customers and suppliers. Bergman & Klefsjo [1994] mentioned customer satisfaction, employee involvement, leadership and teamwork as part of TQ. Dean & Evans [1994] mentioned customer focus, leadership, empowerment, teamwork, relationships with suppliers and organisational change and structure.

TQ elements as defined by other quality gurus typically contain 'cultural' factors. Crosby [1979] referred to management commitment and quality teams and councils while Pfau [1989] wrote about management commitment, leadership, participation and cross-organisation communication. Deming's fourteen points include references to leadership, management commitment, team efforts and employee pride while Juran mentions top management leadership and customer needs. Cullen [1991] included leadership from the top, focus on customer satisfaction and employee involvement in his TQ philosophy.

'Cultural' factors are also included in the criteria for quality awards. The European Quality Award assesses leadership, people management, people satisfaction and customer satisfaction while the Baldrige Award assesses leadership, human resources, development and management along with customer focus and satisfaction.

Although emphasis on different cultural elements change from one quality practitioner to the other and from one company to the other, the following elements are adequately representative of culture from a quality management point of view:

- senior management leadership;
- employee empowerment and involvement;
- teamwork;
- effect of chief executive;
- customer focus;
- partnership with suppliers;
- open corporate culture.

This view of culture was regarded as relevant to the needs of companies that require a culture that complements TQ. This is primarily because these elements were specifically referred to with quality in mind - a factor missing from other views of culture considered. These elements are seen as 'required' quality culture elements or requirements for quality organisations. This model was chosen for this survey and a more detailed description of the individual elements follows in Section 2.3

2.3 Quality Culture

This Section examines each of the quality culture elements in detail. This provides greater insight into their nature and effects and by reviewing what quality practitioners have written about them, justifies this model of quality culture. This model of culture is referred to as the 'required' quality culture.

2.3.1 'Required' Quality Culture

The elements of the 'required' quality culture are described here. This is necessary before investigating ways of changing culture. Culture change is discussed in Sections 2.3.2 and 2.4.

Senior Management Leadership

Crosby [1984] believed that management is 100 percent responsible for the problems with quality. The commitment of senior managers has been demonstrated to be the most important determinant of a successful TQM implementation and its absence is a prime reason why TQM fails [Morgan & Murgatroyd, 1994]. Nakamura [1992] stated that it is clear that unless senior management is fully committed to the idea of a real improvement in quality, exercises leadership and devotes time, energy and resources to this objective, it would be impossible to motivate the rest of the organisation. Mann & Kehoe [1992] believed that if senior management does not demonstrate total involvement and commitment to TQM, then it is at risk. Similar views were expressed by Hand [1992], Procter [1992], Ploman [1992], Fortuna [1992], Dean & Evans [1994] and Bergman & Klefsjo [1994]. Leadership and management commitment are also major factors considered in all major quality award assessments.

In reporting the results of a study, Ploman [1992] contended that commitment from the top will be voiced but is not often supported by action thereby making the rewards and benefits of change elusive. Shingeo [1986] believed that values are best transmitted when management acts them out rather than merely announcing them. This view is also supported by Gufreda et al [1992], Nakamura [1992] and Dean & Evans [1994] who all agree that management should be by example.

Kehoe [1996] and Hutchins [1987] both contended that management must adopt an 'enabling' style of management while Huge & Vasily [1992] and Kehoe [1996] stated that management must respect individual dignity of employees. Huge & Vasily [1992] further suggested that management should view employees as their customers and make genuine effort to address their needs and situation.

Kehoe [1996], Dean & Evans [1994] and Hand [1992] all recognised the importance of communication in organisations and believed that management style must support good communication. Prigent [1992] stressed that communication should not be limited to the organisation but should be extended to suppliers and customers. This

approach can be seen as justifying Baines [1992] observation that senior management is very remote from customers.

The importance of management education is summarised by Crosby [1984]:

"The overall educational aspect requires executive education, wherein senior management can learn its role.....only when the management team becomes educated and sets out on its mission of changing the culture of the company can it hope to reach the rewards such a change produces."

Prigent [1992] and Hand [1992] are of the view that senior management education is vital and should be one of the starting points of any quality initiative.

The establishment of a management steering committee or quality council is widely accepted as vital by quality practitioners. Dean & Evans [1994] noted that most TQ-organisations have a steering committee which is responsible for establishing the TQM policy and for guiding the implementation and evolution of TQM throughout the organisation. Similar views were expressed by Hutchins [1985] and Besterfield [1986] while Prigent [1992] believed that a steering committee is an important forum for discussing successes, failures and problems. Prigent and Besterfield both believed that the appointment of a TQ co-ordinator is necessary to assume some of the added duties that quality improvement requires.

The concept of the development of company vision and mission by senior management is also widely agreed. Fortuna [1992] stated:

"Top management is responsible for developing and communicating a vision, then building organizationwide commitment to its achievement."

This view is supported by Kehoe [1996], Dean & Evans [1994] and Huge & Vasily [1992] but Gufreda et al [1992] add that top management should employ policy deployment (PD) in deploying the vision throughout the organisation.

Bulletpoint [1995] reported that managers must act as leaders and coaches and must help employees identify and solve problems by:

- develop and articulate what the organisation is trying to do;
- create environment where employees figure out what needs doing, then do it;
- delegate authority and responsibility;
- control 'conceptually' not 'procedurally';
- unleash initiative;
- build trust and inspire teamwork;
- facilitate and support team decisions and expand team capabilities.

Employee Involvement and empowerment

Gufreda et al [1992] described employee involvement as the process of transforming an organisation's culture to utilise the creative energies of all employees for problem solving and for making improvements. They further stated that involvement implies that every person has two jobs - doing his or her own job and improving the system. This results in excited and committed workers. Mann & Kehoe [1992] believed that a negative attitude can be changed through involvement of employees in quality activities which result in improvements and that lack of involvement may lead to employee disillusion. Keeping everybody up to date on the status of the improvement process should be seen as vital, a view supported by Crosby [1984]. A successful Employee Involvement (EI) strategy aligns individual and corporate needs and transforms the traditional manager from a commanding officer to a mentor and facilitator. EI is the key to maintaining momentum in a quality improvement process and is cited as the essence of innovation and productivity of Japanese firms as well as the most significant Japanese contribution to the quality movement [Gufreda et al, 1992] [Huge & Vasily, 1992].

Huge & Vasily [1992] held the view that employee involvement is usually the most difficult and critical component of cultural change. A key reason why several

companies have only achieved modest involvement is that managers did not really expect employees to improve things that were important to management. EI requires that employees recognise that their contributions improve the business.

Teams are an important and often quoted component of EI but they are only part of the picture. According to Huge & Vasily [1992], an EI effort will be most successful if the following are regarded :

- employees feel good about offering suggestions for improvement;
- employees have the power to take whatever steps are necessary to ensure a quality output;
- each employee has a sense of how his or her individual action affect the realisation of the company's new vision of excellence;
- employees job security is ensured to the greatest possible degree during the change process.

Gufreda et al [1992] stated that a decision to change from a traditional management system to a quality system is two to ten times more effective when made by a group as a whole - giving a group responsibility for their own goals and procedures maximises the increase in productivity and morale. Fig 2.3 shows the relationship between empowerment and quality. Advantages of involvement are recorded by Gufreda et al [1992] as:

- it replaces an adversarial mindset with trust, co-operation and common goals;
- it develops individual capability by improving self-management and leadership skills;
- it increases employee morale and commitment;
- it fosters creativity and innovation;
- it helps people understand quality principles and instils these principles into the corporate culture;
- it allows employees to solve problems at the source immediately;
- it improves quality and productivity.

Empowerment adopts the principle of delegated control and implies a downwards decentralisation of responsibility. People who have the ability to make quality improvements should be given the authority to do so. However, a study by the Quality Institute (Figure 2.4), reported by Howe et al [1993], implied that empowerment levels are still below average. Figure 2.5 shows the contrast in control between traditional management and empowerment-based TQM. The essence of empowerment is captured in the following statement by Morgan & Murgatroyd [1994]:

"Our definition of empowerment sees it as the ability of an individual or team to work in their own way within agreed time-lines and with agreed resources to achieve a goal set by the leadership of the organisation, but is not an unfettered freedom to determine what goals the team has for the organisation as a whole, or how they would like the organisation to be. Basic empowerment springs from the vision and goals that have been set by the organization's leaders. What a team or an individual is empowered to do is to turn the vision and strategy into reality through achieving the challenging overarching goals set for them by the leaders or senior management".

Teamwork

Kehoe [1996] stated that teamwork is universally adopted as the vehicle for change and the organisational mechanism for involving people in quality improvement. According to Dean & Evans [1994] teamwork can be viewed in three ways:

1. Vertical - teamwork between top management and lower-level employees;
2. Horizontal - teamwork within work groups and across functional lines;
3. Interorganisational - partnerships with suppliers and customers.

Fig 2.3 Relationship between empowerment and quality (Dean, 1994)

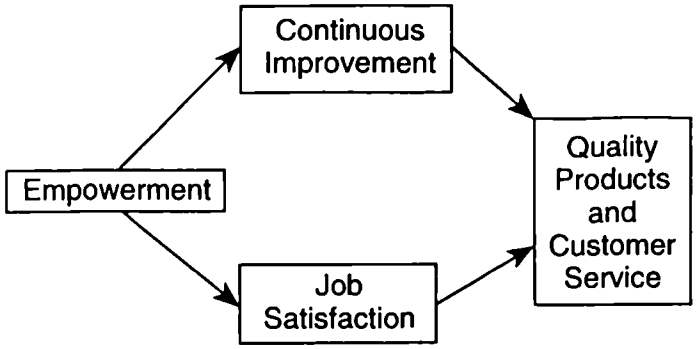


Fig 2.4 Employees' view of current levels of empowerment at work (Quality Institute Research)

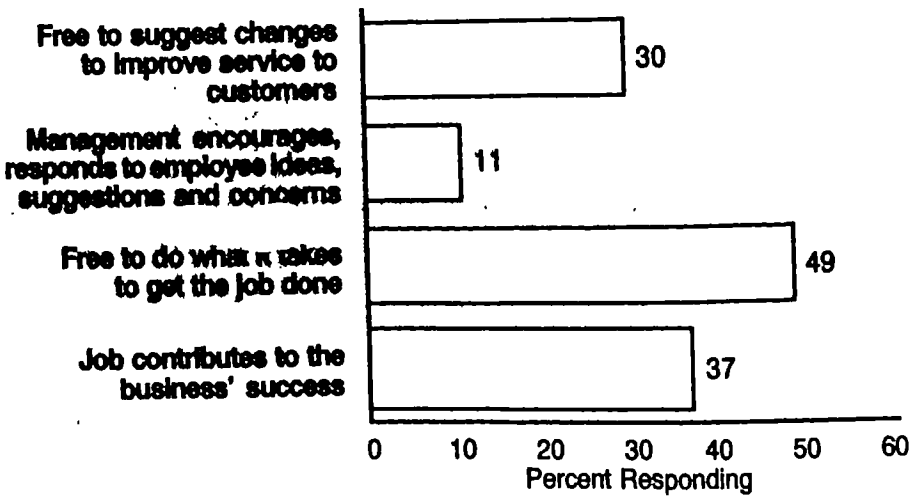
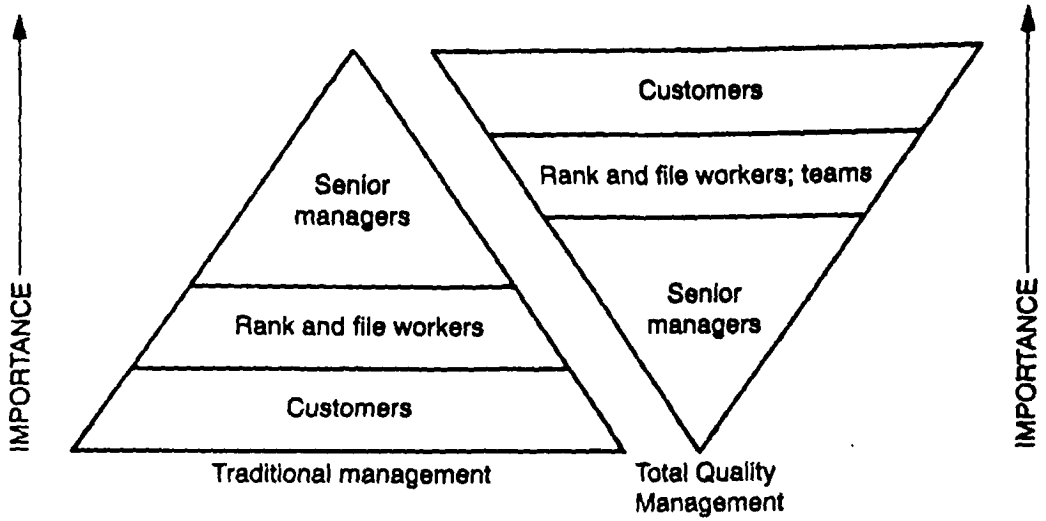


Fig 2.5 Contrast between control pyramid in TQM and Traditional Management (Morgan 1994)



Interorganisational teamworking is considered in other sections. Organisations that use major TQM processes develop corrective action teams for the primary purpose of problem solving around the issues that threaten quality, a view shared by Longnecker et al [1994] and Kehoe [1996]. While vertical teamwork is closely related to empowerment, participation and understanding of company goals, horizontal teamwork is concerned with the development of problem-solving and process improvement, cross-functional work teams. Although the concept of working in teams is very common, it has also generated problems. A study by Da Cruz & Kay [1995] into the use of Japanese manufacturing methods into the U.K. reported that teamworking failed in the companies surveyed. The report cited lack of management support as the major reason for failure. Bulletpoint [1995] reported that while effective teams can increase productivity, raise morale and spur innovation, the following were presented as obstacles to high-performing teams:

- individualism and competitiveness;
- wrong type of team formed;
- insufficient training and resources;
- unnecessary use of teams;
- lack of team-based communication;
- lack of integration between interdependent teams;
- resistance to change.

Many quality practitioners recognise two types of teams - deployed cross-functional teams (or corrective action teams) and voluntary quality improvement teams (or quality circles). Corrective action teams usually comprise designated individuals from different functions tackling defined quality problems over a specific period of time. These teams often invite contributions from 'outsiders' with appropriate skills but without direct involvement with the problem, a view stated by [Kehoe, 1996]. Members of these teams are usually selected on the basis of their knowledge of both the problem and potential solutions, ownership of the problem and ability to function as an effective team.

Quality circles originated in Japan in 1962. Hutchins [1985] defined a quality circle as:

"A small group of between three and twelve people who do the same or similar work, voluntarily meeting together regularly for about an hour per week in paid time, usually under the leadership of their own supervisor, and trained to identify, analyse, and solve some of the problems in their own work, presenting solutions to management, and where possible, implementing the solutions themselves."

Ishikawa lists the basic ideas behind quality circle activities as: 1. To contribute to the improvement and development of the enterprise; 2. To respect human relations and build a happy workshop offering job satisfaction; 3. To deploy human capabilities fully and draw out infinite potential. Quality circles succeed in tapping the huge resource of knowledge and skill in the workforce. Hutchins [1985] believed that quality circles will not work without management support and Cullen & Hollingum [1987] and Besterfield [1986] agreed that this was where there have been major problems. This view was supported by Crosby [1984] when he stated that the chairperson of every team should be someone with easy conversational access to senior management.

It is important that a well motivated team has the requisite problem-solving skills for its task. Great importance should be given to training members in tools and techniques as commonly agreed by Procter [1992] Cullen & Hollingum [1987] and Kehoe [1996].

Team facilitation is also important. Facilitators should provide a cohesive influence, ensure effective participation, and should be experienced in problem solving techniques irrespective of their level of knowledge of the problem at hand [Kehoe, 1996]. The provision of proper facilitation is one way management can encourage teamworking. Another important way is recognition and consideration of recommendations. Procter [1992] believed the team need to see their contributions in the light of the overall company effort; they need to be able to relate their efforts to the company strategy and vision. Goulden [1995] identified the need for a clear team vision and focus and an alignment of goals. Naylor & Ilgen [1988] stated that establishing targets have been found to galvanise group activity and effort towards the achievement of team goals.

Dean & Evans [1994] stated that the most important elements of team processes are the team members themselves. Team members must not only have technical knowledge, but must also have interpersonal skills and achieve a balance in the team. Belbin [1981] concluded that balanced teams usually succeed while unbalanced teams usually fail. The balance of a team is achieved through a collection of individuals having different yet complementary team roles. The team roles identified by Belbin and represented in Figure 2.6 are:

1. Company worker
2. Chairman
3. Shaper
4. Plant
5. Resource investigator
6. Monitor-evaluator
7. Team worker
8. Completer-finisher

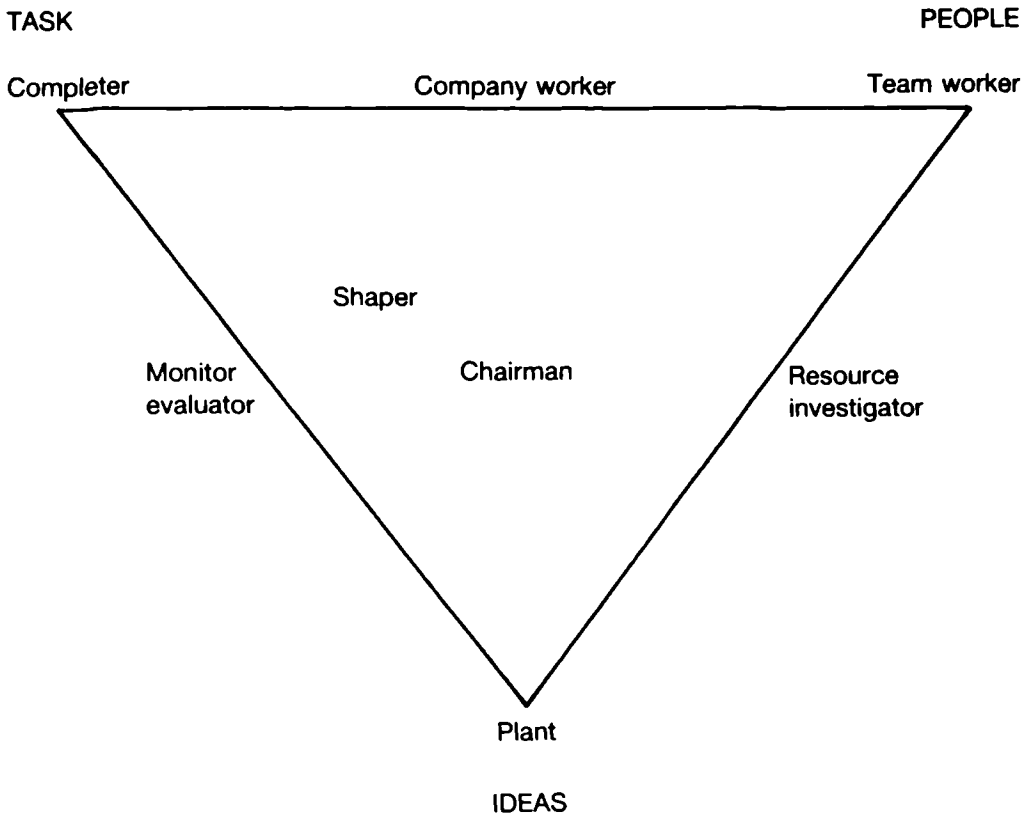
Recognising the significance of team roles and team balance and the importance of providing the right climate are important prerequisites for enabling quality development through teamwork as stated by Kehoe [1996].

Effect of Chief Executive Officer

Although it has been argued that TQM involves everyone within the organisation, the actions of one individual, the CEO, is seen as especially vital. TQM experts are all agreed that unless the CEO takes the lead in a process of quality improvement, any attempts and improvements made by individuals and departments will only be transient in nature [Lascelles & Dale, 1992]. Oakland [1989] writes that to be successful in promoting business efficiency and effectiveness, TQM must start with the Chief Executive. This view is shared by the BQA. It is the single-minded obsession of the CEO with issues of quality that will enable organisational change [Morgan & Murgatroyd, 1994]. Dean & Evans [1994] reported that the CEO should be the focal point providing broad perspectives and vision, encouragement, and recognition while Crosby [1984] stated that the CEO needs to see that the corporate policy on quality is

Fig 2.6 Belbin's team roles (Tyson, 1992)

- **People-oriented roles** — Team worker, Company worker, Chairman, Resource investigator
- **Task-dominated team roles** — Completer finisher, Company worker, Chairman, Shaper, Monitor evaluator
- **Ideas-oriented team roles** — Plant, Monitor evaluator, Resource investigator



issued, understood and communicated to everyone. Oakland [1989] in examining the significance of the CEO wrote:

"If the Chief Executive of an organisation accepts responsibility for and commitment to a quality policy, this action alone will offer a broad approach extending well beyond the accepted formalities of the disciplines required in the quality assurance function"

The CEO must lead, drive, cajole and encourage in order to both generate and sustain enthusiastic support for TQM. Prigent writes that the TQ journey is slow and methodical and at stages where there are doubts and a lack of visible progress, all eyes will be fixed on the CEO to see whether he or she is really committed or just paying lip service.

Dean & Evans [1994] in discussing leadership noted that leaders help to shape the culture of an organisation through key decisions and symbolic actions. Shaping a culture that puts convenience or short-term benefits over quality will kill the quality effort. Committed leadership is also required to ensure that resources are not showered on programs that cut short-term costs while quality is starved of resources. They then quoted Carroll, another quality practitioner, as saying:

"In our experience, very few CEOs have a real sense of what their role is in the quality improvement process. It goes far beyond simply being a cheerleader and handing out an occasional award. Top management has to provide the proper focus for the organisation. This is not something that can be delegated."

A study by Lascelles & Dale [1992] reported cases where market forces have failed to effect lasting quality improvement because the CEO did not support the improvement process. Besterfield [1986] believed that a knowledge of quality and direct involvement is requisite if the CEO is to have ultimate responsibility for quality. He further suggested that the CEO must not just create a quality council but should sit on it as well as be a member of a quality improvement project team, participate in recognition ceremonies, have quarterly employee meetings, write circulars to all

employees and devise techniques for identifying quality problems first-hand. Besterfield also suggested that the CEO should have some measure of his or her quality performance. This can be done by reviewing the attention paid to his or her areas of responsibility and the percentage of time spent on quality. It may also be desirable to institute an annual independent quality audit as is done by the Japanese.

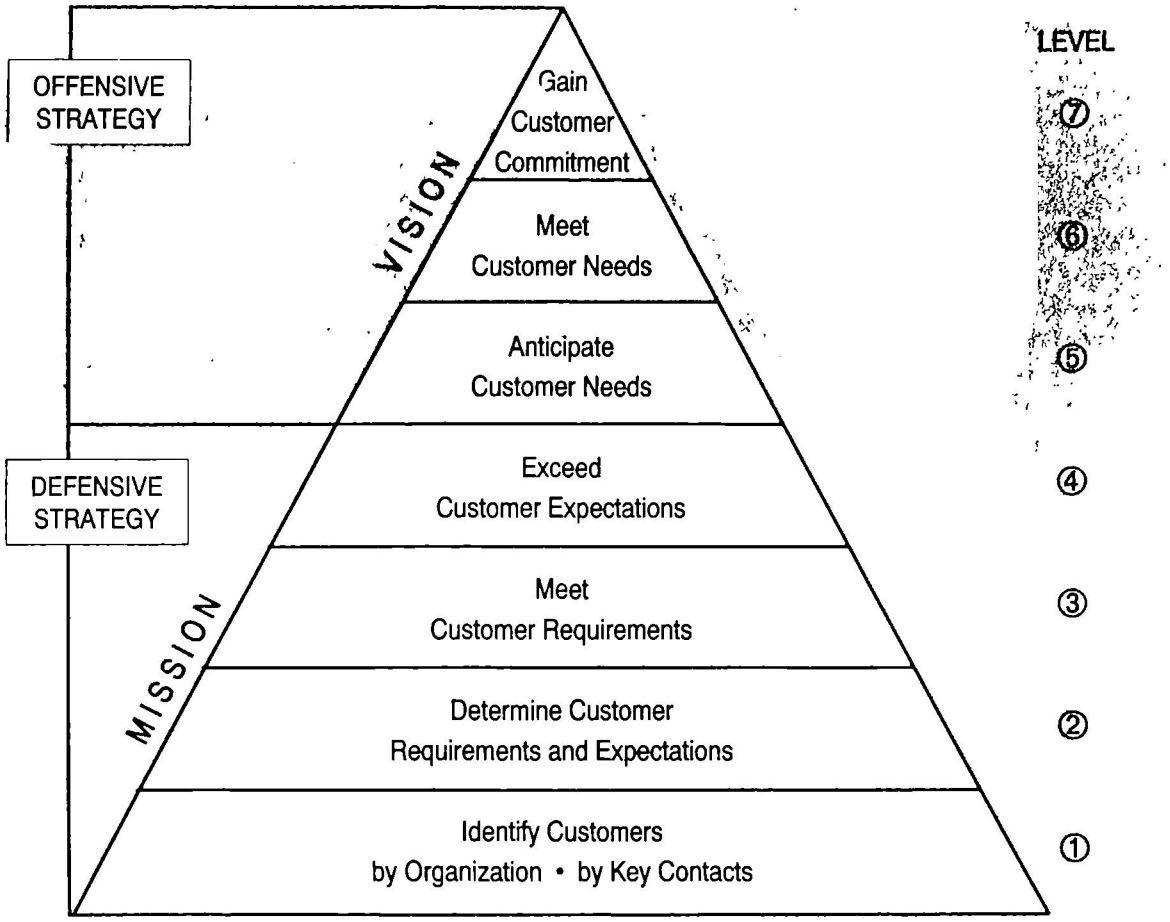
Customer Focus

Customer focus is perhaps the most written about aspect of TQM. The reason for this is the commonly held notion that the customer is at the very heart of Total Quality and all quality efforts are ultimately directed at the customer. The significance of the customer is evident even in the definitions of 'Quality' and 'TQM'. Dean & Evans [1994] contended that the customer is the judge of quality and quality systems must address all product attributes that provide value to the customer and lead to customer satisfaction and loyalty. Quality has to be valued by the customers, and it has to be in relation to their needs and expectations, a view expressed by Bergman & Klefsjo [1994]. Customers are recognised as the guarantee of the organisations continued existence and a focus on them is the foundation of the TQM approach to management. Bergman & Klefsjo [1994] also noted that to focus on the customers implies finding out what the customers want and need, but this can only be done when the customer has been identified. The mission/vision hierarchy of customer focus is shown in Figure 2.7.

Traditionally, organisations have always viewed the customer as the end user of the product. The concept of TQM, however, does not accept this view as adequate. Morgan & Murgatroyd [1994] captured the TQM view of customers in this statement:

"TQM does not, however, only give primacy to the external customer who buys the product or service. It also conceives there to be a whole range of internal customers within the organisation, whatever its type. The TQM perspective considers that all the people working within the organisation - whether manufacturing, commercial service, or public sector provision - are linked in a network or chain of customer-supplier

Fig 2.7 The Mission/Vision Hierarchy of Customer Focus (Howe, 1993)



relationships. Hence the intent of TQM is that all internal customers are to be equally well satisfied with the service of product they are supplied with as are the external or end-user customers to be"

This view is well accepted by quality practitioners and Oakland [1989] stressed that failure to meet the requirements in any part of a quality chain (Figure 2.8) has a way of multiplying and failure in one part of the system creates problems elsewhere. Kehoe [1996] stated that excellence in external customer service can only be achieved if the internal customer-supplier chain operates effectively. Camp [1992] contended that each individual process should satisfy its customer's requirements until ultimately the external customer is satisfied. Whiteley [1991] also identified the intermediate customer as part of the chain. The intermediate customers are identified as distributors or dealers who make products available to the final customer.

If quality is meeting the customer requirements, the first item on the list of things to do is to find out what the requirements are [Oakland, 1989]. This should be the case whether the customer is internal or external. It is important to the success of the enterprise to understand what the outside customer considers to be good quality and to find some means of measuring it [Cullen & Hollingum, 1987]. Ways in which this can be done are identified by McWilliam [1995] as:

- profiling and segmenting customers by collecting information surrounding their characteristics and behaviour;
- ensuring that all customer information available throughout the organisation is collected;
- gathering information on all aspects of the customer to build a complete picture;
- using customer data as the focal point for all decisions surrounding the product;
- getting feedback on technical or specialist requirements that are not widely understood;
- recognising the impact that external market conditions can have on customer requirements;

Fig 2.8 Oakland's Quality Chain

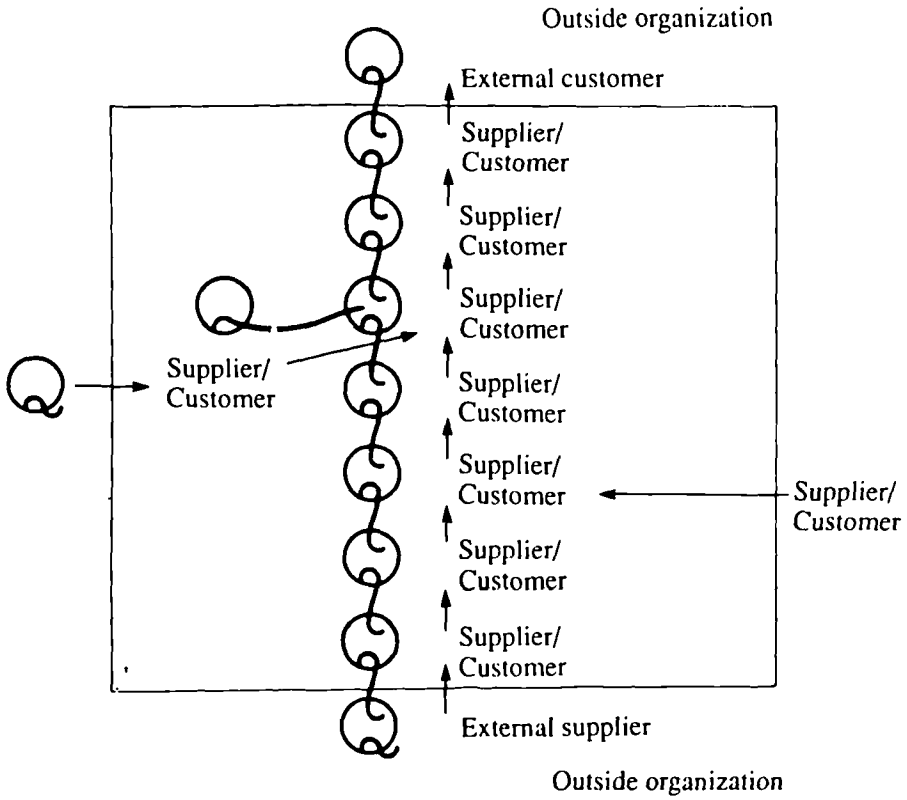
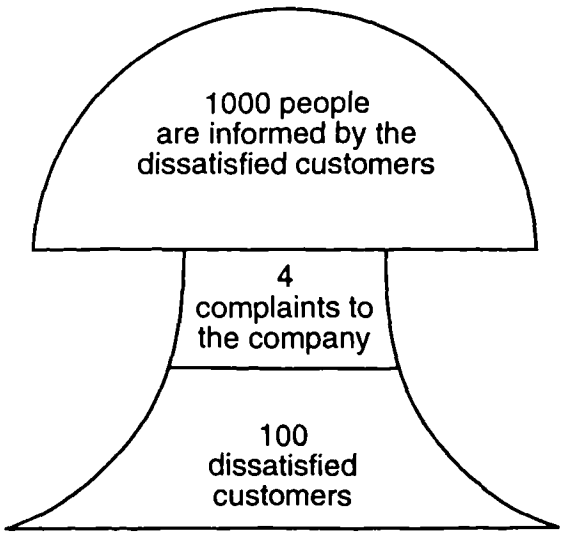


Fig 2.9 The Customer Satisfaction 'Mushroom' indicating that only 4% of dissatisfied customers complain to the company (Bergman & Klefsjo, 1994)



- deciding on whether to give the same level of service to all customers or whether they should be 'streamed'.

The gathering of customer data will lead to the use of such quality tools as Quality Function Deployment (QFD), Taguchi, etc. to meet the requirements. Kehoe [1996] contended that the next stage is to measure customer service performance. Baines [1992] discovered that companies frequently fail to measure actual service performance while Whiteley [1991] noted that in rapidly improving organisations, people measure almost everything that can tell them what kind of job they are doing for the customer. Crosby [1984] believed feedback on the product from the interim and end customers is important and Besterfield [1986] listed the objectives of such feedback as:

- discover customer dissatisfaction;
- discover relative priorities of quality with other attributes like price and delivery;
- compare performance with the competition;
- identify customer needs;
- determine opportunities for improvement.

An important way of measuring performance is customer complaint management. Although a common drawback is that dissatisfied customers rarely complain as noted by Kehoe [1996] and shown in Figure 2.9, progressive companies make it easy to complain, and then use the complaints to address the causes behind customers' dissatisfaction [Whiteley, 1991]. Horne [1995] believed that such complaints should be seen in positive light and used as an opportunity to improve customer relations. Delivery performance and benchmarking (horizontal or vertical) are other frequently used methods for customer performance measurement.

It is important but not enough to know that customers are not dissatisfied, there is a need to know whether they are delighted, a view expressed by Bergman & Klefsjo [1994]. This will lead to customer relationships and ultimately customer loyalty and retention. Bergman & Klefsjo also stated that customer loyalty is an important business

strategy that will become crucial in the future. Kehoe [1996] reported that research has shown that over 60% of an organisation's future revenues will come from existing customers while a 2% increase in customer retention has an equivalent impact upon profitability as a 10% reduction in operating costs. He also adds that developing customer loyalty is a major challenge that requires the creation of a culture whereby commitment to the customer is exhibited by all employees and the importance of the relationship with the customer is recognised.

Partnership with Suppliers

Dean & Evans [1994] believed that suppliers are also crucial to successful TQM since the final product cannot be any better than the parts that comprise it. Hand [1992] reported that many UK businesses persist in dealing with suppliers on the basis of price tag although it has been shown that this leads to a proliferation of poor quality suppliers with consequential high costs of quality. The need is to move to few or single suppliers, based on a long-term relationship of mutual understanding of needs and loyalty and trust. Kay [1992] noted that adversarial relationships and arm's length dealings do little to improve supplier performance. Supplier performance can only be improved by working with a supplier.

It has been shown that working with suppliers and single sourcing does not increase cost but actually decreases cost. On the average, 40-50% of production costs are due to purchased material as noted by both Kehoe [1996] and Besterfield [1986]. In order for both parties to achieve business growth, a partnership should be developed and the supplier should be treated as an extension of the production process. Single sourcing with a large contract will create better quality at a lower cost. Dean & Evans [1994] noted that if a supplier's performance is of consistently high quality, its customer can decrease or eliminate costly incoming inspections that add no value to the product.

Dean & Evans [1994] noted that single sourcing is now widely used in industry although it is against conventional purchasing practices in that it increases dependence on the supplier and increases risk of interruption in supply if the supplier has a

production problem. However the greater advantages include substantial reduction in administrative costs and reduction in variability of incoming products. Single sourcing will almost certainly lead to long-term contracts. This will enable suppliers to make greater commitments to improving the quality of products and provides greater opportunity for joint improvement efforts and the development of inter-organisational teamwork. Ray [1992] believed that exchanges should occur at both operational and top management levels and open and direct communication between customer and supplier technical experts is vital to accomplishing set objectives. Issues that should be addressed as identified by Ray are:

- Business projections;
- Mutual needs, concerns, and expectations of the relationship;
- Education and training needs;
- Design projects requiring joint efforts;
- Research and development efforts and technological developments;
- Cost reduction opportunities;
- Joint strategies, plans, and goals for improvement.

Suppliers should demonstrate their technical capability and capacity to provide quality products. This could lead to a supplier assessment and vendor rating system as suggested by Kehoe [1996] as well as supplier site visits and audit. The credibility of the supplier is also important since partnership implies some knowledge of the customers business plans and strategy. Many companies are reducing inventory levels and employing such systems as JIT. For this to be effective, the supplier's quality must not only be good but must be backed up by excellent delivery performance [Cullen & Hollingum, 1987]. Thus suppliers must reduce set-up time and improve their production systems' reliability.

Customers may also be required to directly assist their suppliers in technical development. Ray [1992] noted that few suppliers are capable of being ideal and the customers must be prepared to provide education, training and technical assistance.

Suggested ways of achieving this include demonstrations, training sessions and workshops and hands-on technical assistance at the supplier's plant.

Open Corporate Culture

Whiteley [1991] stated that increased awareness of quality has brought about the realisation that many companies have built systems which create barriers to customer service. Dean & Evans [1994] contended that while functional structures are suitable for administrative convenience of the organisation, they do not contribute towards providing high-quality service to the customer and therefore contains several inadequacies from a TQ point of view. These inadequacies include:

- Functional structures separates the employees from the customers and encourages a narrow conception of employee responsibilities. They also promote the idea that the boss is the customer whom the employee must strive to satisfy;
- The functional structure inhibits process improvement by proliferating functions that are usually unrelated to the processes used to deliver products to the customers;
- Functional organisations often have a separate quality function. This may lead the rest of the organisation to conclude that quality is not their responsibility since there is a group dedicated to it. The feedback loop that informs employees of a need to improve their work may also be disrupted.

It is often desirable to redesign organisations for quality as is implied in one of Deming's 14 points, 'break down barriers between departments'. Whiteley [1991] listed four management strategies that can help as:

1. Deriving the organisation's official policies from its vision and its day-to-day management practices from those policies;
2. Creating cross-functional management structures to mobilise people from all parts of the company in solving key problems;

3. Adopting 'visible management' to help managers and other employees recognise customers' needs and monitor progress towards meeting those needs;
4. Carrying out regular executive reviews of the processes and control points used in managing each part of the business.

Oakland [1989] suggested the redefinition of the role of the quality function and a clear allocation of responsibilities within the management structure while Dean & Evans [1994] made a case for process redesign of organisations and reduction of hierarchy. Figures 2.10 and 2.11 shows levels of interdepartmental co-operation and relationship noticed in a Quality Research Institute survey and reported by Howe et al [1993].

Huge & Vasily [1992] indicated the need for a shift from the traditional "carrot stick" approach to control. TQM requires that traditional stratification and protocol be removed and responsibility is decentralised downwards with the aim of utilising every ounce of intelligence and ingenuity of the rank-and-file worker. A successful TQM organisation is one where innovation is highly valued and status is secondary to performance and contribution [Morgan & Murgatroyd, 1994]. The creation of corporate culture that encourages employee suggestion can be of immense benefits to the organisation as has been seen in Japanese companies. Gufreda et al [1992] summed up by writing:

"Management should be open with employees about the bad as well as good news. An open attitude builds trust, an essential condition for overcoming people's fears about the quality-related changes sweeping through the organisation, and encourages experimentation and co-operation".

2.3.2 Quality Culture Change

The elements of a quality culture have been identified and are known to many quality practitioners but then culture continues to remain a major issue. Dean & Evans [1994] noted that cultural change is very difficult, takes several years to complete and often

Fig 2.10 Quality of Interdepartmental co-operation (Quality Research Institute)

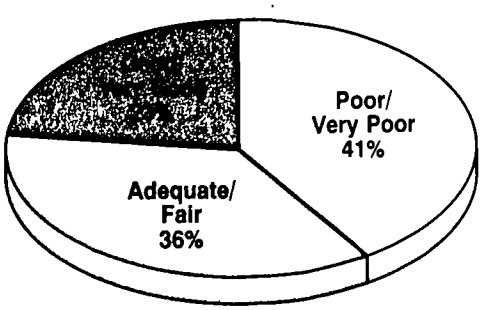
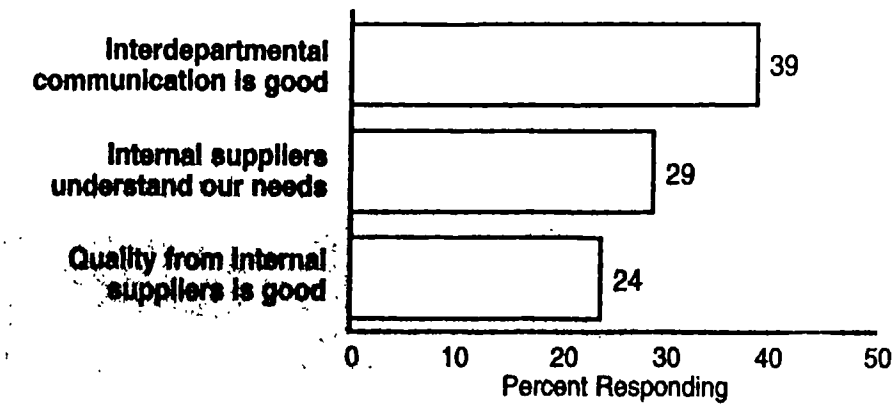


Fig 2.11 Employees view on levels of Interdepartmental relationships (Quality Research Institute)



fails and cites resistance and reward systems as major impediments to change. Crosby [1984] stated that changing a culture permanently cannot be accomplished quickly. Muthler & Lytle [1992] stated that individuals and organisations alike are resistant to change while Lascelles & Dale [1992] attributed the difficulty to the fact that organisations, by their nature are not meant to change.

Crosby [1984] further stated that changing a culture is not about teaching people new techniques or replacing their behaviour patterns. It is about exchanging values and providing role models and this is done by changing attitudes. Lascelles & Dale [1992] proposed the concept of internal and external change agents and this is examined in a cultural context in a later section. Ploman [1992] believed that changing a culture requires change to factors within the organisation and that the historical inertia within an organisation is a major constraint to change implementation. The degree to which TQ challenges the current culture determines the amount of resistance to be expected.

Thus culture change is about attitudes and these are affected by a range of factors within and without the organisation. These factors which are regarded as culture change agents are discussed in the next section.

2.4 Culture Change Agents

Although some of the change agents to be considered are seen in some texts, they have not generally been considered in that context and their possible role in bringing about quality culture change remains uninvestigated. Furthermore, a substantial number of the change agents to be investigated are not usually associated with quality but more with organisational theory and work psychology. The relevance of the change agents and their mapping onto quality culture by the use of fishbone diagrams are also discussed in this section. The author believes that the identification and use of change agents is the vital missing link that has stopped many TQ-implementing organisations from developing the kind of quality culture they truly desire.

2.4.1 Background

Lascelles and Dale [1992] recognised that both internal and external factors can influence change within an organisation. They further mention the concept of change agents and catalysts of change. They define change agents as people who cause and implement change. This study however adopts a more generalised definition that involves all causal elements, human or otherwise, a view shared by Dean & Evans [1994].

A study by Barclay [1986] investigated the perception of a sample of workers with regards to job satisfaction, constraints and concerns and summarised that major concerns were:

1. lack of self and man management skills;
2. lack of influence in the decision making process.

The study also found that the main satisfaction/dissatisfaction factors were identical to Herzberg's findings while the main constraints were found to be:

1. personal efficiency and effectiveness;
2. lack of motivation/communication;
3. lack of involvement.

Dale & Evans [1994] noted that a lot of research and writing in Organisation Theory (OT) focuses on organisation change and can be related to total quality. In particular, they contend that OT theories that deal with changes in values and norms are relevant to the transformations associated with cultural change in TQ. Some of the principles for managing change derived from OT and directly applicable to total quality change are as follows:

- it is necessary to "unfreeze" people's attitudes and behaviour before they can be changed;
- change agents must manage interdependence within the organisation;
- effective change must involve the people whose jobs are being changed;
- change can only succeed with effective leadership.

Bobbitt et al [1978] captured the essence of change agents when they recognised that background factors in the environment and the organisation's influence employee behaviour. Personal characteristics are also important. Furthermore the emergent behaviour of individuals tends to be highly dependent on (and helps determine) the group norms that develop out of the internal social structure of the organisation.

Oakland [1989] believed peoples behaviour is affected by the way an organisation is set down and suggested that the establishment of positive quality policy objectives within an organisation must be accompanied by the clear allocation of responsibilities within the management structure. Kehoe [1996] and Cullen & Hollingum [1987] believed that an understanding of the relationship between people and work can be gained from the contributions of F.W. Taylor, A.H. Maslow, F. Herzberg and D. McGregor

Some of the theories attributed to these people are examined in Section 2.4.2 in which the change agents are identified and discussed.

2.4.2 Culture Change Agents

As mentioned in the Section 2.2, the literature review into behavioural sciences and organisational design showed that they could provide factors that affect attitudes and values on one hand and design of culture-related mechanistic structures on the other hand. These factors will now be examined.

Behavioural sciences

Cooper et al [1988] listed factors that affect work stress and behaviour. These were working conditions, new technology, risk and danger, work overload and underload, relationships with superiors, subordinates and colleagues, job security, self-esteem and organisational climate. Goldstein [1993] contended that training and development activities are aimed at changing behaviours. The nature of the training is also vital. Arnold et al [1995] stated that leadership and the role that leaders play (e.g. decision making, consultation, communication, delegation and participation) influence employee behaviour. Kiesler [1971] and Matey [1986] believed that allowing employees to make decisions leads to an escalation of commitment.

Other behavioural scientists such as Mento et al [1992] and Latham & Yukl [1976] believed that goal setting influences behaviour and the measurement of work performance also affects employee values and behaviour. The British Psychology Society [1986] lists attitude surveys, work design, performance appraisal and ergonomics as important parts of work psychology.

In their measure of job satisfaction, Hackman & Oldham [1976] made mention of various factors including personal pride, work relationships, work communication, style of supervision, work flexibility, use of skills, 'feel' or climate of the organisation and the volume of work.

Arnold et al [1995] examined rewards at work and differentiated between contrived on-the-job rewards (company picnics, after-work parties, company car, feedback about performance, etc) and natural rewards (money, insurance policies, holidays, recognition or praise, job rotation, job enlargement, etc)

Organisational Design

A study by Williams et al [1993] led them to conclude that a major change in technical systems of the organisation (reward systems, organisational structure, technology) may alone result in behavioural and cultural change. They also believed that interaction and communication are vital in the formation of culture and that managerial behaviour, work group behaviour and the work environment are major determinants of culture.

Pheysey [1993] stated that organisational structure and job design (job rotation, ergonomics, job enlargement, etc) influence culture. Other factors linked to culture are decision making, managerial commitment, rewards, motivating leaders, communications and organisational values.

Hampden-Turner [1994] asserted that manager-worker relationships, delegation, involvement, recognition, reward, co-operation, responsiveness, participation, work safety, training programmes, communication and values all play a part in culture development. Hampden-Turner also refers to the McKinsey's seven 'S' model which lists strategy, systems, structure, skills, staff, style and superordinate goals as factors influencing culture.

There is a general consensus among organisational designers that the value system of an organisation is important to culture development and Daft [1988] suggested that managers may help change cultural values by use of slogans, symbols and continuous emphasis. Williams et al [1993] believed that social activities, training and development, appraisal, payment and reward, communications and employee relations are mechanisms of culture change.

Classification of Change Agents

Factors identified in the previous section were grouped into five sets of change agents based on their nature. The change agents are:

- Motivation;
- Reward;
- Policies and values;
- Environment;
- Organisational structure.

These factors then became sub-elements of the five change agents. The sub-elements are shown figure 2.15. These nature of these change agents and their effects are now discussed.

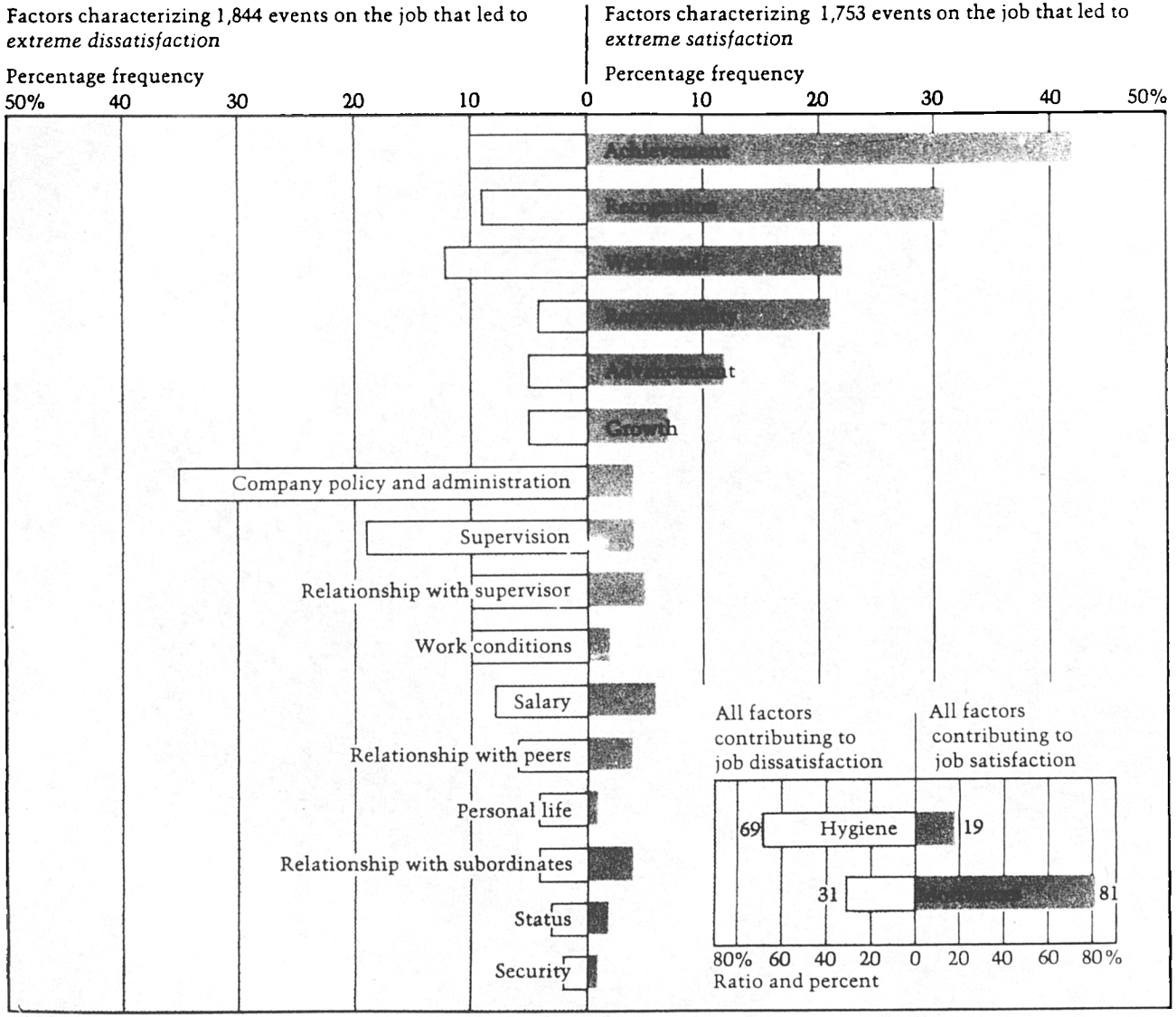
Motivation

To understand motivation, it is vital to investigate what leads people to work. Apart from the need for money, reasons for taking up employment as identified by Robinson et al [1988] include job satisfaction, challenge, social contact, power, prestige, social norms and self advancement. It is generally assumed by behavioural scientists that behaviour is directed towards the reduction of a need (or set of needs). The drive to reduce a particular need may be taken as a 'motive,' [Bobbitt et al, 1978]. The theory of motivation which is perhaps, mostly referred to is the one proposed by Maslow in 1968. Maslow's theory identified a hierarchy of human needs founded on the basis that a satisfied need is no longer a motivator and the individual strives to climb to the next level.

On the other hand Herzberg [1966] found that the factors that employees regarded as satisfying were not the opposite of those they found dissatisfying. He concluded that there were two main groups of factors affecting motivation at work - 'motivators' and 'hygiene factors'. These are also known as satisfiers and dissatisfiers (see Figure 2.12).

McGregor's work examined behavioural models with respect to the way people approach work and identified two theories (known as Theory X and Theory Y) which

Fig 2.12 Herzberg's Factors affecting Job Attitudes



are applicable in organisations. Theory X states that people dislike work and will avoid it where possible, that they dislike responsibility, lack ambition and need to be controlled. In contrast, Theory Y states that people see physical and mental effort at work as natural, workers not only accept but seek responsibility if committed to the organisation's objectives, and are capable of more creativity than they are credited with. Approach to work will depend on which of the theories management (or a manager) adopts.

A different approach is preferred by Alderfer [1972] who disagreed with Maslow's hierarchical theory (see figure 2.13) and believed that needs exist independently of each other. He proposed the ERG theory which identifies needs as:

- Existence - physiological needs;
- Relatedness - the need for satisfying social relationships;
- Growth - the need to develop one's own potential.

Cassidy and Lynn [1989] identified six components of the need for achievement which they believed affect motivation. These are:

1. work ethic - motivation to achieve based on the belief that performance is 'good' in itself;
2. pursuit of excellence - desire to perform to the best of one's ability;
3. status aspiration - desire to climb the status hierarchy and dominate others;
4. competitiveness - desire to compete with others and beat them;
5. acquisitiveness - for wealth and money;
6. mastery - competitiveness against set standards.

Belbin and Hartston [1976] broke down the need for achievement into four elements: competitiveness, attainment, determination and consistency. Tyson & Jackson [1992] quoted Eric Trist's work and argued that he added a new dimension to motivation theories. Trist's main contention is that people prefer reasonably demanding work with some variety and this led to the idea of job design. Trist identified a range of

methodologies to try and improve morale, job satisfaction and motivation. These include:

- Job rotation;
- Job enlargement;
- Job enrichment;
- Job redesign.

Tyson & Jackson [1992] also examined the relationship between job satisfaction and work behaviour and conclude that quality and quantity of output, as well as co-operation, are related directly to effort and purpose. Job satisfaction can also be related to the liking, or otherwise, for the job, which has such indicators as accidents, cheerfulness, lateness, absenteeism, etc. Child [1984] examined deficiencies in organisations and lists reasons for which motivation and morale may be depressed as:

1. People perceive that they have little responsibility, opportunity for achievement and recognition of their worth because there is insufficient delegation of decision making;
2. There is a lack of clarity as to what is expected of people and how their performance is assessed;
3. Decisions appear to be inconsistent and arbitrary in the absence of standardised rules;
4. People are subject to competing pressures from different parts of the organisation;
5. People are overloaded because their support systems are inadequate.

Reward

A reward policy involves the selection of a range of rewards and the design of the manner in which they are administered, with the ultimate aim of motivating employees to contribute effectively to a set of organisational goals [Child, 1984]. Bobbitt et al [1978] distinguish between two types of reward:

Fig 2.13 Maslow's hierarchy of Needs

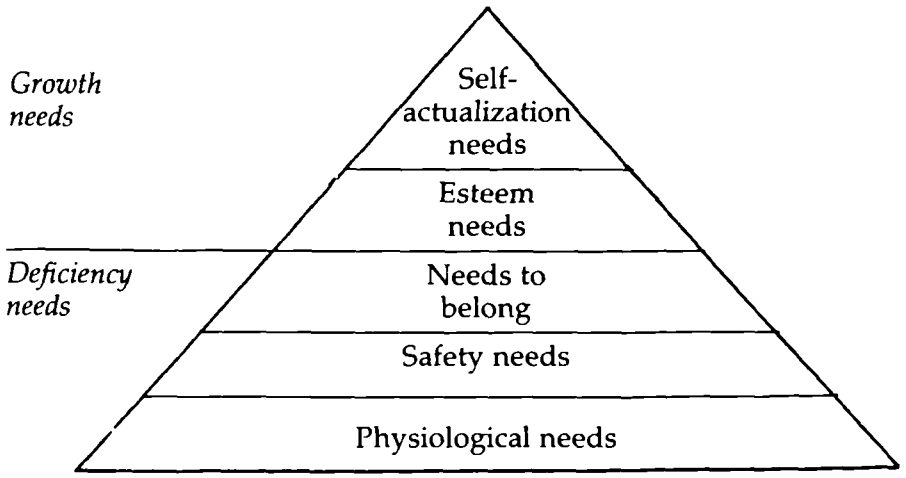
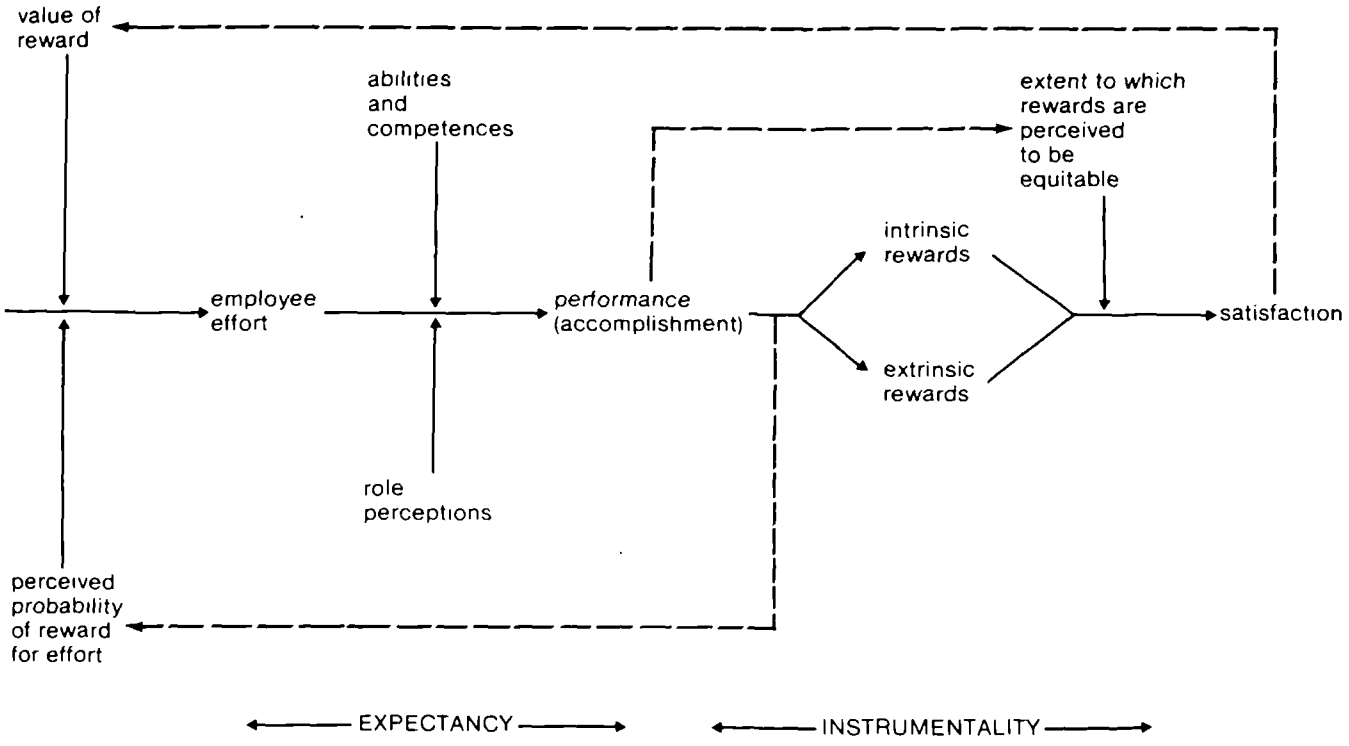


Fig 2.14 Relationship between Reward, Effort and Individual Performance (Porter, 1968)



- intrinsic rewards - these include feeling of achievement, success, accomplishment or having met a challenge;
- extrinsic rewards - these include pay, promotions, performance bonuses, etc.

Intrinsic rewards are rewards a person gives himself while extrinsic rewards are external in nature. Rewards arising from performance generate a satisfaction level that is dependent on the closeness of the rewards to what the person regards as equitable. Extrinsic rewards are more tangible and easier to adjust.

In principle, rewards are meant to encourage the behaviour that precedes them while punishment aim to prevent behaviour repetition and are therefore important control tools [Child, 1984]. Successful reward systems must be compatible with the tasks and structures laid down for the organisation. In viewing reward systems, management and employees tend to apply different criteria. Management would expect reward systems to: (1) attract and retain required personnel; (2) encourage dependable behaviour; (3) secure high commitment and effort; (4) encourage flexibility; and (5) foster innovation (see Figure 2.14). Employees, on the other hand, have a strong tendency towards comparability when considering rewards. Adams equity theory suggests that people evaluate the ratio of input or effort to output (e.g. pay) and compare with ratios of a relevant other person who may be within or without the same organisation [Tyson & Jackson, 1992]. Other dimensions of comparability include comparison with other jobs in the local community and a comparison based on skill and qualifications.

The significance and effects of tangible rewards such as pay are subject to never ending controversy. Herzberg's view that money is not a motivator has been widely disputed. A distinct view is offered by Tyson & Jackson [1992] who concluded that money is a short-term motivator. What is not in doubt is that money is a powerful tool and pay is important to almost everyone. Money often acts as a pull or push incentive for taking up a job or for leaving one job for another. Pressures of contemporary society have made pay even more vital and pay disputes continue to be major reasons for workforce strikes and threats of strikes. The ever-present alternative of unemployment and the need to make a living continue to make rewards, particularly money, the major reason,

and sometimes the sole reason for people to take up employment, often relegating other factors including motivation and working conditions to the background.

The criteria on which rewards are determined are also a source of concern among employees. A study by Barclay [1986] indicated concern about promotion being based on factors that employees either cannot influence or know nothing about. Other concerns indicated include personal career progression.

Irrespective of whatever viewpoint one adopts or the personal preferences and biases of individuals within the organisation, what needs to be seen is that the salary system and benefits or bonuses is as objective as it can be [Tyson & Jackson, 1992].

Policy and Values

Organisational policies must be transmitted into worthwhile values among the workforce. The proliferation of policies will be most effective only when it impacts meaningful and lasting values on members of the organisation. Hofstede [1984] defined values as:

'a broad tendency to prevent certain states of affairs over others.'

It is important that the values of the employee and the organisation are identical. Schein stated that the value system as perceived by the individual is a career anchor. He then argued that if the career anchors are not compatible with the work, the performance and psychological well-being of the individual are directly affected [Tyson & Jackson, 1992]. Employing a cultural approach that entails enlarging and changing values seeks to change behaviour by changing the individual's perceptions, cognition, or attitudes, rather than aiming at behaviour directly [Bobbitt et al, 1978].

It is also vital that conflicting values are not held by different groups within the organisation. Conflict leads to tension which, in many ways, could affect the productivity of the organisation. As much as possible, all members of an organisation

should hold the same values. In the instances where values may differ either along functional of hierarchical lines, then such differing values should not be incongruent with one another or the general organisational values. Ouchi's 'Theory Z'[1981] proposes that decision making should be based on shared values.

Management plays an important role in value development. Tyson & Jackson [1992] noted that the potency of cultural norms seems to depend on the strength and dispersal of the beliefs and values held by people of influence. Kehoe [1996] suggested that employees will tend to adopt the attitudes adopted by management and that the behaviour and values of the workforce is a reflection of management attitude. The reason for this is not far-fetched. Employees want to progress in the organisation and to do this, they tend to 'value' what management 'values.' Thus it is important that management live out the values they want to transmit through the organisation.

Other suggested ways of value transmission include the use of sensitivity training, where the trainer's role to serve as a behaviour model is important [Bobbitt et al, 1978] and the encapsulation of values in company slogans. It is also very important that the policies of the organisation are clearly laid down and known to everyone within and, if necessary, outside the organisation.

Environment

Environment as used in this study refers not only to the ergonomic aspects of work but also to organisational systems, market environment and new technologies. A series of studies by Woodward(1958) showed that management style and decision-making were significantly determined by technical complexity and the type of production system.

Robinson et al [1988] defined a system as a process by which a company organises the production of a service or product it seeks to provide. It is necessary to examine workflow processes in order to identify the various stages and the links between them. Problems arise when plant and equipment are not arranged in a layout that is consistent with the boundaries of groups of activities within the production process [Child, 1984].

This view was further supported by Bobbitt et al [1978] when they pointed out that there are interdependencies between organisational units and when there is no co-ordination among the units, common goals may not be achieved. They also noted that instituting radically new processes could introduce uncertainty into the organisation.

Leavitt [1965] defined technology as direct problem-solving inventions like computers, drill presses and work-measurement techniques. Reasons for introducing new technologies to organisations are rarely cultural but have more to do with such factors as capacity, quality, time, cost, strategic planning, etc. there can however be significant cultural implications. On one hand, they may involve better, easier and worker-friendly work procedures, on the other hand, some employees may fail to see the point of it while others may only foresee a supremacy struggle between themselves and new technology and possible job losses [Robinson et al, 1988]. New technology has also been known to result in an element of 'deskilling.' While this shift from operative to monitoring roles could foster close social interaction, it may diminish interest and sense of achievement [Child, 1984]. However use of obsolete technology has even more far-reaching consequences. These would include increased levels of stress, low output\input ratio, safety concerns and job security concerns.

Lawrence and Lorsch [1967] attempted to define a link between the internal states of an organisation and its market. This view was corroborated by Williamson [1973] who argued that an organisation's efficiency is affected by its market environment. Bobbitt et al [1978] concluded that an organisation must adapt its behaviour to its environment and matching changing environments could be sources of considerable strain. Companies in stable and steady markets are less likely to experience market-related cultural difficulties.

The individual workers perception of his environment is also an important cultural consideration. Significant elements likely to influence the employees view include ergonomic considerations and mastery of the process.

Organisational Structure

The structures of different organisations vary for reasons which were highlighted by Robinson et al [1988] as:

- Organisations vary in size;
- Some organisations perform few, others many, functions;
- Organisations may operate on one site, others are many;
- Organisations may work a 9 to 5 day, others work all around the clock;
- Organisations operate in different markets: some markets are stable, others are volatile;
- Organisations tend to respond to the latest fashion and trends in management theory.

According to Tyson & Jackson [1992] organisational structures are not static, but change in response to internal and external pressures. Traditionally, the demand for reliability through the strict performance of preplanned procedures has influenced the proliferation of hierarchical structures. Bobbitt et al [1978] believed that when designing an organisation in a bureaucratic form, issues to be considered are:

1. The size of the hierarchy;
2. Spans of control;
3. The grouping together of activities.

The size of the hierarchy is typically affected by the span of control and vice versa. Increased levels of hierarchy (tall structures) implies a decreased span of control. According to Child [1984], tall structures tend to increase employees' commitment to the organisation and enhance job satisfaction because they provide many steps for career progression. However, these structures also lead to communication problems, delays, dilute top management control, encourage the 'bypassing' of supervisors and

A. Motivation

1. Workers problems
2. Communication of Mgmt. actions
3. Employee awareness of company's performance
4. Managerial high-handedness
5. Performance targets
6. Responsibility for failure
7. Motivating leader
8. Incentive scheme
9. Recognition scheme
10. Fringe benefit
11. Job pride
12. Training program
13. Responsibility for decisions
14. Multi-skill training
15. Job enlargement
16. Attitude survey

B. Reward

1. Graded pay
2. Pay-effort balance
3. Employee expectation
4. Labour cost trend
5. Pay competitiveness
6. Benefit schemes
7. Overtime
8. Wage review
9. Performance appraisal
10. Work measurement
11. Pension scheme
12. Accident insurance
13. Working conditions
14. Pay negotiations

C. Organisational Policy & Values

1. Policy structure
2. Vigour of policies
3. Quality policy
4. Business performance policy
5. Employee welfare policy
6. Stability of workforce
7. Promotion policy
8. Disciplinary policy
9. Managerial view of profit
10. Policy awareness
11. Policy training
12. Employee contribution to policy
13. Emphasis on quality policy
14. Company slogan
15. Policy stability
16. Employees values
17. Quality audit

D. Environment

1. Equipment availability
2. Equipment maintenance
3. Back-up equipment
4. Employee-equipment familiarity
5. Multi-machine training
6. Employee ability to solve problems
7. On-the-job training
8. Ease of company processes
9. Employees understand processes
10. Multi-dept. process integration
11. Process ability to meet demand
12. External pressure on employee
13. Occupational hazards
14. Market performance and profit

E. Organisational Structure

1. Company size
2. Management levels
3. Instruction channelization
4. Request channelization
5. Worker-manager relations
6. Top mgmt-Frontline communicate
7. Multiple reporting relationship
8. Interdepartmental communication
9. Intradepartmental communication
10. Managerial level relations
11. Joint departmental plans
12. Company teams

Fig 2.15 Identification of Organisational Culture Factorss

make it difficult to distinguish closely between responsibility at different levels in the organisation. They may also reduce the scope of responsibility for subordinates and thus have an adverse effect on motivation and initiative. Furthermore tall hierarchies dilute and often delay the requests of the lower layers leading to a feeling of isolation, frustration, implied indifference and resultant motivational problems. Large spans of control, brought about by flat structures also have cultural implications - they make control difficult and where work interlocks, they encourage multiple reporting relationships which could create considerable tension and stress both for the employees and the management.

Organisations have often encouraged centrifugal tendencies with individuals and departments straining to pursue their own paths. Administratively, creating a highly departmentalised structure has various advantages but the disadvantages are known to have serious consequences. The most obvious problem of such differentiation is communication and integration between departments [Child, 1984]. The integration problem is augmented if different objectives and targets are allocated to the different departments resulting in the steadfast pursuit of sectional objectives. One of the many implications is buckpassing between departments and only partial solutions to common problems. In extreme cases, organisations can experience suspicion and functional dislike (and the attendant cultural implications) between departments or sub-units.

2.4.3 Quality Culture\Change Agents Relationship

The literature on culture change agents provides good support to the suggestion that the identified change agents can affect an organisation's culture. Having identified the elements of quality culture in Section 2.2, the next step will be to determine the relationships between the two and investigate how the change agents could affect culture change. In this respect, emphasis is placed on the sub-elements of the change agents.

The determination of the possible relationships will be the basis for the development of the data gathering instruments. It will also play an important part in the analysis of the

data and ultimately the realisation of the research objectives. Because of the diverse and extensive nature of the culture change sub-elements, it was reasonable to accept that some of the change agents would affect more than one quality culture element. This resulted in an initial suggestion to cross each culture change sub-element against each quality culture element. This idea was later discarded for two reasons - some of the change agents had little or nothing to do with some culture elements and the amount of non-existent and insignificant relationships that would be generated could make it difficult to pick out the required specific information.

It would be necessary to only plot relevant culture change sub-elements against any chosen quality culture elements. The non-trivial nature of the relationships also led to a decision to simplify the relationships as much as possible in order to make identification of elemental effects easy to notice. It was decided that a cause-and-effect approach will be used. This would be done using Ishikawa (fishbone) diagrams. The culture change sub-elements would represent the causes while the quality culture elements would represent the effects. The fishbone diagram is shown in Figure 2.16 while Figure 2.17 gives an overview of the author's impression of culture design as a result of the literature review.

2.5 Summary

Inability to develop a culture that complements TQ implementation has been identified as a primary cause for the failure of many TQ efforts. A common problem is the lack of understanding of the nature and constituents of a TQ culture. Culture has been viewed from three perspectives - behavioural sciences, organisational theory and quality management. The quality management view was found to best reflect the desired culture of which the identified elements are senior management leadership, employee involvement and empowerment, teamwork, effect of chief executive, customer focus, partnership with suppliers and an open corporate culture.

Fig 2.16 Mapping of change agents onto 'required' quality culture

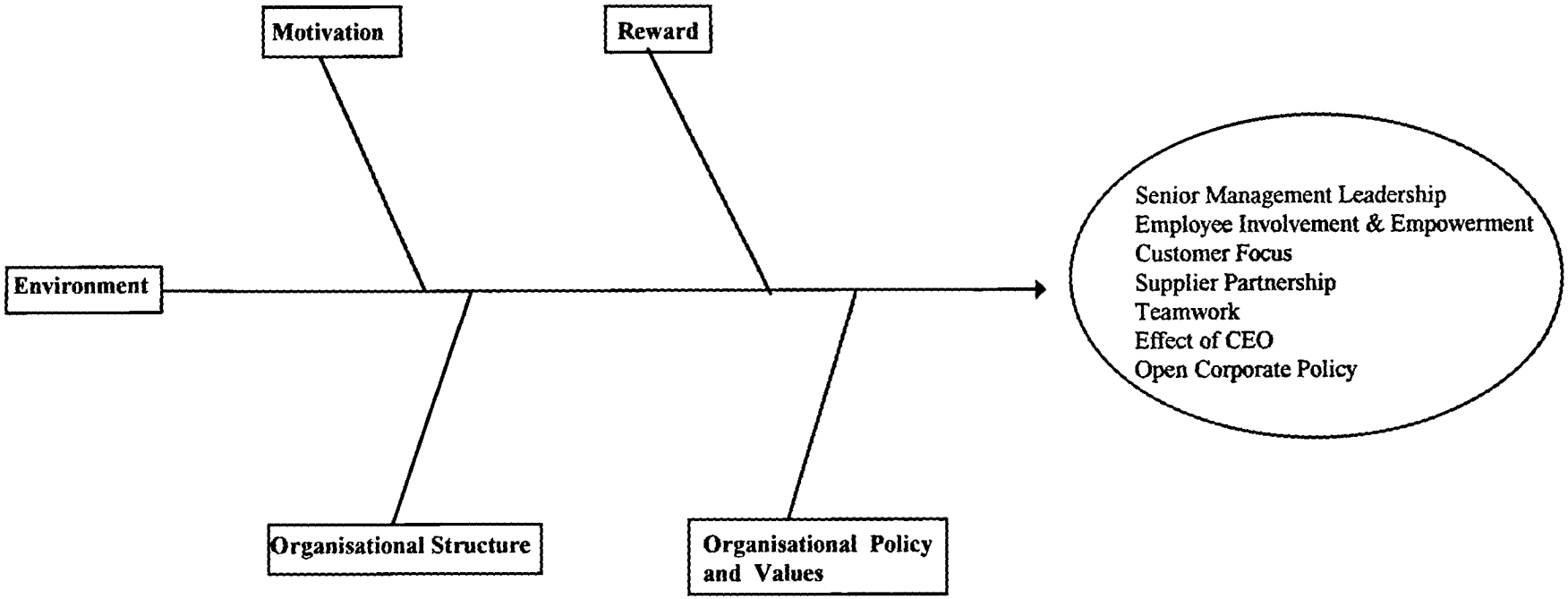
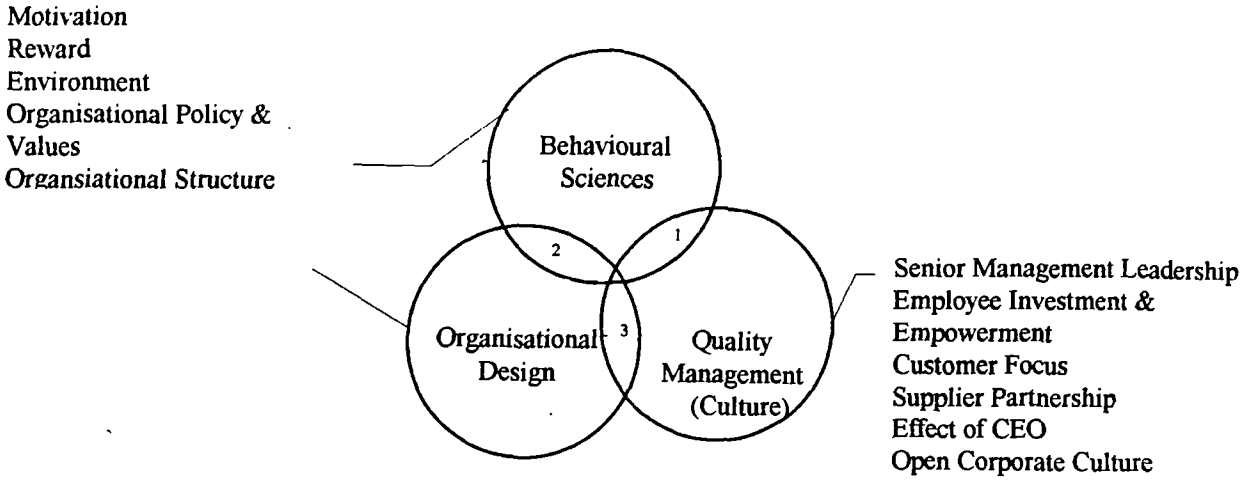


Fig 2.17 Culture Design



1. Behavioural Sciences affects Quality Culture development and established Quality culture may influence personal behaviour traits.

2. Organisational Design influences personal behaviour.

3. Organisational design literature explains nature of culture and Quality Culture requirement may affect company organisational design.

The importance of each of the quality culture elements have been identified. Senior management should direct the overall TQ effort and lead by example. The chief executive should promote an environment suitable for quality development and provide the necessary resources. Employees should contribute to the quality effort and participate in teamwork. Customer focus and supplier partnership should be considered as vital to overall success and structured approaches should be adopted. Major problems with culture change were identified as natural resistance to change and the often substantial timeframe required to achieve change.

The various factors that have the potential to change the way people work and think have been grouped under five change agents :- motivation, reward, policy and values, environment and organisational structure. Employee motivation is regarded as fundamental to the need for satisfaction while reward is commonly considered as a powerful incentive which is also vital to well-being. Policy and values exert a strong influence in determining what issues are considered as important while the work environment can significantly affect attitudes. The structure of an organisation can affect communication, work relationships and job satisfaction.

CHAPTER 3 - QUESTIONNAIRE PLANNING AND DESIGN.

3.1 Introduction

This chapter describes the process involved in planning and designing of the Quality Culture questionnaire. It also describes the distribution method as well as the response rates and insights as to how the information gathered was to be analysed. A copy of the questionnaire(s) and covering letters are to be found in Appendix A.

3.2 Objectives

The reasons for adopting the postal questionnaire method of data collection have been discussed in Section 1.5. The 'Quality Culture' questionnaire was intended to specifically achieve the following:

1. gather information on the responding organisation;
2. give a quantifiable and qualifiable index of the current level of quality culture development in the organisation;
3. indicate the level of employment of identified culture change agents.

This information would then be analysed in order to investigate the relationship between quality culture and culture change agents. It would also provide a platform for the designing of the personal interviews as well as the realisation of the research hypothesis. The ability of the questionnaire to elicit the required information was determined from the analysis of the pilot questionnaire. The pilot questionnaire was found to be inadequate and amendments were made before Survey 1 was carried out.

3.3 Questionnaire Planning

Planning of the questionnaire was carried out in as much detail and as carefully as possible. The different stages involved in the planning are discussed in the sections that follow.

3.3.1 Information Required

The elicitation of the general approach to quality culture was viewed as a vital result of the survey. The level of culture development and use of change agents was seen as very important. It was equally important that this information was collected in a format that was not only easy to measure but was also a true reflection of the state of the responding organisation.

3.3.2 Target Organisations

Issues considered in the determination of where the information was to come from were:

- The type of organisations and number of responses which would meet the information requirements.
- The most appropriate person(s) within the organisation to respond and the possibility of seeking more than one opinion within the same organisation.

The decisions taken on each of these considerations are now discussed.

Organisation type

Although the 'required' quality culture elements and the change agents identified in the study were valid for both manufacturing and non-manufacturing organisations alike, only manufacturing organisations were surveyed. A major reason for this option was advanced by Zain [1993] by writing that the quality revolution was the brainchild of

the manufacturing industry and it would follow that there was the likelihood of encountering more quality developed organisations if this sample type was considered. Furthermore, the structure of the questionnaire had a slight bias towards manufacturing industry. It was believed that a choice of this sample type would not render the research findings inapplicable to other sample types. The results, with little or no modification, were expected to be easily adaptable to service-based industry.

The questionnaire was to be addressed to two classes of manufacturing organisations identified as:

a) TQ Sample - A sample of organisations that were implementing TQM and were likely to be highly quality developed. These organisations were either described as TQM orientated in Quality journals or were market leaders or multinational organisation with an inclination towards superior quality development.

b) Non-TQ Sample - A sample of manufacturing organisations selected at random and were not expected to be TQ implementing or highly quality developed. This would enable an investigation of culture development in both 'quality' and 'non-quality' organisations.

The Respondent

It was not considered desirable to seek two responses from the same organisation. Reasons for this included cost consideration, time factor and the possible refusal of respondents to participate.

Having decided to seek only a single response from each organisation, a decision had to be taken on the intended respondent. Three options were considered:

a) The Quality Manager - The individual responsible for quality and was expected to be interested in Quality issues. Quality Managers however, tend to be under considerable pressure and may be unable to respond.

b) The Chief Executive - Chief Executives, although busy, are often interested in quality advancement and novel ideas, especially from academia. When unable to answer, there is a likelihood of delegating the duty to an equally capable assistant.

c) The Human Resources Manager - HRH's are likely to be under considerably less pressure than the previous options. Furthermore the issues involved in the questionnaire were not of a nature that would make replying difficult for a HRM.

The pilot questionnaires were sent to equal numbers of the above in both sample types. The results showed that Quality managers were most likely to respond even when the questionnaires were addressed to others. Based on this observation, questionnaires sent out in the two subsequent surveys were all addressed to the Quality Manager.

Sample Size

The pilot survey was sent to 150 organisations (75 from each sample) and a total of 35(23.3%) valid responses were received. 23 of these were from TQM implementing organisations while 12 responses were from non-TQ organisations. This result, along with other considerations such as cost and minimum required number of responses formed the basis of surveys 1 and 2.

Survey 1

An analysis of the pilot questionnaire was carried out. This analysis showed that the questionnaire was unable to extract all the information that would be required for the research. Consequently, the scope of the questionnaire was expanded before Survey 1 was carried out. Survey 1 was carried out in two stages. The first stage involved sending out 150 questionnaires. This included 35 that were sent to organisations that had responded to the pilot. The responses were then analysed for adequacy. Some of the respondents were also contacted by telephone to find out if they had any difficulties in understanding the issues addressed in the questionnaire. When the adequacy and

suitability of the questionnaire had been ascertained, a further 250 questionnaires were dispatched.

Survey 2

The decision to have this survey was purely tactical. Having decided from the onset the number of questionnaires to be sent out in total, it was considered desirable to carry out the exercise in two stages. It was felt this would enable the cost and effort to be spread over time. Furthermore, a measure of flexibility was to be gained by examining the outcome of Survey 1 before embarking on Survey 2. For Survey 2, a total of 250 questionnaires were sent out.

3.3.3 Anticipating Response rates

The difficulty in obtaining an adequate response rate is the most serious problem of postal questionnaires as noted by Zain [1993] and Nachmias & Nachmias [1992]. Two reasons why this happens are:

1. refusal to respond for such reasons as lack of time, effort and motivation as well the nature of the questions asked;
2. contacting the wrong person in the organisation.

Apart from the obvious result of a decreased sample size, poor response may create a bias because nonrespondents differ from respondents. Nachmias & Nachmias [1992] stated that the bias resulting from nonresponse may limit the ability to make generalisation to the entire population.

Such a trend was noticed with the pilot questionnaires whereby equal numbers were sent to organisations in both sample but the responses from the TQ sample (23) was almost double the responses from the non-TQ sample (12). A major reason for this was highlighted by Mann [1992] when he wrote that TQ companies were more likely to be highly quality developed and would tend to be more interested in completing a

quality questionnaire. Certain steps were taken to minimise the possibility of non-response. These were:

Covering letter - The covering letter was designed to convince the respondents to fill out the questionnaire and mail it back.

Inducement to respond - There was an appeal to the respondents' altruistic sentiment by informing them of the study's significance. They were also promised a copy of the research findings. This proved to be quite agreeable as 80.1% of the respondents requested the findings.

Selection of respondents - Mann [1992] recorded a significant number of uncompleted questionnaires because they were sent to non-manufacturing companies. To prevent such occurrences, the questionnaires were only sent to companies that were certified to be manufacturers.

Mailing - A return addressed envelope was provided but stamps were not provided due to cost constraints.

Questionnaire layout - As much as possible the questionnaire was designed to make it respondent friendly.

Anonymity - The questionnaires in both surveys were not 'tagged' and respondents had the option on omitting their names and their companies' names thus ensuring complete anonymity.

3.4 Questionnaire Design and Content

In designing the questionnaire, it was decided that the two major issues to be considered were the questionnaire content and the question design. To provide the required data, it was vital that the questionnaire was able to translate the research

objectives into specific questions while the question must motivate the respondent to provide accurately, the information requested.

3.4.1 The Questions

Content, structure, format and sequence were taken into consideration in formulating the questions. The success of questionnaires is influenced by the clarity and simplicity of the questions [Jollife, 1986], and every care was taken in wording the questions. All the questions asked can be classified into two categories:

- *Factual Questions* - These are intended to elicit objective information from the respondents. Such questions are easier to design and are believed to generate more accurate answers [Fowler, 1989]. Most of the factual questions in the survey are concerned with the company details and specific activities carried out by the company.
- *Opinionated Questions* - Survey questions about opinions present more problems in construction than questions about facts. Opinions may not always be measured with single questions and this was one of the factors that necessitated the expansion of the questionnaire after the pilot study. Furthermore, answers to opinionated questions are more sensitive to changes in wording, emphasis and sequence when compared to factual questions. In a study of this nature, it was impossible to do away with this class of questions. Extreme care was taken to make them as streamlined and 'factual' as possible.

All questions asked were closed-ended questions although there was ample space for respondents to express their views. The response categories differed according to question type. Respondents were generally required to circle or tick appropriate answers. A substantial number of the questions were of the 'yes/no' type. Also used were rating scales where respondents are required to make a judgement in terms of sets of ordered categories such as "always," "often," "sometimes," and "never." Section H (this section assesses elements of the 'required' quality culture) consisted

entirely of matrix questions because the set of rating questions had the same response categories.

Avoiding Bias

The creation of bias is a noted problem in questionnaire construction. Steps taken to avoid this occurring are now listed:

- The questions were worded so that respondents will have little difficulty understanding them and so that the questions had the same meaning to each respondent;
- Answer formats were varied within sections to avoid response sets [Nachmias, 1992] and 'unthinking' answers [Zain, 1993].
- Leading questions which might suggest to the respondent that the researcher expects a certain answer were avoided.
- Double-barrelled questions or questions which combine two or more questions in one were avoided.

3.4.2. Survey Cost

Resources for the survey were reasonable but limited and every attempt was made to achieve maximum output from allocated resources. Exercises carried out in cost control include the adjustment of the questionnaire lay-out to reduce paper usage although double-sided sheets were avoided. All questionnaires were sent by second class mail while the selection and labelling of companies were carried out in the department as opposed to purchasing from external organisations.

Steps were taken to ensure reasonable response rates thereby eliminating the contingency of sending out more questionnaires. These steps have already been discussed. Although, cost was monitored, none of the cost measures affected the contents and overall quality of the questionnaire.

3.4.3 Contents

The pilot questionnaire was divided into 8 sections but a ninth section was added before surveys 1 and 2 were sent out. The issues in these sections can be classified into three areas - Company details, Change agents and Quality culture. Sections A and B were concerned with company details and Section H investigated quality culture while all the other sections were concerned with change agents. The sections are now examined in more detail. The questions related to the change agents are also linked to the relevant quality culture elements. This links were determined from indications in the literature survey.

Sections A (Respondent details) & B (Company profile)

Section A requests personal details of the respondent while section B surveys the size, market- related performance and ownership of the organisation. The section also determines if the company was a TQ company and for how long. Non-TQ companies were also to indicate if they intended to subscribe to TQM.

Section C (Motivation)

The level of motivation of employees was assessed in this section. Management approachability, attitudes and communication with employees were assessed. Training schemes, employee attitudes and empowerment were all investigated. The use of bonuses, recognition and incentive schemes were also examined. Table 3.1 shows the questions asked and their link to the quality culture elements.

Table 3.1 Motivation-related questions

Question No.	Details of Questions	Link to Quality culture
8	**Which of the following activities are peculiar to your company?**	
	1. The chief executive displays a motivating personality	CEO, TW,SML
	2. There is a quality champion in top management ranks	SML, EIE, TW CEO, SP
	3. Management motivates by taking responsibility for their actions	SML, TW,CEO
	4. Are quality problems blamed on systems rather than people	SML

	5. Performance targets demand constant improvement	SML, EIE, SP, CEO
	6. Freedom of workers to individually schedule own work	EIE, CEO,OCC
	7. Workers approach supervisors and managers easily	SML
	8. Workers are encouraged to express their difficulties	SML, EIE
9	**Please rate the following issues accordingly** **A = always; O = often; S = sometimes; N = never**	
	1. Management specifies reasons for their decisions to all workers	EIE
	2. Management speedily addresses operational problems	SML
	3. Management regularly informs all employees of the performance e.g. monthly sales, quarterly profits, etc.	EIE
	4. Management involve/ consult employees in appropriate decision making	CEO, EIE
	5. Management conduct formal/informal attitude surveys	EIE, CEO
	6. Management seeks reasons for poor business performance	SML, SP,TW, CEO
10	**Please indicate which of the following is/are available to your employees** 1. Employee suggestion scheme 2. Fringe benefits (e.g. product subsidies) 3. Incentive schemes (e.g. bonuses) 4. Recognition schemes	CEO, EIE
11	**Please indicate which of the following can be used to describe the company's training programme at your site** 1. Involves improvement training 2. Customer focused 3. Team based 4. Multiskill training 5. Regular refresher courses	SML, EIE, SP, CEO, OCC
12	**With regards to all employees, would you say:**	
	1. Operators are trained to take decisions	CEO, EIE
	2. Workers understand customer needs	CF
	3. Workers know product characteristics	CF
	4. Production decisions are taken at the expense of quality	SML
	5. Workers in general, take pride in their jobs	EIE,CEO,OCC
13	**Would you say the company's suppliers:**	
	1. Meet product specification	SP
	2. Deliver on time	SP
	3. Are involved at an early stage in new development	SP, TW

CEO = effect of chief executive; SML = senior management leadership; TW = teamwork; SP = supplier partnership; CF = customer focus; EIE = employee involvement and empowerment; OCC = open corporate culture

Section D (Reward)

The section on reward requests information on the reward schemes available in the organisation. The adoption and significance of performance appraisal methods are examined. Employee involvement, general working conditions, wage competitiveness, adequacy and acceptability are examined. Table 3.2 shows the questions asked and their link to the quality culture elements.

Table 3.2 Reward-related questions

Question No.	Details of Questions	Link to Quality culture
14	**Which of the following schemes are available to all workers** 1. Paid holiday 2. Accident insurance 3. Sick pay 4. Overtime pay rates 5. Pension (non-contributory)	EIE, CEO
15a	**Is performance appraisal the major factor for determining remuneration for all employees**	EIE
15b	**Which of the following is/are applicable to the company's performance appraisal for all workers** 1. Improvement orientated 2. Regularly carried out 3. Individual based 4. Customer orientated 5. Team based (where teams are used) 6. Target based	EIE
16	**Would you say the pay rates:** 1. Are above average within the industry 2. Are competitive within the locality 3. Meet employee expectation 4. Reflect the workload 5. Need to be higher to improve motivation/quality	 EIE EIE EIE EIE EIE,CEO
17	**Are employees actively involved in:** 1. Work measurement 2. Determination of working conditions 3. Wage review	 EIE EIE EIE
18	**Generally would you say the working conditions are:** 1. Excellent 2. Good 3. Average 4. Below average 5. Poor	EIE, CEO

CEO = effect of chief executive; SML = senior management leadership; TW = teamwork; SP = supplier partnership; CF = customer focus; EIE = employee involvement and empowerment; OCC = open corporate culture

Section E (Organisational policy and values)

The existence and general awareness of a quality policy is determined in this section. Other policies which could affect the values of the organisation are investigated. The significance of quality and quality improvement to employees and management are also investigated in this section. Table 3.3 shows the questions asked and their link to the quality culture elements.

Table 3.3 Organisational policy and values-related questions

Question No.	Details of Questions	Link to Quality culture
19a	**Does the company have a quality policy**	CEO, SML
19b	**If yes, is the policy in writing**	CEO, SML
19c	**Which of the following are fully aware of the policy** 1. All employees 2. Suppliers 3. Customers	CF, SP
20	**Which of the following policies are in writing** 1. Employee welfare policy 2. Continuous improvement policy 3. Customer service policy 4. Supplier partnership policy 5. Supplier quality policy 6. Sales/marketing policy	SP, TW
21	**Does the company carry out policy training for** 1. Management 2. Workers 3. Suppliers 4. Customers	EIE, CEO, TW, SP, CF
22a	**Does quality consideration play an important part in decision making**	SML,EIE,SP, CEO
22b	**Does sales, profit or other consideration (please specify) take precedence over quality**	SML, CEO
23	**Which of the following is/are applicable to the company** 1. Stable policies 2. Stable workforce 3. Company slogan 4. Employee involvement in policy making 5. Management acts out its policies 6. Management monitors the effects of policies	EIE
24	**Do the workers understand the need for quality improvement**	EIE,TW,SML

CEO = effect of chief executive; SML = senior management leadership; TW = teamwork; SP = supplier partnership; CF = customer focus; EIE = employee involvement and empowerment; OCC = open corporate culture

Sections F (Environment) & G (Organisational Structure)

The section on environment requested data on issues regarding the general working environment in the organisation. Emphasis on suitable equipment and desirability and understanding of company processes are all examined. Management efforts to create a relaxed and encouraging environment as well as integration between all employees are examined.

The section on structure examines flexibility, bureaucracy and clear definition of lines and scope of responsibility in the organisation. Table 3.4 shows the questions asked and their link to the quality culture elements.

Table 3.4 Reward-related questions

Question No.	Details of Questions	Link to Quality culture
25	**With regards to equipment, which of the following does the company place major emphasis on** 1. Better than average for industry 2. Documented preventative maintenance 3. Up-to-date technology 4. Safety equipment	CEO
26	**With regards to the company's major processes, which of the following will you agree with** 1. The processes are simple (e.g. few stages) 2. Employees are trained to understand the processes 3. Employees are able to meet the process' technical and schedule requirements 4. The process capability is good and well within requirements 5. Management regularly reviews the processes 6. Suppliers are able to meet the process' demands	 OCC EIE, OCC EIE SML SML,EIE, CEO SP
27	**Does management:** 1. Specify different performance targets for different departments 2. Consider recommendations from company teams 3. Act in a self-critical manner 4. Make itself aware of customer needs and complaints 5. Buffer the effects of market forces/competition on workers	 TW, SML,OCC TW, CEO SML SML,TW EIE
28a 28b 28c	**Do senior and junior staff attend seminars, courses, etc. together** **Does the company have recreation programmes e.g. staffclub, departmental lunches, family parties, etc.** **Does the company work well together as a team**	EIE,CEO, SML TW OCC
29a 29b	**Are management's instructions quickly transmitted through the organisation** **Do bureaucratic matters often delay decision making**	OCC OCC,SML, CEO
30	**Which of the following are visible in the company** 1. Clearly defined lines of responsibility 2. Well defined worker/manager reporting relationships 3. Regular interdepartmental meetings 4. Employee interaction	OCC
31	**Which of the following units/departments are autonomous** 1. Customer service department 2. Quality assurance department 3. Product development unit 4. Market research unit 5. Process development unit	OCC

CEO = effect of chief executive; SML = senior management leadership; TW = teamwork;

SP = supplier partnership; CF = customer focus; EIE = employee involvement and empowerment; OCC = open corporate culture

Section H (Quality Culture)

This section assessed the current level of quality culture development in the organisation. Ranking matrix questions were asked on all previously determined quality culture elements i.e. senior management leadership, employee involvement and empowerment, customer focus, supplier partnership, teamwork, effect of CEO and open corporate culture. The levels were assessed as follows:

Please indicate the emphasis your company places on the following activities and rate accordingly

0 = No activity. Little emphasis (1) ..... (5) Great emphasis

The culture indicators ranked are shown below in Fig 3.5:

Table 3.5 Quality Culture elements

32	**Senior management leadership**
a	Quality training for management
b	Management steering committee
c	Long-term TQM goal
d	Quality information feedback to management
e	BS 5750/ ISO 9000 specifications
f	Statistical process control
g	Problem solving techniques
h	Internal quality audit
i	Quality improvement techniques (e.g. Taguchi)
j	Benchmarking
33	**Employee involvement and empowerment**
a	Quality awareness programme
b	Quality progress feedback to workers
c	Quality improvement courses for workers
d	Employee morale
e	Profit distribution
f	Involvement in decisions
g	Job enlargement
34	**Customer focus**
a	Customer feedback to management
b	Customer visits by management
c	After-sales service
d	Customer survey
e	Customer training
f	Long-term customer relationship

g	Pro-active approach to market information
35	**Supplier partnership**
a	Single sourcing
b	Information feedback to suppliers
c	Supplier audit
d	Supplier improvement activities
e	Supplier quality training
f	Supplier visits
g	Supplier awards
h	Joint design specification with suppliers
i	Joint problem resolution with suppliers
36	**Teamwork**
a	Quality circle
b	Problem solving team
c	Joint company/supplier team
d	CEO (chief executive) monitoring team
e	Joint company/customer team
f	Other deployed quality improvement teams
g	Other voluntary quality improvement teams
h	Team co-ordinator
37	**Effect of CEO**
a	CEO commitment to quality
b	CEO site visits (factory profile)
c	CEO attendance at quality courses
d	CEO independent quality audit
e	CEO resource commitment to quality
f	CEO flexibility to allow more empowerment, quality improvement, etc.
g	CEO encourages reward and recognition
38	**Open corporate culture**
a	Team membership rotation
b	Interdepartmental co-operation
c	Flat-layered management structure
d	Lean and flexible workforce

Section I (Teams and Customers)

This section is the last and was added after the results of the pilot had been analysed and indicated problems with teamwork and customer focus. It requested information on types and constitution of teams used. Facilitation, teamworking problems, benefits and training are also examined.

Capturing and fulfilment of customer requirements are examined. The use of customer satisfaction measures is investigated. Tendency to develop, maintain and evaluate

relationships with customers is examined. Table 3.6 shows the questions asked and their link to the quality culture elements.

Table 3.6 Teamwork and Customer focus-related questions

Question No.	Details of Questions	Link to Quality culture
39	**Does your organisation:**	
	a. address problems more on an individual basis as opposed to a team approach	TW, SML
	b. mostly encounter problems whose nature make them unsuitable for solving by a team based approach	TW
	c. have methodologies for determining what problems are best tackled by teams (e.g. crossfunctional or design problems)	TW
	d. have an organisational structure or physical layout that makes crossfunctional day-to-day integration difficult	TW
	e. employ Information Technology systems in interdepartmental, multilevel communication	TW, OCC
40	**Is your organisation:** - functionally based(i.e. organised into functional departments) - task based (i.e. organised for particular tasks or processes) - fairly balanced between both	TW, OCC
41	**Are your employees trained in appropriate teamworking techniques**	TW, SML
42 a b c	**What kind of teams are used in your organisation** - management teams - departmental teams - crossfunctional teams	TW, SML, OCC
43a	**Do your employees readily form voluntary problem-solving teams**	TW, EIE
43b	**If no, is it because of**	TW
1	- unwillingness to challenge current practice	
2	- lack of recognition of team efforts and individual contribution	
3	- junior employees feel their recommendations will have little impact	
4	- lack of time	
5	- lack of awareness of teamwork advantages	
6	- other	
44	**Has your company encountered any of the following teamworking problems?**	
a	- negligible benefits from teams	TW
b	- people don't like teams	TW
c	- company politics	TW, OCC
d	- costs (direct & indirect)	TW
45	**How are team members selected**	
a	- by team profiling (e.g. belbin technique)	TW, OCC
b	- by expertise	TW, OCC
c	- by personality	TW, OCC
d	- by volunteering	TW
46	**What type of facilitation is available to teams**	
a	- full-time facilitators	TW
b	- management facilitators	TW
c	- facilitator training	TW, EIE
47	**Are customer requirements communicated to all customer**	CF

	service employees	
48	**Can you consistently meet customer requirements over a period of time**	CF, SML
49	**Does your organisation have mechanisms for capturing changing requirements**	CF, TW
50	**Is your organisation aware of the needs of intermediate customers (dealers, distributors, sales outlets, etc.)**	CF, TW
51	**Does your organisation:-** (a) have a specified response timeframe to attend to customer needs (b) usually meet these response times (c) anticipate expectations of intermediate and end user (d) make customer retention a priority (e) encourage every employee to satisfy internal and external customers (f) pay particular attention to personal service (g) encourage customers to complain where necessary	 CF CF CF CF, TW CF CF CF
52.	**Has there been reorganisation to make the company more responsive to customers**	CF, TW, OCC
53a 1 2 3 4 53b	**Does your organisation use any of the following customer satisfaction measures:-** - complaints - delivery performance - level of satisfaction - product return rate **Are the values of these measures checked for improvements**	 CF CF, SML CF, SML CF CF, SML
54	**Does your organisation:-** (a) offer variety and flexibility in products and services (b) give technical assurances on products (i.e. warranties, spare parts) (c) reward major and/or loyal customers (e.g. bulk purchase discounts, loyalty benefits, etc.) (d) measure the quality of the relationship with customers (e) have a 'passion' for customer satisfaction	 CF, SML CF, SML CF CF, TW CF

CEO = effect of chief executive; SML = senior management leadership; TW = teamwork; SP = supplier partnership; CF = customer focus; EIE = employee involvement and empowerment; OCC = open corporate culture

3.5 Questionnaire Response Rates and Analysis

The rates of response to the survey and the methods of analysis used are now described.

3.5.1 Response rates

A total of 630 questionnaires were sent out with approximately half going to each of the two samples. The number of valid responses received and used in the analysis was

166 or 25.4%. Of these, 91(54.8%) responses were from TQ implementing organisations and 75(45.2%) responses were from non- TQ organisations. These numbers were deemed as sufficient and were actually slightly higher than the anticipated 23.3% indicated in the pilot survey. This rate also compares favourably with that of other researchers (Zain [1993] had response rates of 13.5% and 26.5% for her two surveys). The success rate was attributed to the care taken in designing the questionnaire and the nature of the issues in the questionnaire.

3.5.2 Analysis

Data generated from the questionnaires was entered into SPSS Data Entry and the analysis was carried out with SPSS/PC+. Output was mainly in the form of frequency distributions and crosstabulation. The results from this analysis are discussed in Chapter 5.

3.6 Summary

The questionnaires were sent to Quality managers in manufacturing companies. A total of 630 questionnaires were sent out and a 25.4% response rate was achieved. Steps taken to achieve this response rate included careful selection of respondents, respondent-friendly questionnaire design and inducement to respond. The questionnaire was intended to examine the level of use of culture change agents and the development of quality culture.

CHAPTER 4 - STRUCTURED INTERVIEWS

4.1 Introduction

This Chapter describes the methodology adopted in the design and administration of the structured interviews. The format and contents of the interview and the selection and contacting of respondents are also examined. The need to collect information through the structured interview was explained in Chapter 1.

The structured interview was particularly aimed at sections of TQ culture that were indicated as significant from the results of the questionnaire survey. These results are shown in detail in Chapter 5. A copy of the structured interview, covering letter and brief summary of questionnaire (sent along with the structured interview) can be found in Appendix C.

4.2 Interview design

In designing the interview, factors taken into consideration include the content, format, clarity and ability to elicit required information. These issues are now examined in detail.

4.2.1 Content.

The interview focused specifically on three aspects of TQ culture - management leadership, teamwork and customer focus. These areas were selected as a result of the indicated performances in the questionnaire survey (Chapter 5). Teamwork was indicated to be generally low in both TQ and non-TQ companies. Customer focus, on the other hand, was high in both TQ and non-TQ companies but no set of companies was really achieving a breakthrough. Management leadership was vital because of its overriding influence on other aspects of TQ culture. There was a section for each of

these issues as well as a section on general company details. A summary of the company details is shown in Chapter 6. In summary, the questions in the different section were structured as follows:

Section 1 - Confirmed the size, origin, quality status, process and product orientation and market situation of the company.

Section 2 - Investigated the style of management, management problems, relative successes and activities peculiar to the company.

Section 3 - Investigated the level of teamwork, significant change activities and teamwork problems in the company.

Section 4 - Investigated the customer focus activities in use in the organisation.

4.2.2 Format

Nachmias & Nachmias [1992] differentiated between three types of interview formats:

1. The schedule-structured interview, in which the sequence and wording of questions are fixed and identical for all interviewees. This ensures that variations in responses are attributed to differences in experiences of the respondents.
2. The nondirective interview in which the questions are not prespecified or asked in a specific order. Respondents are encouraged to relate their experiences with minimal direction from the interviewer.
3. The non-schedule-structured interview in which interviewees are at liberty to describe their experiences regarding the situation presented to them.

The format chosen was a compromise between interview types 1 and 3 as described above. The same questions were asked in a fixed sequence but many of them were non-restrictive and encouraged the respondent to narrate the experience of the company as regards the topic in question. This option had the advantage of keeping the

interview in focus while keeping the scope of information gathered open. This is especially important in such areas as quality culture where most of the issues are not technocratic in nature and open to different interpretations and approaches in different companies. To facilitate this, the questions asked were a mix of open-ended and close-ended questions.

4.2.3 Ability to elicit Information

In designing the interview, questions were prioritised with those likely to elicit the most information considered first. The interview was designed to be conducted in one hour. This was considered adequate time to investigate the culture prevalent in the company. Furthermore, the open-ended nature of most of the questions would ensure that responses would also provide answers to other aspects of culture that were not included in the interview.

The final design was viewed against other interviews designed in the department before being reviewed by the project supervisor and other researchers within the department. Finally, a pilot interview was carried out before the interview format was deemed capable of eliciting the required information.

4.3 Planning the Interviews

Having designed the interview, there now remained the task of finding the appropriate respondents and convincing them to participate. Once again, different factors played a part in determination of what companies would participate in the structured interview. These factors are now discussed.

4.3.1 Quality development

This was the most important factor in determining the companies to be contacted. All other factors were considered secondary to quality development. The companies'

quality development was determined from their responses to the questionnaire survey. To elicit vital information, the companies were classed in three groups :

- A companies - These were companies that had indicated best practice or prominence in teamwork and/or customer focus
- B companies - These companies were chosen at random
- C companies - These were companies whose responses had indicated problems or lack of success in teamwork and/or customer focus

By comparing differences in companies at different levels of development, it would be possible to extract the vital factors that contributed to their status. The industry sector was not regarded as vital since quality culture can be developed in any organisation by employing the same principles.

4.3.2 Contacting companies

It was decided that a total of 15 companies would be interviewed at first with the option of extending the survey if need be. This number was initially regarded as sufficient for the information required. The number of participating companies was extended to 21 during the course of the interviews. The reason for this was the need to collect more qualitative information from a wider range of companies. A total of 52 companies were shortlisted. These were companies that had shown interest in the findings of the survey. To encourage the companies to participate, a cover letter and a summary of the findings from the questionnaire survey was sent to the shortlisted companies. A copy of the interview format was also sent to give an idea of the scope of the interview (a copy can be found in Appendix C). About a week after sending the letters, the companies were contacted by phone and interview dates fixed for the final participants. The processes of contacting the companies was staggered with the "A companies" being contacted and interviewed first and followed by the "B" and "C" sets. This was necessary to keep the interview program in control and avoid a high concentration of interviews at any given time.

Letters were sent to 41 companies and 21 were interviewed. 6 companies declined participation and 10 companies could not be contacted while the others were eliminated from the study. In almost all cases, the interviewed person was the quality manager, his deputy, or both together. A detailed breakdown of company information can be found in Chapter 6. In most cases, confirmation phone calls were made a day or two before the actual interview.

4.3.3 The Interview

The interview usually started with the researcher giving a brief description of the aims of the research, the data collection methods and the necessity of the interview. In many cases the respondent(s) also gave a background talk before the start of questioning.

The respondent was then taken through the entire questionnaire. The nature of the research topic demanded that the respondent be given considerable latitude to answer in reasonable detail. Respondents often displayed documents to back-up their statements. Most of the interviews were held in the respondent's office and a few were held in conference rooms. Interruptions to the interviews were minimal and the respondents didn't leave the interview room or have colleagues come in. In most cases, the interview was followed by a quick tour of the company's operations and sometimes discussion with other employees.

Note taking was the primary method of information recording. This was made faster and easier by the development of an extended questionnaire which contained different answer groups thus facilitating 'ticking' in many cases. This was always complemented by written notes. The extended questionnaire was not made available to the respondents as this would have limited the scope of their answers. Tape recording was not used as it was felt the idea would make respondents nervous and encourage them to give 'cautious' answers. Notes were typed into a computer immediately after the interview to ensure that no details were lost. The option of follow-up phone calls was also left open if this was later deemed as desirable.

4.3.4 Constraints

Constraints to a structured interview program were listed by Zain [1993]. Two of these constraints - willingness to participate and industry sector - have already been discussed. The outstanding constraints are:

- the interview should be carried out at companies which were within geographical reach;
- the execution of the program should be deemed to be reasonable in terms of time and financial demands.

In this regard, appropriate companies that were nearest were considered before those that were farther away.

4.4 Interview Analysis

Various formats were employed in the analysis of the interviews. Everyone of the responding companies was treated as a case study. This gave a detailed view of the quality culture approach and the state of development of the company. This also gave general information such as size, turnover and industry sector. Most importantly, it gives information about important culture elements that could not be accommodated in any of the other analysis formats.

Questions and responses were also categorised in areas of quality culture and the quality class of the company. In some cases, responses of some of the companies are not shown. The reasons for these would be one or more of the following:

1. The companies had no activity in this area;
2. Responses were insignificant or irrelevant to the question asked;
3. The information had already been extracted.

Comparison between companies of different classes was commonly used and often forms the basis for the extraction of required information. Detailed analysis can be found in Chapters 6 and 7.

4.5 Verification of Questionnaire Validity

The structured interviews served as the major tool for determining the validity of the questionnaire results. A primary shortcoming of postal questionnaires is the lack of feedback to and direct observation by the researcher. This raises some questions on how the questionnaire may have been viewed. The first of these is the accuracy of the interpretation of the questions asked in the postal questionnaire. The second is the possibility of bias by the respondent while the third is the uniformity of the questionnaire interpretation across all respondents. A primary step taken to compensate for these situations was in the design of the questionnaire itself. The questions were simplified as much as possible without compromising the quality of information to be elicited. Secondly, initial assessors of the questionnaire (comprising industrialists and academics) were required to highlight questions which appeared ambiguous or difficult to interpret. These views were taken into consideration in the design of the final questionnaire format. Steps taken to avoid bias have already been mentioned in Section 3.4.

In addition to being used as a major tool for information gathering, structured interviews were also employed to determine the validity of questionnaire responses. All companies interviewed were selected on the basis of their responses to the questionnaire. This enabled the researcher validate the earlier responses which were convincingly found to indicate that the questionnaire had been accurately interpreted by the companies interviewed. Since these companies were at different stages of development (some being poorly developed) as validated by the structured interviews, it was reasonable to accept that bias was minimal. For example, Question 9 (4) [which asks if 'management involve/ consult employees in appropriate decision making'] and Question 17 (examines employee involvement in work measurement, wage review, etc.) of the questionnaire are re-examined in Question 16 of the structured interview.

Similarly, Questions 43a ('Do your employees readily form voluntary problem-solving teams?) and 43b (examines reasons for failure to form teams) of the postal questionnaire are validated by Questions 25 ('Are voluntary teams in use in your organisation?') and 27 ('What factors will motivate employees to form voluntary teams?') in the structured interview.

In addition, interviewed companies had documents to support their answers. This was possible because copies of the interview had been sent beforehand and they knew documents that would be required. Furthermore, interviews in 16 of the 21 companies were followed by tours of the company site which enabled the researcher to both observe information on company noticeboards as well as speak to other employees within the company. These also served as an important way of validating company responses

4.6 Summary

Structured interviews were carried out in 21 companies. The companies were divided into three classes based on their level of quality culture development. Ten of the companies were well developed while five (5) indicated problems with quality culture. The remaining six (6) companies were chosen at random. The interviews served as both a verification of the questionnaire results and a tool for in-depth analysis of the change agents and their perceived effects. The interview format primarily addressed three aspects of culture - senior management leadership, teamwork and customer focus. The interviews were held primarily with quality managers and chief executives.

CHAPTER 5 - RESULTS FROM THE QUESTIONNAIRE SURVEY.

5.1 Introduction

This chapter describes the methods used and the results obtained in an investigation of the level of quality culture development in industry. This was accomplished by analysing the responses from the postal questionnaire. The responses are analysed with particular attention being paid to:

1. the level of use of change agents among the sample set;
2. the emphasis placed on development of quality culture elements in Section H of the questionnaire.

The unit of comparison used is the implementation of TQM by the responding companies. The findings from this chapter will:

1. give an indication of level of culture development in industry;
2. provide adequate comparison between TQ and non-TQ companies;
3. indicate the major problem areas in quality culture;
4. provide organisations with information on the selection and usage of change agents
5. provide organisations with a tool for benchmarking their quality culture development.

5.2 Method of analysis

The methodology adopted in the analysis of the questionnaire results is described in this section. The description includes both the overall analysis strategy and the specific analytical steps used.

Analysis Strategy

The overall analysis strategy is illustrated in Fig 5.1. The analysis was carried out in three parts. The first part of the analysis (Sections 5.3.1 -5.3.6) examined significant relationships between TQ implementation and the use of change agents. The method of analysis was to compare performance in the TQ sample with performance in the non-TQ sample and test for relationships by means of the chi-square significance testing. The second part of the analysis (Section 5.3.7 - 5.3.13) examined significant relationships between TQ implementation and the level of culture development by means of the chi-square significance testing.

The third part of the analysis (Section 5.5) involved the comparison of quality culture elements with change agents for both TQ and non-TQ companies. This would give an indication of the type of activities companies are likely to adopt to bring about the development of particular cultural elements. For example, the level of development of 'quality circles' is viewed against such factors as, 'willingness of employees to form teams', 'teamwork training', 'employees value of quality improvement', 'tendency to address problems on an individual basis', etc. From this analysis, an indication of the most common and least common change agents is derived.

From the described three-part analysis, it was possible to the examine the trends in the use of change agents in the surveyed companies. The trends are shown in Section 5.7.

The Chi-square test

The chi-square test is used in comparing two samples for association. It is assumed that the variables are independent and normally distributed (i.e. for the frequency distribution, the majority have a measure near the middle and the minority have measures near the extreme) [Castle, 1982]. By crosstabulating the values from the sample, chi-square statistic can be calculated and correlation and hypothesis testing carried out. According to Rees [1989] association can be investigated by:

Fig 5.1 Summary of analysis methodology

Part 1

Section	Comparison	Factors	Test
5.3.1 - 5.3.6	TQ vs Non-TQ	Relative use of change agents	Correlation test by means of the chi-sq statistic at 0.05 significance

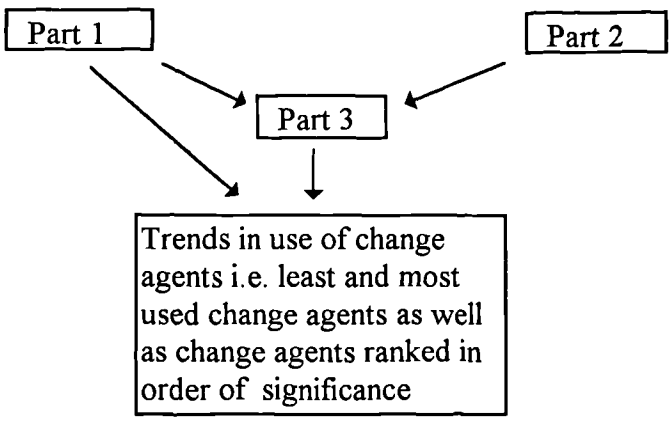
Part 2

Section	Comparison	Factors	Test
5.3.7 - 5.3.13	TQ vs Non-TQ	Level of development of quality culture	Correlation test by means of the chi-sq statistic at 0.05 significance

Part 3

Section	Comparison	Factors	Test
5.5	Change agents vs quality culture elements	Tendency to use specific change agents in relation to quality culture elements	Significant quality culture relationships viewed against significant change agent relationships

Resultant



- summarising the sample data graphically in a scatter diagram;
- calculating the numerical measure of the degree of association (correlation coefficient;
- carrying out an hypothesis testing between the variables.

For the survey, hypothesis testing is primarily used in testing for association although the correlation coefficient was also calculated. The correlation coefficient used was the Pearson's correlation coefficient which is applicable to normally distributed variables and gives more accurate results than the Spearmans rank order correlation coefficient [Castle, 1982]. For the chi-sq distribution, the higher the correlation coefficient, the greater the correlation and the lesser the significance level. Correlation, however, does not mean causation but only implies association.

Hypothesis Testing

Hypothesis testing (also known as significance testing) was carried out in the following steps :

1. Decide on a null hypothesis (no association between TQ implementation and change agent);
2. decide on an alternative hypothesis (significant association between TQ implementation and change agent);
3. decide on a significance level (5%);
4. calculate the appropriate test statistic (from SPSS);
5. compare the calculated significance with set level and decide whether to reject the null hypothesis;
6. state a conclusion.

According to Rees [1989] a significance level of 5% is the risk we take in rejecting the null hypothesis in favour of the alternative hypothesis, when in reality, the null hypothesis is the correct hypothesis.

The specific details of analytical methods applied to both the quality culture elements and the change agents are presented below.

5.2.1 Change Agents

Most of the change agents (Sections C,D,E,F,G & I) required answers of a 'yes/no' nature. For these questions, the respondents were required to simply tick 'yes' if the activity was carried out and 'no' if otherwise. For example, question 52 was 'Has there been re-organisation to make the company more responsive to customers?' The initial analysis format proposed was to simply compare frequency distribution for the TQ and non-TQ companies and determine which of the activities were significantly associated with TQ implementation. This approach however raised a number of questions - what level of difference in frequencies would be considered 'significant' enough to imply association and how much more significant would, say a 10% difference at frequency levels of say 40% be than the same difference at frequency levels of 75%. Consequently, it was decided that a simple frequency distribution would be more effective in determining 'likelihood' (e.g. TQ companies are more likely to have a 'quality champion' in senior management ranks) than in determining association. To determine association, it was decided that the chi-square statistic be determined from the cross-tabulations. The significance level would then be used as a measure of association. The significance level chosen was 0.05. According to Castle [1982] and Chatfield [1985] this is the most commonly used significance level and indicates that there is a 5% chance that a more extreme result could occur. Thus dual comparison indicating both 'likelihood' and 'association' were used in the analysis.

A total of 12 sub-questions required the respondents to indicate one of the following classes of answers - 'Always - Often - Sometimes - Never'. In analysing these class of responses, it was realised that the overwhelming majority of the responses fell in the 'Often - Sometimes' axis. In some cases, no responses were recorded in the "always" and "never" categories. Comparing results for each response category for TQ and non-TQ companies was not likely to be significant for the extreme categories. Thus the divide was made along the 'often - sometimes' axis and responses that were either

'always' or 'often' were regarded as indicative of a positive pre-disposition to the activity concerned and were classified as 'yes' answers. In contrast 'sometimes' and 'never' were regarded as indicative of a negative pre-disposition to the activity and were consequently classified as 'no' answers. Based on this divide, the earlier described 'likelihood' and 'association' tests were applied to compare the TQ and non-TQ samples.

Eleven questions had a peculiar nature in that they consisted of various sub-activities and the respondents were required to indicate which ones were in use. Individually, the sub-activities did not have great impact but their effects were greater when considered in a group. In analysing these responses, a proposal to classify effects into two groups of say, 'high' and 'low' usage was discarded in favour of a classification into 'high', 'medium' or 'low'. This approach was accepted as being more sensitive and more likely to indicate which of the sample sets was above average. The classification can be illustrated by examining question 11 which requests "Please indicate which of the following can be used to describe the company's training program at your site". If a responding company uses 4 or all 5 indicated factors, the training program for that company will be classified as 'high'. Use of 2 or 3 factors is classified as 'medium' while 1 or 0 factors is classified as 'low'. Based on this classification, 'high' scores for the sample sets were compared to indicate likelihood to use above average number of activities. 'Association' was also tested using the 0.05 significance level for the chi-square statistic.

5.2.2 Quality Culture

Quality culture was assessed in Section H of the questionnaire. Each of the quality culture elements had various sub-elements. These were grouped together and assessed as one question per element - e.g. all management leadership sub-elements are to be found in question 32, question 33 for sub-elements of involvement and empowerment, etc.

The method of analysis chosen for the quality culture elements was different from those for the change agents. This was because a rating system of measurement was adopted for each of the quality culture elements - the respondents were required to indicate on a scale of 0 - 5 the level of emphasis their companies attached to the element concerned. A score of '0' would indicate no development of the element concerned while a score of 5 would indicate that there was great emphasis on the element. The use of rating would give a precise indication of the level of culture development within the company. It would also indicate clearly, in what areas companies had succeeded, failed or were struggling. Rating was deemed to be relevant since various companies would be at different levels of development.

To facilitate comparison, it was necessary to develop measures that would accurately reflect the differences in levels of development between the TQ and non-TQ companies. The method of determining the figure would have to take into account the different levels of emphasis on the different activities by the companies. Such a method would be applicable to all the assessed elements. A weighting method was regarded as most appropriate since this would take into account the levels of development and award proportional scores - the score indicated by the respondents was directly adopted in the weightings. Thus responses in the '5' category were awarded 5 points and 4 points for '4' responses, etc.

To enable comparison of general level of development between TQ and non-TQ companies, it was desirable to generate an absolute score for both sets of samples and for each of the elements. This was achieved by analysing the scores of both sample sets separately and calculating the mean of the weighted values (e.g. if 20% and 32% respectively of the TQ companies had scores of '4' and '5', the weighted scores were derived by multiplying 4 by 20 and 5 by 32 and so on for all the scores and the average found. The formula was thus:

$$\{(0*A) + (1*B) + (2*C) + (3*D) + (4*E) + (5*F)\}/ (0 + 1 + 2 + 3 + 4 + 5)$$

or

$$\{(0*A) + (1*B) + (2*C) + (3*D) + (4*E) + (5*F)\}* 0.0625$$

where

0,1,2,3,4,5 are the assigned value weights

A = percentage of companies indicating a score of 0

B = percentage of companies indicating a score of 1

C = percentage of companies indicating a score of 2

D = percentage of companies indicating a score of 3

E = percentage of companies indicating a score of 4

F = percentage of companies indicating a score of 5

This method would indicate the general level of development and the likelihood of one sample set to be better or less developed than the other. However averages, according to Chatfield [1983] are not indicative of spread and thus cannot be used as indicators of association. To facilitate evaluation of association, the chi-square statistic was calculated from the cross-tabulation and the 0.05 significance level test applied.

The results of the analysis are shown in Sections 5.3 and 5.4

5.3 TQ Relationships from the questionnaire survey

This section investigates the relationships between the implementation of TQM and the use of the change agents and development of quality culture. The relationships are investigated by means of crosstabulations. The different sections in the questionnaire analysed separately.

5.3.1 Motivation

Results of the crosstabulation for Section C (Motivation) are shown in Table 5.1 and the findings are summarised.

Table 5.1 Relationships between TQ implementation and motivation

Q. No 8 - 1	CROSSTABULATION 1: TQ IMPLEMENTATION/MOTIVATING CEO Chi-sq: 2.57692; Significance: 0.10843; DF - 1.
	With 79.1% of TQ and 67.6% of non-TQ companies having motivating CEOs, the likelihood is that TQ companies are more inclined to have motivating CEOs but the Chi-sq statistic

	indicates there is no significant association between TQ implementation and motivating CEOs.
8 - 2	CROSSTABULATION 2: TQ IMPLEMENTATION/QUALITY CHAMPION Chi-sq: 5.48637; Significance: 0.01917; DF - 1.
	With 79.3% of TQ and 62.5% of non-TQ companies having Quality champions in top management ranks, the likelihood is that TQ companies are more inclined to have quality champions and the Chi-sq statistic indicates significant association between TQ implementation and quality champions.
8 - 3	CROSSTABULATION 3: TQ IMPLEMENTATION/MANAGEMENT RESPONSIBILITY FOR ACTIONS: Chi-sq: 0.02433; Significance: 0.87605; DF - 1.
	With 85.4% of TQ and 84.5% of non-TQ companies having management that motivates by taking responsibility for their action, and a Chi-sq significance of 0.87605, the conclusion is that there is no relationship between TQ implementation and the willingness of management to assume responsibility for their actions.
8 - 4	CROSSTABULATION 4: TQ IMPLEMENTATION/QUALITY PROBLEMS BLAMED ON SYSTEM Chi-sq: 3.10834; Significance: 0.07789; DF - 1.
	With 71.9% of TQ and 58.6% of non-TQ companies blaming problems on the system, TQ companies are more likely to attribute their quality problems to the system as opposed to the employees but the Chi-sq statistic indicates that there is no significant association.
8 - 5	CROSSTABULATION 5: TQ IMPLEMENTATION/PERFORMANCE IMPROVEMENT TARGET Chi-sq: 2.86188; Significance: 0.23908; DF - 1.
	With 83.1% of TQ and 75% of non-TQ companies having performance targets that demand constant improvement, and a Chi-sq significance of 0.23908, the conclusion is that there is no significant relationship between TQ implementation and the setting of demanding performance improvement targets.
8 - 6	CROSSTABULATION 6: TQ IMPLEMENTATION/FREEDOM OF WORK SCHEDULE Chi-sq: 5.99761; Significance: 0.01433; DF - 1.
	With 34.4% of TQ companies and 17.1% of non-TQ companies allowing freedom of work schedule, TQ companies are twice as likely to allow their employees a reasonable scope to schedule their own work and the Chi-sq statistic indicates that there is significant association.
8 - 7	CROSSTABULATION 7: TQ IMPLEMENTATION/EMPLOYEES APPROACH SUPERVISORS Chi-sq: 0.10309; Significance: 0.74815; DF - 1.
	With scores of 85.4% and 83.6% for TQ and non-TQ companies respectively, and a chi-sq significance of 0.74815, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of employees to approach supervisors and managers easily.
8 - 8	CROSSTABULATION 8: TQ IMPLEMENTATION/EMPLOYEES EXPRESS DIFFICULTIES Chi-sq: 2.48135; Significance: 0.11520; DF - 1.
	With 87.8% of TQ and 78.7% of non-TQ companies encouraging employees to express difficulties, and a Chi-sq significance of 0.11520, the conclusion is that there is no significant relationship between TQ implementation and the encouragement of employees to express their difficulties.
9 - 1	CROSSTABULATION 9: TQ IMPLEMENTATION/MANAGEMENT COMMUNICATES REASONS Chi-sq: 4.46081; Significance: 0.03468; DF - 1.
	With scores of 60.4% and 44% for TQ and non-TQ companies respectively, management in TQ companies are more likely to specify reasons for their decisions to the employees and the Chi-sq statistic indicates that there is significant association.
9 - 2	CROSSTABULATION 10: TQ IMPLEMENTATION/MANAGEMENT ADDRESSES PROBLEMS Chi-sq: 0.40239; Significance: 0.52586; DF - 1.
	With 67% of TQ and 71.6% of non-TQ companies having management that speedily address operational problems, and a Chi-sq significance of 0.52586, the conclusion is that there is no relationship between TQ implementation and the ability of management to speedily address operational problems.

9 - 3	CROSSTABULATION 11: TQ IMPLEMENTATION/MANAGEMENT COMMUNICATES PERFORMANCE Chi-sq: 4.94051; Significance: 0.02623; DF - 1.
	With 72.5% of TQ companies and 56% of non-TQ companies having management which communicate performance, management in TQ companies were more likely to inform employees about the company's performance and the Chi-sq statistic indicates that there is significant association..
9 - 4	CROSSTABULATION 12: TQ IMPLEMENTATION/EMPLOYEE CONSULTATION Chi-sq: 3.67118; Significance: 0.05536; DF - 1.
	TQ companies had a score of 49.5% compared to 34.7% for non-TQ companies. Management in TQ companies were more likely to consult employees in the decision making process but the Chi-sq statistic indicates that there is no significant association.
9 - 5	CROSSTABULATION 13: TQ IMPLEMENTATION/ATTITUDE SURVEY Chi-sq: 12.80665; Significance: 0.00035; DF - 1.
	With scores of 38.5% and 13.5% for TQ and non-TQ companies respectively management in TQ companies are almost three times more likely to conduct employee attitude survey and the Chi-sq statistic indicates that there is significant association.
9 - 6	CROSSTABULATION 14: TQ IMPLEMENTATION/MANAGEMENT EXAMINES PERFORMANCE Chi-sq: 12.61934; Significance: 0.00038; DF - 1.
	With scores of 93.3% for TQ companies and 73% for non-TQ companies, and a Chi-sq significance of 0.00038, there is a relationship between the implementation of TQ and the tendency of management to seek reasons for poor business performance.
10	CROSSTABULATION 15: TQ IMPLEMENTATION/MOTIVATION SCHEMES Chi-sq: 13.42036; Significance: 0.00122; DF - 1.
	20.5% and 59.1% of TQ companies had high and moderate levels respectively of motivation schemes as opposed to 5.6% and 51.4% for non-TQ companies. The Chi-sq statistic indicates that the significant relationship is that TQ companies are more likely to have better motivation schemes(recognition, incentive, etc.)
11	CROSSTABULATION 16: TQ IMPLEMENTATION/TRAINING PROGRAM Chi-sq: 25.34172; Significance: 0.00000; DF - 1.
	44.4% of TQ companies had highly developed training program as opposed to 12.5% of non-TQ companies. The Chi-sq statistic indicates that there is significant relationship between the implementation of TQ and the use of highly developed training programs.
12 - 1	CROSSTABULATION 17: TQ IMPLEMENTATION/OPERATOR DECISIONS Chi-sq: 4.72323; Significance: 0.02976; DF - 1.
	With scores of 64.8% for TQ companies and 47.9% for non-TQ companies, TQ companies are more likely to train their operators to take decisions and the Chi-sq statistic indicates that there is significant association.
12 - 2	CROSSTABULATION 18: TQ IMPLEMENTATION/COMMUNICATION OF CUSTOMER NEEDS Chi-sq: 0.51776; Significance: 0.47180; DF - 1.
	With scores of 69.2% and 63.9% for TQ and non-TQ companies respectively, and a Chi-sq significance of 0.47180, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of employees to understand customer needs.
12 - 3	CROSSTABULATION 19: TQ IMPLEMENTATION/COMMUNICATION OF PRODUCT CHARACTERISTICS Chi-sq: 0.91032; Significance: 0.34003; DF - 1.
	With scores of 89.9% and 84.9% for TQ and non-TQ companies respectively, and a Chi-sq significance of 0.34003, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of the employees to know the product characteristics.
12 - 4	CROSSTABULATION 20: TQ IMPLEMENTATION/PRODUCTION BEFORE QUALITY Chi-sq: 3.51377; Significance: 0.06086; DF - 1.
	With scores of 22% and 35.1% for TQ and non-TQ companies respectively, non-TQ companies were more likely to take production decisions at the expense of quality but the Chi-sq statistic indicates that there is no significant association.
12 - 5	CROSSTABULATION 21: TQ IMPLEMENTATION/JOB PRIDE Chi-sq: 2.21172; Significance: 0.13697; DF - 1.
	TQ companies had a score of 90% and non-TQ companies had a score of 81.9%. The Chi-sq statistic indicates that there is no significant relationship between the implementation of TQ

	and the likelihood of employees to take pride in their jobs
13 - 1	CROSSTABULATION 22: TQ IMPLEMENTATION/SUPPLIERS MEET SPECIFICATIONS Chi-sq: 0.03844; Significance: 0.84457; DF - 1; Cells E.F <5: 2 of 4.
	TQ companies had a score of 97.8% and non-TQ companies had a score of 97.3%. The Chi-sq statistic indicates that there is no significant relationship between the implementation of TQ and the likelihood of suppliers to meet product specifications.
13 - 2	CROSSTABULATION 23: TQ IMPLEMENTATION/SUPPLIER ON-TIME DELIVERY Chi-sq: 0.18932; Significance: 0.66348; DF - 1.
	TQ companies had a score of 90.1% and non-TQ companies had a score of 88%. The Chi-sq statistic indicates that there was no significant relationship between the implementation of TQ and the likelihood of suppliers to deliver on time.
13 - 3	CROSSTABULATION 24: TQ IMPLEMENTATION/SUPPLIER IN NEW DEVELOPMENT Chi-sq: 4.66492; Significance: 0.03078; DF - 1.
	With TQ companies having a score of 65.9% and non-TQ companies a score of 49.3%, TQ companies are more likely to involve their suppliers at an early stage in new development and the Chi-sq statistic indicates that there is significant association.

Discussion

Significant relationships were noticed between the implementation of TQ and use of the following organisational activities :- quality champion in top management, freedom of employees to schedule work, tendency of management to specify reasons for decisions, tendency of management to communicate the company's performance, training program, employee attitude survey, motivation schemes, ability of operators to take decisions, tendency of management to examine reasons for poor quality performance and early involvement of suppliers in new development.

There were no significant relationships noticed between TQ implementation and the following :- the presence of a motivating CEO, setting of performance improvement targets, encouragement of employees to express their difficulties, tendency of employees to understand customer needs and to know product characteristics, employee pride in their jobs, management willingness to take responsibility for their actions, employee tendency to approach supervisors and managers easily, management's ability to speedily address operational problems, tendency of suppliers to meet specifications and deliver on time, consultation of employees, tendency to consider production before quality and the blaming of quality problems on the system rather than the employees.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.2 Reward

Results of the crosstabulation for Section D (Reward) is shown in Table 5.2 and the findings are summarised.

Table 5.2 Relationships between TQ implementation and Reward

Q. No	CROSSTABULATION 1: TQ IMPLEMENTATION/REWARD SCHEMES Chi-sq: 7.63238; Significance: 0.05425; DF - 1.
14	74.7% of TQ companies and 58.7% of non-TQ companies have highly developed reward systems. TQ companies are more likely to have better reward schemes(overtime pay, sick pay, holiday pay, etc.) but the Chi-sq statistic indicates that there is no significant relationship.
15a	CROSSTABULATION 2: TQ IMPLEMENTATION/PERFORMANCE APPRAISAL Chi-sq: 0.14157; Significance: 0.70672; DF - 1.
	38.5% of TQ companies and 41.3% of non-TQ companies employ performance appraisal as the major factor for determining remuneration for all employees. The Chi-sq statistic indicates that there is no significant relationship between the implementation of TQ and the use of performance appraisal.
15b	CROSSTABULATION 3: TQ IMPLEMENTATION/PERFORMANCE APPRAISAL FOCUS Chi-sq: 14.05052; Significance: 0.00089; DF - 1.
	17.9% and 57.7% of TQ companies respectively have highly and moderately developed performance appraisal measures as opposed to 7.2% and 39.1% for non-TQ companies. The Chi-sq statistic indicates that the significant relationship is that TQ companies are more likely to have better performance appraisal measures.
16 - 1	CROSSTABULATION 4: TQ IMPLEMENTATION/INDUSTRY COMPETITIVE PAY Chi-sq: 4.43938; Significance: 0.03512; DF - 1.
	With a score of 52.9% for TQ companies and 35.8% for non-TQ companies, TQ companies are more likely to compare their wages with other companies within the same industrial sector and the Chi-sq statistic indicates that there is a significant association.
16 - 2	CROSSTABULATION 5: TQ IMPLEMENTATION/LOCALLY COMPETITIVE PAY Chi-sq: 0.01436; Significance: 0.90460; DF - 1 Cells E.F.< 5: 2 of 4.
	TQ companies had a score of 95.5% and non-TQ companies had a score of 95.8%. The Chi-sq statistic indicates there is no relationship between TQ implementation and the comparison of company wages with local averages.
16 - 3	CROSSTABULATION 6: TQ IMPLEMENTATION/EXPECTED PAY Chi-sq: 2.31538; Significance: 0.12810; DF - 1.
	With a score of 65.9% for TQ companies and 53.7% for non-TQ companies, and a Chi-sq significance of 0.12810, there is no significant relationship between TQ implementation and the likelihood to meet the pay expectation of their employees.
16 - 4	CROSSTABULATION 7: TQ IMPLEMENTATION/PAY-WORKLOAD BALANCE Chi-sq: 0.56554; Significance: 0.45204; DF - 1.
	TQ companies had a score of 63.1% and non-TQ companies had a score of 57.1%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the likelihood of the company to strike a balance between pay and the workload.

16 - 5	CROSSTABULATION 8: TQ IMPLEMENTATION/HIGHER PAY Chi-sq: 1.56777; Significance: 0.21053; DF - 1.
	With a score of 29.1% for TQ companies and 38.6% for non-TQ companies, and a Chi-sq significance of 0.21053, the conclusion is that there is no significant relationship between the implementation of TQ and the need to increase employee pay.
17 - 1	CROSSTABULATION 9: TQ IMPLEMENTATION/WORK MEASUREMENT INVOLVEMENT Chi-sq: 24.35115; Significance: 0.00000; DF - 1.
	TQ companies had a score of 68.5% and non-TQ companies had a score of 29.7%. The Chi-sq statistic indicates that there is a significant relationship between TQ implementation and the involvement of employees in work measurement.
17 - 2	CROSSTABULATION 10: TQ IMPLEMENTATION/WORK CONDITIONS REVIEW Chi-sq: 3.96096; Significance: 0.04657; DF - 1.
	With a score of 66.7% for TQ companies and 51.4% for non-TQ companies, TQ companies are more likely to involve their workers in the review of working conditions and the Chi-sq statistic indicates that there is significant association.
17 - 3	CROSSTABULATION 11: TQ IMPLEMENTATION/WAGE REVIEW INVOLVEMENT Chi-sq: 3.50023; Significance: 0.06136; DF - 1.
	TQ companies had a score of 51.7% and non-TQ companies had a score of 37%. TQ companies are more likely to involve their employees in a review of wages but the Chi-sq statistic indicates that there is no significant association.
18	CROSSTABULATION 11: TQ IMPLEMENTATION/WORK CONDITIONS Chi-sq: 12.22512; Significance: 0.00665; DF - 3; Cells E.F< 5: 2 of 8.
	With 13.2% and 59.3% of TQ companies having 'excellent' and 'good' working conditions respectively as opposed to 9.5% and 36.5% for non-TQ companies, TQ companies are likely to have better working conditions and the Chi-sq statistic indicates that there is significant association.

Discussion

Significant relationships were noticed between the implementation of TQ and the following activities :- comprehensive performance appraisal measures, industrial sector competitive pay, employee involvement in work measurement, employee involvement in working conditions review and better working conditions.

There was no significant relationships between TQ implementation and the following :- use of reward schemes, pay/workload balance, need for higher pay, use of performance appraisal and a locally competitive pay, meeting pay expectations of employees and involvement of employees in wage review.

The relationships are based on the 0.05 significance levels. For a significance level of

$p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.3 Organisational policy and values

Results of the crosstabulation for Section E (Organisational policy and values) is shown in Table 5.3 and the findings are summarised.

Table 5.3 Relationship between TQ implementation and 'Organisational policy and values'

Q. No	CROSSTABULATION 1: TQ IMPLEMENTATION/QUALITY POLICY Chi-sq: 3.72831; Significance: 0.05350; DF - 1; Cells E.F.<5: 2 of 4.
19a	TQ companies had a score of 98.9% and non-TQ companies had a score of 93.2%. The Chi-sq statistic indicates that there is no significant relationship between the implementation of TQ and the formulation of a quality policy.
19b	CROSSTABULATION 2: TQ IMPLEMENTATION/WRITTEN QUALITY POLICY Chi-sq: 2.74208; Significance: 0.09774; DF - 1; Cells E.F.<5: 2 of 4.
	With a score of 98.9% for TQ companies and 93.2% for non-TQ companies, and a Chi-sq significance of 0.09774, the conclusion is that there is no significant relationship between the implementation of TQ and the documentation of a quality policy.
19c	CROSSTABULATION 3: TQ IMPLEMENTATION/QUALITY POLICY AWARENESS Chi-sq: 0.07440; Significance: 0.96348; DF - 2; Cells E.F< 5; 2 of 4.
	40.9% of TQ companies indicated high awareness of their policies in comparison to 39.1% of non-TQ companies. The Chi-sq statistic indicates that there is no significant relation ship between the implementation of TQ and the general awareness of company quality policy.
20	CROSSTABULATION 4: TQ IMPLEMENTATION/OTHER WRITTEN POLICIES Chi-sq: 0.07440; Significance: 0.96348; DF - 2; Cells E.F<5; 2 of 6.
	29.2% and 38.2% of TQ companies had high and moderate policy structures respectively as opposed to 11.6% and 36.2% for non-TQ companies. TQ companies are more likely to have a better developed policy structure(employee welfare, customer service, supplier quality, etc.) but the Chi-sq statistic indicates that there is no significant relationship.
21	CROSSTABULATION 5: TQ IMPLEMENTATION/POLICY TRAINING Chi-sq: 11.75575; Significance: 0.00280; DF - 2.
	17.4% and 51.2% of TQ companies indicated high and moderate levels of policy training respectively as opposed to 1.5% and 51.5% of non-TQ companies. The Chi-sq statistic indicates that there is significant relationship between TQ implementation and the likelihood to carry out policy training for employees, suppliers and customers.
22a	CROSSTABULATION 6: TQ IMPLEMENTATION/QUALITY CONSIDERATION Chi-sq: 9.11237; Significance: 0.01050; DF - 2; Cells E.F.< 5: 2 of 6.
	With a score of 94.4% for TQ companies and 78.9% for non-TQ companies, quality is more likely to play an important part in decision making in TQ companies and the Chi-sq statistic indicates that there is significant relationship.
22b	CROSSTABULATION 7: TQ IMPLEMENTATION/SALES BEFORE QUALITY Chi-sq: 4.73773; Significance: 0.09359; DF - 1.
	With a score of 14.8% for TQ companies and 26.4% for non-TQ companies, non-TQ companies are more likely to consider sales at the expense of quality but the Chi-sq statistic indicates that there is no significant association.
23	CROSSTABULATION 8: TQ IMPLEMENTATION/POLICY MOTIVATION Chi-sq: 6.41733; Significance: 0.04041; DF - 1.
	29.5% and 34.1% of TQ companies had high and moderate levels of policy motivation

	respectively in comparison to 13.7% and 35.6% for non-TQ companies. TQ companies are more likely to motivate their employees to practise company policy and the Chi-sq statistic indicates that there is significant relationship.
24	CROSSTABULATION 9: TQ IMPLEMENTATION/EMPLOYEES VALUE QUALITY Chi-sq: 6.45102; Significance: 0.03974; DF - 1.
	TQ companies had a score of 94.5% and non-TQ companies had a score of 82.4%. Employees in TQ companies are more likely to value quality improvement and the Chi-sq statistic indicates that there is significant relationship.

Discussion

Significant relationships were noticed between the implementation of TQ and the following activities :- quality consideration in decision making and policy training for employees, suppliers and customers, policy motivation and the tendency of employees to value quality improvement.

No significant relationships were noticed between TQ implementation and the following :- formulation and documentation of a quality policy, awareness of the quality policy, comprehensive policy formulation and the likelihood to promote sales at the expense of quality.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.4 Environment

Results of the crosstabulation for Section F (Environment) is shown in Table 5.4 and the findings are summarised.

Table 5.4 Relationship between TQ and working environment

Q. No	
25	CROSSTABULATION 1: TQ IMPLEMENTATION/EMPHASIS ON EQUIPMENT Chi-sq: 6.15819; Significance: 0.04600; DF - 2.
	29.2% and 55.1% of TQ companies have good and average levels respectively of equipment provision while the figures for non-TQ companies are 15.1% and 57.5%. TQ companies are more likely provide better equipment for their employees and the Chi-sq statistic indicates

	significant association.
26 - 1	CROSSTABULATION 2: TQ IMPLEMENTATION/SIMPLICITY OF PROCESSES Chi-sq: 16.38431; Significance: 0.00028; DF - 2; Cells E.F.<5; 2 of 6 .
	35.2% of TQ companies and 64.9% of non-TQ companies have simple production processes. Non-TQ companies are more likely to have simpler production processes. and the Chi-sq statistic indicates significant association.
26 - 2	CROSSTABULATION 3: TQ IMPLEMENTATION/EMPLOYEE UNDERSTANDING OF PROCESS Chi-sq: 1.26055; Significance: 0.53244; DF - 1.
	TQ companies had a score of 87.9% and non-TQ companies scored 86.3%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the likelihood of the employees to understand the production process.
26 - 3	CROSSTABULATION 4: TQ IMPLEMENTATION/EMPLOYEES MEET PROCESS REQUIREMENTS Chi-sq: 0.244438; Significance: 0.62106; DF - 1.
	TQ companies had a score of 91.2% and non-TQ companies had a score of 88.9%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the technical ability of the employees.
26 - 4	CROSSTABULATION 5: TQ IMPLEMENTATION/GOOD PROCESS CAPABILITY Chi-sq: 0.01719; Significance: 0.89570; DF - 1.
	TQ companies had a score of 74.2% and non-TQ companies had a score of 73.2%. The chi-sq statistic indicates that there is no significant relationship between TQ implementation and the process capability
26 - 5	CROSSTABULATION 6: TQ IMPLEMENTATION/REGULAR PROCESS REVIEW Chi-sq: 5.01748; Significance: 0.08137; DF - 1.
	With a score of 80.2% for TQ companies and 74.7% for non-TQ companies, and a Chi-sq significance of 0.08137, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of management to regularly review the company's processes
26 - 6	CROSSTABULATION 7: TQ IMPLEMENTATION/SUPPLIERS MEET DEMAND Chi-sq: 0.04233; Significance: 0.83699; DF - 1.
	With a score of 86.2% for TQ companies and 87.3% for non-TQ companies, and a Chi-sq significance of 0.83699, the conclusion is that there is no significant relationship between the implementation of TQ and the ability of the suppliers to meet the demands of the company's processes
27 - 1	CROSSTABULATION 8: TQ IMPLEMENTATION/DIFFERING DEPT. TARGETS Chi-sq: 4.72916; Significance: 0.02966; DF - 1.
	TQ companies had a score of 81.1% and non-TQ companies had a score of 66.2%. TQ companies are more likely to set differing performance targets for different departments and the Chi-sq statistic indicates significant association.
27 - 2	CROSSTABULATION 9: TQ IMPLEMENTATION/TEAM RECOMMENDATIONS Chi-sq: 20.15316; Significance: 0.00001; DF - 1.
	With a score of 87.9% for TQ companies and 56.9% for non-TQ companies, and a Chi-sq significance of 0.00001, the conclusion is that there is significant relationship between TQ implementation and the likelihood of management to consider recommendations from company teams.
27 - 3	CROSSTABULATION 10: TQ IMPLEMENTATION/SELF-CRITICAL MANAGEMENT Chi-sq: 1.67151; Significance: 0.19606; DF - 1.
	With a score of 70.8% for TQ companies and 61.1% for non-TQ companies, and a Chi-sq significance of 0.19606, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of the company's management to act in a self critical manner
27 - 4	CROSSTABULATION 11: TQ IMPLEMENTATION/MANAGEMENT AWARENESS OF CUSTOMER NEEDS Chi-sq: 0.49902; Significance: 0.47993; DF - 1; Cells E.F<5: 2 of 4.
	The score for TQ companies was 96.7% and for non-TQ companies was 94.4%. The Chi-sq significance of 0.47993 indicates that there is no significant relationship between the implementation of TQ and the willingness of management to make itself aware of customer needs and complaints.

27 - 5	CROSSTABULATION 12: TQ IMPLEMENTATION/EASE OF MARKET PRESSURE Chi-sq: 2.60228; Significance: 0.10671; DF - 1.
	TQ companies had a score of 47.7% and non-TQ companies had a score of 60.6%. Management in TQ companies is more likely to protect employees from the pressures of market forces but the Chi-sq statistic indicates that there is no significant relationship.
28a	CROSSTABULATION 13: TQ IMPLEMENTATION/JOINT SENIOR-JUNIOR COURSES Chi-sq: 12.30457; Significance: 0.00045; DF - 1.
	The score for TQ companies was 79.8% while the score for non-TQ companies was 54.1%. The Chi-sq statistic indicates that there is significant relationship between the implementation of TQ and the likelihood of junior and senior employees to attend courses and seminars together.
28b	CROSSTABULATION 14: TQ IMPLEMENTATION/COMPANY RECREATION PROGRAMME Chi-sq: 13.74565; Significance: 0.00021; DF - 1.
	TQ companies had a score of 74.7% and non-TQ companies had a score of 46.7%. TQ companies are more likely to have company recreation programmes(staff club, social events, etc.) and the Chi-sq statistic indicates that there is significant relationship.
28c	CROSSTABULATION 15: TQ IMPLEMENTATION/GOOD COMPANY TEAMWORK Chi-sq: 0.40508; Significance: 0.52448; DF - 1.
	With a score of 72.5% for TQ companies and 68% for non-TQ companies, and a Chi-sq significance of 0.52448, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of the company to work well as a team.

Discussion

Significant relationships were noticed between the implementation of TQ and the following activities :- provision of good equipment, good process capability, consideration of team recommendations, simplicity of processes, setting of targets for departments, joint senior/junior courses and company recreation programmes.

There were no significant relationships between the implementation of TQ and the following activities :- employee understanding of company processes, employees technical abilities, regular process review, ability of suppliers to meet process demands, management awareness of customer needs, ease of market pressure on employees, good company teamwork and a self-critical management.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.5 Organisational structure

Results of the crosstabulation for Section G (Organisational structure) is shown in Table 5.5 and the findings are summarised.

Table 5.5 Relationship between TQ implementation and organisational structure

Q. No	
29a	CROSSTABULATION 1: TQ IMPLEMENTATION/RAPID INSTRUCTION TRANSMISSION Chi-sq: 1.13985; Significance: 0.28568; DF - 1.
	TQ companies had a score of 79.1% and non-TQ companies had a score of 72%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the ability to quickly transmit management's instructions through the organisation.
29b	CROSSTABULATION 2: TQ IMPLEMENTATION/COMPANY BUREAUCRACY Chi-sq: 0.82917; Significance: 0.66061; DF - 1.
	With 26.4% of TQ companies and 26.7% non-TQ companies having bureaucratic structures, and a Chi-sq significance of 0.66061, the conclusion is that there is no significant relationship between TQ implementation and company bureaucracy.
30	CROSSTABULATION 3: TQ IMPLEMENTATION/CLEAR COMPANY STRUCTURE Chi-sq: 8.33868; Significance: 0.01546; DF - 2.
	40.7% and 49.5% of TQ companies have good and average levels of clear company structure while the figures for non-TQ companies are 20.8% and 59.7%. TQ companies are more likely to have a good company structure and the Chi-sq statistic indicates significant association.
31	CROSSTABULATION 4: TQ IMPLEMENTATION/DEPARTMENTAL AUTONOMY Chi-sq: 1.47691; Significance: 0.47785; DF - 1.
	23.8% and 35% of TQ companies have good and average levels of departmental autonomy while the figures for non-TQ companies are 19.4% and 44.8%. The Chi-sq statistic indicates that there is no significant relationship between the implementation of TQ and the likelihood of a company to have departments with distinct spans of authority.

Discussion

There was a significant relationship between the implementation of TQ and the likelihood of the company to have a good company structure.

There were no significant relationships between TQ implementation and the following - rapid instruction transmission, company bureaucracy and departmental autonomy.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.6 Teams and Customers

Results of the crosstabulation for Section I (Teams and Customers) are shown in Tables 5.6 and 5.7 and the findings are summarised. This section was included after the pilot study and examines activities associated with teamworking and customer service.

Table 5.6 Relationship between TQ implementation and Team related activities

Q. No	
39 - 1	CROSSTABULATION 1: TQ IMPLEMENTATION/INDIVIDUAL BASIS Chi-sq: 24.73458; Significance: 0.00000; DF - 1.
	With a score of 34.1% for TQ companies and 73% for non-TQ companies, and a Chi-sq significance of 0.00000, the significant relationship is that non-TQ companies are more likely to address problems on an individual basis as opposed to a team approach.
39 - 2	CROSSTABULATION 2: TQ IMPLEMENTATION/PROBLEMS NATURE Chi-sq: 6.65109; Significance: 0.00991; DF - 1.
	TQ companies had a score of 16.5% and non-TQ companies had a score of 33.8%. Non-TQ companies are more likely to encounter problems whose nature make them unsuitable for a team based solution and the Chi-sq statistic indicates significant association.
39 - 3	CROSSTABULATION 3: TQ IMPLEMENTATION/PROBLEMS METHODOLOGIES Chi-sq: 10.18059; Significance: 0.00142; DF - 1.
	With a score of 50.5% for TQ companies and 26% for non-TQ companies, and a Chi-sq significance of 0.00142, the significant relationship is that TQ companies are more likely to have methodologies for determining which problems are best tackled for teams.
39 - 4	CROSSTABULATION 4: TQ IMPLEMENTATION/PHYSICAL LAYOUT Chi-sq: 2.00932; Significance: 0.15634; DF - 1.
	TQ companies had a score of 24.2% and non-TQ companies had a score of 34.2%. TQ companies are less likely to have an organisational structure or physical layout that makes crossfunctional integration difficult but the Chi-sq statistic indicates that there is no significant association.
39 - 5	CROSSTABULATION 5: TQ IMPLEMENTATION/INFORMATION TECHNOLOGY Chi-sq: 7.39751; Significance: 0.00653; DF - 1.
	With a score of 75.6% for TQ companies and 55.4% for non-TQ companies, and a Chi-sq significance of 0.00653, the significant relationship is that TQ companies are more likely to use information technology in promoting interdepartmental communication.
40	CROSSTABULATION 6: TQ IMPLEMENTATION/ORGANISATION TYPE Chi-sq: 6.61410; Significance: 0.03662; DF - 2; Cells E.F.<5: 1 of 6.
	54.9% of TQ companies and 35.1% for non-TQ companies have organisation types that are fairly balanced between functional and task structures. The Chi-sq statistic indicates that the significant relationship is that TQ companies are more likely to have balanced structures and non-TQ companies are more likely to have functional type structures.
41	CROSSTABULATION 7: TQ IMPLEMENTATION/TEAMWORK TRAINING Chi-sq: 42.48738; Significance: 0.00000; DF - 1.
	TQ companies had a score of 82.4% and non-TQ companies had a score of 32.4%. The Chi-sq statistic indicates that there is significant relationship between the implementation of TQ and teamwork training for the employees.
42a	CROSSTABULATION 8: TQ IMPLEMENTATION/MANAGEMENT TEAMS Chi-sq: 9.18013; Significance: 0.00245; DF - 1.
	With a score of 80.2% for TQ companies and 58.7% for non-TQ companies, and a Chi-sq significance of 0.00245, the conclusion is that there is significant relationship between TQ implementation and the use of management teams.
42b	CROSSTABULATION 9: TQ IMPLEMENTATION/DEPARTMENTAL TEAMS Chi-sq: 16.97018; Significance: 0.00004; DF - 1.

	With a score of 86.8% for TQ companies and 58.7% for non-TQ companies, and a Chi-sq significance of 0.00004, the conclusion is that there is significant relationship between TQ implementation and the use of departmental teams.
42c	CROSSTABULATION 10: TQ IMPLEMENTATION/CROSSFUNCTIONAL TEAMS Chi-sq: 25.56765; Significance: 0.00000; DF - 1.
	TQ companies had a score of 85.7% and non-TQ companies had a score of 49.3%. The Chi-sq statistic indicates that there is significant relationship between TQ implementation and the use of crossfunctional teams.
43a	CROSSTABULATION 11: TQ IMPLEMENTATION/VOLUNTARY TEAM FORMATION Chi-sq: 12.40176; Significance: 0.00043; DF - 1.
	TQ companies had a score of 52.7% and non-TQ companies had a score of 25.7%. Employees in TQ companies are more likely to form voluntary teams and the Chi-sq statistic indicates significant association.
43b-1	CROSSTABULATION 12: TQ IMPLEMENTATION/UNWILLINGNESS Chi-sq: 0.04253; Significance: 0.83662; DF - 1.
	TQ companies had a score of 37.2% and non-TQ companies had a score of 35.2%. The Chi-sq statistic indicates that there is no significant relationship between the implementation of TQ and reluctance to form voluntary teams because of unwillingness to challenge current practice.
43b-2	CROSSTABULATION 13: TQ IMPLEMENTATION/EFFORT RECOGNITION Chi-sq: 0.90256; Significance: 0.34207; DF - 1.
	TQ companies had a score of 27.9% and non-TQ companies had a score of 37%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and reluctance to form voluntary teams because of lack of recognition of team efforts and individual contributions.
43b-3	CROSSTABULATION 14: TQ IMPLEMENTATION/JUNIOR EMPLOYEES Chi-sq: 0.34988; Significance: 0.55418; DF - 1.
	TQ companies had a score of 37.2% and non-TQ companies had a score of 31.5%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and reluctance to form voluntary teams because junior employees feel their recommendations will have little impact.
43b-4	CROSSTABULATION 15: TQ IMPLEMENTATION/LACK OF TIME Chi-sq: 0.16453; Significance: 0.68502; DF - 1.
	TQ companies had a score of 65.1% and non-TQ companies had a score of 61.1%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and reluctance to form voluntary teams because of lack of time.
43b-5	CROSSTABULATION 16: TQ IMPLEMENTATION/LACK OF AWARENESS Chi-sq: 3.76968; Significance: 0.05219; DF - 1.
	TQ companies had a score of 34.1% and non-TQ companies had a score of 53.7%. Employees in non-TQ companies are more likely to avoid voluntary teamwork because of a lack of awareness of teamwork advantages but the Chi-sq statistic indicates that there is no significant relationship.
44a	CROSSTABULATION 17: TQ IMPLEMENTATION/NEGLIGIBLE BENEFIT Chi-sq: 0.43892; Significance: 0.50765; DF - 1.
	With a score of 20.2% for TQ companies and 24.6% for non-TQ companies, and a Chi-sq significance of 0.50765, the conclusion is that there is no significant relationship between TQ implementation and the problem of negligible benefit from teamwork.
44b	CROSSTABULATION 18: TQ IMPLEMENTATION/DISLIKE FOR TEAMS Chi-sq: 2.51078; Significance: 0.11307; DF - 1.
	With a score of 13.5% for TQ companies and 23.2% for non-TQ companies, and a Chi-sq significance of 0.11307, the conclusion is that there is no significant relationship between employee dislike for teams and TQ implementation.
44c	CROSSTABULATION 19: TQ IMPLEMENTATION/POLITICS Chi-sq: 5.59879; Significance: 0.01797; DF - 1.
	With a score of 40.4% for TQ companies and 59.4% for non-TQ companies, and a Chi-sq significance of 0.01797, the significant relationship is that non-TQ companies are more likely to face the problem of company politics with teamworking.

44d	CROSSTABULATION 20: TQ IMPLEMENTATION/COSTS Chi-sq: 0.66852; Significance: 0.41357; DF - 1.
	TQ companies had a score of 31.5% and non-TQ companies had a score of 37.7%. The Chi-sq statistic indicates that there is no significant relationship between the problem of teamwork cost and TQ implementation.
45a	CROSSTABULATION 21: TQ IMPLEMENTATION/BELBIN Chi-sq: 3.65855; Significance: 0.05578; DF - 1.
	TQ companies had a score of 18.9% and non-TQ companies had a score of 8.3%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and team selection by Belbin technique(profiling)
45b	CROSSTABULATION 22: TQ IMPLEMENTATION/EXPERTISE Chi-sq: 6.07541; Significance: 0.01371; DF - 1.
	With a score of 82.2% for TQ companies and 65.3% for non-TQ companies, and a Chi-sq significance of 0.01371 the significant relationship is that TQ companies are more likely to select team members by expertise.
45c	CROSSTABULATION 23: TQ IMPLEMENTATION/PERSONALITY Chi-sq: 1.01250; Significance: 0.31430; DF - 1.
	With a score of 36.7% for TQ companies and 29.2% for non-TQ companies, and a Chi-sq significance of 0.31430, the conclusion is that there is no significant relationship between TQ implementation and team selection by personality.
45d	CROSSTABULATION 24: TQ IMPLEMENTATION/VOLUNTEERING Chi-sq: 10.72566; Significance: 0.00106; DF - 1.
	TQ companies had a score of 53.3% and non-TQ companies had a score of 27.8%. TQ companies are more likely to select team members by volunteering and the Chi-sq statistic indicates significant association.
46a	CROSSTABULATION 25: TQ IMPLEMENTATION/FULL-TIME FACILITATORS Chi-sq: 9.76392; Significance: 0.00178; DF - 1.
	With a score of 21.3% for TQ companies and 4.2% for non-TQ companies, and a Chi-sq significance of 0.00178, the significant relationship is that TQ companies are more likely to have full-time facilitators.
46b	CROSSTABULATION 26: TQ IMPLEMENTATION/MANAGEMENT FACILITATORS Chi-sq: 3.99803; Significance: 0.04555; DF - 1.
	TQ companies had a score of 59.6% and non-TQ companies had a score of 43.7%. TQ companies are more likely to have management facilitators and the Chi-sq statistic indicates significant association.
46c	CROSSTABULATION 27: TQ IMPLEMENTATION/FACILITATOR TRAINING Chi-sq: 21.87688; Significance: 0.00000; DF - 1.
	TQ companies had a score of 56.2% and non-TQ companies had a score of 19.7%. The Chi-sq statistic indicates a significant relationship between TQ implementation and the training of facilitators.

Discussion

Significant relationships were noticed between the implementation of TQ and the following team related activities - teamwork training, use of management teams, departmental teams and crossfunctional teams, volunteering for teamwork, facilitator training, use of full-time and management facilitators, team selection by expertise, company politics in teamwork and willingness to form voluntary teams. There were

also relationships between TQ implementation and organisation type, use of information technology, problem evaluation and tendency to approach problems on a team basis approach.

There were no significant relationships noticed between TQ implementation and the following activities - problem-enhancing physical layout, teamwork costs, employee dislike for teams, negligible benefits from teamwork, team selection by Belbin technique and personality, reluctance to form voluntary teams because of poor recognition, lack of time, lack of awareness of teamwork advantages, little impact of team recommendations and unwillingness to challenge current practice.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

Table 5.7 Relationship between TQ implementation and Customer related activities

Q. No	
47	CROSSTABULATION 1: TQ IMPLEMENTATION/CUSTOMER REQD. COMMUNICATION Chi-sq: 0.35862; Significance: 0.54927; DF - 1.
	With a score of 77.5% for TQ companies and 81.3% for non-TQ companies, the general conclusion is that there is no relationship between TQ implementation and the likelihood of customer requirements being communicated to all customer service employees.
48	CROSSTABULATION 2: TQ IMPLEMENTATION/MEET CUSTOMER REQUIREMENTS Chi-sq: 0.70041; Significance: 0.40265; DF - 1.
	TQ companies had a score of 78.9% and non-TQ companies had a score of 84%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the likelihood of the company to consistently meet customer requirements.
49	CROSSTABULATION 3: TQ IMPLEMENTATION/CHANGING REQUIREMENTS Chi-sq: 5.63478; Significance: 0.01761; DF - 1.
	With a score of 91.1% for TQ companies and 77.8% for non-TQ companies, and a Chi-sq significance of 0.01761, the significant relationship is that TQ companies are more likely to have mechanisms for capturing changing requirements.
50	CROSSTABULATION 4: TQ IMPLEMENTATION/INTERMEDIATE CUSTOMER NEEDS Chi-sq: 3.06026; Significance: 0.08023; DF - 1.
	TQ companies had a score of 92.9% and non-TQ companies had a score of 84.1%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the likelihood of the company to understand the needs of the intermediate customer.
51a	CROSSTABULATION 5: TQ IMPLEMENTATION/RESPONSE TIMEFRAME Chi-sq: 1.29900; Significance: 0.25440; DF - 1.
	TQ companies had a score of 74.7% and non-TQ companies had a score of 66.7%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the likelihood of the company to have a structured response timeframe to attend to customer needs.
51b	CROSSTABULATION 6: TQ IMPLEMENTATION/MEET RESPONSE TIME

	Chi-sq: 0.02233; Significance: 0.88122; DF - 1.
	With a score of 82.9% for TQ companies and 82% for non-TQ companies, and a Chi-sq significance of 0.88122, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of meeting response times
51c	CROSSTABULATION 7: TQ IMPLEMENTATION/ANTICIPATE EXPECTATION Chi-sq: 2.31544; Significance: 0.12810; DF - 1.
	With a score of 72.7% for TQ companies and 61.2% for non-TQ companies, and a Chi-sq significance of 0.12810, the conclusion is that there is no significant relationship between TQ implementation and the likelihood to anticipate customer expectation.
51d	CROSSTABULATION 8: TQ IMPLEMENTATION/CUSTOMER RETENTION Chi-sq: 0.02173; Significance: 0.88282; DF - 1.
	TQ companies had a score of 95.3% and non-TQ companies had a score of 95.8%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the likelihood of the customer to make customer retention a priority.
51e	CROSSTABULATION 9: TQ IMPLEMENTATION/INTERNAL CUSTOMER Chi-sq: 5.58752; Significance: 0.01809; DF - 1.
	With a score of 92.3% for TQ companies and 79.7% for non-TQ companies, and a Chi-sq significance of 0.01809, the significant relationship is that TQ companies are more likely to encourage all employees to satisfy internal and external customers.
51f	CROSSTABULATION 10: TQ IMPLEMENTATION/PERSONAL SERVICE Chi-sq: 0.80282; Significance: 0.37025; DF - 1.
	With a score of 78.7% for TQ companies and 72.6% for non-TQ companies, and a Chi-sq significance of 0.37025, the conclusion is that there is no significant relationship between TQ implementation and the company's attention to personal service for customers.
51g	CROSSTABULATION 11: TQ IMPLEMENTATION/ENCOURAGE COMPLAINT Chi-sq: 2.03471; Significance: 0.15374; DF - 1.
	TQ companies had a score of 78.4% and non-TQ companies had a score of 68.5%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the likelihood of the company to encourage customer complaints.
52	CROSSTABULATION 12: TQ IMPLEMENTATION/REORGANISATION Chi-sq: 10.84326; Significance: 0.00099; DF - 1.
	With a score of 84.6% for TQ companies and 62.2% for non-TQ companies, and a chi-sq significance of 0.00099, the conclusion is that there is significant relationship between TQ implementation and customer-orientated company reorganisation.
53a - 1	CROSSTABULATION 13: TQ IMPLEMENTATION/COMPLAINTS MEASURE Chi-sq: 0.08526; Significance: 0.77029; DF - 1 Cells E.F< 5: 1 of 4
	With a score of 93.3% for TQ companies and 94.4% for non-TQ companies, and a Chi-sq significance of 0.77029, the conclusion is that there is no significant relationship between TQ implementation and likelihood of the company to measure complaints.
53a - 2	CROSSTABULATION 14: TQ IMPLEMENTATION/MEASURE DELIVERY PERFORMANCE Chi-sq: 6.48000; Significance: 0.01091; DF - 1.
	TQ companies had a score of 90% and non-TQ companies had a score of 75%. TQ companies are more likely to measure the company's delivery performance and the Chi-sq statistic indicates significant association.
53a - 3	CROSSTABULATION 15: TQ IMPLEMENTATION/MEASURE SATISFACTION LEVEL Chi-sq: 13.30057; Significance: 0.00027; DF - 1.
	TQ companies had a score of 53.3% and non-TQ companies had a score of 25%. TQ companies are more likely to measure satisfaction level of customers and the Chi-sq statistic indicates significant association.
53a - 4	CROSSTABULATION 16: TQ IMPLEMENTATION/MEASURE PRODUCT RETURN Chi-sq: 1.99132; Significance: 0.15820; DF - 1.
	TQ companies had a score of 65.9% and non-TQ companies had a score of 54.9%. The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and likelihood of the company to measure the rate of product return.
53b	CROSSTABULATION 17: TQ IMPLEMENTATION/CHECK MEASURES Chi-sq: 3.62319; Significance: 0.05698; DF - 1.

	With a score of 95.6% for TQ companies and 87.3% for non-TQ companies, and a Chi-sq significance of 0.5698, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of the company to regularly check its customer service measures for improvements.
54a	CROSSTABULATION 18: TQ IMPLEMENTATION/PRODUCTS VARIETY Chi-sq: 0.14097; Significance: 0.70732; DF - 1. Cells E.F.<5: 1 of 4
	With a score of 93.3% for TQ companies and 94.7% for non-TQ companies, and a Chi-sq significance of 0.70732, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of the company to offer variety and flexibility in products and services.
54b	CROSSTABULATION 19: TQ IMPLEMENTATION/TECHNICAL ASSURANCES Chi-sq: 8.15388; Significance: 0.00430; DF - 1.
	With a TQ score of 94.3% and non-TQ score of 79.2%, and a Chi-sq significance of 0.00430, the significant relationship is that TQ companies are more likely to give technical assurances(warranties, spare parts, etc.) on products.
54c	CROSSTABULATION 20: TQ IMPLEMENTATION/CUSTOMER REWARD Chi-sq: 2.43778; Significance: 0.11844; DF - 1.
	With a score of 81.4% for TQ companies and 70.8% for non-TQ companies, and a Chi-sq significance of 0.11844, the conclusion is that there is no significant relationship between TQ implementation and the likelihood of the company to have reward schemes or benefits for major or loyal customers.
54d	CROSSTABULATION 21: TQ IMPLEMENTATION/QUALITY OF RELATIONSHIP Chi-sq: 10.96955; Significance: 0.00093; DF - 1.
	TQ companies had a score of 69.7% and non-TQ companies had a score of 43.7%. The Chi-sq statistic indicates that there is a significant relationship between TQ implementation and the likelihood of the company to measure the quality of relationship with customers.
54e	CROSSTABULATION 22: TQ IMPLEMENTATION/CUSTOMER SATISFACTION PASSION Chi-sq: 5.96020; Significance: 0.01463; DF - 1.
	With a score of 77.5% for TQ companies and 59.7% for non-TQ companies, and a Chi-sq significance of 0.01463, the significant relationship is that TQ companies are more likely to encourage their employees to develop a customer passion.

Discussion

Significant relationships were noticed between TQ implementation and the following customer related activities :- tendency to satisfy internal and external customers, ability to meet set customer response times and capture changing customer requirements, company reorganisation, encouragement of customer satisfaction passion, technical assurance on products, measure of satisfaction level, delivery performance and quality of relationship with customers.

There were no significant relationships between TQ implementation and the following - ability to meet customer requirements, understanding of intermediate customer needs, personal service, encouragement of customer complaint, specification and fulfilment of

response timeframe for customer needs and measurement of customer complaints and product return. There were also no relationships between TQ implementation and tendency to check customer service measures for improvement, offer of products variety, anticipation of customer expectation, rewarding of customers, emphasis on customer retention and communication of customer requirements to customer service employees.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.7 Senior Management Leadership

Table 5.8 Relationship between TQ implementation and level of Senior Management Leadership

Q. No	
32a	CROSSTABULATION 1: TQ IMPLEMENTATION/QUALITY TRAINING FOR MGMT. Chi-sq: 23.6777; Significance: 0.00025; Cells E.F< 5: 1 of 12; Wt. Score: TQ-21.93, non-TQ -14.75
	The significant relationship is that companies practising TQ have better quality training for the management.
32b	CROSSTABULATION 2: TQ IMPLEMENTATION/MGMT. STEERING COMMITTEE Chi-sq: 31.7756; Significance: 0.00001; Cells E.F< 5: None; Wt. Score: TQ-24.79, non-TQ -15.03
	The significant relationship is that companies practising TQ use more of management steering committees.
32c	CROSSTABULATION 3: TQ IMPLEMENTATION/LONG TERM TQM GOAL Chi-sq: 83.1995; Significance: 0.00000; Cells E.F< 5: None; Wt. Score: TQ-25.81, non-TQ -9.66
	The significant relationship is that companies practising TQ attach more importance to having a long-term quality goal.
32d	CROSSTABULATION 4: TQ IMPLEMENTATION/INFORMATION FEEDBACK TO MGMT. Chi-sq: 12.0446; Significance: 0.03417; Cells E.F< 5: 4 of 12; Wt. Score: TQ-25.19, non-TQ -22.25
	The significant relationship is that companies practising TQ have a higher level of quality information fed back to management.
32e	CROSSTABULATION 5: TQ IMPLEMENTATION/ISO 9000 Chi-sq: 17.9963; Significance: 0.00295; Cells E.F< 5: 3 of 12; Wt. Score: TQ-28.79, non-TQ -22.6
	The significant relationship is that companies that practise TQ place more emphasis on ISO 9000 registration.
32f	CROSSTABULATION 6: TQ IMPLEMENTATION/STATISTICAL PROCESS CONTROL Chi-sq: 20.6717; Significance: 0.00093; Cells E.F< 5: None; Wt. Score: TQ-18.96, non-TQ -12.05

	The significant relationship is that companies that practise TQ use more of statistical process control methods.
32g	CROSSTABULATION 7: TQ IMPLEMENTATION/PROBLEM SOLVING TECHNIQUES Chi-sq: 32.9390; Significance: 0.00000; Cells E.F< 5: 2 of 12; Wt. Score: TQ-23.54, non-TQ -15.98
	The significant relationship is that management and employees in TQ companies are more aware of problem solving techniques.
32h	CROSSTABULATION 8: TQ IMPLEMENTATION/INTERNAL QUALITY AUDIT Chi-sq: 8.0296; Significance: 0.15461; Cells E.F< 5: 5 of 12; Wt. Score: TQ-26.91 ,non-TQ -24.01
	The Chi-sq statistic indicates that there is no significant relationship between the implementation of TQ and the emphasis on internal quality audit.
32i	CROSSTABULATION 9: TQ IMPLEMENTATION/QUALITY IMPROVEMENT TECHNIQUES Chi-sq: 44.0343; Significance: 0.00000; Cells E.F< 5: None; Wt. Score: TQ-19.29, non-TQ -9.19
	The significant relationship is that companies that practise TQ make more use of quality improvement techniques(e.g. Taguchi methods)
32j	CROSSTABULATION 10: TQ IMPLEMENTATION/BENCHMARKING Chi-sq: 37.3487; Significance: 0.00000; Cells E.F< 5: 1 of 12; Wt. Score: TQ-17.82, non-TQ -9.5
	The significant relationship is that companies that implement TQ practise more benchmarking.

Discussion

The average of the weighted scores was 23.3 for TQ companies and 15.5 for non-TQ companies. This indicates that on average, the level of management leadership in TQ companies was better. The biggest differences were the possession of a long-term quality goal, the use of quality improvement techniques and benchmarking. This indicates that management in TQ companies is more improvement orientated. Non-TQ companies, however, are more focused on solving problems than on seeking ways of improvement. Management in TQ companies also have a higher level of quality training.

Significant relationships were noticed between TQ implementation and all the culture elements except the use of quality improvement techniques and the use of internal quality audits.

The relationships are based on the 0.05 significance levels. For a significance level of

$p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.8 Employee Involvement and Empowerment

Table 5.9 Relationship between TQ Implementation and Employee Involvement & Empowerment.

Q. No	CROSSTABULATION 1: TQ IMPLEMENTATION/QUALITY AWARENESS PROGRAMME Chi-sq: 30.8965; Significance: 0.00001; Cells E.F< 5: 2 of 12; Wt. Score: TQ-23.78, non-TQ -16.94
33a	
	The significant relationship is that TQ companies have a better quality awareness programme.
33b	CROSSTABULATION 2: TQ IMPLEMENTATION/QUALITY FEEDBACK TO WORKERS Chi-sq: 12.3337; Significance: 0.03049; Cells E.F< 5: 2 of 12; Wt. Score: TQ-22.3, non-TQ -16.78
	The significant relationship is that TQ companies are slightly better at feeding back quality progress information to employees
33c	CROSSTABULATION 3: TQ IMPLEMENTATION/QUALITY IMPROVEMENT COURSES Chi-sq: 37.8972; Significance: 0.00000; Cells E.F< 5: None; Wt. Score: TQ-21.25, non-TQ -11.66
	The significant relationship is that TQ companies place more emphasis on carrying out quality improvement courses for all employees
33d	CROSSTABULATION 4: TQ IMPLEMENTATION/EMPLOYEE MORALE Chi-sq: 6.9425; Significance: 0.22495; Cells E.F< 5: 2 of 12; Wt. Score: TQ-20.09, non-TQ -18.12
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the level of employee morale.
33e	CROSSTABULATION 5: TQ IMPLEMENTATION/PROFIT DISTRIBUTION Chi-sq: 0.9861; Significance: 0.96368; Cells E.F< 5: 2 of 12; Wt. Score: TQ-13.4 , non-TQ -14.78
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the practise of profit distribution.
33f	CROSSTABULATION 6: TQ IMPLEMENTATION/INVOLVEMENT IN DECISIONS Chi-sq: 14.6339; Significance: 0.01205; Cells E.F< 5: 3 of 12; Wt. Score: TQ-17.53, non-TQ -14.58
	The significant relationship is that TQ companies are better at involving their employees in the decision making process.
33g	CROSSTABULATION 7: TQ IMPLEMENTATION/JOB ENLARGEMENT Chi-sq: 11.7912; Significance: 0.03776; Cells E.F< 5: None; Wt. Score: TQ-20.06, non-TQ -15.48
	The significant relationship is that TQ companies are better at practising job enlargement.

Discussion

The average of the weighted scores for TQ companies was 19.77 and the non-TQ companies was 15.48. This indicates, on average, a higher level of employee

involvement in TQ companies. The greatest differences are in the level of quality training and quality awareness as well as information feedback to employees. Employees in TQ companies also have greater involvement in decision making and a higher level of job potential. In general, employees in TQ companies are much more 'part of the company' than employees in non-TQ companies.

Significant relationships were noticed between TQ implementation and all the culture elements except the level of employee morale and the use of profit distribution.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.9 Customer Focus

Table 5.10 Relationship between TQ and level of Customer Focus

Q. No 34a	CROSSTABULATION 1: TQ IMPLEMENTATION/CUSTOMER FEEDBACK TO MGMT. Chi-sq: 12.0955; Significance: 0.03350; Cells E.F< 5: 4 of 12; Wt. Score: TQ-25.96, non-TQ -23.33
	The Chi-sq statistic indicates that there is significant association between TQ implementation and a high level of customer-related information fed back management.
34b	CROSSTABULATION 2: TQ IMPLEMENTATION/CUSTOMER VISIT BY MGMT. Chi-sq: 9.3338; Significance: 0.09647; Cells E.F< 5: 4 of 12; Wt. Score: TQ-24.87, non-TQ -22.67
	The chi-sq statistic indicates that there is no significant relationship between TQ implementation and the emphasis on customer visits by management.
34c	CROSSTABULATION 3: TQ IMPLEMENTATION/AFTER-SALES SERVICE Chi-sq: 12.8461; Significance: 0.02486; Cells E.F< 5: 4 of 12; Wt. Score: TQ-24.8, non-TQ -24.9
	The Chi-sq statistic implies that there is a significant association between TQ implementation and a high level of after-sales service.
34d	CROSSTABULATION 4: TQ IMPLEMENTATION/CUSTOMER SURVEY Chi-sq: 5.3452; Significance: 0.37522; Cells E.F< 5: None; Wt. Score: TQ-21.04, non-TQ -17.96
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and emphasis on customer survey.
34e	CROSSTABULATION 5: TQ IMPLEMENTATION/CUSTOMER TRAINING Chi-sq: 11.7668; Significance: 0.03813; Cells E.F< 5: None; Wt. Score: TQ-17.82, non-TQ -13.17
	The Chi-sq statistic indicates that there is significant association between TQ implementation and carrying out of customer training.
34f	CROSSTABULATION 6: TQ IMPLEMENTATION/LONG TERM RELATIONSHIP Chi-sq: 6.8341; Significance: 0.23327; Cells E.F< 5: 6 of 12; Wt. Score: TQ-28.57 , non-TQ

	-26.5
	The Chi-sq statistic indicates that there is no significant association between TQ implementation and the emphasis on long-term relationships with customers.
34g	CROSSTABULATION 7: TQ IMPLEMENTATION/PRO-ACTIVE APPROACH Chi-sq: 7.4767; Significance: 0.18753; Cells E.F< 5: 2 of 12; Wt. Score: TQ-24.33, non-TQ -21.52
	The Chi-sq statistic indicates that there is no significant association between TQ implementation and the emphasis on pro-active approach to market information.

Discussion

The average of the weighted scores for the TQ companies is 23.91 and for the non-TQ companies, 21.45. These scores imply that Customer focus was the most developed of the Quality Culture elements for both sets of companies. It is also the element that shows least difference between TQ and non-TQ companies and implies that, on average, TQ companies are not much better than non-TQ companies. The major difference is in the level of training given to customers. Both sets of companies had high levels of long-term customer relationship, feedback for customers, customer visits and after-sales service. The general conclusion is that both sets of companies are finding it difficult to progress beyond their present levels of development although they both attach great importance to the customer.

Significant relationships were noticed between TQ implementation and the levels of customer information feedback to management, after-sales service and customer training. There were no significant relationships with other elements of customer focus.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.10 Supplier Partnership

Table 5.11 Relationship between TQ implementation and level of Supplier Partnership

Q. No	CROSSTABULATION 1: TQ IMPLEMENTATION/SINGLE SOURCING
35a	Chi-sq: 12.6021; Significance: 0.02741; Cells E.F< 5: 2 of 12; Wt. Score: TQ-18.51, non-

	TQ -15.13
	The significant relationship is that TQ companies are better at single sourcing than non-TQ companies.
35b	CROSSTABULATION 2: TQ IMPLEMENTATION/FEEDBACK TO SUPPLIERS Chi-sq: 3.6591; Significance: 0.59947; Cells E.F< 5: 2 of 12; Wt. Score: TQ-21.78, non-TQ -19.74
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the level of information fed back to suppliers.
35c	CROSSTABULATION 3: TQ IMPLEMENTATION/SUPPLIER AUDIT Chi-sq: 7.5453; Significance: 0.18314; Cells E.F< 5: 1 of 12; Wt. Score: TQ-22.22, non-TQ -19.56
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the emphasis on supplier audit.
35d	CROSSTABULATION 4: TQ IMPLEMENTATION/SUPPLIER IMPROVEMENT ACTIVITIES Chi-sq: 4.7135; Significance: 0.45183; Cells E.F< 5: None; Wt. Score: TQ-20.24, non-TQ -17.33
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the use of supplier improvement activities.
35e	CROSSTABULATION 5: TQ IMPLEMENTATION/SUPPLIER TRAINING Chi-sq: 9.7100; Significance: 0.08388; Cells E.F< 5: 1 of 12; Wt. Score: TQ-14.96, non-TQ -11.35
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the emphasis on supplier training.
35f	CROSSTABULATION 6: TQ IMPLEMENTATION/SUPPLIER VISITS Chi-sq: 6.5641; Significance: 0.25513; Cells E.F< 5: 1 of 12; Wt. Score: TQ-21.71, non-TQ -18.39
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the emphasis on visiting suppliers.
35g	CROSSTABULATION 7: TQ IMPLEMENTATION/SUPPLIER AWARDS Chi-sq: 12.5551; Significance: 0.02792; Cells E.F< 5: 4 of 12; Wt. Score: TQ-9.75, non-TQ -5.47
	The Chi-sq statistic indicates that there is significant relationship between TQ implementation and the giving of supplier awards.
35h	CROSSTABULATION 8: TQ IMPLEMENTATION/JOINT DESIGN WITH SUPPLIERS Chi-sq: 8.2819; Significance: 0.14137; Cells E.F< 5: None; Wt. Score: TQ-18.77, non-TQ -15.53
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the practice of joint product design with suppliers.
35i	CROSSTABULATION 9: TQ IMPLEMENTATION/JOINT RESOLUTION WITH SUPPLIERS Chi-sq: 6.6950; Significance: 0.24433; Cells E.F< 5: 2 of 12; Wt. Score: TQ-21.41, non-TQ -19.05
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the practice of joint problem resolution with suppliers.

Discussion

The average of the weighted scores for the TQ companies was 18.82 and it was 15.73 for non-TQ companies. This implies that, on average, supplier partnership is better developed in TQ companies although there is room for improvement. The least

development was in the giving of supplier awards. There are no major differences but TQ companies were significantly better at single sourcing and the training of suppliers.

There were significant relationships between TQ implementation and the levels of single sourcing, supplier awards and joint problem resolution with suppliers.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.11 Teamwork

Table 5.12 Relationship between TQ implementation and level of Teamwork

Q. No	
36a	CROSSTABULATION 1: TQ IMPLEMENTATION/QUALITY CIRCLE Chi-sq: 7.3503; Significance: 0.19586; Cells E.F< 5: 2 of 12; Wt. Score: TQ-11.29, non-TQ -6.77
	On average TQ companies place more emphasis on the use of quality circles than non-TQ companies but the Chi-sq statistic implies that there is no significant association.
36b	CROSSTABULATION 2: TQ IMPLEMENTATION/PROBLEM SOLVING TEAM Chi-sq: 41.9116; Significance: 0.00000; Cells E.F< 5: None; Wt. Score: TQ-24.42, non-TQ -13.79
	The Chi-sq statistic indicates that there is significant relationship between TQ implementation and the use of problem solving teams.
36c	CROSSTABULATION 3: TQ IMPLEMENTATION/JOINT SUPPLIER TEAM Chi-sq: 17.9570; Significance: 0.00300; Cells E.F< 5: 2 of 12; Wt. Score: TQ-15.64, non-TQ -9.01
	The significant relationship is that TQ companies are better at forming teams with their suppliers.
36d	CROSSTABULATION 4: TQ IMPLEMENTATION/CEO MONITORING TEAM Chi-sq: 19.3077; Significance: 0.00168; Cells E.F< 5: 1 of 12; Wt. Score: TQ-13.64, non-TQ -6.29
	The significant relationship is that TQ companies make more use of CEO monitoring teams to monitor quality and other issues within the company.
36e	CROSSTABULATION 5: TQ IMPLEMENTATION/JOINT CUSTOMER TEAM Chi-sq: 13.6600; Significance: 0.01792; Cells E.F< 5: None; Wt. Score: TQ-17.49, non-TQ -11.43
	The significant relationship is that TQ companies are better at forming teams with their customers.
36f	CROSSTABULATION 6: TQ IMPLEMENTATION/DEPLOYED QUALITY TEAMS Chi-sq: 36.3191; Significance: 0.00000; Cells E.F< 5: None; Wt. Score: TQ-21.19, non-TQ -11.51
	The Chi-sq statistic indicates that there is significant relationship between TQ implementation and the use of deployed quality teams.
36g	CROSSTABULATION 7: TQ IMPLEMENTATION/VOLUNTARY QUALITY TEAMS Chi-sq: 20.1422; Significance: 0.00118; Cells E.F< 5: None; Wt. Score: TQ-16.36, non-TQ

	-8.7
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the of voluntary quality teams.
36h	CROSSTABULATION 8: TQ IMPLEMENTATION/TEAM CO-ORDINATOR Chi-sq: 38.4676; Significance: 0.00000; Cells E.F< 5: None; Wt. Score: TQ-20.59, non-TQ -9.9
	The significant relationship is that TQ companies are better at having personnel to co-ordinate the efforts of different teams.

Discussion

The average of the weighted scores for TQ companies was 17.58 and it was 9.68 for non-TQ companies. This implies that, on average, TQ companies are much better at teamwork than non-TQ companies. However, it also implies that Teamwork was the least developed of the Quality Culture elements for both sets of companies. In general, the poor level of voluntary teamwork is a major contributor to the weak development of teamwork. The greatest differences between TQ and non-TQ companies are in the use of deployed teams and the co-ordination of team efforts.
There were significant relationships between TQ implementation and all the elements of teamwork except the level of use of quality circles.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.12 Effect of CEO

Table 5.13 Relationship between TQ implementation and effect of Chief Executive Officer

Q. No 37a	CROSSTABULATION 1: TQ IMPLEMENTATION/CEO QUALITY COMMITMENT Chi-sq: 9.9987; Significance: 0.07527; Cells E.F< 5: 3 of 12; Wt. Score: TQ-26.89, non-TQ -22.26
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the commitment to quality of Chief Executives.
37b	CROSSTABULATION 2: TQ IMPLEMENTATION/CEO SITE VISITS Chi-sq: 5.6205; Significance: 0.34491; Cells E.F< 5: None; Wt. Score: TQ-20.82, non-TQ -18.29
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and site visits by the Chief Executive.

37c	CROSSTABULATION 3: TQ IMPLEMENTATION/QUALITY COURSES Chi-sq: 16.4600; Significance: 0.00565; Cells E.F< 5: None; Wt. Score: TQ-16.74, non-TQ -9.61
	The significant relationship is that CEOs in TQ companies attach more importance to attending courses and seminars on quality.
37d	CROSSTABULATION 4: TQ IMPLEMENTATION/INDEPENDENT AUDIT Chi-sq: 8.6776; Significance: 0.12264; Cells E.F< 5: None; Wt. Score: TQ-12.56, non-TQ -10.05
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the level of importance CEOs attach to having independent quality audits.
37e	CROSSTABULATION 5: TQ IMPLEMENTATION/CEO RESOURCE COMMITMENT Chi-sq: 13.3895; Significance: 0.01999; Cells E.F< 5: None; Wt. Score: TQ-21.99, non-TQ -16.97
	The significant relationship is that CEOs in TQ companies have a higher level of resource commitment to quality than CEOs in non-TQ companies.
37f	CROSSTABULATION 6: TQ IMPLEMENTATION/FLEXIBILITY Chi-sq: 15.1034; Significance: 0.00993; Cells E.F< 5: None; Wt. Score: TQ-23.25, non-TQ -17.39
	The significant relationship is that CEOs in TQ companies show more flexibility in management style than CEOs in non-TQ companies
37g	CROSSTABULATION 7: TQ IMPLEMENTATION/ENCOURAGE REWARD Chi-sq: 27 2814; Significance: 0.00005; Cells E.F< 5: None; Wt. Score: TQ-18.63, non-TQ -12.09
	The significant relationship is that CEOs in TQ companies attach more importance to reward and recognition of employees' contributions.

Discussion

The average of the weighted scores for TQ companies is 20.13 and for non-TQ companies, it is 15.24. This implies that, on average, chief executives in TQ companies show more interest and involvement in quality issues than those in non-TQ companies. The greatest differences are in the allocation of resources to quality, attendance at quality-related courses and programmes and encouragement by allowing for reward and encouragement of employee achievement. However, the level of development of the chief executive's quality audit was low in both sets of companies.

Significant relationships were noticed between TQ implementation and CEO flexibility, resource commitment, encouragement of reward and attendance of quality courses. No relationships were noticed with level of quality commitment, site visits and independent quality audit.

The relationships are based on the 0.05 significance levels. For a significance level of

$p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.13 Open Corporate Culture

Table 5.14 Relationship between TQ implementation and development of Open Corporate Culture

Q. No 38a	CROSSTABULATION 1: TQ IMPLEMENTATION/TEAM MEMBERSHIP ROTATION Chi-sq: 37.7949; Significance: 0.00000; Cells E.F< 5: 2 of 12; Wt. Score: TQ-15.97, non-TQ -6.77
	The significant relationship is that TQ companies make teamwork participation open to more employees within the organisation.
38b	CROSSTABULATION 2: TQ IMPLEMENTATION/INTERDEPT. CO-OPERATION Chi-sq: 20.2212; Significance: 0.00114; Cells E.F< 5: 2 of 12; Wt. Score: TQ-23.9, non-TQ -18.61
	The significant relationship is that inter-departmental co-operation is better in TQ companies.
38c	CROSSTABULATION 3: TQ IMPLEMENTATION/FLAT LAYERED MANAGEMENT Chi-sq: 12.7507; Significance: 0.02583; Cells E.F< 5: 2 of 12; Wt. Score: TQ-23.98, non-TQ -18.9
	The significant relationship is that TQ companies are better at having a flat-layered management structures.
38d	CROSSTABULATION 4: TQ IMPLEMENTATION/WORKFORCE FLEXIBILITY Chi-sq: 10.9967; Significance: 0.05145; Cells E.F< 5: 4 of 12; Wt. Score: TQ-27.27, non-TQ -23.6
	The Chi-sq statistic indicates that there is no significant relationship between TQ implementation and the level of workforce flexibility.

Discussion

The average score for the TQ companies was 22.78 and for non-TQ companies, it was 16.97. This implies that, on average TQ companies have much more open organisations than non-TQ companies. All the factors showed significant differences and lead to the conclusion that TQ companies are more flexible and generally have better structures than non-TQ companies.

Significant relationships were noticed between TQ implementation and team membership rotation, flat-layered management and the level of interdepartmental co-operation.

There was no significant relationship between TQ implementation and the flexibility of the workforce.

The relationships are based on the 0.05 significance levels. For a significance level of $p > 0.05$, the null hypothesis (no significant association) was accepted and for $0.05 > p$ the null hypothesis was rejected and the alternative (significant association) was accepted.

5.3.14 Summary of Respondents' details

A total of 166 companies took part in the survey - 91(54.8%) were TQ companies and 75 (45.2%) were non-TQ companies. Forty-one (41) of the TQ companies were U.K owned and 50 were not. Forty-nine (49) of the non-TQ companies were U.K owned and 26 were not. Nine (9.9%) of the TQ companies had more than 5000 employees and 75 (82.4%) had between 51 and 5000 employees. Seven (9.3%) of the non-TQ companies had more than 5000 employees and 55 (73.3) had between 51 and 5000 employees.

Thirty-five (38.5%) of the TQ companies were market leaders with a control of more than 40% of the U.K market. The corresponding number for non-TQ companies was 19 (25.3%). Five (5.5%) of the TQ companies exported more than 80% of total sales value while the corresponding figure for non-TQ companies was 9 (12%).

Fifty-one (56%) of the TQ companies had been practising TQ for more than 3 years and 28 (30.8%) had practised TQ for between 1.5 and 3 years. Of the non-TQ companies, 18 (24%) had plans to start a TQ program.

Eighty (87.9%) of the replies from TQ companies were completed by the quality manager and 7 (7.7%) were completed by the Chief Executive. For the non-TQ companies, 71 (94.7%) of the replies were completed by the quality manager and 2 (2.7%) were completed by the Chief Executive. Eighty-two (90.1%) of the TQ

companies expressed interest in the findings of the survey. The corresponding figure for non-TQ companies was 51 (68%).

5.4 Review of Findings

In general, the TQ companies had developed a better quality culture than non-TQ companies. The level of management leadership and employee involvement indicated considerable improvement with the implementation of TQ. TQ companies also showed a greater level of involvement of and partnership with their suppliers. The level of Chief Executive commitment and attitude to an open corporate culture are also better developed in TQ companies. Most of these issues can be attributed to the implementation and nature of TQ as this requires leadership from the top and a companywide involvement as well as partnership with suppliers.

Two outstanding elements are Customer focus and Teamwork. Both sets of companies are apparently experiencing difficulties with the elements. With Customer focus, both the TQ and non-TQ companies showed a high level of development and the TQ companies didn't have any significant advantage over the non-TQ companies. This would seem to indicate that both sets of companies are doing the same things and no set has achieved a breakthrough. With teamwork, the TQ companies were much better than non-TQ companies but the general level of development of teamwork in both sets of companies was low. This primarily indicates problems with getting employees motivated to work in teams. It may also indicate a failure to develop a structure that complements teamwork. In the author's opinion, Customer focus and Teamwork are the least mechanistic of the Quality Culture elements and the results indicate that the major problems lie with the 'soft' issues. These issues are examined in greater detail in the structured interview.

5.5 Significant Findings from the Questionnaires

This section examines and compares the values of quality culture elements and culture change agents for significant results or trends that could indicate the effects of one on

the other. The values used are those determined in the earlier analysis. The specific aim of this section is to identify which change agents are likely to have been used to develop or influence the indicated quality culture elements

The test method to be used takes advantage of the differences in both sample populations. The major comparison is between TQ and non-TQ organisations. The indices of comparison are the significance levels of both the change agents and quality culture. The change agents to be compared with the selected quality culture elements are determined from the quality culture-change agents link tabulated in Section 3.4.3. This test method will be able to show that a set of companies with high level culture development have a high or low usage of certain culture change agents or otherwise. It will also be able to show what change agents do not seem to have a noticeable effect on the quality culture element. Particular significance will be attached to change agents that indicate any of the following:

1. association (or otherwise) as indicated by significance testing;
2. high usage in both samples;
3. low usage in both samples;
4. major difference in usage between both samples;
5. minor difference in usage between both samples.

The culture elements and change agents that showed association with TQ implementation are indicated under the column 'Sign' with '*' denoting association.

The tables showing the likelihood to use specific change agents are as follows:

Table 5.15 Significant Senior management leadership\Change Agents Relationships

Note: The text in bold type are elements of Senior management leadership. The values used are as determined in the previous chapter.

No	Quality Culture Element\Change Agent	TQ score	non-TQ score	Sign
1	**Management Quality Training**	**21.93**	**14.75**	*
	Quality Champion	79.3	62.5	*
	Training program	44.4	12.5	*
	Joint Courses	79.8	54.1	*
	Motivating CEO	79.1	67.6	

	Performance improvement target	83.1	75	
2	**Steering Committee**	**24.79**	**15.03**	*
	Quality Champion	79.3	62.5	*
	Management examines poor performance	93.3	73	*
	Teamwork training	82.4	32.4	*
	Management teams	80.2	58.7	*
	Address problems on individual basis	34.1	73	*
	Differing departmental targets	81.1	66.2	*
	Quality policy	98.9	93.2	
	Self-critical management	70.8	61.1	
3	**Long-term TQM goal**	**25.81**	**9.66**	*
	Quality policy	98.9	93.2	
	Quality Champion	79.3	62.5	*
	Production before quality	22	35.1	
	Quality consideration in decisions	94.4	78.9	*
	Sales before quality	14.8	26.4	
	Performance improvement target	83.1	75	
4	**Information feedback to management**	**25.19**	**22.25**	*
	Management responsibility for actions	85.4	84.5	
	Employees approach supervisors	85.4	83.6	
	Employees express difficulties	87.8	78.7	
	Employees value quality improvement	94.5	82.4	*
	Management awareness of customer needs	96.7	94.4	
	Customer service values checked	95.6	87.3	
	Company bureaucracy	26.4	26.7	
5	**ISO 9000**	**28.76**	**22.6**	*
	Motivating CEO	79.1	67.6	
	Quality champion	79.3	62.5	*
	Blame on system	71.9	58.6	
	Quality policy	98.9	93.2	
	Quality consideration	94.4	78.9	*
6	**Statistical Process Control**	**18.96**	**12.05**	*
	Performance improvement target	83.1	75	
	Production before quality	22	35.1	
	Good process capability	74.2	73.2	
	Regular process review	80.2	74.7	
	Management addresses problems	67	71.6	
7	**Problem Solving Techniques**	**23.54**	**15.98**	*
	Performance improvement target	83.1	75	
	Management examines poor performance	93.3	73	*

	Training programme	44.4	15.5	*
	Employees express difficulties	87.8	78.7	
8	**Internal Quality Audit**	**26.91**	**24.01**	
	Management addresses problems	67	71.6	
	Management examines poor performance	93.3	73	*
	Performance improvement target	83.1	75	
	Quality champion	79.3	62.5	*
	Quality consideration in decisions	94.4	78.9	*
9	**Quality Improvement Techniques**	**19.29**	**9.19**	*
	Performance improvement target	83.1	75	
	Management examines poor performance	93.3	73	*
	Training programme	44.4	12.5	*
	Regular process review	80.2	74.7	
10	**Benchmarking**	**17.82**	**9.5**	*
	Technical assurances	94.3	79.2	*
	Product variety	93.3	94.7	
	Satisfaction level	53.3	25	*
	Delivery performance	90	75	*
	Meet customer requirement dynamically	78.9	84	

Table 5.16 Significant Employee Involvement\Change Agent Relationships

No	Quality Culture Element\Change Agent	TQ score	non-TQ score	Sign.
1	**Quality awareness program**	**23.78**	**16.94**	*
	Training program	44.4	12.5	*
	Policy training	17.4	1.5	*
	Quality consideration in decisions	94.4	78.9	*
	Employees value quality improvement	94.5	82.4	*
	Quality champion	79.3	62.5	*
	Policy motivation factors	29.5	13.7	*
2	**Quality feedback to workers**	**22.3**	**16.78**	*
	Management specifies reasons for decisions	60.4	44	*
	Management communicates performance	72.5	56	*
	Regular process review	80.2	74.7	
	Company bureaucracy	26.4	26.7	
	Employee consultation	49.5	34.7	
	Ease of market pressure	47.7	60.6	
3	**Quality improvement courses**	**21.25**	**11.66**	*

	Performance improvement target	83.1	75	
	Operator decisions	64.8	47.9	*
	Employees understand process	87.9	86.3	
	Workers readily form teams	52.7	25.7	*
	Facilitator training	56.2	19.7	*
	Employees value quality improvement	94.5	82.4	*
4	**Employee morale**	**20.09**	**18.12**	
	Job pride	90	81.9	
	Reward schemes	74.7	58.7	
	Motivational schemes	79.6	57	*
	Performance appraisal	38.5	41.3	
	Industry competitive pay	52.9	35.5	*
	Locally competitive pay	95.5	95.9	
	Pay\workload balance	63.1	57.1	
	Employees express difficulties	87.8	78.7	
	Performance appraisal focus	17.9	7.2	*
	Employee pay expectations met	65.9	53.7	
	Work conditions	72.5	46	*
5	**Profit Distribution**	**13.4**	**14.78**	
	Employee pay expectations	65.9	53.7	
	Higher pay	29.1	38.6	
	Reward schemes	74.7	58.7	
	Motivational schemes	20.5	5.6	*
	Pay/workload balance	63.1	57.1	
6	**Involvement in decisions**	**17.53**	**14.58**	
	Employee consultation	49.5	34.7	
	Involvement in wage review	51.7	37	
	Involvement in work measurement	68.5	29.7	*
	Involvement in work conditions review	66.7	51.4	*
	Freedom of work schedule	34.4	17.1	*
	Attitude survey	38.5	13.5	*
7	**Job Enlargement**	**20.06**	**15.48**	*
	Freedom of work schedule	34.4	17.1	*
	Training programme	44.4	12.5	*
	Operator decisions	64.8	47.9	*
	Employees understand process	87.9	86.3	
	Employees meet process requirements	91.2	88.9	
	Joint snr/jnr courses	79.8	54.1	*

Table 5.17 Significant Customer Focus\Change Agents Relationships

No	Quality Culture Element\Change Agent	TQ score	non-TQ score	Sign.
1	**Customer feedback**	**25.96**	**23.33**	*
	Management awareness of customer needs	96.7	94.4	
	Complaints measure	93.3	94.4	
	Delivery performance	90	75	*
	Satisfaction level	53.3	25	*
	Product return	65.9	54.9	
	Customer complaints encouraged	78.4	68.5	
2	**Customer visit**	**24.87**	**22.67**	*
	Management awareness of customer needs	96.7	94.4	
	Changing requirements captured	91.1	77.8	*
	Intermediate customer needs	92.9	84.1	
	Anticipate customer expectation	72.7	61.2	
	Customer retention	95.3	95.8	
	Customer complaint encouraged	78.4	68.5	
	Response timeframe	74.7	66.7	
	Meet response timeframe	82.9	82	
3	**After-sales service**	**24.8**	**24.9**	*
	Customer retention	95.3	95.8	
	Meet requirements dynamically	78.9	84	
	Personal service	78.7	72.6	
	Re-organisation	84.6	62.2	*
	Complaints measure	93.3	94.4	
4	**Customer survey**	**21.04**	**17.96**	*
	Communication of customer needs	69.2	63.9	
	Communication of product characteristics	89.9	84.9	
	Changing requirements captured	91.1	77.8	*
	Customer passion	67.7	68.8	
	Relationship quality	69.7	43.7	*
	Satisfaction level	53.3	25	*
	Complaints measure	93.3	94.4	
	Customer requirement communication	77.5	81.3	
	Customer complaints encouraged	78.4	68.5	
	Intermediate customer needs	92.9	84.1	
5	**Customer training**	**17.82**	**13.17**	*
	Policy awareness	40.9	39.1	
	Policy training	17.4	1.5	*
	Customer retention	95.3	95.8	
	Relationship quality	69.7	43.7	*
	Intermediate customer needs	92.9	84.1	
	Internal customers	92.3	79.7	*

6	**Long-term relationship**	**28.57**	**26.5**	
	Customer passion	67.7	68.8	
	Relationship quality	69.7	43.7	*
	Customer reward	81.4	70.8	
	Technical assurances	94.3	79.2	*
	Changing requirements captured	91.1	77.8	*
	Intermediate customer needs	92.9	84.1	
	Anticipate customer expectation	72.7	61.2	
	Customer retention	95.3	95.8	
	Personal service	78.7	72.6	
7	**Pro-active approach**	**24.33**	**21.52**	
	Policy training	17.4	1.5	*
	Relationship quality	69.7	43.7	*
	Customer passion	67.7	68.8	
	Product variety	93.3	94.7	
	Satisfaction level	53.3	25	*
	Re-organisation	84.6	62.2	*
	Changing requirements captured	91.1	77.8	*
	Customer reward	81.4	70.8	
	Customer complaints encouraged	78.4	68.5	

Table 5.18 Significant Supplier Partnership\Change Agents Relationships

No	Quality Culture Element\Change Agent	TQ score	non-TQscore	Sign.
1	**Single sourcing**	**18.51**	**15.13**	*
	Suppliers meet specifications	97.8	97.3	
	Supplier on-time delivery	90.1	88	
	Quality consideration in decisions	94.4	78.9	*
	Supplier in new development	65.9	49.3	*
	Other policies	29.2	11.6	
	Suppliers meet process demand	86.2	87.3	
2	**Feedback to suppliers**	**21.78**	**19.74**	
	Suppliers meet specifications	97.8	97.3	
	Supplier on-time delivery	90.1	88	
	Other policies	29.2	11.6	
3	**Supplier Audit**	**22.22**	**19.56**	
	Suppliers meet specifications	97.8	97.3	
	Supplier on-time delivery	90.1	88	
	Suppliers meet process demands	86.2	87.3	
	Other policies	29.2	11.6	

4	**Supplier Improvement Activities**	**20.24**	**17.33**	
	Supplier in new development	65.9	49.3	*
	Groups policy training	17.4	1.5	*
	Performance improvement target	83.1	75	
	Management examines performance	93.3	73	*
5	**Supplier training**	**14.96**	**11.35**	
	Other policies	29.2	11.6	
	Policy awareness	40.9	39.1	
	Policy training	17.4	1.5	*
	Suppliers meet process demand	86.2	87.3	
	Supplier in new development	65.9	49.3	*
	Training programme	44.4	12.5	*
6	**Supplier visits**	**21.71**	**18.39**	
	Suppliers meet specifications	97.8	97.3	
	Supplier in new development	65.9	49.3	*
	Other policies	29.2	11.6	
	Policy awareness	40.9	39.1	
7	**Supplier awards**	**9.75**	**5.47**	*
	Quality Champion	79.3	62.5	*
	Suppliers meet specifications	97.8	97.3	
	Supplier on-time delivery	90.1	88	
	Supplier in new development	65.9	49.3	*
	Suppliers meet process demands	86.2	87.3	
8	**Joint design with suppliers**	**18.77**	**15.53**	
	Supplier in new development	65.9	49.3	*
	Suppliers meet specifications	97.8	97.3	
	Other policies	29.2	11.6	
	Suppliers meet process demand	86.2	87.3	
	Policy awareness	40.9	39.1	
9	**Joint resolution with suppliers**	**21.41**	**19.05**	
	Supplier in new development	65.9	49.3	*
	Suppliers meet specifications	97.8	97.3	
	Other policies	29.2	11.6	
	Suppliers meet process demand	86.2	87.3	
	Policy awareness	40.9	39.1	

Table 5.19 Significant Teamwork\Change Agents Relationships

No	Quality Culture Elements\Change Agents	TQ score	non-TQ score	Sign.
1	**Quality circle**	**11.29**	**6.77**	
	Workers readily form teams	52.7	25.7	*

	Teamwork training	82.4	32.4	*
	Physical layout makes integration difficult	24.2	34.2	
	Recreation program	74.7	46.7	*
	Employees value quality improvement	94.5	82.4	
	Team recommendations considered	87.9	56.9	*
	Address problems on individual basis	34.1	73	*
	Lack of time	65.1	61.1	
	Lack of awareness	34.1	53.7	
	Junior employees fear lack of impact	37.2	31.5	
2	**Problem solving team**	**24.42**	**13.79**	*
	Teamwork training	82.4	32.4	*
	Address problems on individual basis	34.1	73	*
	Nature of problems unsuitable for teams	16.5	33.8	*
	Problems methodologies	50.5	26	*
	Management teams	80.2	58.7	*
	Departmental teams	86.8	58.7	*
	Cross-functional teams	85.7	49.3	*
	Negligible benefit from teams	20.2	24.6	
	People dislike teams	13.5	23.2	
	Company politics	40.4	59.4	*
	Facilitator training	56.2	19.7	*
	Management facilitator	59.6	43.7	*
	Full time facilitators	21.3	4.2	*
3	**Company\Supplier team**	**15.64**	**9.01**	*
	Supplier in new development	65.9	49.3	*
	Other policies	29.2	11.6	
4	**CEO monitoring team**	**13.64**	**6.29**	*
	Motivating CEO	79.1	67.6	
	Quality champion	79.3	62.5	*
	Management examines poor performance	93.3	73	*
	Management responsibility for actions	85.4	84.5	
5	**Company\customer team**	**17.49**	**11.43**	*
	Management awareness of customer needs	96.7	94.4	
	Re-organisation	84.6	62.2	*
	Customer retention	95.3	95.8	
	Intermediate customer needs	92.9	84.1	
	Policy training	17.4	1.5	*
	Changing requirements captured	91.1	77.8	*
	Relationship quality	69.7	43.7	*
6	**Deployed quality teams**	**21.19**	**11.51**	*
	Teamwork training	82.4	32.2	*

	Expertise	82.2	65.3	*
	Belbin	18.9	8.3	
	Costs	31.5	37.7	
	Company politics	40.4	59.4	*
	Functional organisations	40.7	56.8	*
	Facilitator training	56.2	19.7	*
7	**Voluntary quality teams**	**16.36**	**8.7**	*
	Volunteering	53.3	27.8	*
	Personality	36.7	29.2	
	Unwilling to challenge current practice	37.2	35.2	
	Workers readily form teams	52.7	25.7	*
	Lack of time	65.1	61.1	
	Effort recognition	27.9	37	
	Functional organisation type	40.7	56.8	*
	Information technology	75.6	55.4	*
	Differing departmental targets	81.1	66.2	*
8	**Team co-ordinator**	**20.59**	**9.9**	*
	Quality champion	79.3	62.5	*
	Team recommendation	87.9	56.9	*
	Management teams	80.2	58.7	*
	Cross-functional teams	85.7	49.3	*

Table 5.20 Significant CEO\Change Agents Relationships

No	Quality Culture Element\Change Agents	TQ score	non-TQ score	Sign.
1	**CEO quality commitment**	**26.89**	**22.26**	
	Quality champion	79.3	62.5	*
	Motivating CEO	79.1	67.6	
	Management responsibility for actions	85.4	84.5	
	Quality consideration in decisions	94.4	78.9	*
	Sales before quality	14.8	26.4	
	Quality policy	98.9	93.2	
2	**CEO Site Visits**	**20.82**	**18.29**	
	Motivating CEO	79.1	67.6	
	Regular process review	80.2	74.7	
	Quality champion	79.3	62.5	*
	Attitude survey	38.5	13.5	*
	Company bureaucracy	24.4	26.7	

3	**CEO attendance at quality courses**	**16.74**	**9.61**	*
	Motivating CEO	79.1	67.6	
	Joint snr\jnr courses	79.8	54.1	*
	Policy training	17.4	1.5	*
	Training program	44.4	12.5	*
4	**Independent Audit**	**12.56**	**10.05**	
	Motivating CEO	79.1	67.6	
	Management examines performance	93.3	73	*
	Performance improvement target	83.1	75	
	Regular process review	80.2	74.7	
5	**CEO Resource Commitment**	**21.99**	**16.97**	*
	Quality champion	79.3	62.5	*
	Motivating CEO	79.1	67.6	
	Work conditions	13.2	9.5	*
	Quality consideration in decisions	94.4	78.9	*
	Sales before quality	14.8	26.4	
	Emphasis on equipment	29.2	15.1	*
6	**CEO Flexibility**	**23.25**	**17.39**	*
	Motivating CEO	79.1	67.6	
	Operator decisions	64.8	47.9	*
	Freedom of work schedule	34.4	17.1	*
	Employee consultation	49.5	34.7	
	Company bureaucracy	26.4	26.7	
	Team recommendations considered	87.9	56.9	*
7	**CEO encourages reward, recognition**	**18.63**	**12.09**	*
	Motivating CEO	79.1	67.6	
	Motivational schemes	79.6	57	*
	Higher pay for workers	29.1	38.6	
	Reward schemes	74.7	58.7	
	Job pride	90	81.9	

Table 5.21 Significant Corporate Culture\Change Agents Relationships

No	Quality Culture Element\Change Agents	TQ score	non-TQ score	Sign.
1	**Team membership rotation**	**15.97**	**6.77**	*
	Company politics	40.4	59.4	*
	Belbin	18.9	8.3	
	Expertise	82.2	65.3	*
	Personality	36.7	29.2	
	Cross-functional teams	85.7	49.3	*

2	**Interdepartmental co-operation**	**23.9**	**18.61**	*
	Information technology	75.6	55.4	*
	Functional organisation type	40.7	56.8	*
	Cross-functional teams	85.7	49.3	*
	Differing departmental targets	81.1	66.2	*
	Simple processes	35.2	64.9	*
	Employees understand process	87.9	86.3	
	Good company teamwork	72.5	68	
	Company bureaucracy	26.4	26.7	
3	**Flat-layered management structure**	**23.98**	**18.9**	*
	Rapid instruction transmission	79.1	72	
	Company bureaucracy	26.4	26.7	
	Departmental autonomy	58.8	64.2	
	Re-organisation	84.6	62.2	*
	Task-based organisation	4.4	8.1	
	Functional organisation type	40.7	56.8	*
	Function\task balanced organisation	54.9	35.8	*
4	**Workforce Flexibility**	**27.27**	**23.6**	
	Training program	44.4	12.5	*
	Freedom of work schedule	34.4	17.1	*
	Job pride	90	81.9	
	Employees understand process	87.9	86.3	
	Re-organisation	84.6	62.2	*
	Clear company structure	40.7	20.8	*
	Good company teamwork	72.5	68	

5.6 Discussion of questionnaire results

Senior Management Leadership

1. The significant association between TQ implementation and level of management leadership compares with similar associations with the following :- the possession of a quality champion, the use of well developed training programmes and joint attendance of courses, seminars, etc. by senior and junior staff. Management in TQ companies are better trained in Quality-related matters. Their performance is complemented and may be due to the fact that they have better training programs and encourage their senior personnel to attend courses along with other employees.

Subscription to TQM and the greater presence of quality champions in top management are likely to have contributed to the awareness of quality among managers in TQ companies.

2. The significant association between TQ implementation and the level of use of steering committees compares with similar associations with the following :- possession of quality champions, management concern at poor performance, teamwork training and general use of management teams, setting of departmental targets and tendency to address problems on a team basis. More TQ organisations use Steering committees (or Quality Councils) in their quality drive. Indicated reasons for this includes the widespread acceptance of management teams and a tendency towards a teamwork approach to problems. Furthermore, 82.4% of TQ companies train their workers in teamworking techniques in comparison to 32.4% of non-TQ companies. The use of steering committees is also likely affected by the level of importance management attaches to finding reasons behind poor performance

3. The significant association between TQ implementation and a long-term TQM goal compares with similar associations with the consideration of quality in company decisions and the presence of a quality champion. Non-TQ companies do not generally have a long term quality goal in comparison to their TQ implementing counterparts. This situation is not greatly affected by the fact that 93.2% of non-TQ companies have quality policies. In contrast to TQ companies, less (78.9 in non-TQ and 94.4 in TQ) of them involve quality as a major factor in decision making. Quality champions may also contribute to continued long-term focus on quality. The suggestion is that, in many cases, quality only exists on paper and carries little weight in comparison to other organisational considerations.

4. The significant association between TQ implementation and information feedback to management compares to a similar association with the employees' value for quality improvement. The weighted scores, though, suggest that management in

both TQ and non-TQ companies place greater than average emphasis on information feedback.

5. The significant association between TQ implementation and ISO 9000 registration compares with associations with the presence of a quality champion and the consideration of quality in company decisions. These factors may have greatly influenced ISO 9000 registration in the same way as they may have influenced a long-term quality goal.

6. The association between TQ implementation and use of Statistical Process Control is not complemented by any other association. The author suggests that better development of TQ companies may be a consequential fall-out of better quality awareness.

7. The association between TQ implementation and use of problem-solving techniques is complemented by the use of better training programmes and the likelihood of management to examine reasons for poor performance. TQ companies are better at using problem-solving methods and this may be because they are better trained and their management are more likely to search for problems and examine reasons for failure.

8. There is no association between TQ implementation and the use of internal quality audits. This compares with null associations with the following :- likelihood of management to speedily address problems and the setting of performance improvement targets. The weighted scores suggest that both TQ and non-TQ companies place considerable emphasis on internal quality audits.

9. The association between TQ implementation and the use of quality improvement techniques compares with similar associations with the training programme and the likelihood of management to examine poor performance. The factors involved here are similar to those involved in the association with use of problem-solving techniques.

10. The association between TQ implementation and use of benchmarking compares with associations with the following :- giving of technical assurances on products and measurement of delivery performance and customer satisfaction level. Benchmarking is significantly poorer in non-TQ companies. This may be because 53.3% of TQ companies and only 25% of non-TQ companies measure the satisfaction level of their customers while 90% and 75% respectively examine their delivery performance. TQ companies are also significantly better at giving assurances on their products.

Employee involvement and empowerment

1. The significant association between TQ implementation and the level of quality awareness compares with similar associations with the following :- better training programs which includes company policy training, the greater use of a quality champion, the greater influence of quality in decision making, the influence of policy motivation factors and the encouragement of employees to value quality improvement. These factors may have resulted in the greater quality awareness among employees in TQ companies.

2. The association between TQ implementation and the level of quality information feedback to employees compares with associations with the following :- the likelihood of management to specify reasons for their actions and also communicate company performance to their sub-ordinates. The feedback to employees, which generates greater involvement, is higher in TQ companies. This may have been achieved because their management are more particular about letting everyone know the market performance and they generally specify reasons for their decisions.

3. The association between TQ implementation and the use of quality improvement courses for employees compares with associations with the following :- operator decisions, facilitator training and readiness of workers to form teams and value

quality improvement. The greater importance attached to the ability of operators to take decisions, the use of facilitators and the higher tendency of employees to form teams are factors that may have resulted in the adoption of organisationwide quality improvement courses in TQ companies.

4. There is no association between TQ implementation and the level of employee morale. Important morale boosters may be locally competitive pay rates, encouragement of job pride and use of reward schemes. Other contributory factors, which similarly showed no association with TQ implementation are pay\workload balance, use of performance appraisal, meeting of employee pay expectations and encouragement of employees to express their difficulties.

5. There is no association between TQ implementation and practice of profit distribution. This compares with null associations with the following :- meeting employee pay expectation, even pay/workload balance, use of reward schemes and lack of need for pay increase.

6. The null association between TQ implementation and involvement in decisions compares with similar associations with the use of employee consultation and employee involvement in wage review. Indicated levels of employee involvement in decision making are below average in both sets of organisations. This may have resulted from poor employee consultation (TQ-49.5%; nTQ-34.7%). Furthermore, only 51.7% of TQ and 37% of non-TQ companies involve their workers in wage review.

7. The association between TQ implementation and job enlargement for employees compares with associations with the following :- employee freedom of work schedule, operator decision taking, training programme and joint senior/junior attendance at courses. It would appear that the better practice of job enlargement in TQ companies is influenced by the fact that they train their employees better and allow them to take decisions.

Customer Focus

1. The association between TQ implementation and feedback of customer information to management compares with associations with measuring of delivery performance and customer satisfaction level.

2. The significant association between TQ implementation and customer visits compares with a similar relationship with the likelihood to understand changing customer requirements.

3. The association between TQ implementation and after-sales service compares with an association with company re-organisation to improve customer responsiveness.

4. The association between TQ implementation and the use of customer surveys compares with associations with the following :- need to understand changing customer requirements and the measure of customer satisfaction level and quality of relationship.

5. The association between TQ implementation and level of customer training compares with similar associations with the following :- policy training for customers, measurement of relationship quality and the promoting of the internal customer concept.

6. There is no association between TQ implementation and the emphasis on long-term relationships with customers. This compares with the lack of relationships with the following :- customer passion and reward, focus on personal service and customer retention and the ability to anticipate customer expectations and meet intermediate customer needs.

7. There is no relationship between TQM implementation and a pro-active approach to customer-related issues. This compares with the lack of relationships with the

following :- customer passion, product variety, customer rewards and the encouragement of customer complaints.

Supplier partnership

1. The association between TQ implementation and single sourcing compares with associations with involvement of suppliers in new development and quality consideration in decision making. Single sourcing is more common in TQ companies and this may be because more non-TQ companies will give favourable consideration to factors other than quality (e.g. cost) and TQ companies are more inclined to involve their suppliers in new development.

2. The null association between TQ implementation and level of feedback to suppliers compares with null associations with the following :- supplier on-time delivery, ability to meet specifications and focus on comprehensive company policies (including supplier quality and partnership policies).

3. There is no association between TQ implementation and supplier auditing. This compares with similar null associations with the following :- supplier on-time delivery, supplier ability to meet process demands and specifications and focus on company policies.

4. The null association between TQ implementation and level of supplier improvement activities compares with a similar association with the setting of performance improvement targets.

5. There is no association between TQ implementation and level of supplier training and this compares with null associations with the following :- policy awareness, comprehensive company policies and ability to meet process demands.

6. There is no association between TQ implementation and the visiting of suppliers. This compares with the ability to meet specifications and the awareness of comprehensive company policies.

7. The relationship between TQ implementation and giving of supplier awards compares with the presence of a quality champion and the involvement of suppliers in new development.

8. There are no relationships between TQ implementation and level of joint design and problem resolution with suppliers. This compares with the ability of suppliers to meet specifications and process demands as well as awareness of company policies.

Teamwork

1. There is no relationship between TQ implementation and use of quality circles. This compares with teamwork-hindering physical layout, employee lack of time for teamwork, lack of awareness of teamwork advantages and minimal impact of junior employees in teamwork. The general low level of quality circle development may be due to the fact that workers do not readily form teams although they value quality improvement. The reluctance to form quality circles is attributed to the following :- lack of time, lack of awareness of teamwork benefits, and fear of lack of impact of recommendations, unwillingness to challenge current practice and lack of effort recognition.

2. The relationship between TQ implementation and use of problem-solving teams compare with the following :- teamwork training, high level of facilitation and team proliferation, company politics and a tendency to address problems on a team basis. Companies likely to use problem solving teams are those that train their employees in teamworking, examine the nature of their problems before deciding to employ a team approach or otherwise, encourage the setting-up of various types of teams and provide facilitation for the teams. Major barriers to development of problem

solving and deployed teams are company politics and physical and functional barriers in organisation

3. The relationship between TQ implementation and use of company/supplier team compares with the involvement of supplier in new development and implies that companies which involve their suppliers in new development have a greater tendency to have joint teams with their suppliers.

4. The relationship between TQ implementation and the use of CEO monitoring teams compares with the presence of a quality champion and the tendency of management to seek reasons for poor performance.

5. The relationship between TQ implementation and the use of company/customer teams compares with the following :- evaluation of relationships with customers, understanding of changing customer requirements, company re-organisation to improve customer responsiveness and policy training for customers

6. The relationship between TQ implementation and the use of other voluntary quality teams compares with relationships with the following :- encouragement of team membership by volunteering, readiness of employees to form teams, use of information technology, setting of departmental targets and functional barriers within the organisation.

7. The relationship between TQ implementation and the use of a team co-ordinator compares with the following :- presence of a quality champion, consideration of team recommendations and use of various teams.

Chief Executive Officer

1. There is no relationship between TQ implementation and the level of commitment of the CEO to quality. This compares with having a motivating CEO, management

acceptance of responsibility for actions, specification of a quality policy and precedence of quality over other considerations.

2. The null relationship between TQ implementation and site visits by the CEO compares with similar null relationships with the following :- company bureaucracy, regular process review, and the motivating capabilities of the CEO.

3. The relationship between TQ implementation and CEO attendance at quality courses compares with the following :- joint senior/junior employee attendance and company training program including policy training.

4. The null relationship between TQ implementation and the use of CEO independent quality audit compares with the following :- regular process review, setting of performance improvement targets and the motivating capabilities of the CEO.

5. The relationship between TQ implementation and the level of resource commitment to quality by the CEO compares with the following :- quality consideration in decisions, emphasis on equipment and working conditions and the influence of the quality champion.

6. The relationship between TQ implementation and CEO flexibility compares to relationships with consideration of team recommendations and freedom of employees to schedule work and take decisions.

7. The relationship between TQ implementation and CEO encouragement of reward and recognition compares to the development of motivation schemes.

Open Corporate Culture

1. The relationship between TQ implementation and team membership rotation compares with the following :- use of cross-functional teams, team selection by expertise and the influence of company politics.

2. The relationship between TQ implementation and the level of interdepartmental co-operation compares with relationships with the following :- use of information technology and cross-functional teams, target-setting, simplicity of processes and functional barriers within the organisation.

3. The relationship between TQ implementation and flat-layered management structures compares with company re-organisation and the functional barriers within the organisation.

4. There is no relationship between TQ implementation and the flexibility of the workforce. This compares with similar null relationships with employee job pride and understanding of the process.

5.7 Major trends in use of Change Agents

In this section, the most important change agents will be viewed in the context of quality culture elements with which they are associated. Three specific trends are of particular interest:

- the five most used change agents for each quality culture element;
- the five least used change agents for each quality culture element;
- the change agents that showed significant relationships with TQ implementation.

The first two cases do not take into account the quality status of the companies. They aim to show which change agents industry tends to adopt more (or vice versa) in the development of a particular quality culture element. The third case takes into account the quality status of the companies and shows which change agents TQ companies are more likely to adopt (or vice versa) for any particular quality culture element as opposed to non-TQ companies. The change agents for the first two cases are selected based on the averages of TQ and non-TQ companies while those for the last case are selected based on the greatest significant differences between TQ and non-TQ companies.

The results only show a trend in the use or lack of use of the most significant change agents to achieve the relevant quality culture element and are incapable of attributing success (or otherwise) in quality culture to these change agents. The change agents are ranked in order from 1 to 5. In table 5.22, the change agents are arranged in descending order with no. 1 being the most common change agent. The same arrangement is applied to table 5.23 with no. 1 being the least common change agent. Table 5.24 shows all the change agents that showed significant association (5% significance level) with TQ implementation. The agents are ranked in descending order of significance with no. 50, 'work conditions review' showing least significant association.

Table 5.22 Five most common Change agents used against Quality Culture elements (ranked in descending order.)

	QUALITY CULTURE ELEMENTS						
CHANGE AGENTS	SML	EIE	CF	SP	TWK	CEO	OCC
Quality Policy	1		1			1	
Management awareness of customer needs	2				2		
Quality consideration in decisions		3		2		2	
Management examines poor performance					4		
Management responsibility for actions						3	
Locally competitive pay		1					
Customer service value checked	4						
Suppliers meet specifications				1			
Customer retention			2		1		
Differing dept targets							4
Quality champion						5	
Intermediate customer needs			4				
Supplier on-time delivery				3			
Re-organisation for customer					5		3
Customer complaints measurement			3				
Suppliers meet process demands				4			
Product variety	3						
Job pride		4					1
Technical assurances			5				
Employees understand process							2
Supplier involved early in new				5			
Motivating CEO						4	
Employees value quality improvement	5	2			3		
Employees express difficulty		5					
Teams selected by expertise							5

Table 5.23 Five least used Change Agents viewed against Quality Culture Elements in descending order of usage

	QUALITY CULTURE ELEMENTS						
CHANGE AGENTS	SML	EIE	CF	SP	TWK	CEO	OCC
Measure satisfaction level	1		3				
Suppliers meet process demand				1			
Freedom of work schedule		4					3
Negligible benefits from teams					1		
Training program	2	2				2	
Supplier related policies				4			
Task-based organisational structure							5
Reward schemes						1	
Policy training			5	5	5	5	
Company bureaucracy	4	5					2
Measure quality of relationship			2				
Policy awareness			4	3			
Sales before quality	5					4	
Use of Belbin technique					3		4
Higher pay for workers						3	
Attitude survey		3					
Use of full-time facilitators					4		
Personality based team selection							1
Supplier involved in new development				2			
Monitor product return			1				
People dislike teams					2		
Production before quality	3						
Performance appraisal		1					

Table 5.24 Change agents with significant association with TQ implementation (ranked in order of descending significance.)

Rank No.	Change Agent	Chi-sq Significance	Question No.
1	Training program	0.00000	11
2	Work measurement involvement	0.00000	17 - 1
3	Individual basis for solving problems	0.00000	39a
4	Teamwork training	0.00000	41
5	Crossfunctional teams	0.00000	42c
6	Facilitator training	0.00000	46c
7	Team recommendations considered	0.00001	27 - 2
8	Departmental teams	0.00004	42b
9	Company recreation programme	0.00021	28b
10	Satisfaction level measured	0.00027	53a - 3
11	Simplicity of processes	0.00028	26 - 1
12	Attitude survey	0.00035	9 - 5
13	Management examines performance	0.00038	9 - 6
14	Voluntary team formation	0.00043	43a
15	Joint snr/jnr courses	0.00045	28a
16	Performance appraisal focus	0.00089	15b
17	Quality of relationship measured	0.00093	54d
18	Company reorganisation	0.00099	52
19	Volunteering in team selection criteria	0.00106	45d
20	Motivation schemes	0.00122	10
21	Methodologies for evaluating problems	0.00142	39c
22	Full-time facilitators	0.00178	46a

23	Management teams	0.00245	42a
24	Policy training	0.00280	21
25	Technical assurances on products	0.00430	54b
26	Information technology	0.00653	39e
27	Work conditions	0.00665	18
28	Nature of problems faced	0.00991	39b
29	Quality consideration in decisions	0.01050	22a
30	Delivery performance measured	0.01091	53a - 2
31	Expertise in team selection criteria	0.01371	45b
32	Freedom of work schedule	0.01433	8 - 6
33	Customer satisfaction passion	0.01463	54e
34	Clear company structure	0.01546	30
35	Changing customer requirements captured	0.01761	49
36	Politics	0.01797	44c
37	Internal customers satisfied	0.01809	51e
38	Quality Champion	0.01917	8 - 2
39	Management communicates performance	0.02623	9 - 3
40	Differing departmental targets	0.02966	27 - 1
41	Operator decisions	0.02976	12 - 1
42	Supplier in new development	0.03078	13 - 3
43	Management communicates reasons for decisions	0.03468	9 - 1
44	Industry competitive pay	0.03512	16 - 1
45	Organisation type	0.03662	40
46	Employees value quality	0.03974	24
47	Policy motivation	0.04041	23
48	Management facilitators	0.04555	46b
49	Emphasis on equipment	0.04600	24
50	Work conditions review	0.04657	17 -2

5.8 Summary

The analysis of the questionnaires involved the comparison of TQ and non-TQ companies for both use of change agents and development of quality culture elements. The test used was the correlation test by means of the chi-sq statistic at 0.05 significance. A primary indication was that the major problems were in the areas of teamwork and customer focus. Change agents were compared with quality culture elements in order to identify tendencies to use certain change agents in relation to particular quality culture elements. The analysis identified a total of 50 change agents as having significant association with TQ implementation.

CHAPTER 6 - RESULTS OF THE STRUCTURED INTERVIEWS

6.1 Introduction

This chapter describes the research method used to investigate the effects of change agents on quality culture development. It also examines the general approaches to quality culture development by the interviewed companies as well as highlighting their relative successes and failures. The findings can:

1. provide a greater understanding of how change agents can influence culture change;
2. assist in the determination of tailored approaches to culture development;
3. give an indication of the problems commonly encountered in culture change.

The major sections of the chapter and the issues examined are now described:

Section 6.2: Findings from the structured interview - This section reports the findings from investigations by interview into the effects of change agents on quality culture development. Individual profiles and approaches to quality of the interviewed companies are also examined.

Section 6.3: This section discusses findings in Section 6.2 and gives the author's views.

Section 6.4: This section concludes the chapter.

6.2 Findings from the Structured Interviews

The need for structured interviews was discussed in Chapters 1 and 4. The format for the interviews was also presented in Chapter 4. This section presents some of the issues arising from the structured interviews.

6.2.1 General approaches to Quality Culture

This section examines the background of the interviewed companies and the quality culture change agents they have used. The change agents examined in this section are only the standard ones that were formally included in the interview format. The nature of the interview required that each respondent had the liberty to mention any activity (from without the few standard ones) that had helped or inhibited quality culture development. The result of these open-ended questions are examined in a different section.

The questions analysed in this section involved the respondent answering on the use and effect of specific activities. The section also gives an overview of the general company characteristics that were examined in Section 1 of the structured interview. The information is displayed in tabulated form (Table 6.1). This makes it easy to compare the quality approaches of any two companies or set of companies. It also allows for easy determination of the activities that are most or least common in the interviewed companies.

Table 6.1 Summary of company details and general quality activities for interviewed companies

Activity\company	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6
Respondee: 1=CEO;2= Quality manager;3=other	1	2	2	2	2	2	2	1	1	1	2	2	3	3	2	2	2	2	2	2	2
Company ownership: 1=U.K: 2= non-U.K	1&2	1	2	1	2	1	1	2	1	1	2	1	1	2	2	1	1	2	1&2	1	2
No of employees on site	105	245	1000	45	200	300	350	176	8	23	380	280	24	40	350	57	150	450	560	30	350
Approx. annual turnover of site (million pounds)	50	20	210	8	-	-	150	17.5	0.7	2.8	183	20	1.5	5	50	5	7	400	45	-	400
Subsidiary of large org. Y=Yes;N=No	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y
ISO9000 registered: Y=Yes;N=No	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
TQM company: Y=Yes;N=No	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	N	Y	N	N	N
Years of TQM practice	8	6	12	5	5	5	5	10	-	8	7	1.5	-	6	-	-	-	9	-	-	-
Highly departmentalised internal structure: Y=Yes;N=No	Y	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y
Shop floor layout: 1=product; 2=process;3=varies	2	2	2	2	2	3	2	2	2	1	2	1	2	2	3	2	2	3	2	2	2
Production type: 1=job;2=batch; 3=mass;4=varies	2	1	2	1	2	4	2	3	2	2	2	4	2	2	1	4	1	2	4	2	4
Product complexity: 1=low; 2=medium;3=high	2	2	3	3	3	2	3	2	2	2	2	3	3	2	3	2	3	3	2	2	3
Product range: 1=single;2=few; 3=multiple	3	3	3	2	3	3	3	2	2	2	3	3	3	2	3	2	2	3	3	3	3
Customer base: 1=large;2=few 3=single;4=varies	1	2	1	4	1	4	1	2	1	1	1	1	2	2	2	1	1	1	4	2	1
Market competitiveness: 1=high; 2=substantial;3=little;4=none	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1

Table 6.1 (continued)

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6
MANAGEMENT																					
Employee consultation	✓	✓	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	✓	✓	✓	.	✓	.	✓	.
Market performance communication	✓	✓	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	✓	✓	✓	✓	✓	.	✓
Management training program	✓	.	.	✓	✓	.	✓	✓	.	✓	✓	✓	.	.	✓	✓	.	✓	.	.	.
Quality awareness	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	✓	✓	✓	.	✓	.	✓	✓
Management teams	✓	.	✓	✓	✓	✓	✓	✓	.	✓	✓	✓	.	✓	✓	✓	.	✓	✓	✓	✓
Employee decision making	✓	.	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.	.	.	✓	.	✓	.	✓	✓
TEAMWORK																					
Voluntary teams	✓	✓	.	.	✓	✓	✓	✓	.	✓	✓	✓	.	.	✓	.	.	.	✓	.	.
Teamwork training	✓	✓	✓	✓	✓	✓	✓	✓	.	✓	✓	.	.	.	✓	.	.	.	.	.	.
Facilitation	✓	✓	✓	✓	✓	✓	✓	✓	.	✓	✓	.	.	.	.	.	.	.	.	.	.
Delegated teams	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	✓	.	.	✓	✓	✓	✓
CUSTOMER SERVICE																					
Measure satisfaction level	✓	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	✓	✓	✓	✓	✓	.	.	.
Monitor product return	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	✓	.	✓	✓	✓	✓	✓	✓
Encourage customer complaint	✓	.	.	.	✓	✓	✓	✓	✓	.	.	.	.	.	.	.	.	✓	✓	.	.
Q.F.D	✓	.	.	✓	.	.	✓	.	.	.	.	✓	.	.	.	.	.	.	.	.	.
Taguchi	✓	.	.	.	.	✓	✓	✓	.	.	.	.	.	.	.	.	.	✓	.	.	.
J.I.T	✓	✓	✓	.	✓	✓	.	✓	.	.	✓	✓	.	✓	.	.	.	✓	.	.	.
S.P.C	✓	✓	✓	✓	✓	✓	✓	✓	.	✓	✓	✓	.	.	✓	✓	✓	✓	.	✓	✓
Business Process Re-engineering	✓	.	.	✓	✓	✓	✓	.	.	.	✓	✓	.	.	✓	.	.	✓	.	.	✓
M.R.P	✓	.	.	✓	✓	✓	.	✓	.	.	✓	.	.	✓	.	.	✓	✓	.	.	-

✓ = Activity carried out; . = Activity not carried out; - = No reply

Discussion

Of the 21 companies interviewed, 20 had ISO9000 registration and 13 had implemented TQM. None of the companies had low complexity products and 14 had multiple products. 19 claimed to be in highly competitive markets.

Generally, the A type companies recorded more activities than the B and C companies especially in teamwork and customer service. The use of quality tools (especially Q.F.D., taguchi methods, J.I.T. and M.R.P.) was relatively poor across the range of companies. In contrast, the use of management activities (management teams, employee consultation, market performance communication, etc.) was more common. This observation justifies the selection of the companies in their indicated categories and gives preliminary indications of reasons for poor development.

6.2.2 Profiles of interviewed companies

In this section the profiles of each of the interviewed companies is examined in a Quality culture context. Each company is treated as a case study. The case studies are presented here rather than in the appendix because they are a vital part of the flow of results and are continually refered to in subsequent chapters. The companies will continue to be identified in this and other sections by the classifications described in the last section (i.e. A1 is the first of the 'a' type companies, B4 is the fourth of the 'b' type companies, etc.)

This issues to be examined are those generated in the interviews and will prominently feature the related Quality culture elements (Management leadership, Teamwork and Customer Focus) and change agents as well as the company set-up.

The use of the case study approach is an effective way of examining the culture approach and prevalent culture in the companies by treating each as a single entity. Thus it possible to side track direct comparisons of fragmented aspects of culture which forms a major part of the survey analysis. This approach also allows for the

documentation of many other issues which may have emerged in the interviews and cannot be directly included in tabulated analysis. It also allows the reader a general view of the different cultures as was recorded during the interviews - the assessment of the company's culture by the respondent.

CASE STUDY 1

COMPANY A1

General: Company A1 is a lubricants manufacturing company. It is at the downstream end of operations of a large multinational oil corporation(of which it is a subsidiary) whose interests range from petroleum exploration and production to direct retail of petroleum products. The company has 105 employees on site and has an annual turnover of about 50 million pounds sterling. The company is registered to ISO 9000 standards and has practised TQM for about 8 years. The product range is large ranging from general own brand oils to specific lubricants for customers that operate in special areas. As a result, batch production is adopted and the customer base is large - incorporating both members of the public and specialised industries and corporations. The market is also very competitive.

Culture Overview: The company has undergone a successful culture change. The present culture complements quality and continuous improvement. Problems encountered in the change process were mainly resistance on the part of some senior managers and supervisors. This led to retirements in the management cadre and a scraping of line managers. All employees are quality conscious and the motivation is high. 80% of improvement ideas come from the shop floor and the ideas are usually executed by the shop floor workers. A shop floor operator has volunteered to design a new warehousing system for the company while another was solely responsible for the concept and erection of a safety barrier to stop people walking into doors. All employees have received training in TQM and the company has budgeted 3 million pounds sterling for investment in work culture. Employees are responsible for the quality of their own work and each employee carries out an individual safety audit. Measurement and target setting are given priority. Every statistic right down to fuel consumption and tyre wear of delivery vehicles is measured and targets set. The company also adopts an open business culture. Each department has a notice board that displays their recent performances and their targets. There is also a central noticeboard that gives an overview of market and production performance.

Management: A participative style of management is adopted and managers always consult employees before decision making. Managers are encouraged to be receptive to junior employees and small team briefs are commonplace. Management commitment to quality improvement is very high and improved performance is always recognised and often rewarded. Managers also work in teams to ensure smooth running of the entire facility.

Teamwork: The company as a whole, works well as a team. Employees are also encouraged to work in teams. All employees have had teamwork training and only teamleaders are delegated by management. Other team members are often picked from cross-departmental volunteers. Team-performance is measured in many ways and a team-based performance related pay system is practised. Team briefs are put up on all noticeboards and regular progress reports are given. However, finding time for teamworking is sometimes a problem.

Customer focus: The main customers are workshops and industries. Customer service performance is strictly and comprehensively measured and new targets set. Targets for the past three years have always been met and often exceeded. Customer surveys are carried out regularly and all employees, irrespective of designation go on customer visits. A computerised customer base is kept and various quality tools and techniques are in place to advance customer orientation. A win-win partnership situation with the customer is practised and when necessary, technical assistance(e.g. stock management techniques) is given to customers. Social contact with major customers is also encouraged. The company plans to find more time for its customers and also eliminate rework and waste. The business is to double production over the next two years and break into the international market.

CASE STUDY 2

COMPANY A2

General: Company A2 is a UK owned packaging industry. It is a subsidiary of a larger public-quoted organisation. The company is registered to ISO9000 standards and has been practising TQM for six years. There are 245 employees on site and the approximate annual turnover of the site is about 20 million pounds sterling. The product range is large and the company has a few major customers and some smaller customers. There are no standardised products and all products are customised. Thus job production is the major method of manufacture. The market is highly competitive.

Culture Overview: The company is in the middle of a transition. Some of the problems have been tackled successfully but there still remains a lot to be done. The major problems faced were resistance from senior managers and especially middle managers who generally felt threatened. The inability to cope with changes has led to the resignation of two senior managers while there still remains some rigid managers within the organisation. On the other hand, there are quality champions within the organisation who are attempting to tackle the inherent technological and cultural issues. An outstanding bottleneck within the company is the almost non-existent idea bank on how to tackle some of the problems. Although the contribution from employees is increasing, there is a lack of training in quality techniques and tools for both employees and managerial staff. There is also very

little measurement within the company thus making it difficult to benchmark achievements. The use of quality techniques is only at developmental stages. In summary, the company has embarked on a journey of change. While a majority of the problems have been identified and acknowledged, ways of tackling them are not readily forthcoming.

Management: There is a transformation from an authoritative to a participative style of management although more needs to be done. Employee consultation is practised although the management could do more to encourage bottom-up involvement. The level of commitment of senior managers to quality improvement is high although many managers complain about finding time to fit in quality issues into their already difficult schedules. Management is yet to determine methods of recognition for employee performance although meetings are regularly held to inform employees of the performance of the company. Management has achieved a breakdown of departmental barriers. A management training program is being considered and there is little use of management teams. Employee suggestion and decision making is not generally encouraged by management.

Teamwork: The company works well as a team and voluntary teams are encouraged and empowered. There are however, no ways of measuring the effectiveness of the teams. The major problem is a lack of time for teamworking especially with supervisors and line managers. Company politics and little recognition for team recommendations are outstanding problems that the company is yet to tackle.

Customer focus: The manageable size of the customer base make it relatively easy to monitor customer issues. However there is a low level of customer pro-activeness. There has been no re-organisation to be more responsive to customer demands. The satisfaction level of customers is not measured and customers are not generally encouraged to complain. More can be done to anticipate customer expectation although product return is monitored. Statistical process control is being introduced and business process re-engineering is under consideration.

CASE STUDY 3

COMPANY A3

General: Company A3 is a foreign owned company that was merged with another company about a year ago. The company is a major paint manufacturer with about 1000 employees on site and a turnover of about 210 million pounds sterling. The company has been quality conscious for about 12 years and is registered to ISO9000 standards. Batch production is the major method of manufacture and the market is highly competitive. The company manufactures a range of products ranging from moderate complexity brand name paints for general use to highly complex special paints for use in specific markets such as the oil, automobile and aerospace industries. The company's products carry a very prominent and widely known brand name.

Culture Overview: Although the company has been quality conscious for a long time, a traditional structure is still in place. The focus has been more on product quality than development of quality systems and processes. There has been enormous resistance to change from all levels of management. The board of directors is not totally committed to quality improvement - one director is a quality champion while another does not see why quality should attain any level of prominence. Involvement of employees is encouraged to an extent although there is no employee suggestion scheme. The size and multi-product structure of the organisation makes integration and a breakdown of barriers slow and difficult and some managers believe that maintaining a traditional rigid structure helps keep things under control. The morale among the workforce is low and apprehension is high. This is a direct consequence of the recent merger in which many jobs were lost. The company also has a pre-occupation with making profits. These peculiar situation has made and continues to make culture change difficult in the organisation. The quality champions prod continuously and there is a growing realisation that quality is a useful tool but a lot more needs to be done.

Management: The company has a quality steering committee headed by one of the directors. A participative style of management is being achieved but the barriers within the organisation are not being broken down as quickly as desirable. The low morale, lack of recognition and failure to communicate fully with junior employees stand in the way of effective management leadership. There is also no employee suggestion scheme or management training program.

Teamwork: The organisation generally works well as a team. This is a result of the manufacturing methods, nature of the product and the financial pressure to perform as opposed to a natural inclination to work together. Nothing is done to specifically improve or encourage teamwork and voluntary teams are neither encouraged nor used. Delegated teams are encouraged at the expense of voluntary teams. Teamwork training and facilitation have not been used and there is a general lack of appreciation of other peoples work and contribution.

Customer focus: The company has achieved a reasonable level of customer focus. The strength of the brand name has facilitated the development of long-term relationships. The warehousing system is presently being overhauled to make for more responsiveness. There is also a drive to minimise costs and stay competitive. Customer satisfaction levels and product return are measured regularly. The research team meets regularly with customers and there are methods in place for anticipating customer expectation although there are no methods to encourage customer complaint. Statistical process control is in use although employees do not generally have a passion to satisfy the customer. The major player is the product quality and the strength of the brand name.

CASE STUDY 4

COMPANY A4

General: Company A4 is a UK-owned packaging manufacturing company. It is a subsidiary o a larger organisation. There are 45 employees on site and the turnover is about 8 million pounds sterling. The company is registered to ISO9000 standards and has been practising TQM for 5 years. There is not a great deal of emphasis on departmental structures and rigidity. Job production is the major method of manufacture. The product range is not very large and although there is a large customer base, there are only a few major customers. The packaging manufacturing industry is generally very competitive.

Culture Overview: The company has achieved successful culture change. The restructuring of the company led to the creation of middle management posts. This initially led to resentment among junior managers who were not promoted to the newly created posts. The management has adopted an open culture which has had great benefits. Employees have access to top management at all times and especially at a monthly management review which all directors and employees attend. The size of the company easily allows for this. Departmental barriers are almost non-existent. All employees are trained to be multiskilled. They also attend formal classes and are encouraged to attain nationally-recognised qualifications at the expense of the company. This is complemented by involvement and empowerment - the operators run production with little or no interference from management. This is encouraged especially as managers are not available during night and weekend shifts. Recognition is carried out in the form of a performance-related bonus and promotion. The company's emphasis is on quality and no costs are spared. In some cases, this has made the company's products more expensive than competitors but the reputation for quality has earned the company an increased market share. The company is happy with its culture and the is reflected in a low staff turnover.

Management: A participative style of management is practised and bottom-up involvement and employee consultation is actively pursued. Management commitment to quality is high and employees are encouraged to feel part of the decision-making process. The company has no major problems with management.

Teamwork: The company works well as a team. This is primarily a result of the size, open management and a collective desire to qualify for the performance bonus. Voluntary teams are not in use and problems are usually addressed by delegated teams. In the past, teamwork has been hindered by employment of unsuitable personnel but employee work teams are now allowed to meet with prospective employees before final decisions on hiring are made.

Customer focus: The company is increasing its drive in this area. Additional sales personnel have been hired to increase contact with customers. Satisfaction level of customers is measured but is to be improved. Product return is measured and used in ensuring professionalism and corrective action. Ways of encouraging customer complaints are being explored. A widened range of products has been introduced and new machines have been purchased to improve process capability and flexibility.

High hygiene standards are kept since major part of production involves food packaging materials. The company uses Statistical Process Control and Business Process Re-engineering was recently introduced to increase responsiveness to customers.

CASE STUDY 5

COMPANY A5

General: Company A5 is a bottling, canning and packaging plant for a major international brewing conglomerate. It is the largest of such facilities in the UK. It also carries out jobs for other major brewers who do not have the necessary facilities. A major part of the products are for the export market. There are approximately 200 employees on site. The company is registered to ISO9000 standards and has been practising TQM for five years. There is little emphasis on departmentalisation and batch production is generally used. The range of products is very large and the operations are highly complex. The customer base is large and spread across the world. The canning and bottling is not highly competitive as a result of the unique facilities and capability available. However, the brewing industry is highly competitive and there is substantial pressure on the company.

Culture Overview: The company has achieved a successful culture change. Initial problems faced were with middle management and the unions. The middle managers were reluctant to take part while the union viewed culture change with suspicions of redundancy and a method of passing the buck from management. However the present culture is one that complements continuous improvement. Teamwork is central to the operations. Management is supportive and employees are encouraged to generate ideas for improved procedures. All workers have been trained in quality techniques and a range of quality tools are used. The company regularly carries out various exercises to improve procedures and integration. These include dialogue exercises between internal supplier\customer and between worker\manager. Small groups of workers are also encouraged to make business plan presentations to the General manager and his management team. Recognition is paramount and is carried out in various ways - small awards for successful projects, meals and social get-togethers after group presentation, letters of commendation, general notices of achievement and even tea and biscuits for line teams after particularly successful production shifts. Measurement is central to performance. Targets are set and performance achieved is displayed on departmental and general notice boards.

Management: A participative style of management is adopted and employee consultation is regular. Management\employee relations has and continues to improve. Employee involvement and management commitment is high. There is effective communication with employees and departmental barriers have been broken down. Management skills have been enhanced and a steering

committee is one of the various management teams in use. Managers sometimes find it difficult to combine their normal duties with quality issues and other matters such as safety and pollution.

Teamwork: Teamwork is a part of everyday life at the company. Most things are done in teams with encouragement from management. All production is broken down into line teams. Employees are eager to volunteer for teamwork. This has resulted in teams of 10 first aiders and 15 shop floor safety observers among others. A rotation of teamwork is practised to encourage companywide participation and promote ownership of the process. However, lack of time for voluntary teamworking is sometimes encountered.

Customer focus: To improve responsiveness to customers, the warehousing system has been overhauled and customer teams set up. Monthly meetings are held with customers and performance is strictly measured. The satisfaction level of customers is measured and various methods are in place to anticipate customer expectation. Customers are encouraged to complain and complaints are taken seriously.

CASE STUDY 6

COMPANY A6

General: Company A6 is a wire and cables manufacturing company. It is UK owned and is a subsidiary of a larger organisation. There are about 300 employees on site. The company is registered to ISO9000 standards and has been practising TQM for 5 years. There is little emphasis on departmentalisation. The company has a range of 184 products of multiple complexity. The method of manufacture could be job, batch or mass production and depends on the product. The customer base is large although there are a few major customers. The market is competitive although with only few companies.

Culture Overview: The company has achieved a successful culture change. This was mainly driven by senior management. There were initial problems with middle management who felt threatened. This led to the resignation of some managers and the General manager. Initial attitudes to culture change have however reversed for the better. Employees are encouraged to think about improvement and are now able to challenge current practices. Management commitment to quality improvement is high although the geographical layout of the company slightly separates the office block from the shop floor. Management adopt an open attitude and employees are less fearful of approaching managers. There in regular formal communication between managers and employees and a role-model management is promoted. Departmental barriers have been broken down. The company has invested heavily in training and all employees right down to the cleaning staff have received training in TQM and the use of quality tools. There are no inspectors in the organisation and production teams are

responsible for their own inspection and the quality of their work. Teamwork is paramount and all teams are target orientated. Measurement of every aspect of the company's operations is carried out and benchmarked. There is a general awareness at every level of the impact of work processes on the customer. There is a strong social connection in the company and there are regular social and sporting events for all workers. These are usually organised by a team of volunteers.

Management: A participative style of management is adopted and bottom-up involvement is actively encouraged. There is increased understanding between management and employees and the level of commitment of senior management to quality improvement is high. There are measures in place to encourage improved performance. A management steering team is one of the various functional management teams and a program to enhance managerial skills is under consideration. A full-time TQ co-ordinator oversees the company's quality program.

Teamwork: Teamwork is paramount to the organisation. All production is carried out in small teams. All workers have received formal teamwork training. There are 25 team facilitators within the company and there is always one on every team. Workers see teamwork as part of the culture and there is no reluctance to volunteer for teamwork. There is also no problem with finding time for teamwork. All teams are encouraged to make a presentation of their work.

Customer focus: To increase responsiveness to the customer, new computer systems have been put in place to control scheduling and prioritising of production. There is regular contact with customers and the results of monthly customer satisfaction surveys is fed back to the shop floor. Customers are encouraged to visit the company and shop floor employees are sent on customer visits. Customer complaints are encouraged and many quality tools and techniques are in place to enhance customer orientation. There is also sporting and social contact with customers.

CASE STUDY 7

COMPANY A7

General: Company A7 is a UK-owned company engaged in the manufacture of glass and refractory materials. The company is part of a larger organisation with varied interest. The refractory company has factories all over Europe and has a turnover of about 150 million pounds sterling. The company has about 1600 employees all over Europe out of which 1200 are based in the UK. The site visited has about 350 employees. The company is registered to ISO9000 standards and has been practising TQM for 5 years. The company's internal structure does not place much emphasis on departmentalisation. Batch production is the major method of manufacture. The products are of high complexity and an extensive range. The company's customer base is large and world-wide with sales offices or agents in all continents. Approximately 35% of the company's products are bought by British Steel. The

company recently won British Steel's 'Supplier of the Year' award for the quality of its products, services and processes. The company has also received various commendations from its customers world-wide. The market is global in nature and is not only highly competitive but is also presently over-subscribed.

Culture Overview: The company has been through a successful culture change. While this has not been without problems, the majority of these have been overcome and the new culture has settled in comfortably. An initial problem of reluctance was encountered with middle management, but most managers now adopt a participative style. There is good communication between management and the workers and recognition is considered as vital. There is a training program for all employees. The company has also re-organised and flattened its structure. Quality inspectors have been eliminated and the workers are responsible for their own inspections.

Management: The company's quality drive is led from the top. The management commitment to quality is total with the CEO conducting some of the company's training courses. This attitude has encouraged junior employees into becoming more involved in company activities. They are now more willing to point out and discuss problems. Managers are encouraged to get closer to teams and be part of them. It is quite common to have shop floor workers as team leaders while their functional managers were also present on the team. Management teams are also in use.

Teamwork: The company works well as a team. This is mainly due to the organisational structure. Working in teams is seen as vital to the company's operations. Team leaders have to attend special courses. Voluntary teams are encouraged by management and the company pays for time spent on teamworking. Team benefits are often measured by cost criteria and sometimes process improvement. All employees attend courses on teamworking and internal customer concept. Lack of capital to implement team recommendations is an occasional demoraliser to team members.

Customer focus: The company's main customers are the steel, glass, aluminium and cement industries. The company has reorganised its sales and marketing departments in an effort to bring customers close to the shop floor. The company has an ongoing measure for customer satisfaction and carries out a bi-annual formal customer survey. Emphasis is placed on closeness with the customer. There are joint teams with customers and the company has a technical support facility which often operates in a customer advisory position. The closeness with customers paid of in sales and the company recently broke the European steel making record. The company has a formal customer complaints system. Workers are encouraged to develop a customer passion by giving them as much information about the customers as is possible. Employees also visit customer sites and are encouraged to conduct visiting customers round the company's facilities. This effort has met with favourable responses from both the customers and the employees. The company has installed some quality techniques including SPC and Taguchi method in its operations.

CASE STUDY 8

COMPANY A8

General: The company is a foreign owned organisation engaged in the production of piping insulation. The company employs 176 people and has a turnover of about 17.5 million pounds sterling. The company is a subsidiary of a larger organisation with varied interests. The company is registered to ISO9000 standards and has been practising TQM for 10 years. The company's internal structure does not place much emphasis on departmentalisation. The company primarily employs mass production and has a process inclined layout. The company has few product types although the variations are in excess of 800. The products are of moderate complexity. The company's products can be used by the general public and are only sold through sole distributors. The market is highly competitive. The company is a market leader and one of its products has captured 70% of the market.

Culture Overview: The company has undergone a successful culture change. Initially, the Crosby approach was followed as a result of this being imposed by the American headquarters. This approach achieved negligible success and was discarded after 5 years in favour of an in-house approach. This was an important learning experience for the company. The company was recently judged the best international plant out of 13 identical plants within the group. The company has the lowest scrap, non-conformance and highest production per employee. The company had initial problems with getting its management and employees to change attitude to work. Once this changed, it became norm and didn't need great effort to sustain the drive. Vital to this change was the identification of individuals with an enthusiasm to change. These individuals were encouraged to work on quality improvement projects. Their initial success placed their more cynical colleagues under pressure and gradually, there was a shift towards a TQ culture. The CEO was vital to this drive and lent support all the time. Quality and customer service were stressed as vital. Education and training were important tools to change and all employees recently went through a 13 week course.

Management: Initially managers, especially the older ones were reluctant to change but perseverance and the insistence of the CEO has resulted in the evolution of a participative management style. The management is very open and all managers including the CEO regularly operate on the shop floor. Employee consultation is traditional to the company. Employees are encouraged to participate in company activities and the shop floor workers are responsible for all internal audits. All company information is communicated to employees and job security and recognition are given prominence. Employees are encouraged to develop and utilise their abilities and their contribution is valued by management.

Teamwork: The company works well as a team. The most important reason for this is the organisational structure. Employees basically work in production teams and are given flexibility to organise their work patterns. Voluntary and delegated teams are in use and their benefits are

measured and communicated. The internal customer concept was a central part of the employees training. Management encouragement was very important in motivating employees to work in teams.

Customer focus: The company mainly sells through 30 sole distributors and develops a close relationship with them. The company's products are market leaders although they are not the cheapest on the market. There has been re-organisation to improve customer responsiveness. Customer satisfaction and product return are measured. The company's non-conformance for the last year was 0.0003% of its output. Communication with customers is close and salesmen are employed primarily to give technical advice to end users and are not directly involved in the actual sales. Customers are encouraged to complain and manufacturing methods have been altered to improve customer orientation. A variety of quality tools and techniques have been introduced to improve the company's processes.

CASE STUDY 9

COMPANY A9

General: Company A9 was the smallest company surveyed. The company is UK owned and employs 8 people. The company has a turnover of about 700,000 pounds sterling. The company is not a subsidiary of a larger organisation. The major products are chemical cleaning products including car care products. The company is registered to ISO9000 standards but does not practice TQM. There is not much emphasis on departmentalisation. The shop floor has a process-inclined layout and batch production is the major method of manufacture. The company has few products(about 50) of mainly moderate complexity. The company has a large customer base and the market is highly competitive.

Culture Overview: The company culture is greatly affected by the size of the company. The company structure has always been flexible and management has always been close to the shopfloor. The contribution and knowledge of employees is acknowledged and adequate recognition is given for good performance. There are no departmental barriers within the company although the physical layout of the company sets management apart from the shopfloor. ISO9000 has been of great advantage to the company and forms the basis for the processes within the company. The company maintains a good relationship with its customers although the approach is not totally comprehensive as a result of the limited human resources. The company plans to improve its system further when it moves to a bigger premises shortly.

Management: The management style is participative and the management has a high commitment to quality improvement. Employees are encouraged to make decisions and take part in company activities. Management has instituted a profit share scheme and employees are sometimes given surprise bonuses. Information is passed to all employees although there are no formal methods for

doing this mainly due to time constraints. The management has improved the smooth running of the company and keep examining ways of further advancement.

Teamwork: The company works well as a team because of its size. Voluntary teams are not in use within the organisation. Delegated teams are used whenever the need arises. Organisational teamwork is often stretched during busy periods when the limited human resources becomes more apparent.

Customer focus: The company mainly supplies transport companies, distributors and car companies. It also makes products for companies to market under own-labels. The company measures satisfaction level of its customers regularly and keeps up regular communication with its customers. The company tells it customers to complain when unsatisfied although there are no comprehensive measures for this. Social contact is kept with major customers. The company has not introduced any major quality tools and techniques but new machinery has been purchased to increase levels of production.

CASE STUDY 10

COMPANY A10

General: Company A10 is a UK owned company involved in the manufacture of industrial chemicals. It is a subsidiary of a larger multinational corporation. The site employs 23 workers and has an annual turnover of about 2.8 million pounds sterling. The company is registered to ISO9000 standards and has been practising TQM for 8 years. The site does not include the sales department which s situated across the road. The internal structure places emphasis on departmentalisation and the company has a product inclined layout. Batch production is the major manufacturing method. The company has a limited range of products of mainly moderate complexity. The company has a large customer base in a substantially competitive market.

Culture Overview: Over the past 23 years, the company has been through different phases of expansion, downsizing, and varying management style. Over the past 5 years, the management style has been participative. The company has not encountered any major problems with its work culture. This is mainly helped by the size of the company, its structure and the motivation of its employees. Employee consultation is practised and the employees are involved in all aspects of the company's operations. The company teamwork is good and organisational barriers are weak. The company only distributes products through its sales department and has little contact with the end user. There is however a close relationship between the company and the sales department.

Management: The management is participative in nature. The style has traditionally varied with the CEO. The management commitment to quality improvement is high and employees are encouraged to develop their potential. There is good communication with employees and the company has recognition systems to encourage improvement.

Teamwork: The company works well as a team. This is mainly because of its size and structure. Voluntary teams are in use within the company. The teams are empowered to make changes and their effects are always measured. The employees have been trained in teamwork and facilitation is available to the teams. The internal customer concept is encouraged. Voluntary teams are also in use within the company.

Customer focus: The company keeps a close contact with its sales office. This is necessary to be able to respond to end users demands. Customer satisfaction level and product return are measured. There are methods in place for anticipating customer expectation although customer complaints are not encouraged. Employees are encouraged to develop a customer satisfaction. The company has introduced SPC into part of its operations.

CASE STUDY 11

COMPANY B1

General: Company B1 is a foreign-owned company that specialises in the production of raw materials for the agricultural feed and food processing industry. The company was bought 10 years ago when it was making huge financial losses. It has now turned into a highly profitable enterprise with newly built factories in Hong Kong and Malaysia. There are approximately 380 workers on site and the annual turnover is about 183 million pounds sterling. The company is registered to ISO9000 standards and has been a TQM company for 7 years. Batch production is used in normal operations. The product range is large and the products are of moderate complexity. The company has a large customer base of about 3500 customers and the market is highly competitive.

Culture Overview: The change of ownership started the continuing trend of change in culture and work practice. The company has delayered from 1200 employees 10 years ago to its present workforce. There was an initial problem of middle management feeling threatened. Senior management commitment is very high. The company approaches TQM from the European Quality Award(EQA) perspective and has recently taken part in the award. There is a steering team of 9 directors with each director responsible for one EQA element. A breakdown of departmental barriers via meetings is encouraged. Individual and collective employee involvement is high. Employee suggestions are collected and evaluated on a weekly basis. One of these suggestions in chosen as the "idea of the month". There is companywide project yearly (present topic is 'Cost of Quality') and each department makes a presentation on how the topic affects the department. The company has newsletters on quality and these are widely available to employees and guests. To foster departmental integration, there is increasing use of an open plan layout between departments. The biggest problem

as regards integration is the distance between the office block and the shopfloor - they are situated across the car park - and it is possible for workers on both sides not to have ever met. Empowerment, measurement and recognition need to be improved.

Management: The management style has changed tremendously to a participative style. Employee consultation in major decision making is via a 'council of unions' which is a body representing all the independent unions within the company. Bottom-up involvement is encouraged and there is increasing feedback between employees and management. Weekly management and directors meetings are held. There is a management training program and managers visit and receive visits form other companies especially companies within the conglomerate.

Teamwork: Company teamwork is not always good as a result of the organisational structure. Voluntary teams are in use although delegated teams are sometimes better favoured. Facilitation was recently introduced although there are no means of measuring team effectiveness. A problem commonly encountered with teamworking is difficulty with having shiftworkers participate in teamwork outside their normal work hours.

Customer focus: The company only supplies other industries. This results in some measure of complexity since specifications differ. Business Process Re-engineering is currently being implemented to improve responsiveness. Questionnaires to measure customer satisfaction are currently being designed. Product return is measured and a customer audit is held monthly. There are currently no methods of encouraging customer complaint. A 'customer of the month' program is practised with the aim of increasing customer orientation among employees.

CASE STUDY 12

COMPANY B2

General: Company B2 is a UK-owned company involved in the production or a range of textile materials including friction materials, thermal and fire protection fabrics and armour protective systems. It is a subsidiary of a larger company and there are three other sister companies on the same site although the management are completely independent of one another. There are approximately 280 employees on site and the turnover is in the range of 20 million pounds sterling. The company is registered to ISO9000 standards and has been practising TQM for 18 months. There is not much emphasis on departmentalisation and the company has a product-inclined layout. Job and batch production methods are used. There is a large range of products with complexity ranging from moderate to high. The customer base is large and some of the products are in a very competitive market.

Culture Overview: The company is relatively new to TQM. The culture is beginning to change but there is still a long way to go. There is currently a problem of resistance with middle management. The feeling is that things might go wrong if they give up control. This attitude is proving difficult especially as the company is more than 120 years old and the traditions are deep-rooted. The level of commitment of senior management is high and the European Quality Award(EQA) approach is adopted. Employee involvement is being encouraged although no positive impact has yet been noticed. The deep-rooted culture still makes it difficult for employees to understand the need to breakdown departmental barriers and take decisions. There are plans to physically re-organise the company layout. An employee suggestion scheme is to be introduced.

Management: The management style is being changed from an authoritative to a participative style. There is increasing employee consultation although this is not popular with all managers. There is a management training program and increasing quality awareness and use of management teams. Senior management is persistent with quality improvement and target setting is increasingly in use.

Teamwork: The organisational teamwork is much better than in previous times although there is a long way to go. Organisational re-structuring has been a positive influence on teamwork. Teamwork training has been carried out but not for all employees. There has also been some facilitator training although the facilitators are not always used. Voluntary and delegated teams are in use although the methods of measuring their benefits is not as good as desirable. There is encouragement to work in teams although recognition can be improved.

Customer focus: The company is introducing Business Process Engineering to improve customer responsiveness. There is a close relationship and technical development co-operation with big customers. Customer satisfaction is not measured although product return is. Customer complaints is not measured but new methods of anticipating customer expectation are being considered. Employees are to be encouraged to visit customers. New quality software has been purchased and Just-in -time system and Statistical process control have recently been introduced. A positive factor is the pool of technical resources available to the company from other companies within the conglomerate.

CASE STUDY 13

COMPANY B3

General: Company is a 35 year old family company with 24 workers on site. The company manufactures cranes and lifting equipment. The turnover is approximately 1.5 million pounds sterling. The company recently bought over another company that manufactures heat exchangers. The company is not registered to ISO9000 standards and has not implemented TQM. There is no emphasis on departmentalisation. The company has no standard product and only job production is

used. The complexity of the product varies with the job. The company has a few major customers and is in a market with tough competition from much larger companies.

Culture Overview: The company has not embarked on any form of quality program. Awareness of benefits of quality improvement is limited to only two managers of whom one is the grandson of the founder. The directors are totally unaware of quality systems or a quality culture and there are employees still employed who have been part of the company since inception. These set of conditions make attempts to increase quality awareness by the two young managers extremely difficult. The company cannot afford to register to ISO9000 or train its workers in quality working. However, the newly bought company introduced some software management and awareness of modern business practices into the group. There is a drive to restructure the organisation from its present loose structure to one where specific responsibilities are defined. Bottom-up involvement is encouraged and although the two managers are highly committed to quality improvement, the employees are sceptical and not in any way motivated towards quality. Recognition and management\employee communication is poor. There is no formal employee suggestion scheme but there are hardly any departmental barriers. There are no formal measures of any sort within the company.

Management: There is no definite style of management in the company. Styles vary with the managers. There is a general resistance to give up control at the highest levels of management. Employee consultation is not regular and most managers have not received any form of quality training although there is an attempt to develop management teams.

Teamwork: The company does not work well as a team because of its loose organisational structure. The need to start teamwork training is recognised but the funds are unavailable. Voluntary teams are not in use and the employees are not motivated in this direction. There is a lack of appreciation of others peoples work. However market forces sometimes improves teamwork within the company.

Customer focus: The company has recently introduced customer management software technology. Neither customer satisfaction nor product return is monitored. The company meets with customers to discuss product problems and improvement. Some customers have requested the company subscribe to ISO9000. Customers are not encouraged to complain and employees have no customer orientation. No quality techniques and tools have been introduced and there is a lack of understanding of marketing methods. The company's operations are almost entirely dependent on reputation, long standing relationships and a trait of being responsive to customers requests.

CASE STUDY 14

COMPANY B4

General: Company B4 is an American-owned company that manufactures industrial gas meters. There are about 40 workers on site and the turnover is about 5 million pounds sterling. The company is registered to ISO9000 standards and TQM was introduced 6 years ago. There is not much emphasis on departmentalisation. Batch production is used in normal operations. The product range is very limited and the product complexity is at best moderate. The company only supplies a few major customers. The company is a market leader with a good reputation and consequently does not face stiff competition.

Culture Overview: The TQM effort within the company has been largely unsuccessful. TQM was only introduced to one of the managers by a trainer from the American headquarters. This manager was then given the responsibility of developing quality awareness among the rest of the workforce. The Crosby '14 steps' approach was adopted and 14 teams were set-up, each headed by a manager, to develop each aspect of the approach. The program however faded and remains ineffective. The recognition scheme was based on employee nominations and has also failed. A bonus scheme to encourage improved performance has become a demotivator as a result of inappropriate measures being used in appraisal. Some managers are not totally committed to quality and favour sales and profits otherwise. Multi-skilling has been introduced and line inspectors are not used. The employees are responsible for their own work. There is a desire among some managers to re-focus on TQM but there is scepticism among the workers and an effective approach is yet to be developed.

Management: The management style is largely participative. This is influenced by the flattened structure and the lack of supervisors. Bottom-up involvement is encouraged but the impact is negligible. Organisational performance parameters are not regularly communicated and the management training program is not very functional. Employees are however trained to be multi-skilled and take decisions.

Teamwork: The size, organisational structure and focus on multi-skilling has helped the company to work well as a team. Voluntary teams are not in use and the delegated teams have fallen short of their targets. There are currently no attempts to get the employees to work in teams.

Customer focus: The company only supplies products to its distributors. The flexibility of the company has been increased to make it more responsive to customers. Customer satisfaction measures are not comprehensively and regularly carried out although product return is measured. Customer complaints are not encouraged although it has been suggested. There are no formal methods for anticipating customer expectation. M.R.P and Just-in-time systems have been introduced. These however have some problems because of the distance of the customer.

CASE STUDY 15

COMPANY B5

General: Company B5 is a foreign-owned machine tools manufacturing company. The conglomerate is one of the largest machine tools company in the world. The company has about 350 employees on site and the annual turnover is about 50 million pounds sterling. The company is not a TQM company but is registered to ISO9000 standards. There is a lot of emphasis on departmentalisation in the company. The layout of the shopfloor is a mix of product and process inclination. The company has no standardised product and all production is done on a job basis. The products are of very high complexity. The company has a few major customers mainly in the automotive industry. The market is competitive.

Culture Overview: Although the company is not a TQ company, there has been and continues to be a change in the culture of the company. The management style is more participative than authoritative. There was an initial resistance to change by senior management. There is increased involvement of junior employees in company process. This has resulted in increased ownership among the workforce. Recognition needs to be improved and employees are not generally encouraged to suggest improvement ideas. The chief executive has been a major factor in the change process and his emphasis on quality was vital to change of attitude within senior management ranks. The company has achieved some success in a breakdown of departmental barriers mainly by the use of cross-functional teams.

Management: The relationship between managers and their subordinates has improved with increased employee consultation. There is also increased communication of company performance. This is usually through a monthly presentation by the chief executive, meetings with managers and notice boards. There is a management training program and management teams are in use. However some managers show inconsistent commitment to quality when they have demanding deadlines.

Teamwork: The company works well as a team. About 80% of the workers have received teamwork training. Teams are always voluntary and there is no reluctance to work in teams. There has been no problem of finding time for teamworking. Departmental teams are usually given authority to make changes. Cross-functional teams however, have to submit their recommendation to management. The company has measures for teamwork benefits however facilitation training has not been carried out yet. Teams are encouraged to make a presentation of their work to management.

Customer focus: The company's customers are other industries. The nature of the product necessitates joint design with the customer. The products are usually built over a period of many months and the specifications sometimes change midway. To allow for regular communication, each job has a project manager who is in touch with the customers on an almost daily basis. There are also weekly meetings and monthly general meetings. Customers are encouraged to visit the company site and direct technical and social contact between customers and shopfloor workers is encouraged.

Customers are not encouraged to complain although the company monitors non-conformance and customer complaints. There are no formal methods for anticipating customer expectations as a result of the highly specialised nature of the product and plans can only be made after joint design. The company has experienced problems with the implementation of J.I.T systems but Statistical Process Control is a vital part of the company's operations. In general, the peculiar nature of the company's products promotes close contact with the customer although customer service measures can be improved.

CASE STUDY 16

COMPANY C1

General: Company C1 is a UK-owned plastics manufacturing organisation. The products are primarily sold to the packaging and print lamination industry. The company has 57 workers on site and the annual turnover is in the region of 5 million pounds sterling. The company is not a part of a larger organisation. The company is registered to ISO9000 standards but does not practise TQM. Departmentalisation is not strong within the company. The company has a process-inclined layout. Job, batch and mass production are all used by the company. The company has standard products which are normally kept in stock in anticipation of customer orders. The product range is limited and the product complexity is moderate. The company has a large customer base in what is generally a highly competitive market.

Culture Overview: The company's processes are not complex and this factor along with the size makes for a relaxed culture. The company works well as a team and the management style has traditionally been participative. Employee consultation and involvement has improved ownership among all workers. There is no formal means of encouraging improved performance although there is a lot of communication between different departments and shift teams. Teams are not in use in the organisation. The company has a high internal reject rate. This is however compensated for by recycling the rejects in-house and sending it right back to the start of the production process.

Management: Management has always been open and accessible to workers. All managers are encouraged to visit the shopfloor and managers overalls are identical to those of the shopfloor workers. There is a monthly management quality status review and the results are put up on notice boards and also communicated by means of informal meetings. All managers have had both in-house and external training. The managers meet every month to discuss general matters. Employee decision making and suggestion are encouraged although ownership can be improved if managers explain

reasons for their decisions. The senior management involvement has been of great benefit to both the organisation and the customers.

Teamwork: The company works well as a team. This primarily as a result of its structure, processes and size. There are neither voluntary nor delegated problem solving or quality improvement teams in operation. The company is not planning on instituting teams in its operations.

Customer focus: The company attributes its high reject rate to high specifications demanded by its customers. To improve customer responsiveness, the company has set up a 24 hour ordering service which has proved successful. It also explains the need to have products in stock. The company has three customer service representatives who keep in touch regularly with the customers. They also serve as feedback conduits. Product return is monitored and customers receive a sales credit for rejects. The quality of relationship with customers is evaluated although there are no methods for encouraging customer complaints. To improve customer orientation, the company is constantly examining process improvement and a change of raw materials. The company also encourages the internal customer concept and all employees are encouraged to discuss customer related matters. Statistical process control was started 11 years ago. The company also uses quality function deployment in its operations.

CASE STUDY 17

COMPANY C2

General: Company C2 is a UK-owned plastics manufacturing company. It is a subsidiary of a larger organisation. The company has about 150 employees on site and an approximate annual turnover in the region of 7 million pounds sterling. The company is registered to ISO9000 standards but does not practice TQM. There is great emphasis on departmentalisation within the company. The company only manufactures by job production and the shop floor is process-inclined. The lack of a standardised product makes the product range large. The products are of moderate complexity and the customer base is large. The market is substantially competitive.

Culture Overview: Although the company does not have a formal TQ program, various attempts have been made to introduce elements of a TQ culture into the organisation. All of the attempts have failed. The company is currently in transition as it awaits the appointment of a new chief executive. The former chief executive only paid lip-service to quality working and believed in a traditional style of management. The relationship between management and the employees is of an adversarial 'them

and us' nature. The employees are sceptical of new programs introduced by management. Attempts to introduce teamworking has failed and the company is constantly under pressure from the customers. The company has failed to achieve any form of quality culture primarily due to the attitude of the management.

Management: The management style is authoritative. Any attempts to change have only been on paper. Although management understands the implication and the benefits of change, it prefers to remain conservative and adopt a 'we have always done it this way' attitude. There is no employee consultation. Employee involvement and empowerment is practised in principle but not in actuality. Communication with employees is poor and management commitment to quality improvement is inconsistent. Recognition is poor and employees are not motivated. Management does not attempt to break down departmental barriers. There is no formal training for managers. An attempt to introduce employee suggestions failed. There are also no formal management teams in use.

Teamwork: As a whole, the company works well as a team. This is primarily as a result of its size and an expansion of operations could lead to a breakdown in teamwork. Voluntary teams are not in use. Delegated teams have disintegrated without achieving any results. This is as a result of poor motivation from the directors. Employees have not been trained to work in teams or recognise their internal customer.

Customer focus: The company only supplies other industries. The company is constantly under pressure to reduce its lead time. In response, the company gives preferential treatment to its bigger customers. The company takes note of customer complaints but there is no method for monitoring performance. Product return is monitored but customer complaint is not encouraged. The quality of relationship is only evaluated with the bigger customers. Employees are usually given information about the end product in order to improve customer focus. To improve its customer orientation, the company is computerising its stock. SPC has also been introduced in parts of the plant. The company is tending towards JIT but this is only limited to favoured customers. Some elements of MRP have also been introduced in the company.

CASE STUDY 18

COMPANY C3

General: Company C3 is a non-UK owned company and is a subsidiary of a large international conglomerate. The company's interest include industrial additives, agricultural products, chemicals, pharmaceuticals, polymers, pigments, optical products and laboratory equipment. The UK group employs 4605 employees and has an annual turnover of about 804 million pound sterling. Of this amount 363 million is generated from exports. The site visited has 450 employees and has a turnover of about 400 million pounds sterling. The company is registered to ISO9000 standards and has been

practising TQM for 9 years. The company's structure is flattened and there is little emphasis on departmentalisation. Batch production is the major method of manufacture. The product range runs into thousands and the shop floor layout varies according to the product. The products are usually of high complexity and serve a large customer base which includes many overseas customer. Many of the company's products are in a competitive market. The company is at the earliest stages of merging with another large conglomerate.

Culture Overview: The company has made attempts to change its culture. This has been partly successful. Mainly, managers are reluctant to change. This is mainly due to insecurity about jobs. Any gains the company has made in this aspect is currently threatened by the impending merger and the imminent loss of jobs. This situation also adversely affects teamworking and departmental integration within the company. Increased globalisation has highlighted the need to be more pro-active and cost conscious as regards customer focus.

Management: Managerial style varies with the manager. There have been problems with getting managers to change their style although there is a growing awareness that a participative style is the way forwards. Employee consultation and involvement is practised and employees are encouraged to develop individually. Management commitment to quality improvement is high and communication with employees is good. Recognition schemes vary from division to division but are generally good. Attempts to breakdown departmental barriers are often met with suspicion and resistance. The company has a management training program and management teams are in use. An employee suggestion scheme has not been introduced and employees are not generally trained to take decisions.

Teamwork: The organisation does not work well as a team as a result of the organisational structure. Training and facilitation are being promoted in order to improve teamwork. Voluntary teams are not in use but employees are encouraged to communicate with their internal customers. Delegated teams are in use within the organisation. These have often been successful in the past.

Customer focus: The company has been re-organised to make contact with the customer easier. Customer technical service is also practised. International competition has led to the loss of customers in the past and the company adopts a structured approach to customer relationships. Satisfaction level and product return are measured regularly and complaints are encouraged. There is good communication with customers and the product range is regularly reviewed for its customer orientation. Employees are encouraged to adopt a total process orientation to improve customer focus. A wide range of quality techniques including SPC, MRP, JIT, BPR and Taguchi have been successfully introduced within the company.

CASE STUDY 19

COMPANY C4

General: Company C4 is a part UK-owned company engaged in the manufacture of low voltage electrical equipment. There are about 560 employees on site and the approximate annual turnover is 45 million pounds sterling. The company is a subsidiary of a larger organisation. The company is registered to ISO9000 standards but does not practice TQM. The company has rigid internal structures and a process inclined layout. Job and batch production are used in manufacture. The range of products is large and the complexity varies from low to moderate. The customer base varies with the product but approximately half of the products are sold through distributors. The market is global and very competitive.

Culture Overview: The company has not undergone cultural transformation and has a very traditional structure. The implications of the implementation of TQM is disliked by senior management and any drive towards TQM is avoided. The directors and senior management prefer to be remote from the rest of the company. There is a quality champion in senior management but his efforts are often met with suspicion and avoidance. The relationship with junior employees is strained. Performance is measured by quantity as opposed to quality. This has sometimes led to poor quality products and unavoidably product returns from customers. Subtle efforts are being made by the quality champion to introduce elements of quality working although some of his ideas have caused ripples both within management and the workforce.

Management: Remoteness of senior managers and the attitude of the directors are the greatest obstacles to effective changes in work culture. Only short-term outlook is viewed by management. All activities are measured mainly by financial indices. The non-existent commitment to quality improvement is a demotivator for junior employees. Attempts are not made to break down departmental barriers and employee involvement and empowerment is not encouraged. The use of management teams is new and receives a poor response.

Teamwork: The company does not work well as a team. This is mainly due to departmentalisation and personality conflicts. Managers are being encouraged to form task teams. Some of the teams have had benefits and some have been disbanded for being non-productive. The task teams are being forced on the company by the implementation of a new MRP system. There has been no teamwork training in the company and the workforce is generally reluctant and often discouraged from participating in what is regarded as 'management work'.

Customer focus: The company has reduced its distributors from 400 to 45 in order to improve its relationships with them. The company has a monetary incentive scheme for its distributors. Telephone customer surveys are carried out and complaints and product return are monitored although customer satisfaction level is not measured. There is a need to increase contact with the customers and encourage employees to develop a customer passion. Design and manufacturing methods have been improved although it was carried out for cost reduction rather than customer focus. Customers are not

generally encouraged to complain. The commercial and export departments tend to monopolise contact with the customer.

CASE STUDY 20

COMPANY C5

General: Company C5 is a UK-owned organisation involved in the electroplating of metal components. The company is not a subsidiary of a larger organisation and until 3 years ago it was a family business. The company employs about 30 people. It is registered to ISO9000 standards but does not practice TQM. Batch production is predominantly used on the process-inclined layout of the company. There is little emphasis on departmentalisation. The products are of a wide range and are generally of moderate complexity. The company has a fairly large customer base but about 40% of the jobs come from a few major customers. The market is a very competitive one.

Culture Overview: The management style has been traditionally participative. The employees have always been encouraged to adopt ownership. The CEO and the senior managers are close to both the employees and the shop floor and encourage their sub-ordinates to approach them with problems and suggestions. There is, however, no recognition for improved performance and the communication of business performance to the employees is poor. There is no formal management training program or employee suggestion scheme. The use of measures is not comprehensive and needs to be improved.

Management: The family business background of the company has always ensured that management was close to the employees. While management has not instituted many quality techniques, the open corporate culture and security of employment have been morale boosters for the employees. Management attitude and the size of the company has also ensured that there are no departmental barriers within the company.

Teamwork: The company works well as a team. This is mainly due to the structure, size, manufacturing methods and multiskilling. Direct contact with the customers has also fostered a team effort aimed at meeting customers needs. Voluntary nor delegated teams are not in use within the organisation.

Customer focus: The company only executes contract jobs for other industries. The nature of the process often requires the customers to bring in their own materials. The physical closeness of the customers has resulted in a customer satisfaction passion within the company. The interest in customers and attentiveness to their needs is led by management. However, the company does not measure satisfaction level or encourage customer complaints. Product return is considered solely as a

basis for corrective action as opposed to an indication of relative performance. There has neither been corporate re-organisation nor alteration of manufacturing methods to improve customer orientation. The company constantly discusses product problems and improvements with customers and efforts are made to tackle the problems immediately. SPC has also been introduced in an effort to remove defects within the company's processes.

CASE STUDY 21

COMPANY C6

General: Company C6 is a major international company involved in the manufacture of plastics, agricultural products(including pesticides and feed), colours and chemicals. The site visited was the head office and had no manufacturing lines. There are approximately 350 employees on site and the annual turnover is in the region of four hundred pounds sterling. The company does not practise TQM. The manufacturing sites are registered to ISO9000 standards although the head office is not. The company's internal structure places emphasis on departmentalisation. The company has a wide range of products of generally high complexity. The methods of manufacture used varies with the product. The company has a large customer base. some of its products are in a highly competitive market while others are exclusive to the company.

Culture Overview: Although the company has not started a TQ program, it has tried to introduce elements of quality working. This has only been partly successful. An attempt to change management style was started 5 years ago and has been 50% successful. The company still has some problems with some of its managers. Employee consultation is not usually practised although employees are encouraged to take part in company activities. The company does not have a formal or well developed recognition structure although departments sometimes organise social events. The breakdown of departmental barriers has been largely successful although there were initial problems. The company's teamwork program has not been a great success as a result of a catalogue of factors including lack of motivation and commitment and the absence of team focus and adequate measures. The company has had a problem developing a customer satisfaction passion among its employees especially in product areas where there is no competition. To increase ownership, the company is trying to shift responsibility downwards. There are also plans to start the EQA approach to quality improvement.

Management: The management style is about midway between a participative and authoritative style as some managers still do not understand the need to change attitudes. The commitment of senior managers to quality improvement is inconsistent and does not involve a hands-on approach. this inconsistency is sometimes a demotivator for others within the company. Management training is only carried out for individuals on joining the company and needs to be re-inforced. Although the

employees are encouraged to make decisions within the scope of their duties, there is no formal suggestion scheme.

Teamwork: The company's teamwork is average, encouraged in main by the organisational structure. The company has no voluntary teams mainly because the employees don't volunteer for teamwork. Teamwork training is poor and although delegated teams are in use, these have sometimes had problems of politics, lack of time and objective among others.

Customer focus: The company's products are supplied to other companies. To improve responsiveness, the company structure has been flattened and more customer representatives are in operation. The collection of customer related data is not highly evolved and the data that is collected is not always used as a tool for improvement. Customers are not encouraged to complain and the quality of the relationships is not evaluated. The company has introduced SPC and BPR to improve its process. The company also has a flexible logistics approach as regards meeting customer orders.

6.3 Effects of Change activities on Quality Culture

This section examines the specific activities carried out by each of the interviewed companies and their effects on the change or evolution of culture. In order to achieve a comprehensive review, each of the structured interview questions is analysed separately. In many of the cases, direct comparisons are made between the different classes of companies, i.e. A, B and C. The analysis is done in three sections - as was defined in the interviews (management, teamwork and customer focus).

6.3.1 Management

Interview questions that involve management in the interviewed companies are now to be examined. These questions are found in Section 2 of the structured interview.

Table 6.2 Summary of responses to questions on management style

Question: What style of management does your company adopt?

Findings:
* 10 out of 10(100%) of the A type companies have a participative style of management although 1 company believes it could be better
* 3 out of 5(60%) of the B type companies have a participative style. One company is in transition from an authoritative to a participative style while the style in the last company varies from manager to manager
* 2 out of 6(33.3%) of the C type companies have a participative style while the same number of companies have an authoritative style of management. In the last two companies the style varies with the manager.

Question: Have you attempted to change management style?

Findings:
* 8 out of 10 of the A type companies have changed their management style in the past
* 5 out of 5 of the B type companies have changed or are attempting to change the style
* 6 out of 6 of the C type companies have attempted to change their style in the past. Two companies have failed to achieve any measure of change

Table 6.3 Responses indicating major problems faced in the attempt to change management style(classified by level of management)

Problem type\Mgmt level	Senior Management	Middle Management	Junior Management
Resistance	A2,B5	A5,A8,B2	A8
Feel threatened	C3	A1,A2,A6,A7,B1,B2,C3,C6	A1,C3
Lack of interest	B3,C4		
Frightened	A3	A3	A3
Lack of communication	C2	C2	C2
Resentment			A4

Table 6.4 Analysis of responses to three questions on management

Question: Does management understand that the implementation of quality programs will lead to change of attitude to work and values

Findings: * 10 out of 10 A type companies stated that their management understood the implications of quality implementation
* 3 out of 5 B type companies stated that their management understood the implications of quality implementation but the other 2 companies stated otherwise
* 6 out of 6 C type companies stated that their management understood the implications of quality implementation

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Question: Does management adopt the policy of employee consultation before and after decision making and implementation?

Findings: * 8 out of 10 A type companies consult employees regularly, company A4 consults employees sometimes and company A3 does not usually consult employees
* 4 out of 5 B type companies consult employees regularly but company B3 only consults employees sometimes
* 3 out of 6 C type companies consult employees regularly but companies C2 and C4 do not usually consult employees

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Question: Is bottom-up involvement and participation in company activities encouraged by management?

Findings: * 8 out of 10 A type companies involve their workers fully while companies A2 and A3 involve their employees to a degree
* 4 out of 5 B type companies involve their employees fully while company B2 is only just beginning to involve their employees
* 4 out of 6 C type companies involve their employees fully but companies C2 and C4 do not involve their employees

Table 6.5 Responses describing the effects of employee consultation on employee\management relationship

	A Type companies	B Type companies	C Type companies
Employee consultation	A1 - Very beneficial A2,A9 - Positive A4 - Very good. Employees feel part of the company A5 - Improved relations A6 - Greater understanding between management and employees A7 - More involvement A8 - Excellent communication A10 - Improved commitment and participation	B2,B4,B5 - Positive B1 - Employees feel part of the company, good feedback	C1 - Improved relations C3 - Positive C5 - Employees feel involved C6 - No effect
Lack of employee consultation	A3 - Low morale	B3 - Negative impact because consultation not fully developed	C2 - Lack of co-operation. 'Them and us' attitude C4 - Negative. 'Them and us' attitude

Table 6.6 Responses describing the effects of bottom-up involvement on work practice

	A Type companies	B type companies	C Type companies
Bottom-up involvement and participation in company activities	A1 - 80% of suggestion and subsequent implementation come from shop floor A2,A3 - Positive A4 - Improved work practice A5 -New ideas and improved procedures A6 - Employees think about improvement and are starting to challenge current methods A7 - Less fear, willingness to point out and discuss problems A8 - People willing to help A9 - Smooth running of the company A10 - Improved flexibility, involvement and performance	B1,B3,B5 - Positive B2, B4 - No major impact noticed yet	C1,C5 - Positive C3 - It has encouraged individual development C6 - positive, response is quicker
Lack of involvement			C2,C5 - Negative

Table 6.7 Responses showing the level and effects of management's commitment to quality improvement

Question\company type	A Type companies	B Type companies	C Type companies
Level of commitment of Snr. Mgmt to quality improvement	A1,A2,A4,A5,A6,A7,A8,A9,A10 - Very High A3 - Inconsistent	B1,B2,B3,B4 - Very High B5 - Inconsistent	C1,C3,C5 - Very High C2,C6 - Inconsistent C4 - Non-existent
Is this commitment or lack of it clearly noticeable	A1,A2,A4,A6,A7,A8,A9,A10 - Yes A3 - Sometimes A5 - Partially	B1,B2,B3, - Yes B4 - Often B5 - No	C1,C2,C3 - Yes C4,C5 - Often C6 - No
Has this been a motivator\demotivator for junior employees	A1,A2,A4,A5,A6,A7,A8,A9,A10 - Motivator A3 - Sometimes motivating	B1,B2,B4 - Motivator B3,B5 - No noticeable effect	C1,C3,C5 - Motivator C2,C4 - Demotivator C6 -- Sometimes motivating

Table 6.8 Responses to the question 'How is improved performance by individuals or departments encouraged?'

A Type companies	B Type companies	C Type companies
A1 - Recognition via letters, notice boards, awards and gift vouchers A2,A3 - No formal recognition A4 - Performance bonus, wage increase A5 - small awards for successful projects,annual awards,line teams recognition and small social events A6 - Recognition via notice boards,wage increase,paid overtime to work on projects, individual development and flexibility A7 - Job pride, oral and written acknowledgement, notice boards and team briefings A8 - Company awards and performance-related bonus A9 - Profit share and performance bonus A10 - Appraisal and communication of performance	B1 - Yearly awards B2 - Performance targets,peer pressure B3 - No formal methods B4 - Bonus scheme and annual awards have failed B5 - Company awards,profit related pay	C1,C5 - No formal recognition C2 - Monthly bonus appraisal C3 - Recognition via departmental awards, company bonus and performance related pay C4 - performance quota does not emphasise quality, bonus scheme has failed C6 - No companywide structure but departments have meals and awards, recognition in company newsletter

Table 6.9 Responses to questions on management-led communication in interviewed companies

Question\Company type	A Type companies	B Type companies	C Type companies
Is the organisation's performance communicated to all employees?	A1,A2,A4,A5,A6,A7,A8,A9,A10 - Yes A3 - No(only managers)	B1,B2,B4,B5 - Yes B3 - Sometimes	C1,C2,C3,C4,C6 - Yes C5 - No
How is performance communicated?	A1 - Small team briefs, notice boards A2 - Departmental meetings A4 - Monthly management review with staff A5 - Small group meetings, business plan presentation by general manager A6 - Monthly bulletins, haly-yearly general meeting A7 - Notice boards, monthly newsletter A8 - Notice boards, quarterly newsletter, team briefings A9 - informal means A10 - Team briefings	B1 - Monthly memos B2 - Monthly briefing, bi-monthly newsletter B3 - Informal meetings B4 - Informal means, company magazines(irregular) B5 - Monthly meetings with CEO, notice boards	C1 - Monthly quality status bulletin, informal meetings C2 - Monthly meetings, information filtered down the hierarchy C3 - Notice board memos(quarterly) C4 - Monthly meetings C5 - Informal meetings C6 - Company magazine, dept and site meetings

Table 6.10 Responses to questions on break down of departmental barriers

Question\Company type	A Type Company	B Type company	C Type Company
Does management encourage a breakdown of departmental barriers?	A1,A2,A3,A4,A5,A6,A7,A8,A9,A10 - Yes	B1,B2,B3,B4,B5 - Yes	C1,C3,C5 - Yes C2,C4 - No
If yes, how?	A1 - Teams, specific responsibilities, eliminating rework A2 - Internal customer training A3 - Participation drive A4,A8,A9,A10- Multiskilling, size of company A5 - Crossfunctional teams, Interdept meetings A6 - Crossfunctional teamwork, interdept visits A7 - Functional groups, flat structure, crossdepartmental reports	B1 - Interdept visits, quality systems auditors B2 - Interdept meetings, crossfunctional approach to work B3 - Size B4 - Crossfunctional approach B5 - Teams, training	C1 - Communication C3 - Crossfunctional teams C5 - Multiskilling C6 - Departmental meetings and visits
Major problems encountered in this respect	A1 - Slow at the beginning, lack of social contact A2,A4,A8,A9 - No major problems A3 - Too slow A5 - disruption to process A6 - Inability to understand others requirements A7 - Personality problems A10 - Time	B1 - Geographical barriers B2 - Inability to understand the need B3,B4,B5 - No major problems	C1,C5 - No major problems C3 - Resistance, suspicion C6 - Initial suspicion

Table 6.11 Significant effects of specific activities on management leadership

Activity\Company Type	A Type company	B Type company	C Type company
Management training program	A1,A4,A5,A7,A8,A10 - Positive A2,A3,A6 - Activity being considered A9 - No activity	B1,B2,B5 - Positive B3 - Selective training, negligible effect B4 - Irregular training, no effect	C1,C3 - Positive C2 - Activity being considered C4,C5 - No activity C6 - Weak activity,needs to be improved
Quality awareness	A1,A2,A3,A4,A5,A6,A7,A8,A9,A10 - Positive	B1,B2,B3,B5 - Positive B4 - No effect	C1,C3,C5,C6 - Positive C2,C4 - No effect
Use of management teams	A1,A3,A4,A5,A6,A7,A8,A10 - Positive A2,A9 - No activity	B1,B2,B5 - Positive B3 - Just starting activity, effects not measured B4 - No effect	C1,C3,C5,C6 - Positive C2 - No activity C4 - Weak Activity, poor start
Employee decision making	A1,A3,A4,A5,A6,A7,A8,A9,A10 - Positive A2 - No activity	B1,B5 - No response B2 - Just starting activity, effects not measured B4 - Positive	C1,C3,C5,C6 - Positive C2 - No activity C4 - Effects not measured
Employee suggestion scheme	A1,A6,A8 - Positive A2,A5,A7,A9,A10 - No activity A3 - Activity being considered	B1 - Positive B2 - Activity being considered B3,B5 - No activity B4 - Activity has failed	C1 - Positive C2,C4 - Activity has failed C3,C5,C6 - No activity

Table 6.12 Statements on general factors that have helped or hindered effective management leadership

Factors\Company Types	A Type companies	B Type companies	C Type companies
Factors helping mgmt. leadership	A1 - Lack of supervisors, training lack of trade union, right people for the jobs, willingness to change, change of old managers, visits to other companies A3 - Steering team, quality champion on board of directors A4 - Management involvement, employee accessibility to top mgmt A5 - Accessibility of management A6 - Education, recognition, leadership motivation, role model management, change of old managers A7 - Getting closer to teams by being part of them A8 - Communication, mixing with workers A9 - Incentives, profit share A10 - Open management, good communication between site personnel	B1 - Delayering, training, visits to other companies, visits from other companies, steering team of 9 directors, regular management meetings B2 - Persistence with quality B4 - Lack of quality inspectors, flat structure B5 - Pressure from CEO, customer pressure	C1 - Involvement of senior management C3 - Flattened structure C4 - Involvement of CEO and senior management C6 - Communication
Factors hindering mgmt. leadership	A2 - Too many rigid managers A3 - Some directors favour sales at the expense of quality A5 - Limited management skill, time to work on quality in addition to normal duties	B3 - Funds for training B4 - Some managers favour sales at the expense of quality	C1 - Managers need to explain decisions C2 - Lack of motivational leadership C3 - Reluctance of senior management to change authoritarian attitude C4 - Remoteness of senior management, attitude of directors, short-term business goals C6 - Business decisions, loss of personnel due to restructuring

Findings and Observations

1. There is a growing awareness of the need to adopt a participative style of management. All interviewed companies have attempted or are attempting to change their management style.
2. Companies that have a TQ program are more likely to achieve a successful change of management style.
3. The majority of problems faced with respect to change of management style are encountered at middle management level. The most common problem is that of 'feeling threatened' as a result of the proposed change.
4. A majority of managers are aware that the implementation of quality programs will require them to change their attitude to work.
5. There is a growing tendency to consult employees in the decision making process. More than 70% of the interviewed companies practice employee consultation.
6. More that 75% of interviewed companies encourage bottom-up involvement in company activities. This tendency is greater among TQ companies.
7. All companies that practice employee consultation have recorded benefits while those that do not practice employee consultation have recorded negative impacts.
8. More than 85% of companies that encourage bottom-up involvement have noticed an improvement in work practice.
9. A noticeable management commitment to quality improvement generally has a motivating effect on employees. Inconsistent or non-existent commitment often demotivates employees.
10. More than 85% of interviewed companies communicate the company's performance to all their employees.
11. More than 90% of interviewed companies encourage a breakdown of departmental barriers. This tendency is greater among the TQ companies.
12. More than 50% of interviewed companies have a regular management training program and have recorded a positive impact on management leadership.
13. Quality awareness among managers has generally had a positive impact. This tendency is greater among TQ companies

14. More than 80% of interviewed companies use management teams. More than 85% of these companies believe their management teams have had a positive impact on management leadership
15. Only 24% of interviewed companies have a formal employee suggestion scheme. These companies have recorded benefits from the scheme. 9.5% are considering starting the scheme and 14% of the companies claim the scheme has failed in their companies.

6.3.2 Teamwork

Responses to questions on teamwork are presented in this section. The questions are to be found in Section 3 of the structured interview. The findings and observations from the responses are discussed.

Table 6.13 Responses to the question "Does your organisation work well as a team?"

A Type companies	B Type companies	C Type companies
A1, A2,A3,A4,A5,A6,A7,A8,A9,A10 - Yes	B1 - Sometimes B2 - Much better than before B3 - No B4,B5 - Yes	C1,C2,C5 - Yes C3,C4 - No C6 - Sometimes

Table 6.14 Factors that have positively influenced organisational teamwork

Factor\company Type	A Type company	B Type company	C Type company
Organisational structure	A1, A3, A4, A5, A7, A8, A10	B1, B2, B4, B5	C1, C5, C6
Manufacturing methods	A1, A2, A3, A5, A6, A8, A10	B2	C1, C5
Product complexity	A3, A5, A8, A10		
Size of organisation	A1, A2, A3, A4, A5, A8, A9, A10	B4	C1, C2, C5
Other	A1 - Mgmt support and involvement		

Table 6.15 Factors that have negatively influenced organisational teamwork

B Type companies	C Type companies
B3 - Poor organisational structure	C3 - Lack of organisational structure C4 - Rigid organisational structure, personality differences

Table 6.16 Responses describing specific steps taken to improve organisational teamwork

A Type companies	B Type companies	C Type companies
A1,A2 - Management encouragement A4 - Open management style A6 - Cell system work structure A8 - Functional teamwork, eliminated foremen A10 - Clarification of responsibilities and job functions	B1 - Encouragement B2 - Organisational re-structuring B3 - Education B4 - Multiskilling B5 - Training	C2 - Failed project groups C3 - Training C4 - Task teams C5 - Multiskilling C6 - Functional teamwork

Table 6.17 Responses to questions on use of voluntary teams

Question\company type	A Type companies	B Type companies	C Type companies
Are voluntary teams in use in your organisation?	A1,A2,A5,A6,A7,A8,A10- Yes A3,A4,A9 - No	B1,B2,B5 - Yes B3,B4 - No	C4 - Yes C1,C2,C3,C5,C6 - No
Is this encouraged by management?	A1,A2,A5,A6,A7,A8,A10 - Yes	B1,B2,B5 - Yes	C4 - No, forced by new technology
Are these teams given reasonable authority to make changes?	A1,A2,A5,A6,A8,A10 - Yes A7 - Recommendations only	B1 - Recommendations only B2 - Yes B5 - Departmental teams only	C4 - Yes
Have voluntary teams had benefits in the past?	A1,A5,A6,A7,A8,A10 - Yes A2 - Some	B1 - Sometimes B2,B5 - Yes	C2 - No C4 - Sometimes
How are these benefits measured?	Quality improvement - A1,A5,A6,A7,A8 Process improvement - A1,A5,A6,A8 Time factor - A1,A5,A8 Market performance - A1,A5,A6,A7,A8 No definite measures - A2 Benchmark against set targets - A10	Process improvement - B5 Time factor - B5 No definite measures - B1 Varies - B2	Market performance - C4

Table 6.18 Responses to the question 'What factors will motivate employees to form voluntary teams?'

A Type companies	B Type companies	C Type companies
A1,A5 - Recognition, job pride, management encouragement, ownership of process A2,A4 - Management encouragement A6 - Job pride, ownership of process A7 - Job pride, ownership of process A8 - Recognition, management encouragement A10 - involvement in operations	B1,B3 - Ownership of process B2 - Empowerment and time B5 - Job security, ownership of process	C3 - Management encouragement, ownership of process C4 - Job security, ownership of process C5 - Ownership of process C6 - Reward, ownership of process, career enhancement

Table 6.19 Specific steps taken to overcome teamworking problems

Problem\company type	A Type companies	B Type companies	C Type companies
Lack of time for voluntary teamworking	A6,A7,A8 - Paid overtime, time off during working hours	B1,B2 - Paid overtime	C4 - Work study group(failed) C6 - Get managers to release people
Little recognition for team recommendations	A6 - Empowerment A8 - Formal explanation		
Reluctance to volunteer for teamwork	A8 - Peer pressure A10 - Involve people informally to encourage participation	B2 - Consideration of recommendation B3 - Education	
Company politics	A5 - Increase process efficiency A6 - Central control	B2 - Physical restructuring of company B3 - Improve company structure	C4 - Disband teams

Table 6.20 Impact of specific factors on voluntary teamworking

Factors\company types	A Type companies	B Type companies	C Type companies
Teamwork training	A1,A2,A5,A6,A7,A8,A10 - Positive A3,A4 - No activity	B1,B5 - Positive B2,B3,B4 - No activity	C1,C2,C3,C4,C5 - No activity C6 - No activity for majority
Facilitation	A1,A2,A5,A6,A7,A8,A10 - Positive A3,A4 - No activity	B1 - Effects not yet measured B2 - facilitation not always used B3,B4,B5 - No activity	C1,C2,C3,C4,C5,C6 - No activity
Organisational market performance	A1 - Positive A5,A6 - No effect	B1,B2 - Effects not measured	C4 - No effect

Table 6.21 Responses to the question 'How are employees encouraged to fulfil the needs of internal customers?'

A type companies	B Type companies	C Type companies
A1,A6 - Education, communication systems, interdepartmental teams A2,A3 - Education A4 - No formal methods A5 - Education, interdepartmental teams, one-to-one meetings between internal supplier\customer A7 - Education, crossfunctional training A8 - Education, interdepartmental teams A9 - Standard procedure A10 - Communication	B1 - Meetings B2,B3 - No formal methods B4 - Education B5 - Encourage to communicate	C1,C3 - Communication systems C2,C4,C5 - No formal methods C6 - Training, encourage to communicate

Table 6.22 Responses to two questions on use of delegated teams

Question\company type	A type company	B type company	C type company
Are delegated teams encouraged at the expense of voluntary teams?	A1,A2,A4,A5,A6,A7,A8,A9,A10 - No A3 - Yes	B1 - Sometimes B2,B3,B5 - No B4 - Yes	C1 - No delegated teams C2,C3 - Yes C4,C5,C6 - No
Have delegated teams met their targets in the past?	A1,A4,A10 - Yes A2,A5 - Sometimes A3,A7,A8,A9 - Often A6 - Always	B1,B2, - Often B3 - Targets not measured B4 - No B5 - No delegated teams	C2 - No C3 - Yes C4,C6 - Sometimes

Table 6.23 Statements on general factors that have helped or hindered teamwork

Factors\company type	A type companies	B type companies	C type companies
Factors helping teamwork	A1 - Lack of trade union A4 - Willingness of employees right from the top A6 - Target orientation, training, project team managers, recognition, open management style, company structure A7 - recognition of importance of teamwork	B2 - Consideration of recommendation B5 - Teamwork training	
Factors hindering teamwork	A2 - Negative response from supervisors, attendance A4 - Occasional bad employee A5 - Trade union resistance A6 - Time A7 - Lack of capital and rejection of recommendations A8,A9 - Lack of manpower A10 - Personality differences	B3 - Unstable market forces B4 - Demotivation from failure to meet goals	C1 - Occasional personal conflicts C2 - Lack of motivation from directors C3 - Perceived lack of freedom C4 - Money for training, attitude of workforce\management C6 - Lack of time, poor cimmitment by some managers, lack of team focus and measures

Findings and Observation

1. More than 75% of interviewed companies work well as a team. This tendency is greater with TQ companies.
2. More than 65% and 55% of interviewed companies identify 'organisational structure' and 'size of organisation' respectively, as factors that have positively influenced teamwork while 48% identify 'manufacturing methods' as an important factor.
3. Problems with the organisational structure is cited as the most important factor that has a negative effect on organisational teamwork.
4. Only 52% of the companies have voluntary teams in operation. TQ companies are more likely to use these teams. The use of these teams is supported by management and the teams are generally empowered to make changes.
5. 72.7% of companies that have voluntary teams have benefited consistently from the activity while 27.3% have benefited at times. One company stopped the activity as a result of poor results.
6. Process improvement and market performance are the measures mostly use in evaluating team effectiveness. Quality improvement and time factor are used to a slightly lesser extent.
7. 'Management encouragement', 'ownership of process' and 'job pride' are factors most likely to encourage the formation of voluntary teams. 'Recognition' and 'job security' are other identified factors.
8. Teamwork training and facilitation are factors that positively influence voluntary teamworking. These factors are almost exclusive to TQ companies.
9. 'Education', 'communication systems' and 'meetings' are most commonly employed methods in the fulfilment of internal customer needs. TQ companies are more likely to encourage the internal customer concept.
10. More than 75% of the companies do not encourage delegated teams at the expense of voluntary teams. The tendency is greater among TQ companies.
11. More than 60% of the companies have had delegated teams that have met targets regularly in the past.

6.3.3 Customer Focus

This section presents the responses to questions in Section 3 of the structured interview. The questions are concerned with customer focus in the interviewed companies. The findings from the responses are discussed.

Table 6.24 Responses indicating major customers and the relationships developed with them

Company A1: The major customers are workshops and industry. Products are also sold to members of the public through service stations. A strong relationship is maintained with the *major customers*. The products are of a leading brand and there is little technical pressure on the company.
Company A2: The major customers are other industries. Demands are high and it is necessary to be as close as possible. There is a good deal of technical communication.
Company A3: The major customers are specialised industries. About 50% of products is also sold to the public through distributors. A close technical relationship is kept with specialised industries. The relationship with the public and distributors is not as strong as the company relies on its brand name.
Company A4: The major customers are other industries. The specifications tend to be very high and varied especially since many products are made for the food industry where hygiene is a major consideration. The company finds it necessary to maintain close technical links with its customers.
Company A5: The products are of a leading brand. The company's major customer is its parent company. The relationship is close but relaxed. There is not much technical pressure since the company already knows what the parent company wants.
Company A6: The company only supplies products to the parent company. This allows for a close but relaxed relationship since the demands are already known to the company.
Company A7: The company supplies industries in the aluminium, glass and cement sectors and has to develop a close technical relationship with its customers in order to cope with requirement and pressure
Company A8: The company sells mainly through distributors and keeps close to them as a result of the small number(30)
Company A9: The company's customers range from the general public through transport companies to companies that demand own label products. The company has a flexible approach to its relationships with customers
Company A10: The company's products are only sold through the conglomerate's sales office. this allows for a close and relaxed relationship.
Company B1: The company's major customers are in the feed industry. Customer demands are high and there is a need to maintain close contact with the relationship. Varying customer demands can sometime make things difficult for the company.

Table 6.24 contd

Company B2: The major customers are other industries. Some products are also sold to government and international organisations. The products are fairly standardised and the is little need for close technical co-operation.
Company B3: The major customers are other industries. The absence of standardised products demands that a close technical relationship must be kept with the customers. customer specifications are usually very high.
Company B4: The company's products are standardised and of a leading brand name. The products are sold through distributors. Technical relationships are not kept and the brand name tends to be influential in the company's sales.
Company B5: The company's major customers are other industries. The absence of a standardised product and the high specifications demanded in the industry forces the necessity for close technical relationships
Company C1: The major customers are the packaging and print lamination industries. The products are fairly standardised. The company can stockpile finished products and there is not much pressure from customers.
Company C2: The company's products are only sold to other industries. Some of the products are fairly standardised. However, the nature of other products force the need for close relationship with customers. the company is often under considerable pressure from its main customers.
Company C3: The company's products are of a leading brand and are sold to a whole range of customers. The company adopts a structured approach to customer relationships depending on the product and the market forces.
Company C4: The company's products are standardised and are sold through distributors. This eliminates the need for close technical relationship with the customers.
Company C5: The company's major customers are other industries. The products are fairly standardised and the need for a close technical relationship is not very strong.
Company C6: The company only sells to other industries. This fosters a close technical relationship in order to determine specific requirements.

Table 6.25 Responses to two questions on company re-organisation

Question\company type	A Type companies	B Type companies	C Type companies
How have re-organised the company to make it more responsive to customers?	A1 - Set customer service targets A3 - Improve warehousing system A4 - Additional sales personnel to improve contact with customers A5 - Improve warehousing system, set customer service targets, customer service teams A6 - Computer systems for scheduling, prioritising and driving production A7 - Reorganisation of sales and marketing departments A8 - Reorganisation of sales procedure, increased customer access to management A10 - Better contact with sales department	B1,B2 - Company's processes being re-designed B3 - Set up a computerised customer database B4 - Increased organisational flexibility B5 - Appointment of project managers	C1 - Additional personnel to improve contact to customers, out of orders ordering service C3 - Single point of contact with sales, improved customer technical service C4 - Reduced number of distributors to improve contact C6 - Flattened company structure, more customer representatives
What results have been noticed?	A1,A3,A4,A5,A7,A8,A9,A10 - Positive A6 - Too early to judge	B1 - Too early to judge B2,B3,B4,B5 - Positive	C1,C3,C6 - Positive C4 - Effects not measured

Table 6.26 Methods used to measure satisfaction level of customers

A Type companies	B Type companies	C Type companies
A1 - Surveys, visits, complaints A2 - No activity A3,A4 - Complaints A5 - Monthly product supply meetings with customers A6 - Monthly surveys A7 - Ongoing surveys A8 - Random surveys A9 - Customer visits A10 - Complaints systems and customer audits	B1,B4,B5 - Complaints B2,B3 - No activity	C1,C6 - Customer visits C2,C4 - Complaints C3 - Customer survey via questionnaires C5 - No activity

Table 6.27 Responses to questions on product return

Question\company Type	A Type companies	B Type companies	C Type companies
Do you monitor level of product return?	A1,A2,A3,A4,A5,A6,A7,A8,A9,A10 - Yes	B1,B2,B3,B4, - Yes B5 - No	C1,C2,C3,C4,C5,C6 - Yes
How has this helped or hindered customer service?	A1,A3,A5,A6,A8 - Positive A2 - Respond better to customers A4 - Better response, increased professionalism, basis for corrective action A7 - Highlight problems A9 - Basis for corrective action A10 - Improved quality	B1,B2,B3,B4 - Positive	C1,C2,C3,C4 - Positive C5 - Basis for corrective action C6 - No effect

Table 6.28 Responses to questions on customer communication

Question\company type	A Type companies	B Type companies	C Type companies
Do you meet with customers to discuss product problems and improvements?	A1,A2,A4,A5,A6,A7,A8,A9- Yes A3,A10 - When necessary	B1 - Through a customer audit scheme B2,B3,B5 - Yes B4 - Not much	C1,C2,C3,C5,C6 - Yes C4 - Not enough
How has this affected communication with customers?	A1,A2,A3,A5,A6,A10 - Improved communication A4 - Can do more A7,A8 - Improved technical support A9 - Improved relations	B1,B2,B3,B4,B5 - Improved communication	C1 - Customers welcome the idea C2,C3,C6 - Improved communication C4 - Better communication in some cases C5 - Customers are happy about it

Table 6.29 Responses to questions on customer expectation

Question\company type	A type company	B type company	C type company
What methods do you use to anticipate customer expectation?	A1 - Survey, visit customers, benchmarking A2,A8, - Visit customers A3 - Sales information, complaints A4 - No formal methods A5,A7,A9 - Visit customers, benchmarking A6 - Visit customers, encourage customers to visit company facilities A10 - Market survey	B1 - Visit customers B2 - Visit customers, customer surveys and benchmarking being considered B3 - Benchmarking B4 - No formal methods B5 - Joint design with customers	C1,C2,C6 - Visit customers C3 - Visit customers, benchmarking, complaints C4 - Visit customers, complaints C5 - Customer specification
Has this resulted in noticeable success?	A1 - No effects noticed A2,A3,A5,A7,A8,A9 - Yes A6 - New customers gained A10 - Fewer problems meeting customer needs	B1, B2,B5 - Yes B3 - No effects noticed	C1 - Product improvement C2,C3,C4,C5,C6 - Yes

Table 6.30 Significant responses to the question 'How is your relationship with the customer affected by the size of customer base?'

A Type companies	B Type companies	C Type companies
A1,A9 - Maintain good contact with all customers irrespective of the large number A2,A4,A7,A8 - Customer base is limited and fosters close relationships A5,A6,A10 - Our major customer is our parent company so the relationship is good	B1 - Maintain good contact with all customers irrespective of the large number B2,B3 - Not much relationship with customers B4 - Maintain close contact with distributors B5 - Maintain close contact with all customers as a result of our product type	C1 - Maintain close contact with all customers C2,C3,C5,C6 - Maintain close contact with big customers only

Table 6.31 Methods used to evaluate quality of relationship with customers

A Type companies	B Type companies	C Type companies
A1 - Level of communication, social contact with particular customers A2 - Amount of business information shared A3,A4,A7 - Volume of business A5 - Level of communication, amount of business information shared A6 - Level of communication, social and sports contact A8,A10 - Level of communication A9 - Social contact	B1 - Volume of business B2 - Level of communication B3,B4,B5 - No formal methods	C1 - Level of communication C2 - Amount of business information shared(limited to bigger customers) C3 - Amount of business information shared C4 - Volume of business C5 - Amount of business information shared, volume of business C6 - No formal measures

Table 6.32 Methods used to encourage customer complaints

A Type companies	B Type companies	C Type companies
A1 - Customer complaint line, complaint via salesmen A2,A3,A4,A9,A10 - No formal methods A5 - Customer complaint line A6 - Customer complaint survey A7,A8 - Customer complaint system, customer complaint form	B1,B2,B3,B4,B5 - No formal methods	C1,C2, C5,C6 - No formal methods C3 - Customer complain form sent with product C4 - Phone calls to customers

Table 6.33 Responses to the question 'How are employees encouraged to develop a passion to satisfy the customer?'

A Type companies	B Type companies	C Type companies
A1 - Review meetings with management, teams, internal customers, employees visit customers A2 - Stress importance of customer, internal customers A3,A9 - No particular methods A4 - Job pride, internal customer, performance bonus A5 - Internal customer A6 - Training, awareness of impact on customer, social contact with customers, employees visit customer site, internal customer A7 - Customer information in newsletters, employees visit customers, customers visit site A8 - Total team approach, employee contact with customers, customer information, stress importance of customer A10 - Involvement, communication of need, internal customer	B1 - Pass customer information via 'customer of the month' scheme, internal customer B2 - Employees visit customer site B3 - No formal methods B4 - Internal customer B5 - Employees visit customer site, employees entertain visiting customers, internal customer	C1 - Communicate and discuss customer information, internal customer C2 - Information about uses of products C3 - General team approach C4 - No formal methods C5 - Direct contact with customers C6 - Find it very difficult, internal customer

Table 6.34 Significant responses to the question 'How have you altered manufacturing methods to improve customer orientation?'

A Type companies	B Type companies	C Type companies
A1 - Reduced errors and rework A3 - Reduce costs A4 - New machinery with increased capability, increased range of products A6 - Changed from product to process orientation A7,A10 - Continuous process review A8 - Reduced waste and overhead, new machinery with increased capacity, increased product range A9 - New machinery, faster production	B1 - Increased flexibility to meet varied customer specifications B2 - Changed from process to product orientation B4 - Increased manufacturing flexibility B5 - Improved product versatility	C1 - Improve manufacturing process, change of raw materials C2 - Reduced stock through computerisation C3 - Increased product range, improved technical support C4 - Improved method and design to cut cost C6 - Ability to customize products

Table 6.35 Significant effects of specific activities on customer focus

Activity\Company Type	A Type companies	B Type companies	C Type companies
Quality function deployment	A1,A2,A3,A4,A5,A6,A8,A9,A10 - No activity A7 - Positive impact	B1,B3,B4,B5 - No activity B2 - Limited activity but positive impact	C1,C2,C3,C4,C5,C6 - No activity
Taguchi methods	A1,A6,A7,A8 - Positive A2,A3,A4,A5,A9,A10 - No activity	B1,B2,B3,B4,B5 - No activity	C1,C2,C4,C5,C6 - No activity C3 - Positive
J.I.T	A1,A2,A3,A5,A8 - Positive A4,A7,A9,A10 - No activity A6 - Positive, reduction in work-in-progress	B1 - Activity being introduced B2 - Positive B3 - No activity B4,B5 - Activity difficult to run	C1,C2,C4,C6 - No activity C3,C5 - Positive
Statistical process control	A1,A3,A5,A7 - Positive A2 - Just introducing activity A4,A9 - No activity A6 - Performance has gone through the roof, prevention of errors A8 - Amazing benefits A10 - Little activity	B1,B2,B5 - Positive B3,B4 - No activity	C1,C3,C5,C6 - Positive C2 - Part introduction has had some positive effect C4 - Just introducing activity
Business process re-engineering	A1,A3,A4,A5,A6,A7 - Positive A2 - Activity being considered A8,A9,A10 - No activity	B1,B2 - Positive B3,B4 - No activity B5 - Activity not fully developed	C1,C2,C4,C5 - No activity C3,C6 - Positive
M.R.P	A1,A3,A5,A8 - Positive A2,A4,A7,A9,A10 - No activity A6 - Effects not measured	B1,B2,B3,B5 - No activity B4 - Positive	C1,C5,C6 - No activity C2 - Elements of M.R.P. introduced C3 - Positive C4 - Activity being introduced

Table 6.36 Statements on general factors that have helped or hindered customer focus

Factors\Company Types	A Type companies	B Type companies	C Type companies
Factors helping customer focus	A1 - Elimination of waste, creating more time for customers, technical assistance to customer A3 - Product reputation, ISO9000 A4 - Increased contact with customers, improved machine capability, ISO9000 A5 - Improved communication with customers A6 - Training, communication of all information down to shop floor, monthly departmental meetings, general awareness at every level of impact on customer A8 - Market leaders, ability to convince customers about value for money, efficiency, customer satisfaction drive, perseverance A9 - ISO9000, improved production process, continuous improvement A10 - Knowledge of the market, competition and a desire to succeed	B2 - Awareness of general market orientation, ISO9000, technical resources of parent company B5 - Encouragement of customers to visit company site	C1 - Involvement of senior management C5 - Attentiveness to customers, removal of product defects, immediate attention to problems
Factors hindering customer focus	A2 - Some mangers are still unwilling to change A3 - Lack of training, Lack of awareness of need for continual change, difficult to get people involved in quality effort A7 - Lack of capital investment	B3 - Lack of understanding of marketing techniques	C3 - Market globalisation, increased competition C4 - Commercial department tries to exclude customers from other departments C6 - Lack of training and education, inability of employees to understand that everyone is a customer

Findings and Observation

1. Companies that manufacture standardised products are likely to be more distant from the end users of their products. They tend to be closer to distributors.
2. Companies that manufacture predominantly for other industries are under greater pressure to be closer to the customer. They are also under more pressure to meet specifications and operational deadlines.
3. More than 80% of the companies have re-organised to improve responsiveness to customers. 83% of these companies have noticed positive results from re-organisation while the others are yet to measure the effectiveness
4. Complaints are the most common method of measuring customer satisfaction, surveys and meetings are less common activities
5. Almost 95% of the companies measure product return and all but 1(C6) have recorded benefits from the use of the activity.
6. All interviewed companies, some better than others, meet with customers to discuss product problems and improvements. Improved communication is the most common benefit of this activity.
7. Customer visits are the most common method of anticipating customer expectation. Surveys, benchmarking and complaints are used to a lesser extent. Almost 81% of the companies have realised benefits from these methods.
8. Companies with a limited customer base tend to maintain close relationships with their customers. Companies with larger customer bases have a greater tendency to have weaker relationships or maintain close relationships with their bigger customers only.
9. 'Level of communication' and 'amount of business information shared' are the most common methods of evaluating the quality of relationship with customers. 'Volume of business' and 'social contact' are used to a lesser extent. More than 75% of surveyed companies use one or more of these activities.
10. Almost 70% of the companies do not encourage companies to complain. Complaint lines, surveys, forms, follow-up phone calls and visits are activities employed by companies which encourage complaints.

11. More than 75% of the companies(some better than others) encourage their employees to develop a passion to satisfy customers. Direct contact with customers, education and internal customer concept are the most widely used methods.
12. 81% of the companies have altered manufacturing methods to improve customer orientation. Improved manufacturing efficiency, flexibility, process and product range are the most common ways in which this has been done.
13. SPC, JIT and BPR are the most common quality techniques used by the companies. QFD, Taguchi methods and MRP are the least used techniques.

6.4 Summary

The structured interviews indicate similarities to the culture change approach by the different classes of companies. The case studies present a summary of the approach adopted by the different companies and the resultant culture. Common usage or lack of usage of activities by companies within the same class was noticed and the effectiveness of the usage (or otherwise) of these activities was clearly indicated. Some activities were somewhat common to companies in different class groups and most companies had achieved varying levels of cultural transformation. A discussion of these issues is presented in the next chapter.

CHAPTER 7 - DISCUSSION OF FINDINGS

7.1 Introduction

The results of the questionnaire survey and the structured interview have been presented in Chapters 5 and 6. The findings have also been reviewed. This chapter gives a general discussion of the findings including the results of the literature review, with a view to presenting a general overview on the current state of quality culture development in industry. More importantly, the vital culture change agents as identified from the survey results are presented in this chapter. The change activities that complement these change agents are presented and discussed in Chapter 8.

7.2 Results from the Literature Review

The literature review provided an understanding of the dimensions of quality culture. It was apparent that the nature of quality culture was not very clear to companies that were interested in TQM implementation. The literature review identified two major concepts - quality culture elements and culture change agents - which provided a different perspective of quality culture development and formed the basis for this study.

7.2.1 Quality Culture Elements

Quality culture elements represent the model of culture that companies should strive to achieve. Seven elements of culture were identified - senior management leadership, employee involvement and empowerment, supplier partnership, customer focus, teamwork, effect of chief executive and open corporate culture. These elements were widely accepted by quality practitioners and their importance was well documented.

Briefly, senior managers were expected to steer the TQ effort, lead by example and enable an environment that complements the principles of TQM. Employees are expected to participate actively and positively in the quality improvement drive while partnership with suppliers was important because the quality of products and service was vital to overall output. Satisfying customer demand is a primary goal of TQM and this implies the necessity to develop an attitude of focusing on the need of customers. Teamwork was viewed as important to organisationwide development. The chief executive is the most important person in the enabling process and must not only be fully committed to the principles of TQM but should also ensure that adequate resources are available. An open corporate culture implies an organisational framework that is devoid of functional barriers.

7.2.2 Culture Change Agents

Although the quality culture elements were well understood, the mechanism of change to bring about their development wasn't. It was agreed that culture change was necessary but what this meant and how it was to be brought about was not very clear.

Changing culture is about changing attitudes, values and behaviour. Thus it was important to understand the factors that bring about these changes. From organisational design theory and the behavioural sciences, various activities that affect the way people work and think were identified and grouped into five classes of culture change agents - motivation, reward, policy and values, environment and organisational structure.

Motivation of employees is commonly agreed as being important to their well-being and productivity. Reward is a powerful tool in attitude change and productivity especially in contemporary society. The values held by employees are important determinants of what they believe in and would work for. The work environment and organisational structure are vital to employee attitudes and their relationship to each other.

7.2.3 Relationship

The identification of these two dimensions of culture led to the research design. This fundamentally, was to find out how the culture change agents related to quality culture and possibly brought about its development. This resulted in the development of the questionnaire survey and structured interviews as appropriate tools for the study

7.3 Culture Development

In general, the companies that have been successful at changing their culture are those that have implemented TQ. The implementation of TQ is, however, not a guarantee of change as some of the failed companies are also TQ companies. Non-TQ companies, in general, have not had a benefit of exposure and generation of improvement ideas that a quality programme provides. While many of the non-TQ companies have introduced some elements of quality working and achieved some measure of success, their inability to adopt a comprehensive and planned approach has meant that success achieved is in most cases is limited and inconsistent.

Companies that have achieved a successful culture change, have faced problems identical to those confronting the less successful companies. The difference in fortunes is to a great extent, influenced by the successful use of the relevant change agents. The successful companies also conceded that culture change was a gradual process that was almost certain to face resistance at many stages and from different levels in the organisation. Having achieved success however, the companies found that their new culture was self-propelling and needed minimal impetus. It became the norm and the employees found it easy to work within the new culture. The successful companies have recorded immense benefits in all-round efficiency within the organisation. In most cases, the new cultural approach has led to direct benefits in market performance. More commonly, the newly achieved efficiencies have led to substantial in-house cost reduction. The smooth running of the organisations has led to a change of focus from problem-solving to seeking new ideas for improvement.

In contrast, the failed companies tend to find themselves in many instances solving operational problems and therefore find it difficult to generate ideas for continuous improvement. These companies, generally are aware of their shortcomings and the benefits that could be gained from TQ and the associated culture change. What is lacking is a long term quality focus, unwillingness to invest in quality programmes and culture change, which by nature do not have quick returns. Other major reasons for failure are unwillingness to accept and cope with the many implications of culture change and a lack of ideas on how to go about that change.

In general, companies can be divided into 2 broad classes with respect to their quality culture perspective :- those with a positive tendency and those with a negative tendency.

Companies with a positive tendency can further be divided into:

- those that have successfully completed culture change. These are generally the companies that have invested substantially, persevered in their efforts and have patiently waited for the payback;
- those that are in the middle of culture change. These are generally companies that are still investing in culture change. While they have not had complete success, they have noticed benefits and tend to persevere. In some cases, they lack ideas on how to sustain their limited gains. Failure to tackle this could lead to a stagnation of the efforts and possibly failure of the whole programme.

Companies with a negative tendency can similarly be divided into:

- those that have had failed attempts at culture change. These are generally companies that have gone about quality and culture change without sufficient conviction or targets or those that have run out of ideas in the middle of their effort and gradually slipped into failure. In many cases, these companies talk of reviving the programme but face even more problems, including cynicism, as a result of their earlier failed attempt;

- those that have made no attempt at culture change. These are generally the companies that are unable to accept the implications of having a quality culture or are unwilling to invest because of the payback period. They also include companies that have no ideas on how to proceed with culture change and those who see no need to change from 'how we have always done it'.

7.4 Linking Change Agents with Quality Culture

The success of companies that have achieved a quality culture can, in the main, be attributed to the various activities aimed at improving work culture and company processes. These activities are referred to as culture change activities. These activities are of a varied nature and differ from company to company. What is common among these companies is that the activities can be batched into groups. Each of these groupings defines a culture change agent. The culture change agents are generally common to the successful companies and to varying extents in companies in the process of culture transition. Some of these companies are identified (either as case studies or analysis tables) with the listing of the change agents.

7.4.1 Senior Management Leadership

Almost all companies, successful or otherwise faced problems with management. The most common problem was that of middle management feeling threatened. The other major problem was a resistance to change. In general, most managers felt that the adoption of a participate style of management would rob them of their 'power' and possibly endanger their jobs since some of their 'responsibility' would be passed on to junior employees. Management leadership is the starting point of a culture change and possibly the singular most important quality culture element. Companies that attempted to develop other quality culture elements without a firm and total conviction from all managers have generally failed. In almost all successful companies, the change of culture has led to the resignations and retirements of senior managers who could not cope with the new culture.

While most managers claim to recognise the importance of quality, a common failure is the view that quality is separate from their core functions. This generally leads to claims of 'lack of time' for quality related issues because of 'deadlines' and 'other pressing issues' which in many cases are problems generated by lack of quality working in the first instance. In some cases, managers fail to see any potential in their junior, and often less educated colleagues. This sometimes resulted in cynical views of the quality programme especially in the aspects of employee involvement and empowerment.

Employees are quick to recognise a lack of commitment among the managers and subsequently adopt a cynical view of the change efforts. On the other hand, hands-on management involvement, backed up by consultation, communication and recognition has been a major motivator for junior employees. Furthermore, the unwavering commitment of management convinces other employees that quality working is 'the way forward'.

The vital culture agents for management leadership are:

- Education (Ref. case studies 4,5,6,7,8,11 and figs 6.4, 6.12 & 5.24)
- Training (Ref.case studies 4,5,6,7,8,10,11,17,12 and figs 6.11, 6.12, 5.23 & 5.24)
- Involvement (Ref. case studies 3,4,5,6,7,8,10,17,19,21 and figs 6.6, 6.11 & 6.12)
- Measure (Ref. case studies 1,6,20 and figs 6.7 & 5.22)
- Reward and Recognition (Ref. case studies 3,4,5,7,9,10,17 and figs 6.8 & 6.12)

7.4.2 Employee Involvement and Empowerment

Employee involvement and empowerment has been most successful after senior management leadership has been assured. In many cases, employees are reluctant to take to changes often viewing such with suspicion. In some cases, it is seen as just another management tool or a way of 'sneaking in' employee redundancies. Older employees often don't understand why methods that have worked for so long now need to be changed. Supervisors and foremen, in particular, view quality working

methods with disdain as it tends to empower their sub-ordinates. Indeed, some of the successful companies have eliminated this level of management from their organisation. The case for this line of action becomes more convincing where all employees have received quality training.

Attempting to involve employees without informing them of the goals and advantages of the changes will almost certainly lead to suspicion and resistance. It is vital that employees are assured of their job security. Employees must be encouraged to feel comfortable within the new dispensation. A common occurrence is that some employees will take readily to the changes while others will adopt a 'wait and see' attitude or an outright refusal of the changes. It is at this point that management support becomes critical. Even the most cynical employees are quick to recognise advancement by their more accommodating employees especially if such advancement takes the form of such operational factors as increased productivity, improved quality of work and personal factors such as new qualifications, job enlargement and management recognition.

The vital change agents for employee involvement and empowerment are:

- Education (Ref. case studies 1,4,5,6,13,17 and figs 6.12, 5.22 & 5.24)
- Training (Ref. case studies 1,4,5,6,7,13 and figs 6.10, 5.23 & 5.24)
- Encouragement (Ref. case studies 4,5,6,7,8,9,11,16,17 and figs 6.6, 6.7, 6.10, 6.11, 6.12 & 5.24)
- Flexibility (Ref. case studies 1,3,5,6,7,9,17 and figs 6.6, 6.11, 6.12, 5.23 & 5.24)
- Communication (Ref.case studies 1,3,5,6,9,13 and figs 6.5, 6.9, 6.10, 6.12 & 5.24)
- Measures (Ref. case studies 1,5,6 and figs 5.23 & 5.24)
- Recognition (Ref. case studies 1,4,5,7,9,13,17 and figs 6.8, 6.12 and 5.24)

7.4.3 Customer focus

Customer focus is the most developed of the quality culture elements. All companies irrespective of their level of culture development recognise the importance of the

customer to their continued existence. Thus a lot of effort is put into this aspect of the companies' businesses. Some companies have however excelled in this sector. The two major differences between excellence and 'the rest' are the possession of a comprehensive and highly structured approach to customer-related data and the ability to make employees 'work for the customer'.

Companies that have excelled have developed a high sensitivity to customers. They have developed vital and highly regarded measures of customer satisfaction. They have found it insufficient to sell and assume that all is well if there is no complaint. They have elected to investigate the satisfaction level of their customers and actively solicited complaints from unsatisfied customers. They have also fostered 'relationships' with many customers with standing technical teams and social events encouraged in many instances. Bigger companies with adequate technical and manpower resources have also given assistance to their smaller and less endowed customers.

Increasingly relevant factors to customer focus among employees is the encouragement of direct contact between all employees and the customers and the encouragement of the internal customer concept. Companies that have excelled have discarded the old attitudes whereby only salesmen and customer service personnel had direct contact with customers. This has, in many cases, pleased the customers and increased their level of loyalty to the companies. Perhaps more importantly, the enthusiasm and desire for excellence among the shop floor workers, who perform the majority of the work, has increased. This is tied directly to the fact that the employees now know whom they manufacture for and how vital it is to get things right. In some instances where personal contacts and friendships have been developed, the desire not to disappoint is even stronger.

Failing companies, on the other hand, have been content to simply attempt to get technical specifications right, collect their money and move on to the next sale. In most of these companies, customer data is not specifically collected and where collected, significant use is not made of the information. Commonly advanced reasons for this failure are lack of human resources and lack of time.

The vital change agents for customer focus are:

- Communication (Ref. case studies 3,4,5,6,7,8 and figs 6.28, 6.29, 6.31, 6.32 & 6.36)
- Employee focus (Ref. case studies 6,7 and figs 6.33, 6.36 & 5.24)
- Measures (Ref. case studies 3,4,5,6,7 and figs 6.25, 6.26, 6.27, 6.31, 5.22, 5.23 & 5.24)
- Relationship building (Ref. case studies 4,5,6,7 and figs 6.29, 6.30, 6.31, 6.36, 5.22 & 5.24)
- Reward (Ref. case studies 1,7 and figs 5.22 & 5.24)

7.4.4 Supplier Partnership

The commercial need for ISO 9000 and its conditions of traceability has played an important role in increasing awareness of the importance of suppliers. Furthermore most companies have realised that many of their external and internal non-conformances are directly traceable to defects in supplied components. This has prompted many companies to reduce their supplier base and form closer relationships with the remaining few. However the level of partnership can be improved further as only few companies have excelled in developing good relationships with their *suppliers.*

The level of information feedback is still generally limited to when non-conformances are noticed. Companies that have good partnerships with suppliers always feedback information even when things are all in order. In some cases, commendation and recognition of suppliers are given. These have been noticed to boost supplier morale and increase their level of commitment to the company.

An important and often ignored aspect of partnership is the involvement of suppliers in the business process as early as possible. While companies are not expected to divulge their sensitive plans to suppliers, early and joint technical and business designs with

suppliers are increasingly being practised by companies with good partnerships. Successful companies and their partners often tend to have standing teams or steady contacts and regularly exchange visits. This aspect of partnership is especially common with companies that have successfully implemented techniques such as J.I.T. or who plan to change some aspect of their production, change technical specification of products or introduce new products.

At the apex of supplier partnership are companies that give training and technical assistance to suppliers. These are usually larger companies with the resources to allow such assistance. It however strongly demonstrates a strong commitment of both company and supplier to grow together.

The vital culture change agents for supplier partnership are:

- Education (Ref. figs 6.35, 5.22, 5.23 & 5.24)
- Communication (Ref. case studies 8,18 and figs 6.35, 5.22, 5.23 & 5.24)
- Recognition (Ref. case study 7 and figs 5.22 & 5.23)
- Training(optional) (Ref. figs 5.22 & 5.23)

7.4.5 Teamwork

The level of teamwork is still very low inspite of the fairly substantial literature on teamwork and its advantages. Reasons for these are both technical and cultural. However some companies have excelled in teamwork.

For general company teamwork, many small-to-medium sized companies rely mainly on their small size to engineer in-house co-operation. While this has achieved some success in many instances, political division and poor management has countered any potential advantages in a few companies. Furthermore, this approach is not applicable to the larger companies. Successful companies have employed organisational structure, manufacturing methods and the internal customer concept in achieving good

companywide teamwork. Team-based recognition has also fostered organisational teamwork.

Success of specific teams, voluntary or delegated, is greatly influenced by training available to employees and facilitation available to these teams. Management encouragement and recognition is also very vital to attracting employees to participate in teamwork Common reasons for failure to participate in teamwork include lack of time, company politics and a lack of awareness of teamwork advantages. As with employee involvement, it is quite usual for a few employees to take instantly to teamwork while others are more sceptical. It is here that encouragement, recognition and peer pressure play vital roles.

The vital change agents for teamwork are:

- Education (Ref. case studies 1,5,6,7 and figs 6.21 & 5.24)
- Organisational structure (Ref. case studies 4,5,6,7,8 and figs 6.14, 6.15, 6.16, 6.21 & 6.23)
- Communication (Ref. case studies 1,5,6 and figs 6.21 & 5.24)
- Manufacturing methods (Ref. case studies 3,5,6 and fig 6.14)
- Recognition and rewards (Ref. case studies 1,4,5,6 and figs 6.18 & 6.23)
- Teamwork training (Ref. case studies 1,6, and figs 6.16, 6.20, 6.23 & 5.24)
- Facilitation (Ref. case studies 6,7 and figs 5.20, 5.23 & 5.24)
- Encouragement (Ref. case studies 1,5,6,8 and figs 6.16, 6.17, 6.18, 6.19, 6.22, 6.23, 5.23 & 5.24)

7.4.6 Chief Executive Officer

The CEO has played an important role in companies that have achieved a successful culture change. In the first instance the CEO has to be totally committed to quality improvement. While CEOs are generally unable to be part of the day-to-day quality effort, generally delegating this to a senior manager, they must neither spare effort nor resource as regards quality. It is quite common that the quality champion, often the

quality manager or director, will not have the personal authority to make other senior managers or directors adopt quality working in addition to their core functions. Only the insistence of the CEO on quality will gradually draw dissenting managers or directors in line.

CEOs in successful companies often find time to practice hands-on involvement in quality-related programmes. Such gestures are powerful tools for culture change and often send strong messages to the rest of the organisation. It is almost inconceivable that a senior manager or director will not attend a quality presentation or course when the CEO will attend in person. Quality-related speeches by CEOs have been a vital to attitude change in many successful companies.

CEOs in successful companies have also adopted the open management style. They have made themselves easily accessible to even the shopfloor workers. This form of identification with the employees has not only been a motivator to the junior workers but has often pushed managers nearer to the shopfloor where most of the work is done and where a majority of problems occur.

The change agents associated with the CEO are

- Education (Ref. case studies 4,6,7,8,13,15,17,19 and figs 6.12 & 5.22)
- Communication (Ref. case studies 4,5,7,8,11,13,15,17,19,20 and figs 6.12 & 5.22)
- Measures (Ref. case studies 4,11,13,17,19,20 and figs 6.12 & 5.23)
- Recognition (Ref. case studies 5,8,13,17 and figs 5.22 & 5.23)

7.4.7 Open Corporate Culture

Companies that have achieved a quality culture have recounted the benefits of having an open corporate culture. Of particular importance is the breakdown of departmental barriers and the resultant elimination of suspicion and polarity. Departments are urged to see themselves as part of team and to realise that to function efficiently, they must not only depend on but also plan along with other departments.

Flexible working and exchange of staff between departments, when needed is actively encouraged. Company information is less restricted among employees. This has generally led to 'relaxation' within the companies. Companies with open corporate styles have noticed a reduction in company bureaucracy with the resultant increase in efficiency.

The recreation factor is perhaps the single most important entity in the development of an open corporate culture. Employees have worked within the same company and on the same site for upwards of 10 years without ever meeting. In some instances, shiftworking has meant that some employees that do identical jobs on the same equipment would be unable to compare notes. Companies that have recreational programmes or staff clubs have been able to foster a certain openness among all employees, senior or junior. In-built barriers or suspicions created at work have been known to disappear when employees have the opportunity to get together in a social context.

The change agents associated with an open corporate culture are:

- Communication (Ref. case studies 4,7,11,16,17,19 and figs 6.9, 6.10, 6.12, 6.21, 6.23 & 6.25)
- Organisational structure (Ref. case studies 11,15,16,19 and figs 6.10, 6.14, 6.15, 6.16, 6.23 & 6.25)
- Recreation (Ref. case studies 5,6,11)

7.5 Modification of Change Agents

The change agents identified in the previous section generally appear to differ from those mentioned in Chapter 2 (i.e. motivation, reward, environment, organisational structure and organisational policy and values). While some - reward and organisational structure - remained unchanged, others do not. In general the study

seemed to have identified more change agents than the literature review did but the author strongly believes that both sets of change agents are related.

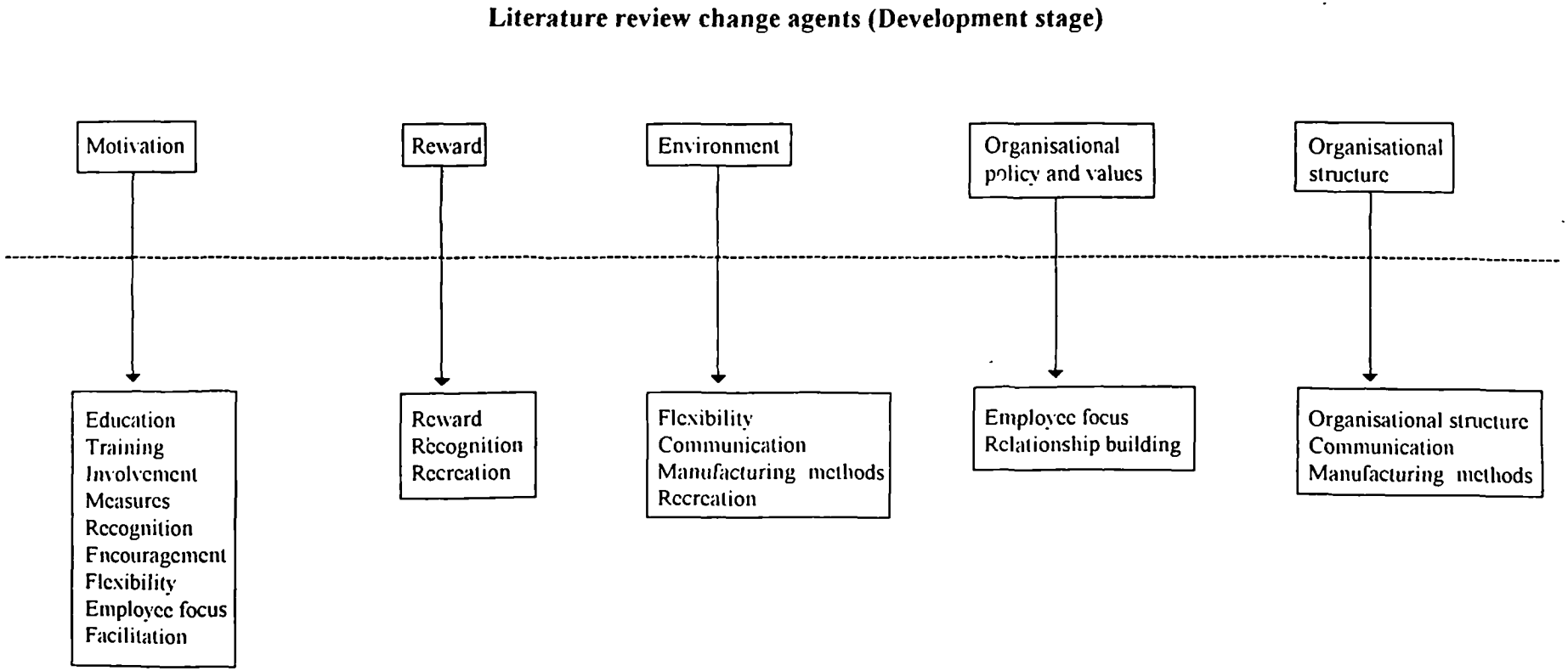
The 'new' (or specific) change agents can be viewed as aspects of the 'old' (or generic) change agents. What the research has achieved is the 'customization' or modification of the generic change agents into a form that is specifically relevant to quality culture. For example, the literature survey showed that motivation was important to culture change but was not specific on the mode of motivation suitable for culture change. On the other hand, the study identified education, training, involvement, encouragement, recognition, and so on to be vital change agents but these are all ways of motivating people and could be considered as aspects of motivation most relevant to culture change. The relationship between the generic and the specific change agents is shown in Figure 7.1.

Some of the specific change agents are associated with more than one of the generic change agents - e.g. flexibility can be viewed as related to either environment (fostering closer contact between employees) or motivation. The unaltered change agents are also linked with some newer ones - e.g manufacturing methods and communication are linked with organisational structure.

7.6 Summary

The change agents for the quality culture elements as identified from the survey have been presented and discussed. They differ mainly from change agents identified from literature in being more specific and being primarily associated with the quality culture elements as opposed to culture in general. Some change agents (e.g. education, training, recognition, communication) are common to more than one quality culture element.

Fig 7.1 Variation in change agents



CHAPTER 8 - THE OBJECTIVE-AGENT-TASK (OAT) QUALITY CULTURE FRAMEWORK

8.1 Introduction

This chapter presents the detailed quality culture framework which has been designed based upon the findings from the research survey. This serves as both a fulfilment of the research objective and as a method for presenting the findings in an easy-to-understand and easy-to-apply format.

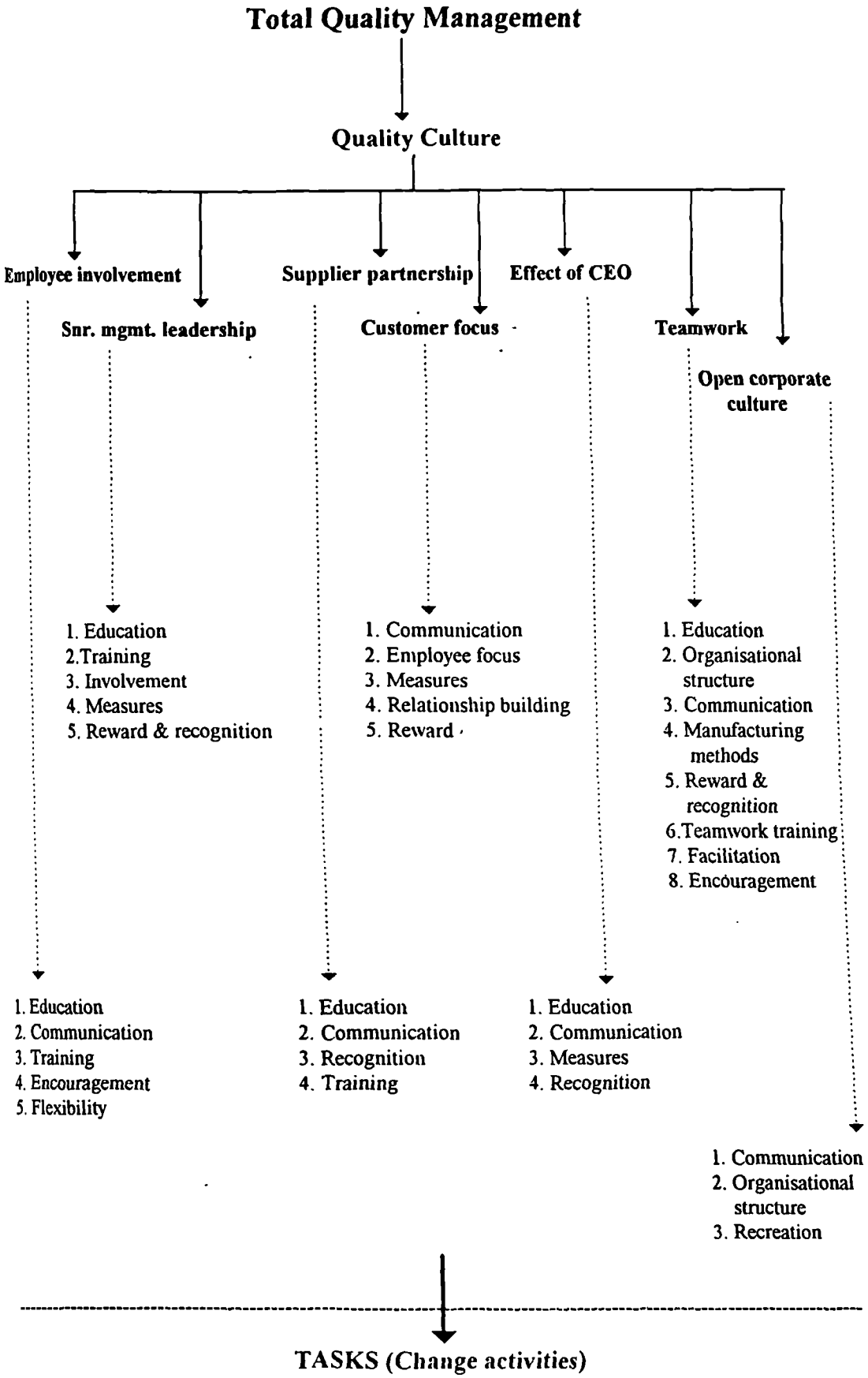
A background to the framework is given and the framework is presented objective-by-objective. Each aspect of the framework is also illustrated with a relevant diagram.

8.2 Background to the Framework

The Objective-Agent-Task (OAT) is a three-tiered framework that links quality culture with change agents and day-to-day activities. The aim is to provide guidance and a new perspective into quality culture development. An overall diagram for the framework is depicted in fig 8.1. The component diagrams for each of the elements are shown in detail in subsequent sections. The three levels of the framework can be summarised as:

- Objective - these are the elements required to attain a quality culture;
- Agent - these are the culture change agents identified in the preceding chapter. They facilitate change and are present in all companies that have had a successful culture transformation;
- Task - these are suggested activities that engineer change.

Fig 8.1 Overall diagram of OAT framework and its relation to TQM



The 'Task' is a suggestion of various basic level activities which have been recorded throughout the research. As a result of their widespread nature and the varying circumstances of different organisations, not all the activities would be relevant to each company. It is however not advisable that interested parties opt for minimal use of the activities. In many cases, the apparent difference between success and failure has been the number of 'tasks' per 'agent' used. More successful companies simply carry out more activities than their less successful counterparts.

For most part of the framework, a concise but explanative statement on each activity is given. The possible effects of using these activities, as discovered from the survey are also presented. Objective 5 (Teamwork) is divided into two - one aspect dealing with companywide teamwork and integration as a whole and the other dealing with the development of target orientated groups.

The objectives in the framework are the same as the quality culture elements identified from the literature survey. On the other hand, the agents and the tasks have been identified from both the questionnaire survey and the structured interview. For each of these, the relevant reference is given. Where the same task has been identified in both the questionnaire survey and the structured interview, more than one reference is given.

8.3 Objective 1 - Senior Management Leadership

Fig 8.2 shows the basic structure for this objective. The components are explained as follows:

8.3.1 Education

The implementation of quality requires changes in the management attitude. Often, managers view such changes with suspicion and in some cases, can be uncooperative. Before embarking on a TQM journey, the management need to be educated and re-

assured that the new practises will be of benefit to them. Suggested ways in which this may be done are:

Quality meetings (fig 6.12) - All managers should be invited to quality meetings where the quality drive of the company and the reasons will be explained. By so doing, there is a greater likelihood that they will feel involved right from the start. Objections may also be stated first-hand and dealt with quickly and effectively.

Company visits (fig 6.12) - Managers should be encouraged to visit other companies that had successfully implemented TQM and the associated culture change. Improvements in these companies may convince the managers that the quality effort does work and is not a 'textbook' technique.

Feedback of information (fig 6.6; fig 5.24) - As matter of routine, progress made with TQ implementation should be regularly fed back to managers. This has the tendency of not only being a motivator but eliminates any feelings of marginalisation.

Quality policy (fig 6.11) - All managers must be aware of the company's quality policy. They must also be constantly reminded that quality is the responsibility of all managers and departments and not just the 'Quality' department.

8.3.2 Training

To assist the managers cope with the new changes, it is important that they undergo some form of training. Educating on the importance and benefits of TQM does not adequately define what their role in the new scheme will be. Training will help eliminate the widely asked question, 'What are we expected to do?'. Training may be carried out by the following methods:

Training courses (fig 6.11; fig 5.24) - Formal training courses provide a direct means of teaching new management techniques to the managers

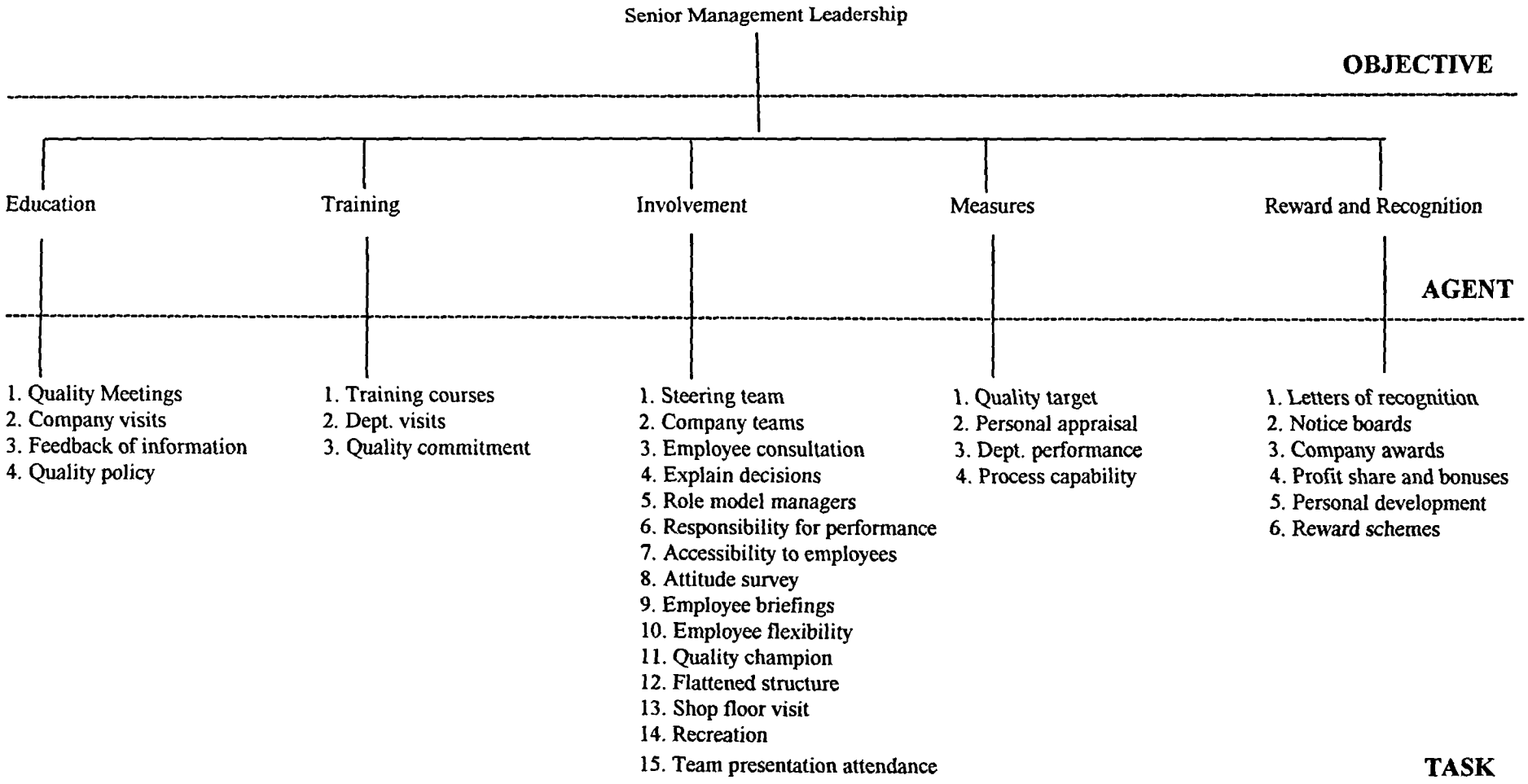


Fig 8.2 OAT structure for Objective 1 (Senior Management Leadership)

Departmental visits (fig 6.10) - A common complaint is that many managers are parochial and are only concerned about their own departments and core functions. Encouraging managers to visit other departments, deputise for absent colleagues or carry out management re-shuffling will increase the appreciation of the work done by other departments and the impact it might have on the manager's core department or vice-versa.

Quality commitment (fig 6.7; 5.24) - Managers should be reminded constantly that quality is a way of work and should not be viewed as separate from their day to day functions.

8.3.3 Involvement

Involvement of managers is the goal of the other change agents. Involvement is the interface where managers meet with other people within the organisation and where their actions are likely to make an impact and could make them become motivators for others. Suggested actions to improve involvement are as follows:

Steering team (fig 6.12; fig 5.24) - Senior managers should make up the steering team to direct the overall TQM drive of the company. They must constantly be in touch with changes in the organisation.

Company teams (fig 6.12; fig 5.24) - Managers should be members of company teams along with their sub-ordinates. They must not necessarily be the team leaders.

Employee consultation (fig 6.5) - Managers should be encouraged to consult employees in the decision making process. This is not only because employee involvement is increased but because any decisions are likely to affect the employees. Furthermore, since most of the work is done on the shop floor, the major problems and sometimes solutions can only be uncovered by effective consultation at that level.

Explain decisions (fig 6.12; fig 5.24) - Managers should explain their decisions and the reasons for choosing that line of action.

Role model managers (fig 6.12) - Managers should be seen to be leading and not merely directing. Their attitude to quality improvement is likely to inform the attitudes of their sub-ordinates.

Responsibility for performance (fig 6.22; fig 5.22) - Managers should readily accept ultimate responsibility for the performance of their departments. Successes and shortcomings alike should be viewed as a group function. This helps make the group work hard for each other and ultimately for the company.

Accessibility to employees (fig 6.12) - Managers should make themselves easily accessible to employees. This not only improves relationships with employees but encourages employees to confidently approach managers with problems and ideas for improvement.

Attitude survey (fig 5.24; fig 5.24) - The company may carry out a formal employee attitude survey at pre-determined times. This may help know where problems lie. Further managers should have a 'feel' for the attitudes of their sub-ordinates.

Employee briefings (fig 6.9) - Managers should hold frequent briefings (weekly or fortnightly) for their groups. These sessions are often effective means of feedback to both the managers and the employees.

Employee flexibility (case study 1; fig 5.24) - As much as possible, managers should give employees reasonable flexibility within which to carry out their functions and take their own decisions.

Quality Champion (fig 6.12; fig 5.24) - Aside from the steering committee, the company should have a quality champion. Ideally, such a person should be in the senior management ranks and should take quality improvement as more or less, a personal crusade. A quality champion should be an inspiration and motivator for the rest of the organisation including other managers.

Flattened structure (fig 6.12) - A flattened management structure has the tendency to improve managerial efficiency, eliminate bureaucracy and reduce conflict in the managerial cadre.

Shop floor visit (fig 6.12) - Senior managers should be encouraged to visit the shop floor daily. This not only motivates the shopfloor workers but also reduces the management/employee divide and gives the senior managers a feel of the organisation.

Recreation (case study 5; fig 5.24) - Managers should, where possible, seek to meet on an informal basis. This not only fosters the feeling of togetherness but also provides a different perspective for viewing work-related issues.

Team presentation attendance (case study 5) - Managers should attend presentations by company teams irrespective of whether the issues to be presented have any direct bearing on their departments. This not only acts as a source of inspiration to the teams but gives the managers an idea of quality progress and the possible directions the company may be heading for.

8.3.4 Measures

The use of measures is vital to TQM implementation. Various kinds of management measures ranging from the long-term TQ goal to individual measures. Measures that may be used are:

Quality target (case study 19) - Comprehensive targets should be set for the departments. The targets should not be exclusively based on volume of work but also on the quality of the output.

Personal appraisal (case study 18; fig 5.24) - Managers should be advised that their personal appraisal would not exclusively be based on personal performance but may include the ability of their departments to achieve or aspire towards set targets.

Departmental performance (case study 1) - The performance of the various department should be continuously benchmarked against set targets.

Process capability (case study 4) - Managers should be encouraged to regularly review the ability of the process and hardware to conform with the quality targets of the company.

8.3.5 Reward and Recognition

Recognition of the contributions of the managers should be viewed as important. This assures them that their efforts are not unnoticed and spurs them to greater achievements. Suggestions for rewarding and recognising managerial efforts are as follows:

Letters of recognition (fig 6.8) - These may be sent to the relevant persons.

Notice boards (fig 6.8) - Notices of outstanding contribution or performance may be put up on company notice boards.

Company awards (fig 6.8) - Small company awards may be given for successful completion of projects or as part of annual appraisal.

Profit share and bonuses (fig 6.8) - The company may chose to have a profit share or bonus scheme for its managers.

Personal development (fig 6.8) - Managers that continually excel should be assisted to develop personally. Such development may involve career enhancement or even acquisition of formal qualification.

Reward schemes (fig 6.8) - Where possible reward schemes such as paid holidays, sick pay and pension schemes should be instituted.

8.4 Objective 2 - Employee Involvement and Empowerment

The change agents and tasks associated with Employee Involvement and Empowerment are discussed below and shown in fig 8.3.

8.4.1 Education

Education is an important starting point for involving employees in the quality effort. Attempts to adapt employees to new working practices are more likely to fail if the employees have no prior knowledge of the organisation's ultimate aims. A common reason is that employees often equate new practices with job loses or increased workload. This tendency is even greater in companies that have active employee unions. Suggested ways of getting employees educated about the TQ effort are mentioned below.

Quality presentations (case study 5) - Employees should be encouraged and indeed allowed to attend company presentations on TQ implementation and its impacts.

Managerial briefs (fig 6.9) - Managers should continually stress the importance of the quality effort during their meetings with members of their respective departments.

Company policies (case study 7; fig 5.24) - Employees should be aware of the companies policies. This not exclusively imply 'Quality policy' but may include others such as Employee welfare, Customers and Suppliers. These policies may be included in a handbook or put up on company notice boards.

8.4.2 Training

The new role to be taken up by employees demands that they have some form of training to enable them adapt easily. It is worth pointing out that any training would benefit both the employee and the company. Suggested ways of training are as follows:

Multiskilling (case study 6; fig 5.24) - Employees should be encouraged to develop new range of skills. This may be done on-the-job or by attending training courses.
Formal qualifications (case study 4) - Employees with an aptitude and desire for furthering their education and gaining formal qualifications should be encouraged to do this. The company should allow them time to attend classes and where possible pay for or subsidise the cost of such study.
Process improvement (fig 6.6) - Employees should be trained to have a wide view of the company's process. Employees may find it difficult to participate in process improvement when they don't know the full process in the first place.
Company visits (case study 1) - Visits to companies that have achieved employee involvement and empowerment should be encouraged. Employees are usually quick to notice any improvements and advantages colleagues from other companies have. Such visits are likely to inject the employees with new ideas and an increased quality drive.

8.4.3 Encouragement

Employees need to be constantly encouraged to continue the quality drive and adapt to the new ways of working. Encouragement assures the employees that TQ implementation is an issue viewed seriously by the company. Ways of encouraging employees may include the following:

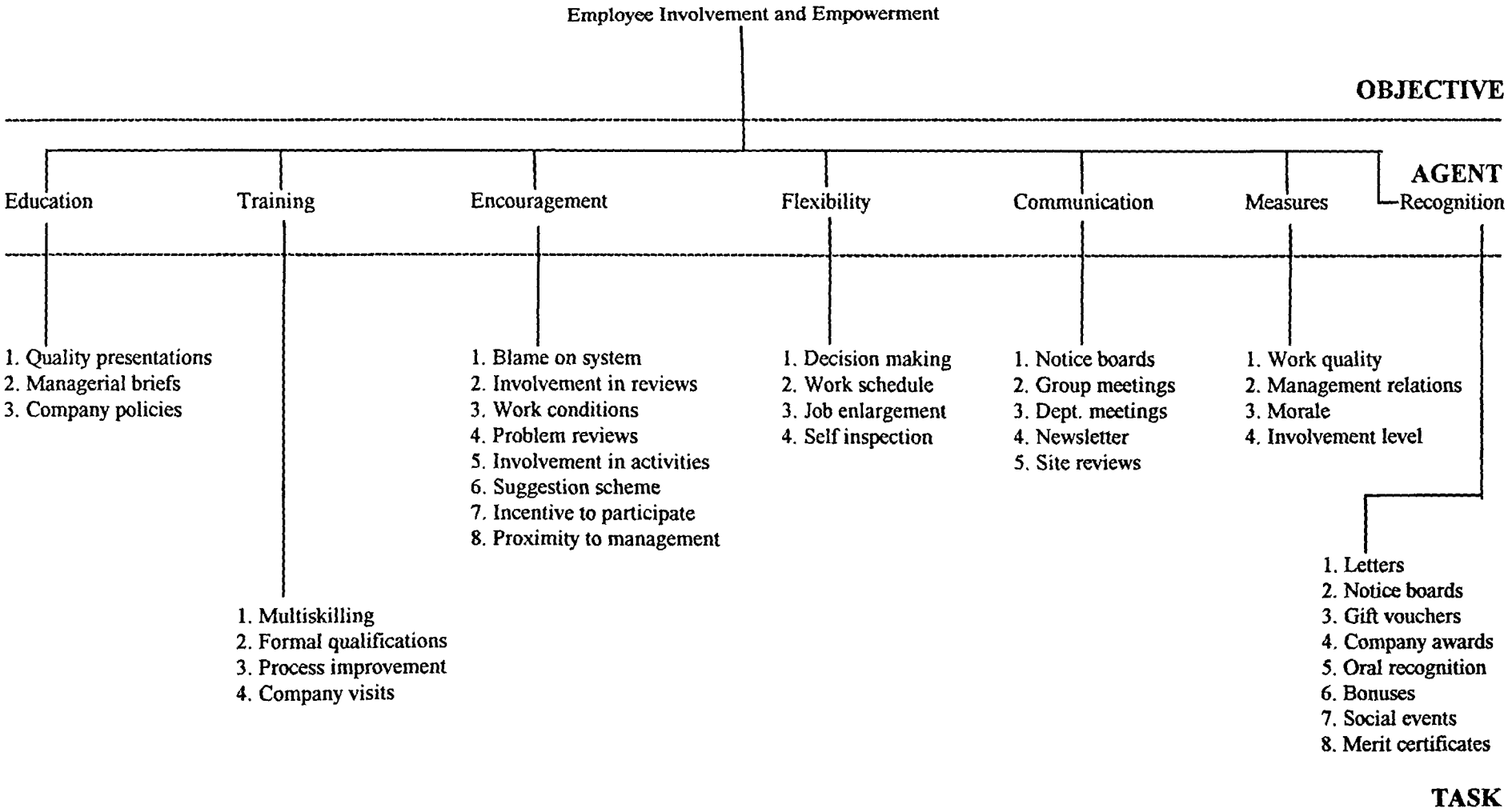


Fig 8.3 OAT structure for Objective 2 (Employee Involvement and Empowerment)

Blame on system (case study 8) - As much as possible, shortfalls should lead to an examination of the system and should not be used as an avenue for seeking scapegoats. The likelihood is that erring employees already feel bad that they let down the rest of the group.

Involvement in reviews (case study 11; fig 5.24) - Employees or their representatives should be involved in such activities as work review or wage review. This not only makes them feel like part of the company but improves their relationship with the management.

Work conditions (case study 13; fig 5.24) - The conditions under which employees carry out their functions should be regularly reviewed for possible improvements. In general employees like to have a feeling of being 'looked after'.

Problem reviews (case study 1; fig 5.24) - Employees should not be sidelined during review of problems that involve their functions. Since they carry out the work, the likelihood is that they will know more about the problem than anyone else.

Involvement in activities (case study 5; fig 5.24) - Employees should be encouraged to take part in company activities. such activities may include implementation of new ideas or team recommendations.

Suggestion scheme (case study 11) - A formal employee suggestion scheme should be introduced. Employees whose suggestions are rejected should be given full explanation. Having a 'Suggestion of the week/month' scheme is a suggested way of keeping the scheme self-generating.

Incentive to participate (case study 8; fig 5.24) - Employees may be given incentives for participating in company activities. Such incentives may include allocation of extra points during annual appraisal.

Proximity to management (fig 6.5) - Employees should perceive that they are close to management and can approach them easily.

8.4.4 Flexibility

The basis of training, involvement and empowerment is to allow employees play a greater role in the company's quality drive. This to some extent presumes that a certain amount of flexibility will be accorded the employees. The reasoning being that

employees knowing what is expected of them (education) and knowing how to achieve these goals (training) should be given reasonable allowance to carry on with their duties with minimal interference. It is generally noticed that empowered employees with set targets tend to perform better than employees with minimal flexibility and responsibilities. Suggested methods of promoting flexibility are as follows:

Decision making (case study 6; fig 5.24) - Within the scope of their duties, employees should be encouraged to make certain decisions.
Work schedule (case study 4; fig 5.24) - Where possible, employees should be encouraged to organise their work schedules. This is even more likely where such employees are involved in other activities such as teamwork, training courses or company visits.
Job enlargement (case study 8) - Employees who show a keenness to make use of a wide range of skills should be encouraged to do this.

Self inspection (case study 6; fig 5.24) - As much as possible, line inspectors should be discouraged and employees given responsibility for inspecting their own work. This is not only time effective but tends to induce higher personal standards on the employees.

8.4.5 Communication

If employees are to be more involved in the company's activities, there will be a need to pass on general company information to them. Such information should be wide-ranging and comprehensive. Presumably, the workers should at the least, be informed of performance targets, recent performance levels and market performance. Provision of such information is likely to encourage employees to strive for excellence or maintain achieved levels. Suggested ways of communicating with employees are:

Notice boards (fig 6.9) - Company notice boards should be placed in all departments and in general areas.

Group meetings (fig 6.9) - Information dissemination by addressing small groups of workers(e.g. shift group) should be encouraged.
Departmental meetings (fig 6.9) - General departmental meetings should be held at pre-specified intervals. This gives the added advantage of examining performance and targets as a larger function of the organisation.
Newsletter (fig 6.9) - Company newsletters or bulletins are often an effective way of passing information around the company.
Site review (fig 6.9) - A general company meeting should be held at pre-specified intervals. Ideally, such meetings should be attended by the CEO and senior managers. Smaller companies may find it easier to hold site reviews or may tend to meet more often than large companies.

8.4.6 Measures

To monitor the progress made with employee involvement and empowerment, it is necessary that some form measures are taken. These measures should be continuously benchmarked. Suggestions for measures to be taken are:

Work quality (case study 5; fig 5.24) - The performance of the employees should be monitored to discover the effect of involving and empowering the employees.
Management relations (fig 6.5) - The relationship between employees and management should be constantly monitored. This will generally give an indication of how the new work practices have settled into the organisation.
Morale (fig 6.5) - Where possible, employee morale should be monitored as this may give an indication of the acceptance of the new practices.
Involvement level (fig 6.5; fig 5.24) - The readiness of employees to be more involved in company activities may be monitored. Various parameters including suggestions, reported problems etc. may be used.

8.4.7 Recognition

Recognition of the contributions made by employees is vital to assuring them that their efforts are appreciated and are in line with the general direction of the organisation's goals. In general recognition is often favoured over reward as there is the danger of employees getting used to the idea of being rewarded for doing jobs for which they are already being paid. Suggested ways of promoting recognition are:

Letters (fig 6.8) - Personal letters of commendation may be sent to relevant employees
Notice boards (fig 6.8) - Notices of achievement may be put up on company notice boards. These tend to be major boosts for the employees involved as well as sources of inspiration to others.
Gift vouchers (fig 6.8) - These may be given in recognition of exceptional contribution.
Company awards (fig 6.8) - Annual company awards may be given to outstanding employees
Oral recognition (fig 6.8) - Employees may be personally commended by their managers.
Bonuses (fig 6.8) - Bonuses tend to be more of reward than recognition but may be encouraged if suitable for the company.
Social events (fig 6.8) - Outstanding employees may also be recognised socially by such methods as company sponsored meals or a meal with the senior managers or CEO.
Merit certificates (case study 5) - Certificates of merit may be given to deserving employees.

8.5 Objective 3 - Customer Focus

The change agents and tasks associated with Customer focus are discussed below and shown in fig 8.4.

8.5.1 Communication

Communication is an important factor in ensuring a focus on customers. The communication should involve both the internal and external aspects of the organisation's activities. Suggested ways of developing communication are as discussed as follows:

Employee training (fig 6.36; fig 5.24) - Employee training should involve methods of effectively communicating with customers.

Business process review (fig 6.36) - The company's business process should be constantly reviewed to improve ways of internal communication.

Visit customers (fig 6.29) - Communication with customers may be maintained by visiting the customers.

Encourage customer visits (fig 6.29) - As much as possible, customers and potential customers should be invited to visit the company site. This gives them first-hand knowledge of the company's operations and could generate instant feedback.

Joint design (fig 6.29) - For customers with special specifications, a joint company/supplier design team may be set-up. This ensures that both companies understand what is expected.

Encourage complaints (fig 6.32) - A majority of unsatisfied customers do not complain. This attitude should be discouraged. Ways of encouraging complaints include setting up of a complaint line, sending complaint forms with products, follow-up phone calls or complaint surveys.

Customer needs (fig 6.28) - Various methods of understanding customer needs should be developed.

Company structure (fig 6.25; fig 5.24) - As much as possible, the company structure should allow for easy communication with customers. This could involve having single points of contact or appointment of project officers.

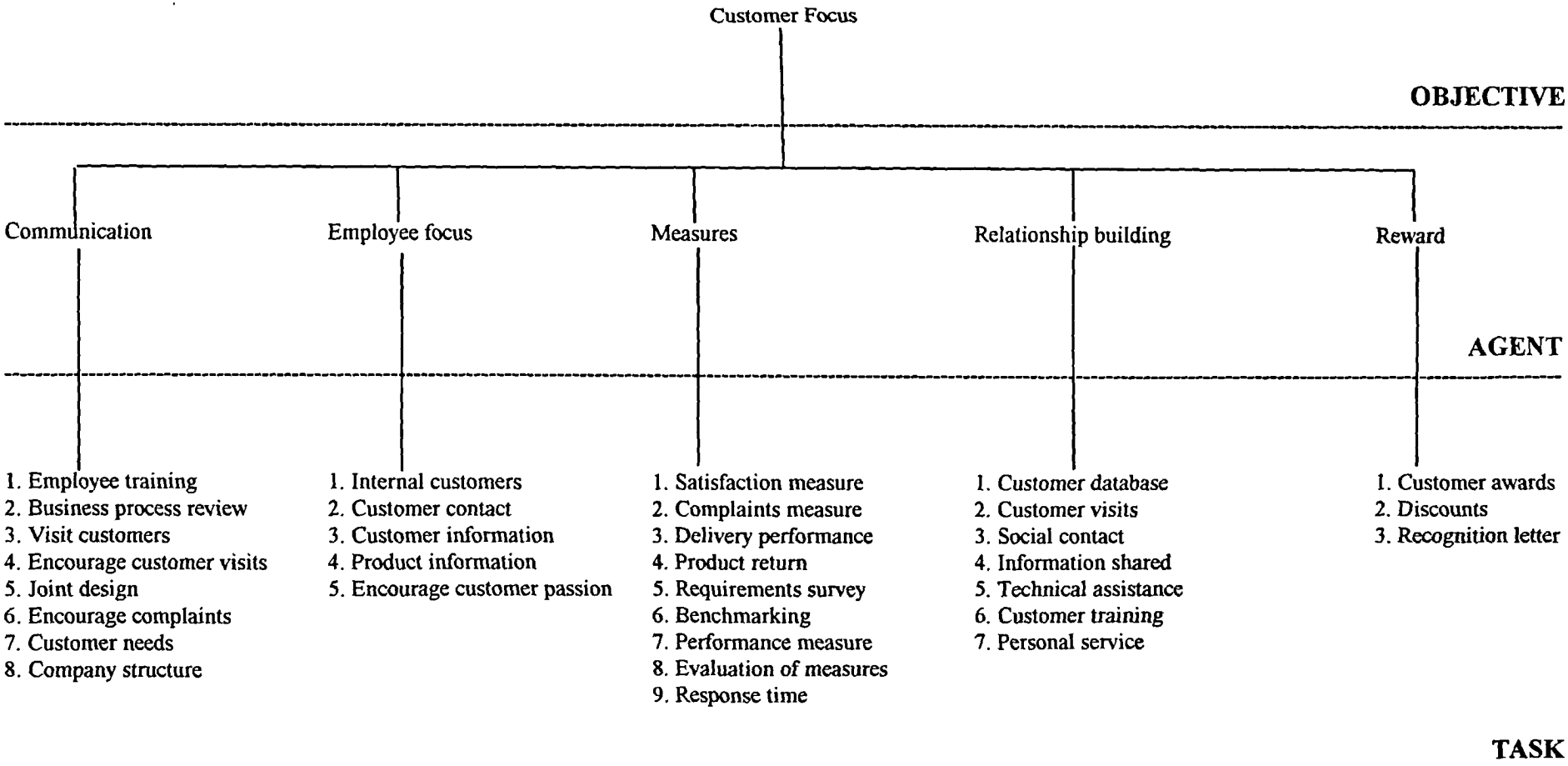


Fig 8.4 OAT structure for Objective 3 (Customer Focus)

8.5.2 Employee focus

It is important that all employees within the organisation are focused on the customer. Traditional preferences whereby only customer service personnel are encouraged to have customers in mind should be discouraged. Every stage of a company's operations should have the customer in focus. Suggested methods for achieving this are:

Internal customers (fig 6.33; fig 5.24) - All employees should be aware of the internal customer concept. This can further be practicalised by encouraging interdepartmental visits or by having internal supplier/customer dialogue exercises.

Customer contact (fig 6.33) - Direct contact between all employees and the customers should be encouraged. Sending shopfloor workers on company visits or assigning visiting customers to operators are two popular ways of achieving such contact.

Customer information (fig 6.33) - In cases where direct contact cannot be fully achieved, employees should be given as much information about the customer as possible. Such schemes as 'Customer of the week/month' may be introduced. Having employees know who the customers are and what they do is likely to inform them that their performance does have a lot of bearing on other peoples fortunes.

Product information (case study 1) - Employees should also be informed about the uses of the company's products and the implications of its failure to meet the desired standards.

Encourage customer passion (fig 6.33; fig 5.24) - Employees should be constantly reminded that they have jobs only because customers exist hence the need to keep customers satisfied. Every employee should know that his or her function has an impact on the customers.

8.5.3 Measures

Measures are probably more important in Customer focus than in any of the other objectives. A vital way of judging overall success and having a feel of the market is to have and make use of customer-related measures. Markets can sometimes be so

dynamic that companies without a comprehensive system of measures will have lost considerable market share before realising there is a problem. Some measures that may be used are now presented:

Satisfaction measure (fig 6.26; fig 5.24) - The satisfaction level of customers may be measured by surveys and visits.
Complaints measure (fig 6.26; fig 5.22) - The level of complaints from customers should be monitored and used as a basis, via such tools as Pareto analysis, for corrective action and continuous improvement.
Delivery performance (fig 6.25; fig 5.24) - The company's delivery performance should be measured and utilised in such areas as process improvement and warehousing.
Product return (fig 6.27) - Product return should be measured and satisfactory feedback should be given to the customers involved.
Requirements survey (fig 6.29; fig 5.24) - Comprehensive survey methods for evaluating customer requirement should be developed.
Benchmarking (fig 6.29) - The company's performance should be regularly benchmarked against itself and against other companies.
Performance measures (case study 5; fig 5.24) - The company's business performance should be measured continuously.
Evaluation of measures (case study 6; fig 5.22) - Any measures recorded by the company should be checked for improvements on a regular basis. as much as possible, the measures should also be used in corrective actions or improvement plans.
Response time (case study 1) - Where applicable, the company should have a structured format for responding to customer enquiries.

8.5.4 Relationship building

It is generally agreed that it is easier and more cost effective to keep old customers than to make new ones. Many successful companies attribute a large percentage of their income to specific customers. Hence the need for relationship building with

customers irrespective of their volume of business. Suggested methods for relationship building are as follows:

Customer database (fig 6.25; fig 5.24) - A database of all the company's customers may be kept. Monitoring of this may inform the company of a pattern in customer behaviour e.g. reduced orders, seasonal orders, etc.
Customer visits (fig 6.36) - In many cases, regular customer visits tend to develop into personal contacts which allow for easier relationship building.
Social contact (fig 6.31; fig 5.24) - Where permissible, some form of social contact should be kept with customers.
Information shared (fig 6.31) - As much as possible, reasonable amounts of technical or market information may be shared with customers. This may result in the development of a win-win situation and customer loyalty.
Technical assistance (case study 8; fig 5.24) - Companies with enough resources may give different forms of technical assistance to customers e.g. product optimisation, process improvement, stock maintenance, etc.
Customer training (case study 1; fig 5.24) - Training may be extended to customer personnel. This is even more desirable when customers are required to have an idea of the company's processes.
Personal service (case study 15) - In applicable situations, some form of personal service should be accorded to customers.

8.5.5 Reward

Rewarding and recognising customers is a way of maintaining their business. In many cases, this factor has played an important role in deciding where customers purchase goods of identical quality from. Suggested ways of rewarding customers are:

Customer awards (case study 19) - Annual awards may be given to good customers.
Discounts (case study 19) - Discounts on large orders or regular purchase may be given.

Recognition letter (case study 1) - Letters of recognition of customer loyalty and pledge of continuous service may be sent to customers.

8.6 Objective 4 - Supplier Partnership

Change agents and tasks associated with Supplier partnership are discussed in this section and shown in fig 8.5.

8.6.1 Education

When implementing TQ, it is necessary to let suppliers know of the new effort and the role they will be required to play. They will also need to be aware of the new specifications that may be required. Tasks that may be linked with supplier education are as follows:

Policy awareness (fig 5.24) - Supplier policies should be drafted and all suppliers should be aware of these policies.
Meetings (fig 5.24) - Meetings with suppliers should be arranged to allow specification of requirements and feedback.
Information dissemination (fig 5.22) - Any information that could help supplier performance must be passed to the relevant suppliers.

8.6.2 Communication

It is necessary to maintain close contact with suppliers. This would increase the likelihood of frictionless operations. Communication should be at more that one

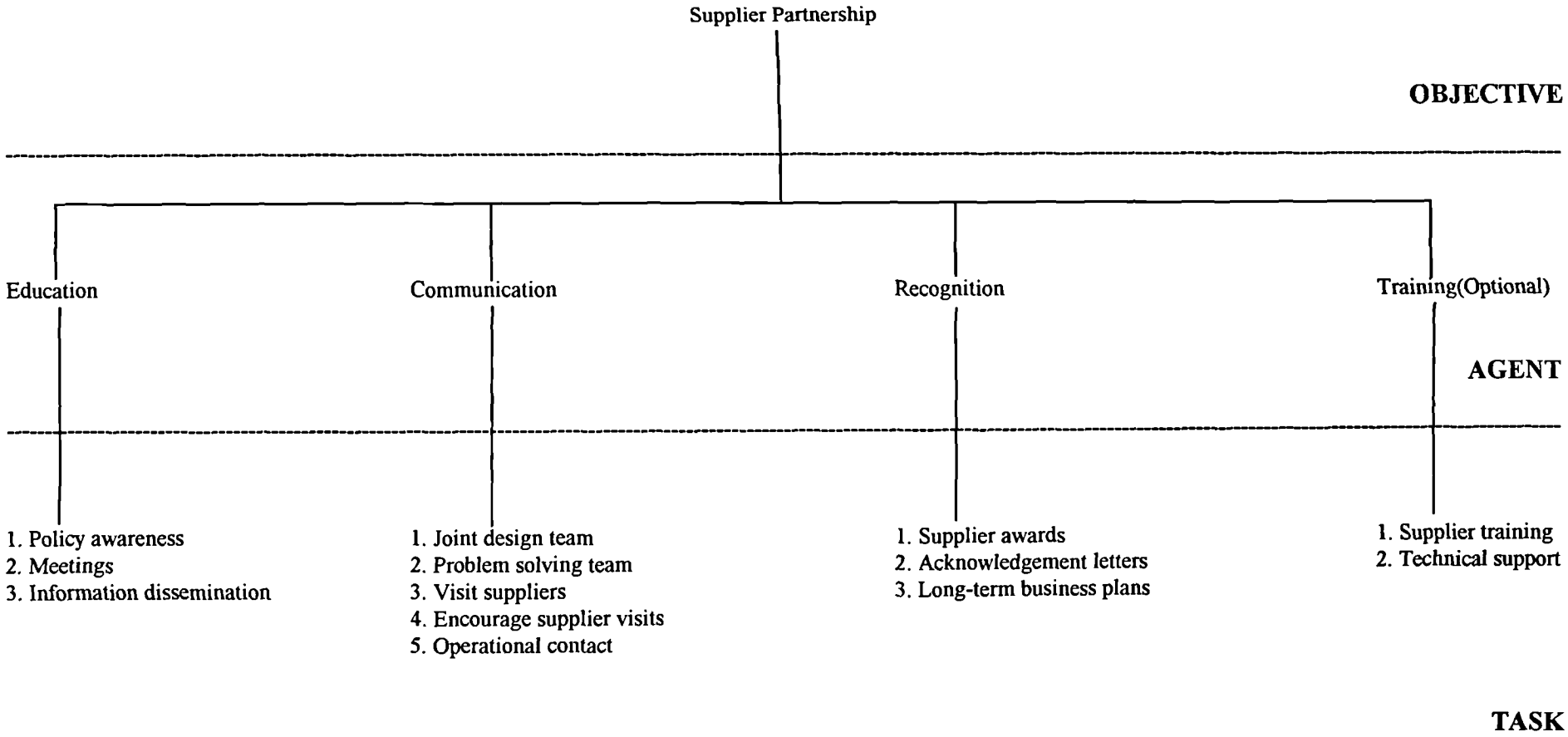


Fig 8.5 OAT structure for Objective 4 (Supplier Partnership)

interface or at a single level. It may also be necessary to occasionally evaluate the level of communication with suppliers. Suggested ways of improving supplier communication are now discussed.

Joint design team (fig 5.24) - A joint design team with the suppliers may be appointed especially when a new product is to be introduced or when changes need to be made to outstanding specifications.
Problem solving team (fig 5.24) - A joint team may also be appointed to seek reasons and propose solutions for technical shortcomings or operational difficulties.
Visit suppliers (fig 6.29; fig 5.24) - Supplier sites should be visited as part of the company's supplier routine. This may be for the purposes of an audit, facility inspection, etc.
Encourage supplier visits (fig 6.29; fig 5.24) - Suppliers may be encouraged to visit the company. This may involve process familiarisation, increased contact, etc.
Operational contact (fig 5.22) - The company and its suppliers need to have effective operational contact. Having appointed supplier/customer officers may help reduce incidence of late orders, wrong orders, duplicated orders, etc.

8.6.3 Recognition

To improve partnership with suppliers, the old notion of 'business only' and 'cost adversaries' needs to be discouraged. Suppliers often receive a boost when their efforts or performance is acknowledged. Supplier recognition may be promoted by the following activities:

Supplier awards (case study 7) - Company awards for outstanding performance by suppliers may be given. This has the tendency to not only boost supplier ego but sets standards which suppliers will generally strive to maintain.
Acknowledgement letters (case study 7) - Letters of acknowledgement after meeting difficult deadlines or specifications are generally welcome by suppliers.
Long-term business plans (case study 1) - Commendable performance by suppliers may lead to development of long-term business plans. Single sourcing is increasingly

being adopted. Suppliers are likely to welcome the steady business and further improve their commitment to the company.

8.6.4 *Training (Optional)*

Steady relationships with suppliers may further be strengthened by carrying out some form of training for suppliers. This is more likely if the company is bigger and has more resources than the supplier who may be experiencing some form of difficulty. Suggested ways of providing assistance to suppliers are as follows:

Supplier training (case study 1) - Large companies with in-house training facilities may invite supplier's employees to attend workshops that may assist the supplier improve their performance.
Technical support (case study 7) - Suppliers facing technical problems with their processes or products may be given some technical support where available.

8.7 Objective 5 - Teamwork

This objective is divided into two - one involves general teamwork in the organisation as a whole while the other involves the use of specific company teams. The change agents and tasks associated with these objectives are now discussed and are shown in figs 8.6 and 8.7.

A - Teamwork (General)

8.7.1 Education

It is important that all employees are aware of the need to have an organisationwide teamwork culture. They must understand that the total team approach must be adopted in the company's day-to-day operations. Every member of the organisation irrespective

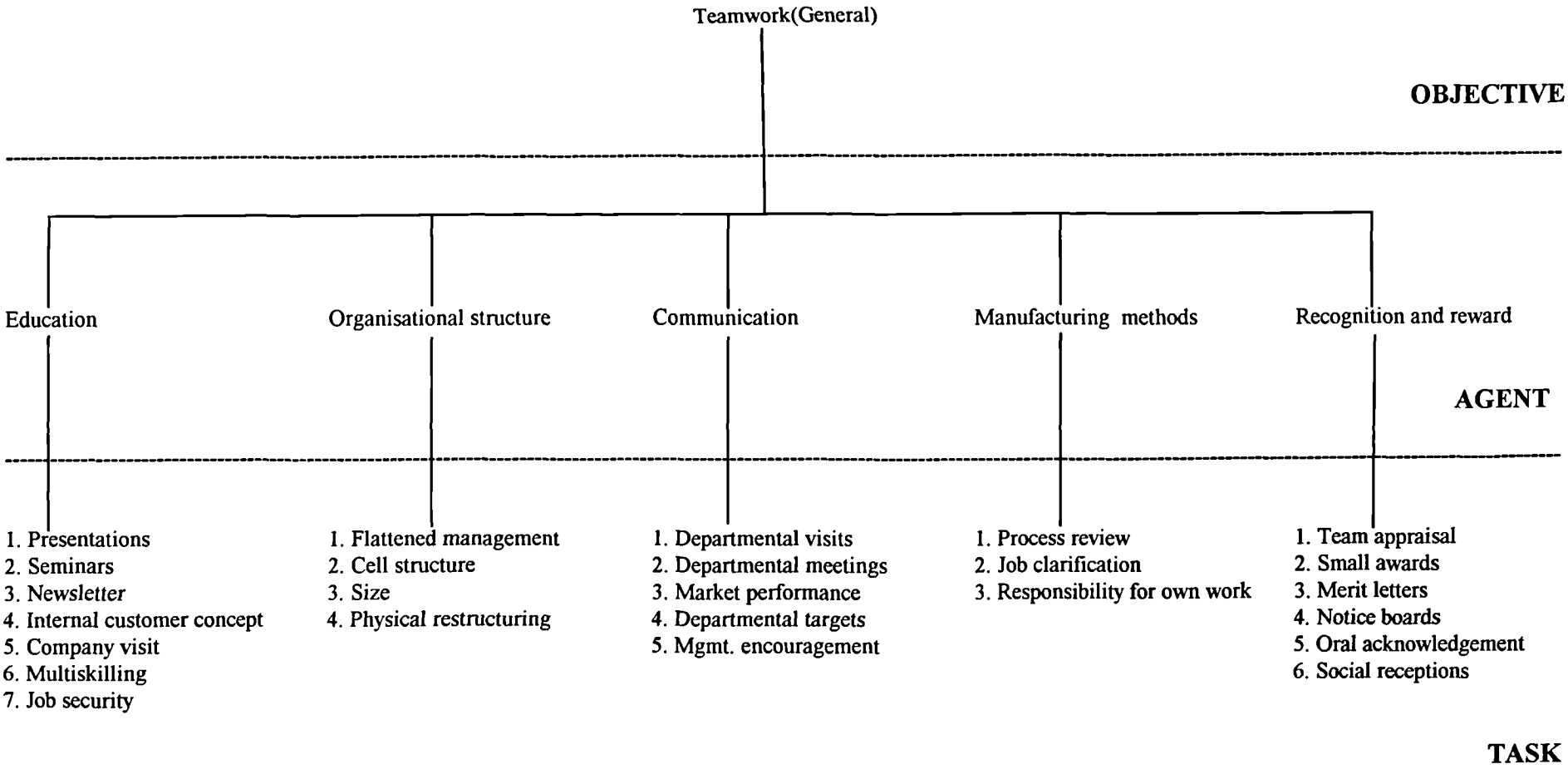


Fig 8.6 OAT structure for Objective 5a(Teamwork - General)

of function or hierarchy must see themselves as members of one large team. It should be clear that the employees, the company and the customer stand to benefit more from a frictionless organisation. Suggested ways of promoting education are:

Presentations (case study 5) - All employees should attend presentations on organisational integration and teamwork.
Seminars (case study 8) - Employees and managers who are expected to be teamwork motivators may attend seminars designed to assist them in their task.
Newsletter (case study 11) - Company newsletters and magazines should continually remind the employees of the need to work as a team.
Internal customer concept (case study 5; fig 5.24) - The internal customer concept should be included in employee training as this is likely to foster teamwork.
Company visit (case study 1) - Employees may be encouraged to visit companies that have successfully achieved companywide teamwork.
Multiskilling (fig 6.16; fig 5.24) - The possession of multiple skills by employees increases their flexibility and should be encouraged where possible.
Job security (case study 18) - It is important that employees are assured of job security as it reduces suspicion of the new work practices.

8.7.2 Organisational structure

To assist companywide teamwork, it would be helpful if the company has a structure that naturally complements teamwork. This has traditionally been difficult in many organisations. The effect of organisational structure on teamwork is a function of both hierarchical and physical issues. Issues that may be considered are:

Flat management (fig 6.16; fig 5.24) - A flat management structure reduces the likelihood of bureaucracy, multiple reporting relationships and ensures that management is closer to the shopfloor.
Cell structure (fig 6.16; fig 5.24) - A cell structure whereby employees work in small functional groups is likely to promote continuity especially in larger organisations with many employees.

Size (fig 6.14)- Smaller companies generally have a tendency to work better as a team.
Physical structuring (case study 11; fig 5.24) - As much as possible a company's physical structure should facilitate interdepartmental integration. The practice of separating managers from the shopfloor should also be discouraged as this has generally played a significant part in promoting a 'them and us' attitude.

8.7.3 Communication

Departments must be encouraged to communicate on an ongoing basis. They must realise that traditional attitudes of suspicion, secretiveness and blame peddling provide problems rather than solutions. The functional advantages of liaising with other departments must be known to all. Suggested ways of assisting communication within organisations are:

Departmental visits (case study 5) - Employees must be urged to visit other departments in order to both appreciate their function and familiarise with other employees. This form of established contact does make functional communication needed when required.
Departmental meetings (case study 5) - Formal interdepartmental meetings should be regularly held to examine ways of improving integration and teamwork.
Market performance (case study 1) - The company's market performance should be regularly communicated to employees. They should be made to realise that their ability to work in unison does make an impact on the fortunes of the company and consequently the continuity of their jobs.
Departmental targets (case study 1; fig 5.24) - Where possible departmental targets should reflect a need to work closely together with other functions of the organisation.
Management encouragement (case study 8; fig 5.24) - Managers must not only encourage their sub-ordinates to work together but must lead by example.

8.7.4 Manufacturing methods

As much as possible, a company's manufacturing methods must be designed to encourage organisational teamwork. While methods will differ considerably from market to market and from company to company, some issues that may generally assist teamwork are:

Process review (case study 5; fig 5.24) - The companies manufacturing processes and layout must be continually reviewed for improvements or adaptation to new products or machinery.

Job clarification (fig 6.16; fig 5.24) - Responsibilities of different groups and individuals must be clearly specified. 'Grey areas' should be avoided as much as possible as this has sometimes led to a neglect of vital functions or delays in production.

Responsibility for own work (case study 6; fig 5.24) - Employees should accept responsibility for their own work and be made to realise that every time they perform below expectation, they are not only likely to cause discontinuity in the process but will also let down their customer.

8.7.5 Recognition and reward

Promoting team-based recognition and reward can help in the development of teamwork within the company. The recognition may be for small teams such as functional groups or cells or may be for larger groups such as departments or divisions. Suggested ways of achieving team-based reward and recognition are as follows:

Team appraisal (case study 7) - The performance of the team may have an impact on the appraisal of individual employees. Employees must be aware of the limited advantage of outstanding personal performance when the final output from the group is less than commendable.

Small awards (case study 5) - Small awards may be given to line teams or functional groups that have outstanding performance.

Merit letters (case study 5) - Letters of acknowledgement may be sent to the individuals or departments involved.

Notice boards (case study 1) - Commendable performance achieved by functional teams or departments may be displayed on company notice boards.

Oral acknowledgement (case study 7) - Recognition may also be orally given at managerial briefings and departmental or site meetings.

Social receptions (case study 5) - Social receptions(e.g. meals, social evenings) may be sponsored by the company in recognition of performance by line teams.

B - Teamwork (Specific)

8.7.6 Education

The formation of specific teams within an organisation needs to be preceded by some form of education on the need for and the advantages of teams. There is also need to inform that formation of teams is not a managerial privilege but is indeed an activity that should involve everyone. Employees must be aware that by forming teams to solve problems or seek improvements, they are in the main, seeking ways of improving their own functions through personal contributions. Suggested ways of educating on teamwork are as follows:

Departmental briefings (case study 1) - These should serve as a basis for promoting and launching teams.

Company newsletter (case study 11) - These should constantly remind employees of the need for teams. They may also serve as sources of information as to which teams are being formed and need for members. They may also give information as to the members of running teams and the function of such teams.

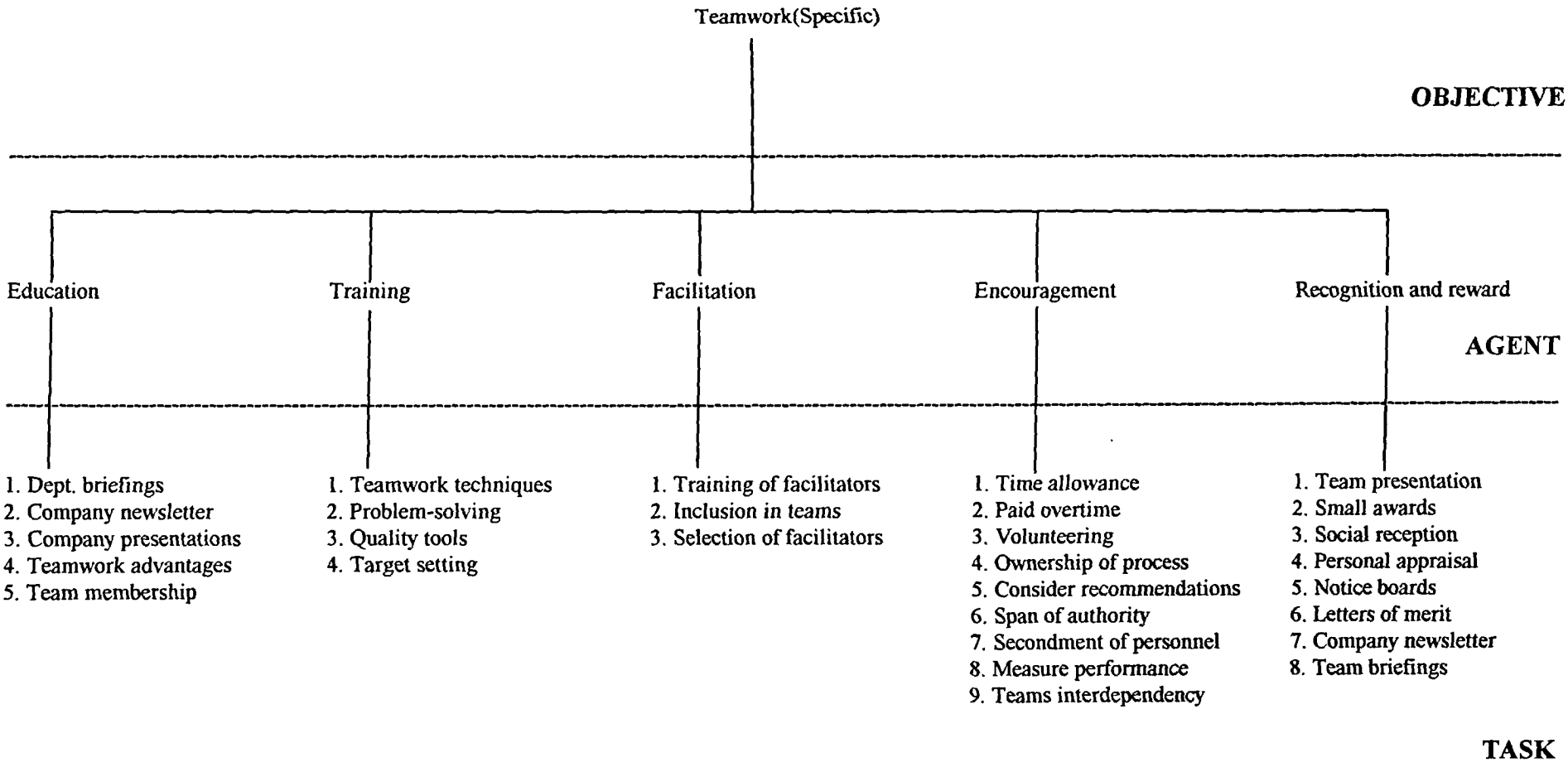


Fig 8.7 OAT structure for Objective 5b (Teamwork - specific)

Company presentations (case study 11) - Company presentations may also be used as avenues of promoting the formation of teams.

Teamwork advantages (fig 6.23) - Advantages of working in teams must be continually sounded throughout the organisation.

Team membership (case study 15; fig 5.24) - As much as possible, membership of teams should be open to all within the organisation. Employees must also be aware of the need to balance teams by considering such factors as personality profiling and knowledge of problem.

8.7.7 Training

Training is extremely vital to the success of teams. Generally, companies that have trained their employees in the technicalities of teamwork have had more fruitful results from their teams while companies without teamwork training have not generally been able to develop considerably at teamwork. Suggested ways of promoting teamwork training are:

Teamwork techniques (fig 6.20; fig 5.24) - Training should include techniques for working in teams - finding time, sharing responsibility, choosing team leaders, recording progress, making recommendations, etc.

Problem solving (fig 6.20; fig 5.24) - Employees should be trained in the use of problem solving techniques such as cause-and-effect diagrams, pareto analysis, FMEA,etc.

Quality tools (fig 6.20; fig 5.24) - Training should involve knowledge of quality improvement tools such as SPC, QFD, Taguchi methods, etc.

Target setting (fig 6.23; fig 5.24) - Teamwork training should involve the setting of targets for teams and how to benchmark the results with original targets. This is an important way of judging the effectiveness of teams.

8.7.8 Facilitation

Facilitation should be provided for company teams. Many successful organisations have cited team facilitation as an important factor in the development of effective teams. Suggested ways of promoting team facilitation are now presented:

Training of facilitators (case study 6; fig 5.24) - Team facilitator training should be part of the company's training schedule. This would inform team facilitators of the role they are expected to play and equip them technically to go about their assignments.
Inclusion in teams (case study 6; fig 5.24) - The inclusion of a facilitator in every company team should be encouraged.
Selection of facilitators (case study 6; fig 5.24) - Larger companies with many teams may opt to have full-time team facilitators. Other companies may chose candidates for training based on personality profiling.

8.7.8 Encouragement

In many companies, attempts at teamwork fizzle out after an initial period of success. A common reason for this is a lack of encouragement until a period when teamwork is seen as norm and becomes spontaneous and self-generating. A wide variety of factors usually account for this lack of encouragement. Suggested ways of promoting encouragement for formation and success of teams are discussed as follows:

Time allowance (case study 11) - Team members should be given time during official hours to attend team meetings or carry out team functions.
Paid overtime (case study 7) - If employees are required to perform team-related functions outside official hours, they should be adequately compensated for their efforts.
Volunteering (case study 15; fig 5.24) - As much as possible, team membership should be open to volunteers. Many companies have noticed that team members are more enthusiastic when working on problems in which they are interested.

Ownership of process (fig 6.18) - Employees should be reminded that by forming teams, they are taking ownership of the process.

Consider recommendations (fig 6.23; fig 5.24) - In general, the disregard of team recommendations has been uninspiring to team members and sometimes gives the impression that their efforts were wasted. Team recommendations should be carefully considered and where rejection is inevitable, team members must still be commended and full explanations should be given.

Span of authority (fig 6.17) - As much as possible, teams should be given reasonable authority to make changes. They must also be empowered to elicit required information from different parts of the organisation.

Secondment of personnel (case study 7) - In some instances, expertise required by a team may fall outside the personal capabilities of the team members. All steps should be taken to ensure that the team receives the technical opinion it requires.

Measure performance (fig 6.17) - Methods of measuring team performance should be developed within organisations. This is likely to increase team desire to succeed.

Teams interdependency (case study 6) - In companies that run multiple teams, it may be advisable to have some link between teams. This is likely to prevent teams working against each other or arriving at conflicting solutions.

8.7.10 Recognition and reward

The adoption of recognition and reward is both an indication of acknowledgement of beneficial teamwork and a form of motivation to other employees and teams. Some form of recognition should always be given even when team solutions fail to measure up to expected standards as even companies that have achieved high levels of teamwork occasionally have teams that are not very successful. Recognition is a powerful message that informs the team members that their efforts are appreciated and that their participation in more teams is desired. Suggested ways of promoting recognition and reward are now discussed:

Team presentation (case study 5) - Teams should be encouraged to make a formal presentation of their work. Such presentations should be held regularly depending on

the number of teams within the organisations. Senior managers and the CEO should endeavour to attend such presentations.

Small awards (case study 5) - Completion of successful projects may be rewarded with small company awards.

Social reception (case study 5) - Successful quality teams may be sponsored on social outings. Company teams may also be given entertainment allowances for use during team meetings.

Personal appraisal (fig 6.18; fig 5.24) - Involvement in company teamwork may also be included as a factor in annual personal appraisal.

Notice boards (case study 5) - Group photographs of team members along with a summary of the team particulars may be put-up on company notice boards.

Letters of merit (case study 5) - These may be sent to employees that have successfully participated in teamwork.

Company newsletter (case study 5) - Names of team members and a summary of the team particulars may be included in the company newsletter or in-house magazine. These may also serve as channels for informing other employees of the outcome of teamwork.

Team briefings (case study 5) - Oral acknowledgement may also be given at team briefings or debriefings.

8.8 Objective 6 - CEO Effect

The change agents and tasks associated with the effect of the Chief Executive Officer are discussed in this section and are shown in fig 8.8.

8.8.1 Education

A common complaint about CEO's is that they are only interested in short-term measures that will be recoverable almost immediately. This implies a need educate the CEO's of the benefits of TQM. Some ways of achieving CEO education are now suggested.

TQM effort (case study 15) - CEO's should be aware that a quality drive is on-going and its implementation and continuation should not be a subject of company politics. It is also noteworthy that some aspects of TQM, especially quality tools or techniques often result in almost instant returns.

Quality seminar (case study 7) - CEO's should make every effort to attend quality seminars. They are likely to be in a better position to lead when they themselves have a reasonable idea of what TQM is about and what is required from them.

Long-term goals - CEO's should be aware that TQM implementation, while providing its most significant results in the long term, does not particularly have a negative result on short-term market performance. Implementation of TQM should be seen as a drive to introduce new and desirable ways of working.

Resource commitment (case study 6) - CEO's must be aware that considerable human and material resources may be required to get the quality drive in motion.

8.8.2 Communication

CEO's must ensure that they do not lose contact with the quality effort. They must always be aware of the progress and plans. While they may not manage quality on a day-to-day basis, continuous insistence on quality by the CEO sends a powerful message to the rest of the organisation. Suggested ways of keeping in touch are as follows:

Quality at management meetings (case study 15; fig 5.24) - CEO's should insist that quality must feature at all important meetings. These meetings should serve as a means of keeping up-to-date with quality progress and for discussing proposed plans.

Open management style (case study 8; fig 5.24) - CEO's must not give the impression that they are unapproachable and view themselves as separate from the rest of the organisation.

Shop floor visits (case study 8; fig 5.22) - As often as possible, CEO's must visit the shopfloor and possibly talk with the operators. This not only acts as a motivator to the rest of the company but informs them that quality improvement is not being paid lip service. Furthermore, they can view the TQM effort first-hand.

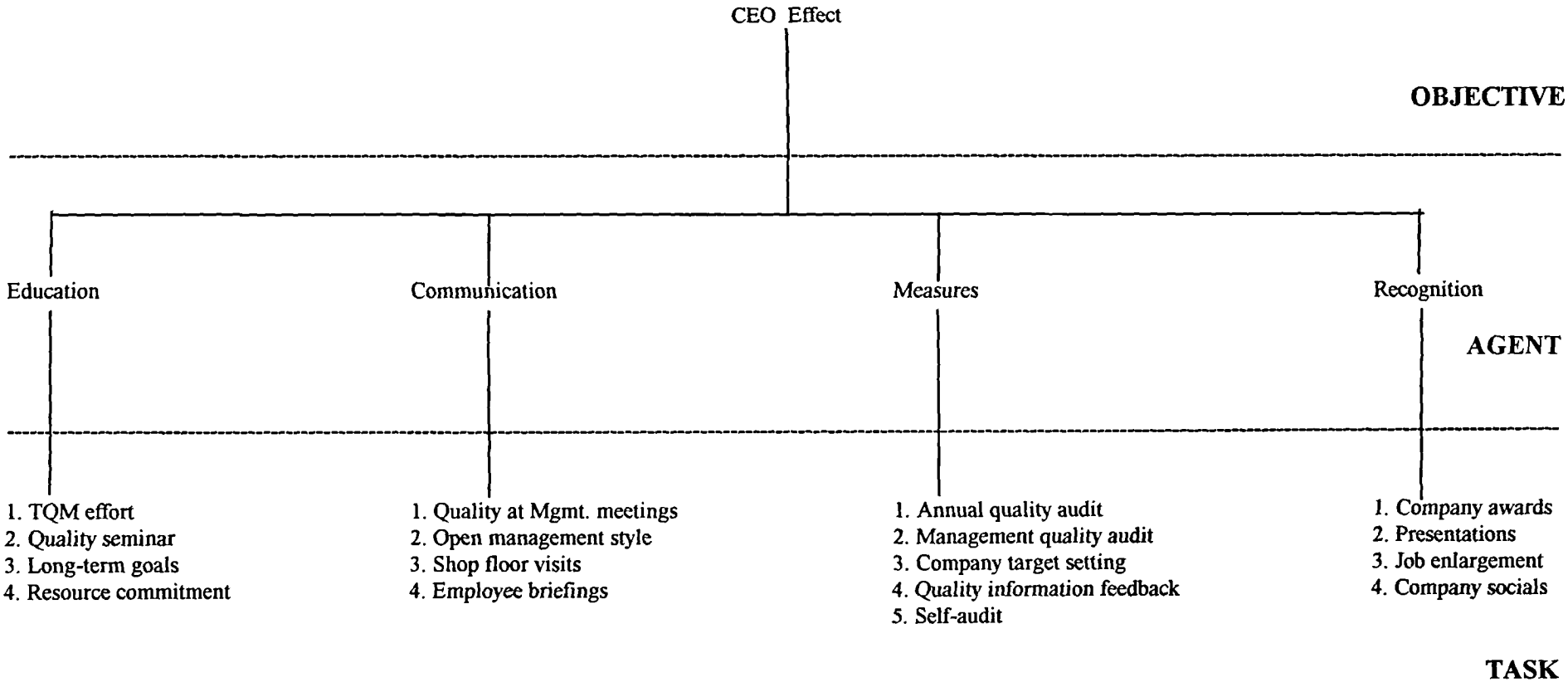


Fig 8.8 OAT structure for Objective 6 (CEO Effect)

Employee briefings (case study 4; fig 5.22) - CEO's must be present at site briefings and should endeavour to talk to the employees as well as answer their enquiries.

8.8.3 Measures

CEO's should develop their own individual measures of the progress and benefits of TQM implementation. Many CEO's are simply complacent with launching and supporting the quality efforts without taking continuous personal interest in the result of the effort. Suggested ways of keeping up with measures are now discussed.

Annual quality audit (case study 1) - CEO's may hold an independent quality audit on an annual basis. This should take into account the overall quality development of the organisation.

Management quality audit (case study 15) - CEO's should impress upon management that the quality of their functions will be taken into account in their personal appraisal.

Company target setting (case study 1) - CEO's should ensure that competitive quality targets are set for the company at regular pre-determined intervals.

Quality information feedback (case study 15; fig 5.24) - CEO's may set up some formal quality information structure. This may be in the form of requesting specified information(e.g. first-time pass rate, rework costs, reject goods, etc.) on a weekly/monthly basis.

Self-audit (case study 17) - CEO's must learn to examine their personal performance with respect to quality improvement. Developing a personal structure(e.g. visit shopfloor twice a week, attend team presentations once a month, etc.) may be of assistance.

8.8.4 Recognition

CEO's should support and indeed promote recognition of commendable performance by employees within the organisation. Most attempts at recognition may not be

successful without the support of the CEO. Suggested ways of achieving these are now presented.

Company awards (case study 5) - CEO's should support and endeavour to be present at award ceremonies. In larger companies with multiple recognition methods, the CEO may have a special "CEO award" for exceptional performance.
Presentations (case study 5) - CEO's should endeavour to attend presentations by teams. The fact that the CEO will be present in person is likely to be a morale booster for the employees concerned.
Job enlargement (case study 8) - Chief executives should encourage promising employees to achieve their full potential by making personal development options available to them.
Company socials (case study 5; fig 5.24) - CEO's should endeavour to attend company social events or may indeed host a social function for deserving employees.

8.9 Objective 7 - Open Corporate Culture

The change agents and tasks associated with achieving an open corporate culture are presented in this section and are shown in fig 8.9.

8.9.1 Communication

Communication throughout the organisation is vital. Such communication should be well defined both along managerial hierarchy and across the organisation. Poor communication has the tendency to cause operational inertia, inefficiency and conflict within the organisation. Suggested ways of improving company communication are as follows:

Well defined manager/employee relationship (case study 5; fig 5.24) - Lines of authority should be well defined and multiple reporting relationships should be avoided as this may lead to poor accountability and personality conflicts.

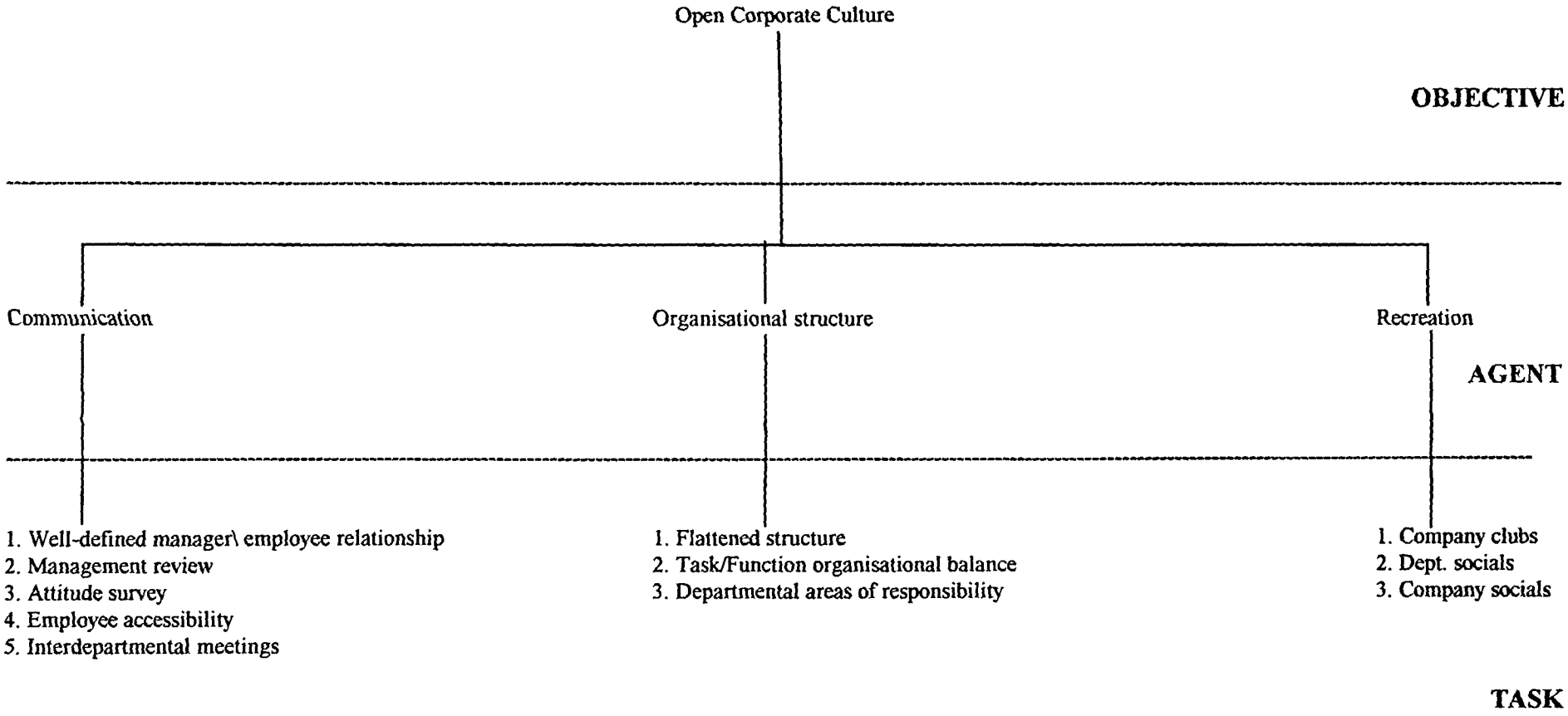


Fig 8.9 OAT structure for Objective 7 (Open Corporate Culture)

Management review (case study 5; fig 5.24) - Management should regularly review the communication channels within the organisation.

Attitude survey (case study 19; fig 5.24) - An attitude survey of employees should seek to establish their willingness to communicate freely with both managers and other colleagues across the organisation.

Employee accessibility (case study 6) - In the course of performing their functions, employees should be allowed to have access to people or information that may be of assistance to them.

Interdepartmental meetings (case study 5) - A structured approach may be adopted in respect of interdepartmental meetings especially between internal customer/supplier departments. Ways of improving communication should constantly be sought.

8.9.2 Organisational structure

A company's organisational structure should also support the development of an open corporate culture. Such a structure should be well defined and should also complement communication and the flow of processes within the company. Suggested tasks in this respect are as follows:

Flattened structure (case study 1; fig 5.24) - In many organisations, tall hierarchical structures are being eliminated in favour of flattened structures which tend to have some operational advantages.

Task/Function organisational balance (fig 6.35; fig 5.24) - With the growing popularity of such techniques as Business Process Re-engineering (B.P.R), many organisations are attempting to achieve a balance between a task-based organisation which focuses on processes and the traditional functional organisation which focuses on departmentalisation.

Departmental areas of responsibility (case study 5; fig 5.24) - Functions and areas of responsibility of the different departments should be clearly spelt out. Where interdepartmental co-operation is needed, a formal structure of operational processes may be developed.

8.9.3 Recreation

Where possible, the company should attempt to have some form of regular recreational concept. Often teamwork and togetherness in a non-formal environment translates into teamwork and efficiency in a formal environment. Recreation may be practised at different levels and in a variety of ways including the following:

Company clubs (case study 6; fig 5.24) - Employees with similar interests(e.g. chess, darts, football, etc.) may form a club and may even organise competitions with other companies or local clubs. Larger companies with resources may choose to build a company club house. Common rooms within the company site also promote recreation.

Departmental socials (case study 5; fig 5.24) - Employees in departments or within the same work group may decide to organise social functions occasionally. If the department has an entertainment budget, such functions may be subsidised.

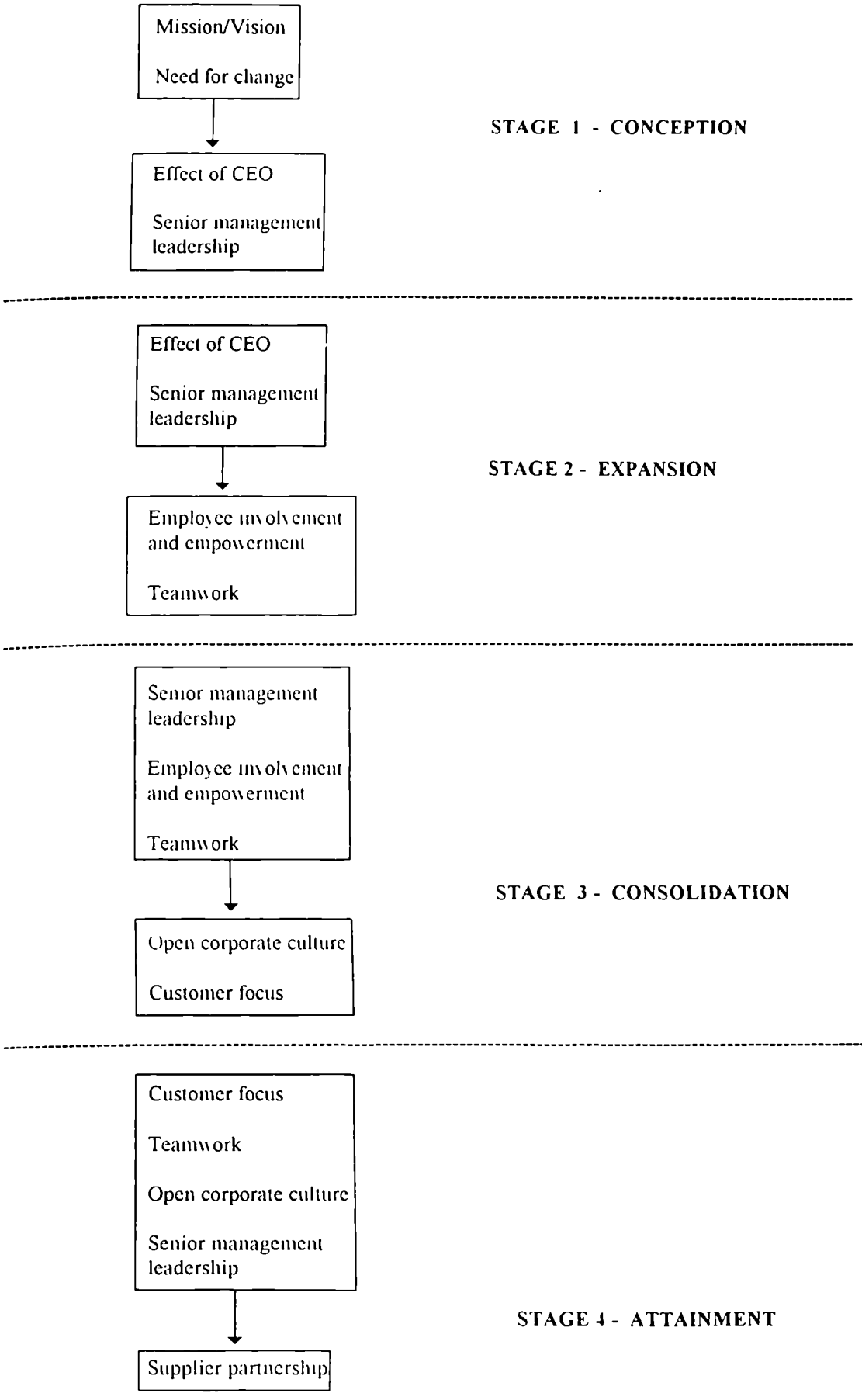
Company socials (case study 6; fig 5.24) - The company may also organise social functions for the employees and/or their families(e.g. end of year party, children's Easter party, etc.).

8.10 Developmental stages of the Quality Culture Elements

The quality culture elements represent the 'objective' in the OAT structure. While the relationships between them and the progression from one to the other is non-trivial and can differ considerably from company, the best practice companies have generally developed in four main stages (Figure 8.10).

The initial or 'conception' stage is the stage where the need for change or the determination of a company mission/vision leads to the triggering of the chief executive and senior management. Generally these two elements will be almost completely developed before moving to the next stage.

Fig 8.10 Relationship between quality culture elements



The second stage is the 'expansion' stage where the chief executive and the management attempt to spread the message to all employees. Success at this stage generally leads to more involvement of employees and the acceptance of the teamwork concept. This is perhaps the most difficult stage as a majority of the failed companies indicate that their major problems were encountered here.

'Consolidation' is the third stage. Having achieved some form of company-wide consensus, the companies now start breaking barriers in their corporate style and increasingly focus on the market and their customers. Thus the tendency is to get things 'right' within the organisation before focusing on the external aspects of the business.

The final stage is the 'attainment' stage where having generally noticed general improvement in internal efficiency, companies tend to seek further operational efficiency and possible cost cuts by seeking closer ties with their suppliers. Commonly, this stage represents the attainment of a quality culture.

It should be noted that the above is a general observation only. The approach to development and the aspect of quality culture focused on will depend greatly on the company and its ultimate goals. Some companies may find it more suitable to work on multiple objectives simultaneously as opposed to a step-by-step approach. Other companies may experience considerable problems with only certain aspects of culture and may decide to specifically address these areas.

8.10.1 Relative weightings of quality culture elements

There is a tendency to assume that some of the quality culture elements are more important than others and that some form of quantitative weighting guidelines should be given. This view is particularly favoured if the fact that organisations face greater problems in teamwork and customer focus is taken into consideration.

However, the transitional nature of culture development described in the previous section and the experiences of both successful and unsuccessful companies provides an alternative viewpoint. The relative weightings of the quality culture elements appear to be transitional rather than static. The implication of this is that at certain times during quality culture development, particular elements are all important. If these elements are developed at the relevant periods, they become less important at the next stage where another element assumes overwhelming importance. Inability to develop the important element at the appropriate period can lead to failure or stagnation of quality culture and the overall TQM effort. Attempts to develop other elements of quality culture before fully developing the pre-requisite elements is not likely to be successful. The elements form a 'chain of development' and weakness in any of the linkages is likely to affect the whole framework.

Failure to understand this concept of transitional weightings has led to failure in unsuccessful companies. The desire to combine TQ success with short-term business goals leads organisations to embark on some elements such as teamwork without first ensuring that their management structure would support teamworking or indeed ensuring that employees are involved enough and feel empowered to participate in teamworking. Not only does a weak linkage affect further development, it can have a backlash on past successes.

8.11 Factors excluded from the OAT framework

The questionnaire survey and the structured interviews provided detailed information on activities and factors which positively or negatively affect quality culture development. However, not all factors included in both surveys fit into the framework - some activities appear to have negligible or no impact on quality culture development. Broadly speaking, these activities do not fit a general pattern and appear to be random in nature. These activities include:

- size of customer base - although companies with a smaller customer base can potentially be closer to their customers, this did not indicate that they focused more on their customers than companies with larger customer bases;
- product complexity - the nature of the product does not appear to have any significant effect on the companywide teamwork. Companies that manufacture simple products are equally likely to fail or succeed in teamworking as are those that manufacture complex products;
- customer profile - customer type (i.e. industries, general public, sister companies, etc) does not affect the customer focus of the company although it creates different dynamics (e.g. ease of discussing needs, certification of product needs, sales policies, warehousing and delivery systems) for different companies;
- quality techniques - while techniques such as SPC, BPR, MRP, JIT, etc can help companies develop reliable systems, they seem to have negligible cultural effects. Some companies that were successful with culture change had not used some of these techniques while some failed companies had used them;
- equipment - although equipment with up-to-date technology can have an impact on employee work patterns, this factor in itself does not significantly motivate employees;
- nature of processes - simplicity or other attributes of the company's processes do not appear to have any significant cultural impact;
- cost - costs associated with teamworking do not appear to have any significant effect on the likelihood of the company to promote teamwork;
- range of products - companies that manufacture a few items are equally as likely to focus on their customers as companies that have a large range of products.

8.12 QUALITY CULTURE SELF-ASSESSMENT FOR THE OAT FRAMEWORK

Organisations would find the OAT structure useful in an effort to attain a quality culture. However, it will be somewhat necessary for them to know what aspect of quality culture they are weak at in order to determine what aspect of the framework to focus on. Thus, there is a need to make use of some form of quality culture

assessment. Such assessment would also enable the companies monitor their progress and know how they compare with other organisations. A document that would assist organisations achieve this is presented in this section. The questions in the self-assessment are based primarily on findings from the survey. The questions assess the extent to which the organisation has overcome problems associated with culture and developed major attitudes associated with the best-practice companies.

8.12.1 Culture Assessment

Questions are asked for each of the 'objectives' of the OAT framework. The organisation will rank the companies development out of a maximum score of 10. The total score for each of the 'objectives' can then be calculated to indicate the overall level of development. The questions for the assessment are tabulated below:

Table 8.1 Self-assessment for senior management leadership

No	Question (senior management leadership)	Score
1.	Managers adopt a participative rather than an authoritative management style.	
2.	Managers understand the need for quality improvement and the roles they are expected to play	
3.	Managers have been trained on leadership in a TQ environment	
4.	Employees have easy access to their managers	
5.	Managers participate actively in company teams at all levels	
6.	Managers encourage their sub-ordinates to take decisions at work	
7.	Managers are physically close to their employees and their basic functions	
8.	There are adequate rewards and incentives for managers to participate in quality programmes	
9.	Management includes quality improvement in long-term business plans	
10.	Managers generally consult employees in the decision-making process	
11.	Appraisal of managers takes quality performance into account	
12.	Managers are good role models for other employees	
	Total	

Table 8.2 Self-assessment for employee involvement and empowerment

No	Questions (employee involvement and empowerment)	Score
1.	All employees are aware of the need for quality improvement	
2.	Employees are aware they have a vital role to play in the quality drive	
3.	The company has a formal scheme enabling all employees to contribute their ideas/suggestions	
4.	There are good rewards and incentives for outstanding achievements by employees	
5.	The company actively encourages career development of all employees	

6.	Employees display a sense of belonging and commitment to the company	
7.	Employees have reasonable flexibility in the performance of their functions	
8.	Performance targets are regularly set for all functions	
9.	All employees are regularly informed of the company's operation and business performance	
10.	Employees are encouraged to participate in company activities	
11.	Employees have been properly trained in skills to enable them perform their functions creditably	
12.	Employees are generally pleased with their working conditions	
	Total	

Table 8.3 Self-assessment for customer focus

No	Questions (customer focus)	Score
1.	The company has been re-organised specifically to make it more responsive to customers	
2.	The company has established methods for continually evaluating the level of customer satisfaction	
3.	The company actively encourages dissatisfied customers to complain	
4.	All employees are encouraged to meet with customers and are regularly provided with general customer-related information	
5.	Communication and customer contact are regular even when direct sales are not involved	
6.	Manufacturing methods are constantly reviewed to improve product quality and process efficiency	
7.	The company actively employs a wide range of customer-related performance measures	
8.	The company has effective methods designed to accurately capture customer requirements	
9.	The company actively seeks to develop relationships (both commercial and social) with customers	
10.	The company recognises and rewards loyal customers	
11.	The company gives adequate training and technical assistance to intermediate and end customers where required	
12.	The company's products and service performance are constantly benchmarked against competitors and against customer expectations	
	Total	

Table 8.4 Self-assessment for supplier partnership

No	Questions (supplier partnership)	Score
1.	All suppliers are aware of the company's quality policy	
2.	Communications with suppliers is constant and there are established points of contact	
3.	Suppliers are encouraged to visit the company's facilities	
4.	Employees are encouraged to visit the supplier's facilities	
5.	The company gives or is ready to give technical assistance to established suppliers who require such assistance	
6.	Product quality plays a more important role than cost in choice of suppliers	
7.	Consistency and quality of service play a more important role than cost in choice of suppliers	
8.	The company prefers to discuss inconsistencies with suppliers instead of changing suppliers automatically	

9.	Suppliers are involved as early as possible in the company's business and design processes	
10.	The company recognises good and consistent service from suppliers	
	Total	

Table 8.5 Self-assessment for teamwork

No	Questions (teamwork)	Score
1.	The organisational structure allows for easy integration between employees and departments	
2.	Manufacturing methods encourage interdepartmental and intradepartmental co-operation	
3.	Employees are encouraged to volunteer for teamwork	
4.	As much as possible the company is split into work groups	
5.	The use of voluntary and deployed teams is strongly supported by management	
6.	All employees have been trained in teamwork methods and problem-solving tools	
7.	Facilitation is provided for every company team	
8.	All employees understand the concept of the internal customer and its importance	
9.	Teamwork is rewarded and the efforts of team members are recognised	
10.	Regular communication between departments is actively promoted	
11.	Outstanding performance by departments and functional workgroups is recognised	
12.	All employees understand the importance of teamwork and company-wide co-operation	
	Total	

Table 8.6 Self-assessment for CEO

No	Questions (effect of CEO)	Score
1.	The CEO shows total commitment to quality improvement	
2.	The CEO promotes a long-term quality objective	
3.	The CEO attends quality-related functions	
4.	The CEO has personal contact with all levels of employees in the organisation	
5.	The CEO sets overall quality targets for the company	
6.	The CEO closely monitors quality performance	
7.	The CEO actively supports recognition of outstanding achievement by employees	
	Total	

Table 8.7 Self-assessment for open corporate culture

No	Questions (open corporate culture)	Score
1.	The organisation is not bureaucratic by nature	
2.	Generally, there is good communication through all levels and across all functions in the organisation	
3.	The organisational structure is well defined and complements the quality effort	
4.	Operational and structural barriers within the organisation have been broken down	

5.	Employees are able to regularly get together in a social context	
	Total	

8.12.2 Benchmarking self-assessment

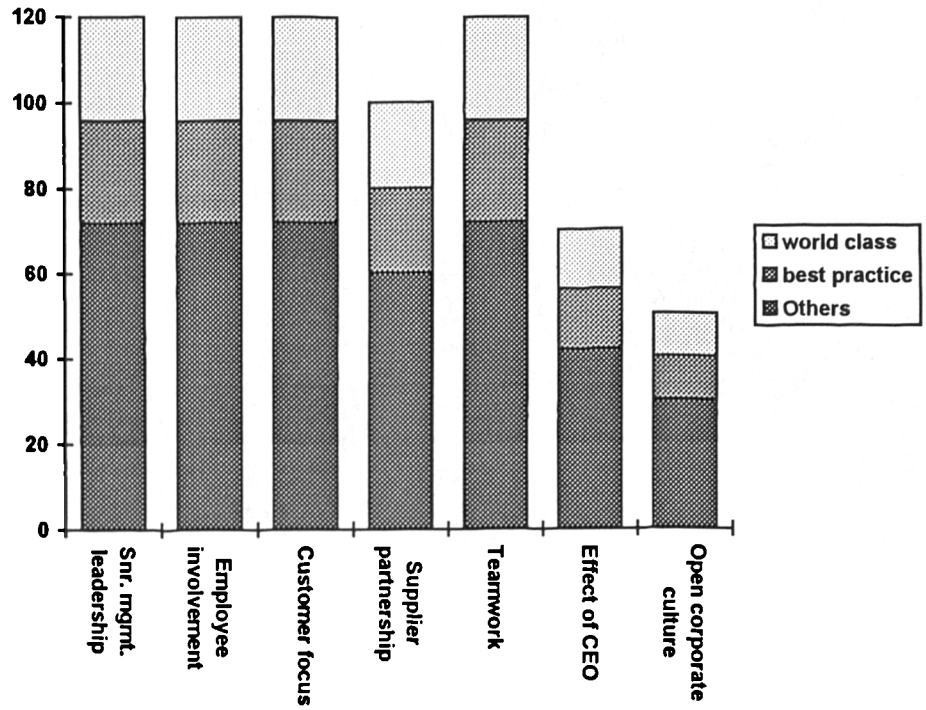
The score for each of the above elements will give the organisation concerned an idea of how well it has overcome its culture problems and the extent to which new attitudes have been ingrained in the organisation. Ultimately, all organisations should aspire to world-class performance. World-class organisations, by indications from the structured interviews, would score no less than 80% for each of the objectives. To achieve an average score of at least 8 out of 10 for each of the statements, in the assessment, the statement must be completely and actively true and totally applicable to all functions and members of the organisation relevant to the statement. 'Best-in-class' or best practice organisations would typically score at least 60% for each of the objectives. These should be the performances other organisations should benchmark against.

As with most self-assessment methods, there is always the possibility of assessor bias. This may be compensated for by having the scores verified by a third party outside the organisation. Such verification may be carried out on an annual or bi-annual basis while self-assessment itself may be carried out at much shorter intervals. The minimum scores to be achieved for world class are shown in the table and graph below:

Table 8.8 Benchmarking self-assessment against world-class performance and best practice

No	Objective	Min. score (best practice)	Min. score (world-class)
1.	Senior management leadership	72	96
2.	Employee involvement & empowerment	72	96
3.	Customer focus	72	96
4.	Supplier partnership	60	80
5.	Teamwork	72	96
6.	Effect of CEO	42	56
7.	Open corporate culture	30	40

Fig 8.11 Graph showing world-class benchmark



Based on their performance in the above assessment, organisations may consult the OAT framework to apply activities relevant to their shortcomings.

8.12.3 Applying self-assessment results to the OAT framework

The self assessment scores will enlighten organisations as to what their failings in quality culture development are and the extent to which they have failed. They will then be in a position to determine what elements to place emphasis on and how much emphasis should be placed on each. In planning their improvement strategy, the organisation should take into consideration the developmental stages of quality culture. They should ensure that the elements focused on at any particular stage are the appropriate ones for their level of development. Culture development should form part of the overall corporate strategy and should not be viewed as a short-term project.

At the objective-agent level, the organisation would determine which of the agents have been achieved or have been focused on. The number of activities used can provide an indication of this. For the agents at which the company is weak, the company must examine ways of strengthening their focus. Suggested activities at the 'task' level may be introduced. Alternatively, the organisation may develop their own ideas based on their past experiences. The important consideration is that the activity to be introduced should be relevant to the organisation and its strategies, people, market, etc and should have the potential to succeed.

This approach should be applied to all the change agents relevant to the particular objective. When the company has developed sufficiently at that stage, it may then move on to the next objective in its developmental strategy. Development may be confirmed by use of the relevant self-assessment questions. It may not be necessary for organisations to develop to world-class standard at one objective before moving on to a new one. What is necessary is that performance is above average. Shifting emphasis from one objective to the other does not expressly imply that development on the previous objective would stop or backslide. On the contrary, the former objective becomes instituted in the organisation and a minimum requirement of maintenance of attained performance is required to increase chances of success with the current objective. With the continuation of improvement activities, past development is more likely to approach world-class development than backslide.

To ensure that the whole effort is still or track, a comprehensive self-assessment should be carried out at regular intervals to be determined by level of development and other organisational characteristics. Companies with longer developmental journeys are likely to assess more frequently (possibly twice or thrice a year) to increase sensitivity while better developed companies may assess less frequently (possibly once a year).

8.13 Summary

The Objective- Agent-Task (OAT) framework proposes a mechanism for culture change. It links change agents (Agent) to quality culture (Objective) and suggests

change activities (Task) that can easily be applied to facilitate change. Not all suggested 'Tasks' need be implemented but the more they are adopted, the greater the likelihood of successful change.

The quality culture self-assessment framework complements the OAT framework by providing a means for determining the quality culture elements to be focused upon. It also allows for monitoring progress in all aspects of quality culture.

CHAPTER 9 CONCLUSION

9.1 Introduction

This chapter concludes the research thesis. It gives a general overview of the research starting with the need to research into quality culture. The research methodology is also reviewed. The OAT quality culture framework is briefly summarised. Limitations of the research and proposals for future research and extension of issues uncovered during the research are given. A brief overview of the research programme is also presented

9.2 The need for Quality Culture Research

The failure to achieve desired results after TQ implementation led to the emphasis on quality culture. The major reasoning was that new working procedures and techniques had been introduced without attempting to get employees develop a culture that complements the new practices. In response, quality practitioners identified elements of a working culture that should be present in companies that implement TQ. However, no significant attempt was made to advise on how to achieve this desired culture. This shortfall is often attributed to the non-technocratic or 'soft' nature of issues associated with culture. However, there still remained a need to identify the important agents that affect attitudes to work and these agents could be manipulated to bring about advancement in quality culture development. The research programme focused on this need.

9.3 Research Methodology

The research was carried out in the following stages:

- Literature Survey

The first stage of the research consisted of an extensive literature search to get an appreciation of TQM and to identify the issues involved with quality culture. The major aim was to identify areas of quality culture that needed to be implemented and the possible factors that could positively or negatively affect such implementation. Two distinct groups - quality culture elements and culture change agents - were identified. The quality culture elements were mainly identified from quality management literature and represent aspects of culture that organisations should aspire to. These are senior management leadership, employee involvement and empowerment, customer focus, supplier partnership, teamwork, effect of CEO and open corporate culture. The culture change agents were mainly identified from behavioural sciences and organisational design texts and represent factors which may affect culture development. These factors were grouped into five classes - motivation, reward, policy and values, environment and organisational structure. The identification of this issues formed the basis for the next stage of the research - the questionnaire survey.

- Postal Questionnaire Survey

The questionnaire survey was designed to elicit current information from a wide range of industrial organisations. In particular, the levels of quality culture development were investigated. A primary indication was that there seemed to be more problems in the areas of customer focus and teamwork. With customer focus, organisations were unable to achieve outstanding performance while with teamwork, there was difficulty in getting employees to work in teams. In addition, the questionnaire investigated various day-to-day activities carried out by the organisations in order to determine their relationship with quality culture. Many of

this activities were eventually included in the quality culture framework. Findings from the questionnaire also formed the basis for the development of the structured interviews.

- Structured Interview Programme

The structured interview programme was primarily designed to validate findings from the questionnaire survey. In addition new questions raised from analysis of the questionnaire findings were to be surveyed. The structured interviews would also enable discovery of new information by virtue of its hands-on and less restrictive nature. A major finding from the interviews was the association of culturally successful companies with the use of multiple change activities. The interviews also identified the important change agents and the activities associated with them. Different approaches to cultural development by the various organisations were also presented. Many of the findings from this programme played an important part in the appreciation of the state of quality culture and the development of the quality culture framework.

- The Quality Culture Framework

The information gathered from the previous three stages of the research formed the basis for the development of the Objective-Agent-Task (OAT) quality culture framework.

9.4 The Quality Culture Framework

The quality culture framework was designed in a three-tiered format known as the Objective-Agent-Task (OAT) framework. The objectives are the identified quality culture elements - Senior Management Leadership, Employee Involvement and Empowerment, Customer Focus, Supplier Partnership, Teamwork, Effect of CEO and Open Corporate Culture. The Agents are the culture change agents that facilitate the transition to a quality culture while the tasks are the basic level actions that will

engineer change. All-together, the framework provides a concise and easy to understand presentation of the findings from the research. It will be of interest to industry, quality practitioners and the academia.

9.5 Research Overview

The research has been a worthwhile and highly motivating learning experience. A fruitful insight has been gained into quality culture development, an aspect of TQM which is gaining more importance especially with the increasing adoption of TQM and such awards as the EQA and programmes like Investors In People (IIP).

The readiness of Industrial managers to co-operate with the researcher and their in-depth knowledge of the associated issues not only justifies the relevance of the research but also indicates a widespread interest to seek ways of improving work culture within industry.

In-as-much-as quality culture is seen as a 'soft' issue, the research experience has shown that culture does stand out in organisations. The substantial differences in culture development in the various companies visited testify to this view.

While the framework that has been developed cannot be described as final, it is hoped that it will present industry with new insights into solutions to culture problems as well as serve as a useful reference for continuous research into TQM in general and quality culture in particular.

In hindsight, it is worthwhile noting that certain assumptions have been made and certain views adopted which have strongly influenced the result of the research. The results may have differed if alternative views had been adopted and different questions. These views and assumptions are as follows:

1. Culture has been viewed primarily from a TQ perspective. Many organisational change practitioners view culture as being wider subject. They see the whole

organisation as being a culture or being made up of various sub-cultures [Kotter and Heskett, 1992]. Thus focusing on a TQ perspective implies that only a sub-sector of overall organisational culture has been addressed;

2. The quality culture model itself is somewhat simplistic as it identifies seven distinct aspects. It is fair to assume that in reality, there is a more complex relationship between the identified elements themselves as well as with other activities and systems within the organisation;
3. The study has assumed that culture is an object or 'thing' or part of a bigger 'thing'. Some theorists [Bate, 1994] disagree with this view and rather see culture as being synonymous with organisation or being a particular way of viewing and thinking about organisation. Thus while some theorists view culture as primarily being a mindset, others view it as being a structural or methodological issue;
4. Possibly as a result of the previous assumption, the perspective to culture development that has been adopted by the study is that organisational activities drive culture and the mindset rather than the other way round. Furthermore, some theorists [Williams et al, 1993] view the relationship between culture and activities as being a 'push-pull' affair;
5. Bate [1994] identifies four approaches to cultural change - aggressive, conciliative, corrosive and indoctrinative. In the author's opinion, the OAT framework is primarily conciliative in nature. Bate advocates that some aspects of other mindsets should be included in the total organisational change programme;
6. While many of the companies that have been surveyed are multinational organisations, the study primarily had a UK-oriented outlook at culture. Hofstede [1980] and Pheysey [1993] believed that national cultures impact upon organisational culture. Thus, from this perspective, the study and its results may be assumed to be more associated with UK culture.

9.6 Limitations and Suggestions for Future Research

A primary limitation of the study is that a snapshot view of the organisations has been taken rather than a dynamic view. One of the reasons for this has been the time constraints of the research.

With regards to the research methodology, many of the change agents in the OAT framework have come from the structured interview and consequently have only been examined in a limited number of organisations. Alternative approaches would have been to conduct the interviews first and then test the resulting issues in a wider range of organisations via postal questionnaires or to further carry out another questionnaire survey after the structured interviews.

The research programme and the resultant framework have been linked exclusively with the manufacturing industry. While a substantial amount of the findings will remain valid and relevant to the non-manufacturing or service industry, a more focused research on this subject area will be desirable.

Time constraints associated with the research has meant that the OAT framework cannot be applied and its effects documented. A quality culture is likely to take years to evolve. Future research could focus on the development of a time framework to complement the OAT framework as well as the continuous evaluation and revision of the activities that make up the framework.

As companies' requirements and business needs change, there will be need to modify or update the OAT framework to accommodate the changes. There may also be need to evaluate the relevance of parts of the framework to the particular company's needs.

Suggested areas for future research are:

- further development of the quality culture self-assessment framework;
- benchmarking developments from the OAT framework against other established frameworks such as the EQA model;
- adaptation of the OAT framework to non-manufacturing organisations, and;
- further investigation of the links between the OAT framework and the quality culture self-assessment framework.

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APPENDICES

Appendix A

Copy of the postal questionnaire and covering letter

THE UNIVERSITY
of LIVERPOOL

Department of Industrial Studies

Liverpool
L69 3BX

Telephone Direct:
0151 794
Undergraduate School: 0151 794 4900
Postgraduate School: 0151 794 4681
Facsimile: 0151 794 4695

10th November 1995

Dear Sir/Madam,

The University of Liverpool is currently conducting research into the cultural aspect of Total Quality Management. Our purpose is to learn more about how to help organisations such as yours to develop a culture that will complement Total Quality. You have been selected at random to participate in our industrial survey - thus your views will be used to represent many similar organisations.

Enclosed find a copy of our questionnaire. While it may require about 20 minutes to complete, we hope that you will take the time to complete it and return the questionnaire to us in the enclosed self-addressed envelope. The information you provide will contribute to an important study which will be of great significance to the U.K. manufacturing industry.

Your response will be treated with utmost confidentiality and no-one outside the research group will have access to your response. Further-more the statistical package to analyze your response has been designed to exclude your name and your company's name - thus your name will not be associated with your response.

We appreciate your willingness to help us in our research effort. If you would like a copy of our completed study, please indicate this on the last page of the questionnaire. We believe that you will find the questionnaire both interesting and provocative and look forward to receiving your reply.

If you encounter any problems or require some more information, please do not hesitate to contact me at the following address:

Dotun Adebanjo
Dept of Industrial studies,
University of Liverpool.
Liverpool L69 3BX
Tel: 0151-794-4776.

Thank you for your co-operation.

Yours sincerely,

B A Adebanjo

Dotun Adebanjo.

QUALITY CULTURE QUESTIONNAIRE

Please tick or circle the appropriate response or write in the space provided.Tick or circle more than one response where necessary.

Section A. Respondee Details.

1. Name:

2. Job title:

Section B. Company Profile.

3. Is the company U.K or non-U.K owned?
   (1) U.K owned .....
   (2) Non-U.K owned .....

4. Number of employees (approximately)?
   (1) 1-50
   (2) 51-5000
   (3) over 5000

5. What is your U.K market share for your major product (approximately)?
   (1) 0-3% (4) 21-30%
   (2) 4-10% (5) 31-40%
   (3) 11-20% (6) > 40%

6. Approximately what percentage of total sales by value is exported?
   (1) 0% (3) 6-20% (5) 51-80%
   (2) 1-5% (4) 21-50% (6) 81-100%

7. Are you currently implementing Total Quality Management (TQM)? Yes/No
   If yes:-
   For how long .....

   If no:-
   Do you currently have plans to implement it? Yes/No

Section C. Motivation.

This section assesses how the company motivates it's workers

8. Which of the following activities are peculiar to your company?

   (1) The chief executive displays a motivating personality Yes/No
   (2) There is a quality champion in top management ranks Yes/No
   (3) Management motivates by taking responsibility for their actions Yes/No

(4) Are quality problems blamed on systems rather than people Yes/No
(5) Performance targets demand constant improvement Yes/No
(6) Freedom of workers to individually schedule own work Yes/No
(7) Workers approach supervisors and managers easily Yes/No
(8) Workers are encouraged to express their difficulties Yes/No

9. Please rate the following issues accordingly
A = always O = often S = sometimes N = never

(1) Management specifies reasons for their decisions to all workers A O S N
(2) Management speedily addresses operational problems A O S N
(3) Management regularly informs all employees of the performance e.g monthly sales, quarterly profits, etc A O S N
(4) Management involve/consult employees in appropriate decision making A O S N
(5) Management conduct formal/informal attitude surveys A O S N
(6) Management seeks reasons for poor business performance A O S N

10. Please indicate which of the following is/are available to your employees
(1) Employee suggestion scheme .....
(2) Fringe benefits (e.g. product subsidies) .....
(3) Incentive schemes (e.g. bonuses) .....
(4) Recognition schemes (e.g achievements) .....

11. Please indicate which of the following can be used to describe the company's training programme at your site
(1) Involves improvement training
(2) Customer focused
(3) Team based
(4) Multi-skill training
(5) Regular refresher courses

12. With regards to all employees, would you say:
(1) Operators are trained to take decisions Yes/No
(2) Workers understand customer needs Yes/No
(3) Workers know product characteristics Yes/No
(4) Production decisions are taken at the expense of quality Yes/No
(5) Workers, in general, take pride in their jobs Yes/No

Please rate accordingly
A = always O = often S = sometimes N = never

13. Would you say the company's suppliers:
(1) Meet product specifications A O S N
(2) Deliver on time A O S N
(3) Are involved at an early stage in new development A O S N

Section D. Reward.

This section assesses how the company rewards it's workers.

14. Which of the following schemes are available to all workers?
    (1) Paid holiday ..... (4) Overtime pay rates .....
    (2) Accident insurance ..... (5) Pension (non-contributory) .....
    (3) Sick pay .....

15. Is performance appraisal the major factor for determining renumeration for all employees? Yes/No

    Which of the following is/are applicable to the company's performance appraisal for all workers?
    (1) Improvement orientated ..... (2) Regularly carried out .....
    (3) Individual based ..... (4) Customer orientated .....
    (5) Team based (where teams are used) .....
    (6) Target based .....

16. Would you say the pay rates:-
    (1) Are above average within the industry Yes/No
    (2) Are competitive within the locality Yes/No
    (3) Meet employee expectation Yes/No
    (4) Reflect the workload Yes/No
    (5) Need to be higher to improve motivation/quality Yes/No

17. Are the employees actively involved in....
    (1) Work measurement Yes/No
    (2) Determination of working conditions Yes/No
    (3) Wage review Yes/No

18. Generally, would you say the working conditions are:-
    (1) Excellent (3) Average (5) Poor
    (2) Good (4) Below average

Section E. Organisational policy and values.

This section assesses the policies of the company and it's employees values.

19. Does your company have a quality policy? Yes/No
    If yes, is the policy in writing? Yes/No
    Which of the following are fully aware of the policy?
    (1) all employees
    (2) suppliers
    (3) customers

20. Which of the following policies are in writing?
    (1) Employee welfare policy (2) Continuous improvement policy
    (3) Customer service policy (4) Supplier partnership policy
    (5) Supplier quality policy (6) Sales/marketing policy

21. Does the company carry out policy training for....
(1) Management (3) Suppliers
(2) Workers (4) Customers

22. Does quality consideration play an important part in decision making? Yes/No
Do sales, profit or other consideration (please specify) take precedence over quality? Always.... Often.... Sometimes.... Never....

23. Which of the following is/are applicable to the company?
(1) Stable policies (4) Employee involvement in policy making
(2) Stable workforce (5) Management acts out its' policies
(3) Company slogan (6) Management monitors the effects of policies

24. Do the workers understand the need for quality improvement? Yes/No

Section F. Environment.

This section investigates the working environment within the company.

25. With regards to equipment which of the following does the company place major emphasis on?
(1) Better than average for industry (3) Up-to-date technology
(2) Documented preventative maintenance (4) Safety equipment

26. With regards to the company's major processes, which of the following will you agree with?
(1) The processes are simple (e.g. few stages) Yes/No
(2) Employees are trained to understand the processes Yes/No
(3) Employees are able to meet the process' technical and schedule requirements Yes/No
(4) The process capability is good and well within requirements Yes/No
(5) Management regularly reviews the processes Yes/No
(6) Suppliers are able to meet the process' demands Yes/No

27. Does management:-
(1) Specify different performance targets for different departments? Yes/No
(2) Consider recommendations from company teams Yes/No
(3) Act in a self-critical manner Yes/No
(4) Make itself aware of customer needs and complaints Yes/No
(5) Buffer the effects of market forces/competition on workers Yes/No

28. Do senior and junior staff attend seminars, courses, etc together? Yes/No
Does the company have recreation programmes e.g. staff-club, departmental lunches, family parties, etc Yes/No
Does the company work well together as a team? Yes/No

Section G. Organisational structure.

This section investigates the organisational structure of the company
Please rate A = always O = often S = sometimes N = never

29. Are management's instructions quickly transmitted through the organisation? A O S N
Do bureaucratic matters often delay decision making? A O S N

30. Which of the following are visible in the company?
Clearly defined lines of responsibility
Well defined worker/manager reporting relationships
Regular interdepartmental meetings
Employee interaction

31. Which of the following units/departments are autonomous?
(1) Customer service department
(2) Quality Assurance department
(3) Product development unit
(4) Market research unit
(5) Process development unit

Section H. Quality Culture.

This section assesses the inherent quality culture in the organisation.

Please indicate the emphasis your company places on the following activities and rate accordingly.
0 = No activity. Little emphasis (1) ..... (5) Great emphasis.

32. Quality training for management	(0)	(1)	(2)	(3)	(4)	(5)
Management steering committee	(0)	(1)	(2)	(3)	(4)	(5)
Long-term TQM goal	(0)	(1)	(2)	(3)	(4)	(5)
Quality information feedback to management	(0)	(1)	(2)	(3)	(4)	(5)
BS 5750/ ISO 9000 specifications	(0)	(1)	(2)	(3)	(4)	(5)
Statistical process control	(0)	(1)	(2)	(3)	(4)	(5)
Problem solving techniques	(0)	(1)	(2)	(3)	(4)	(5)
Internal quality audit	(0)	(1)	(2)	(3)	(4)	(5)
Quality improvement techniques(e.g Taguchi)	(0)	(1)	(2)	(3)	(4)	(5)
Benchmarking	(0)	(1)	(2)	(3)	(4)	(5)
33. Quality awareness programme	(0)	(1)	(2)	(3)	(4)	(5)
Quality progress feedback to workers	(0)	(1)	(2)	(3)	(4)	(5)
Quality improvement courses for workers	(0)	(1)	(2)	(3)	(4)	(5)
Employee morale	(0)	(1)	(2)	(3)	(4)	(5)
Profit distribution	(0)	(1)	(2)	(3)	(4)	(5)
Involvement in decisions	(0)	(1)	(2)	(3)	(4)	(5)
Job enlargement	(0)	(1)	(2)	(3)	(4)	(5)

34. Customer feedback to management	(0)	(1)	(2)	(3)	(4)	(5)
Customer visits by management	(0)	(1)	(2)	(3)	(4)	(5)
After-sales service	(0)	(1)	(2)	(3)	(4)	(5)
Customer survey	(0)	(1)	(2)	(3)	(4)	(5)
Customer training	(0)	(1)	(2)	(3)	(4)	(5)
Long-term customer relationship	(0)	(1)	(2)	(3)	(4)	(5)
Pro active approach to market information	(0)	(1)	(2)	(3)	(4)	(5)
35. Single sourcing	(0)	(1)	(2)	(3)	(4)	(5)
Information feedback to suppliers	(0)	(1)	(2)	(3)	(4)	(5)
Supplier audit	(0)	(1)	(2)	(3)	(4)	(5)
Supplier improvement activities	(0)	(1)	(2)	(3)	(4)	(5)
Supplier quality training	(0)	(1)	(2)	(3)	(4)	(5)
Supplier visits	(0)	(1)	(2)	(3)	(4)	(5)
Supplier awards	(0)	(1)	(2)	(3)	(4)	(5)
Joint design specification with suppliers	(0)	(1)	(2)	(3)	(4)	(5)
Joint problem resolution with suppliers	(0)	(1)	(2)	(3)	(4)	(5)
36. Quality circle	(0)	(1)	(2)	(3)	(4)	(5)
Problem solving team	(0)	(1)	(2)	(3)	(4)	(5)
Joint company/supplier team	(0)	(1)	(2)	(3)	(4)	(5)
CEO(chief executive) monitoring team	(0)	(1)	(2)	(3)	(4)	(5)
Joint company/customer team	(0)	(1)	(2)	(3)	(4)	(5)
Other deployed quality improvement teams	(0)	(1)	(2)	(3)	(4)	(5)
Other voluntary quality improvement teams	(0)	(1)	(2)	(3)	(4)	(5)
Team co-ordinator	(0)	(1)	(2)	(3)	(4)	(5)
37. CEO commitment to quality	(0)	(1)	(2)	(3)	(4)	(5)
CEO site visits (factory profile)	(0)	(1)	(2)	(3)	(4)	(5)
CEO attendance at quality courses	(0)	(1)	(2)	(3)	(4)	(5)
CEO independent quality audit	(0)	(1)	(2)	(3)	(4)	(5)
CEO resource commitment to quality	(0)	(1)	(2)	(3)	(4)	(5)
CEO flexibility to allow more empowerment, quality improvement, etc	(0)	(1)	(2)	(3)	(4)	(5)
CEO encourages reward and recognition	(0)	(1)	(2)	(3)	(4)	(5)
38. Team membership rotation	(0)	(1)	(2)	(3)	(4)	(5)
Interdepartmental co-operation	(0)	(1)	(2)	(3)	(4)	(5)
Flat-layered management structure	(0)	(1)	(2)	(3)	(4)	(5)
Lean and flexible workforce	(0)	(1)	(2)	(3)	(4)	(5)

Section I. Teams and Customers.

This section examines problems associated with teamworking and customer service.

39. Does your organisation:
(a) address problems more on an individual basis as opposed to a team approach? Yes/No

(b) mostly encounter problems whose nature make them unsuitable for solving by a team based approach? Yes/No

(c) have methodologies for determining what problems are best tackled by teams(e.g. crossfunctional or design-based problems)? Yes/No

(d) have an organisational structure or physical layout that makes crossfunctional, day-to-day interaction/integration difficult? Yes/No

(e) employ Information Technology systems in interdepartmental, multilevel communication? Yes/No

40. Is your organisation(please indicate where appropraite):
- functionally based(i.e. organised into functional departments).....
- task based(i.e. organised for particular tasks or processes).....
- fairly balanced between both.....

41. Are your employees trained in appropriate teamworking techniques? Yes/No

42. What kind of teams are used in your organisation:-
- management teams.....
- departmental teams.....
- cross-functional teams.....

43. Do your employees readily form voluntary problem-solving teams? Yes/No
If no, is it because of
- unwillingness to challenge current practice.....
- lack of recognition of team efforts and individual contribution.....
- junior employees feel their recommendations will have little impact.....
- lack of time.....
- lack of awareness of teamwork advantages.....
- other.....

44. Has your company encountered any of the following teamworking problems?
- negligible benefits from teams.....
- people don't like teams.....
- company politics.....
- costs(direct and indirect).....

45. How are team members selected?
- by team profiling(e.g. belbin technique).....
- by expertise.....
- by personality.....
- by volunteering.....

46. What type of facilitation is available to teams?
- full-time facilitators.....
- management facilitators.....
- facilitator training.....

47. Are customer requirements communicated to all customer service employees? Yes/No

48. Can you consistently meet customer requirements over a period of time? Yes/No

49. Does your organisation have mechanisms for capturing changing requirements? Yes/No

50. Is your organisation aware of the needs of intermediate customers(dealers, distributors, sales outlets, etc)? Yes/No

51. Does your organisation:-
    (a) have a specified response timeframe to attend to customer needs? Yes/No
    (b) usually meet these response times? A O S N
    (c) anticipate expectations of intermediate and end user? A O S N
    (d) make customer retention a priority? Yes/No
    (e) encourage every employee to satisfy internal and external customers? Yes/No
    (f) pay particular attention to personal service? Yes/No
    (g) encourage customers to complain where necessary? Yes/No

52. Has there been reorganisation to make the company more responsive to customers? Yes/No

53. Does your organisation use any of the following customer satisfaction measures -
    - complaints.....
    - delivery performance.....
    - level of satisfaction.....
    - product return rate.....
    (b) Are the values of these measures regularly checked for improvements? Yes/No

54. Does your organisation:-
    (a) offer variety and flexibility in products and services? Yes/No
    (b) give technical assurances on products(i.e. warranties, spare parts)? Yes/No
    (c) reward major and/or loyal customers(e.g. bulk purchase discounts, loyalty benefits, etc) Yes/No
    (d) measure the quality of the relationship with customers? Yes/No
    (e) have a 'passion' for customer satisfaction? Yes/No

If you would like to receive a summary of the research findings, please fill in your company details:

Company name:

Address:

Appendix B

Company details and examples of questionnaire analysis patterns

Examples of Crosstabulation and analysis for questionnaire findings

Example 1- TQM implementation: 1=yes; 2=no
by Company ownership: 1=UK; 2=non-UK

	OWNER		
Count Row Pct Col Pct Tot Pct	1	2	Row Total
TQM			
1	41 45.1 45.6 24.7	50 54.9 65.8 30.1	91 54.8
2	49 65.3 54.4 29.5	26 34.7 34.2 15.7	75 45.2
Column Total	90 54.2	76 45.8	166 100.0

Chi - Square Value: 6.81117
Degree of Freedom: 1
Significance: .00906

The summary would state that 54.9% of TQ companies are non-UK owned while 45.1% of non-TQ are UK owned. The Chi-sq statistic indicates that there is an association between TQ implementation and company ownership.

Example 2: TQM implementation: 1=yes; 2=no by steering committee

Count / Row Pct / Col Pct / Tot Pct	0	1	2	3	4	5	Row Total
TQM							
1	3	5	6	18	28	31	91
	3.3	5.5	6.6	19.8	30.8	34.1	54.8
	13.6	35.7	35.3	54.5	70.0	77.5	
	1.8	3.0	3.6	10.8	16.9	18.7	
2	19	9	11	15	12	9	75
	25.3	12.0	14.7	20.0	16.0	12.0	45.2
	86.4	64.3	64.7	45.5	30.0	22.5	
	11.4	5.4	6.6	9.0	7.2	5.4	
Column	22	14	17	33	40	40	166
Total	13.3	8.4	10.2	19.9	24.1	24.1	100.0

Chi - Square Value: 31.77557

Degree of Freedom: 5

Significance: .00001

The chi-sq statistic indicates that there is an association betwwen TQ implementation and the use of steering committees.

Calculation of mean weighted scores

For TQ companies:

(3.3*0 + 5.5*1 + 6.6*2 + 19.8*3 + 30.8*4 + 34.1*5)/(0+1+2+3+4+5)

= (0+5.5+13.2+59.4+123.2+170.5)/15

= 371.8 /15

=**24.79**

For non-TQ companies:

(25.3*0 + 12.0*1 + 14.7*2 + 20.0*3 + 16.0*4 +12.0*5)/(0+1+2+3+4+5)

= (0+12+29.4+60+64+60)/15

= 225.4/15

= **15.03**

In general, if 100% of the companies had a score of 5 out of 5(100%), the mean weighted score will be:

5*100/15 = 500/15 = **33.33**

this also represents the maximum achievable score

If 100% of the companies had a score of 4 out of 5(80%), the mean weighted score will be:

4*100/15 = 400/15 = **26.67**

Thus a 20% difference in perfomance between the companies translates into a difference of 6.66 in mean weighted score. Consequently, a unit mean weighted score represents a 3% difference in performance.

Summary of company details from questionnaire survey

Number of employees

Employee No.	TQ	non-TQ
< 50	7	13
51 - 5000	75	55
> 5000	9	7

UK market share

Market share	TQ	non-TQ
0 - 3%	1	7
4 - 10%	6	14
11- 20%	11	9
21 - 30%	12	13
31 - 40%	13	9
> 40%	35	19

Responses from 17 companies were missing

Percentage of sales exported

Sales Exported	TQ	non-TQ
0%	6	5
1 - 5%	13	18
6 - 20%	14	16
21 - 50%	19	17
51 - 80%	24	8
81 - 100%	5	9

Responses from 12 companies were missing

Appendix C

Copy of the Structured interview and covering letter

10th May 1996

Dear Sir/Madam,

Research into achieving a Quality Culture

Your company recently participated in a Quality Research Programme conducted by the University of Liverpool. This consisted of completing a 'Quality Culture' questionnaire. Please find enclosed a brief summary of the findings of the survey.

The key issues noticed were that both Total Quality and Non-Total Quality companies are experiencing problems in teamworking and customer orientation. The final stage of our information gathering is concerned with determining the effectiveness of culture change agents in terms of these two issues.

From our responses, your company has been selected as a case review. We would like to evaluate your company's experience in teamwork and customer orientation. Information from this exercise will help determine why companies have succeeded or failed, what specific problems they are still experiencing and how these problems can best be approached. As a result, a framework can be drawn to assist organisations like yours develop a company culture that complements quality improvement.

Further research will involve a 1 hour (maximum) personal interview and your co-operation will be highly valued. I hope we will be able to arrange an interview date for sometime over the next couple of weeks. I shall contact you by phone within a week to discuss further and hopefully agree on a date for the interview. Enclosed is a copy of the interview to give you an idea of the topics to be discussed.

Thank-you for your co-operation.

Yours sincerely,

Dotun Adebanjo

Summary of Main Findings from the University of Liverpool survey into Quality Culture

- 166 companies participated in the survey. The survey was grouped into TQ companies (91) and non-TQ companies (75).

- There was **no significant** difference between scores for TQ and non-TQ companies in **Customer orientation**. Both set of companies have put a lot of effort into this area but none has a competitive edge over the other.

- Although TQ companies performed much better at **Teamwork** than non-TQ companies, the general level of teamworking in both set of organisation was **very low**.

- There is **increasing involvement of suppliers and employees** in organisational operations although TQ companies are more successful at this.

- Management in TQ companies are **more successful at leadership**. Leadership parameters considered include management commitment (to quality), empowerment of employees, involvement and implementation of quality tools and techniques.

- CEO's are showing commendable commitment to quality and employee development although a **majority do not carry out an independent quality audit.**

- Both TQ and non-TQ companies are achieving **success breaking down bureaucratic structures** in their organisation.

- Many culture change agents had significant scores either in terms of absolute value of differences between TQ and non-TQ companies. The effectiveness and relevance of the change agents will need to be investigated in case studies via interviews.

- Results from the survey and the proposed case studies are being used at the University to develop a quality culture framework.

Figure 1. Relative Emphasis between Total Quality and Non-Total Quality Companies in terms of Quality Culture

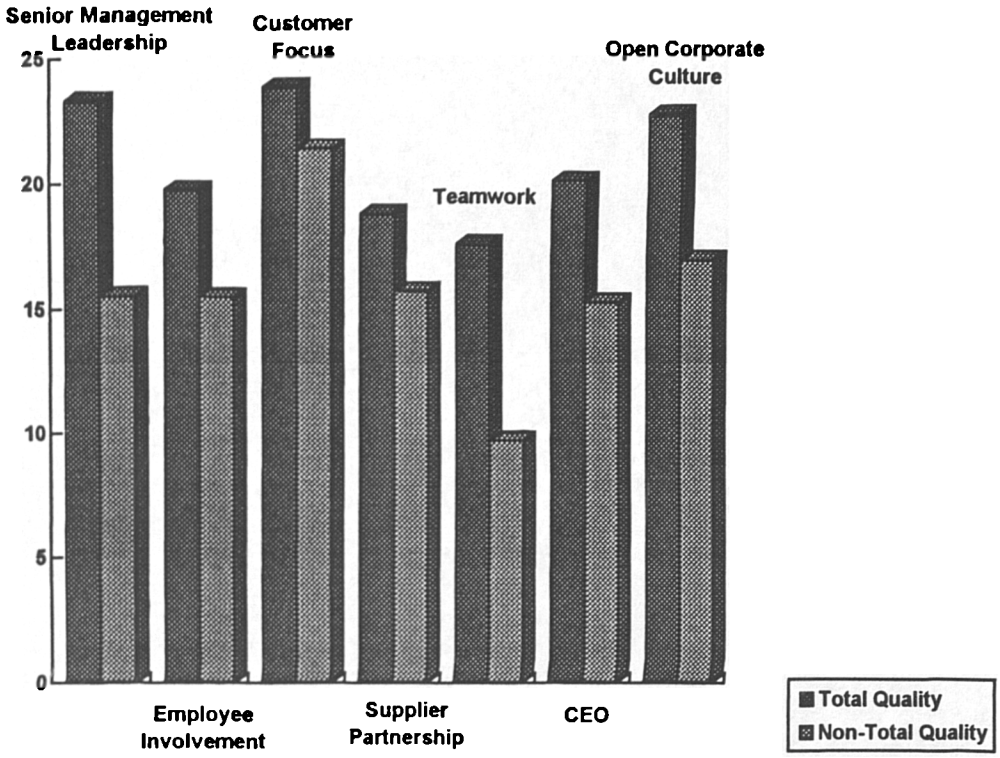

Figure 2. Significant Culture Change Agents

Teamwork

Team Solution Approach
Training
Work Measurement
Facilitation
Employee Volunteering
Consideration of Team Recommendations
Simplicity of processes

Customer Focus

Customer Satisfaction Level
Customer Relationship Quality
Recognition of Customer Needs
Complaints & Improvement Measurement
Customer Retention Orientation
Internal Customer Concept
Product Characteristics

STRUCTURED INTERVIEW - QUALITY CULTURE

Respondent's details

Name(optional):

Job title:

Section 1 - Confirmation of Company details

Company name(optional):

Company address(optional):

Telephone no:

1. Is the company UK or non-UK owned
   (1) UK owned
   (2) Non-UK owned

2. What is the approximate number of employees on site? .....

3. What is approximate annual turnover of the site? .....

4. Is the company a subsidiary of a larger organisation? Yes\No

   If yes, what is the name of the holding company?

5. Are you a Total Quality Management(TQM) company? Yes\No

   If yes, for how long? .....

6. Is your company registered to ISO 9000 standards? Yes\No

7. Does your company's internal structure place a lot of emphasis on departmentalisation?
   (1) Very much
   (2) To an extent
   (3) Not very much

8. How is your shop floor laid out?
   (1) Product-inclined layout
   (2) Process-inclined layout
   (3) Varies
9. What is\are your major method(s) of manufacture?
   (1) Job production
   (2) Batch production

(3) Mass production

10. How are your products best described:-

	Single product	Few products	Multiple products
Low complexity	1	2	3
Moderate complexity	4	5	6
High complexity	7	8	9

11. Which of the following best describes your major customers?
    (1) Large customer base
    (2) Few major customers
    (3) Single customer
    (4) Varies according to product(specify) .....

12. How is your market best described?
    (1) Highly competitive
    (2) Substantial competition
    (3) Little competition
    (4) No competition

Section 2. Management

13. What style of management does your company adopt?
    (a) Authoritative
    (b) Participative

14. Have you attempted to change management style? Yes\No

    (a) If yes, did you have problems with Snr, Middle or Jnr management? Yes\No

    What problems?

    (b) If no, what problems would you expect?

15. Does management understand that implementation of quality programs will lead to change of attitude to work and values? Yes\No

16. Does management adopt the policy of employee consultation before and during decision making and implementation ? Yes\No

    What impact has this had on employee\management relations?

17. Is bottom-up involvement and participation in company activities encouraged by management? Yes\No

How has this affected work practice?

18. What is the level of commitment of Snr management to quality improvement?

Is this commitment or lack of it clearly noticeable? Yes\No

Has this been a motivator\demotivator for junior employees?

19. How is improved performance by individuals or departments encouraged?

Is the organisation's performance communicated to all employees? Yes\No

How?

20. Does management encourage a breakdown of departmental barriers? Yes\No

If yes, how?

What major problems have you encountered in this respect?

21. What other problems have you encountered with management leadership?

How have this been tackled?

What problems remain outstanding?

22. What effect will the following have on management leadership?

(a) management training program
(b) quality awareness
(c) use of management teams

(d) employee decision making
(e) employee suggestion scheme

Which of the above do you currently use?

What other factors have helped or can help management leadership in your company?

Section 3 Teamwork

23. Does your organisation work well as a team? Yes\No

How is this influenced by:

(a) organisational structure

(b) manufacturing methods

(c) product complexity

(d) size of organisation

24. What steps have you taken to improve organisational teamwork?

What results have these had?

25. Are voluntary teams in use in your organisation?

Is this encouraged by management?

Are these teams given reasonable authority to make changes? Yes\No

26. Have voluntary teams had benefits in the past?
Yes\No

How are these benefits measured?

27. What factors will motivate employees to form voluntary teams?

What steps have you taken to overcome the following?

(a) lack of time for voluntary teamworking

(b) little recognition for team recommendations

(c) reluctance to volunteer for teamwork

(d) company politics

28. What impact will the following have on voluntary teamworking?

(a) teamwork training

(b) facilitation

(c) organisational market performance

29. How are employees encouraged to fulfil the needs of internal customers?

30. Are delegated teams encouraged at the expense of voluntary teams?

Have delegated teams met their targets in the past?

31. What other factors have helped or hindered teamwork in the past?

Section 4 Customer Focus

32. Who are your main customers?

How does this affect the relationship you develop with them?

33. How have you re-organised the company to make it more responsive to customers?

What results have been noticed?

34. Do you measure satisfaction level of customers? Yes\No

How is this done?

How often?

35. Do you monitor level of product return? Yes\No

How has this helped or hindered customer service?

36. Do you meet with customers to discuss product problems and improvements?

How has this affected communication with customers?

37. What methods do you use to anticipate customer expectation?

Has this resulted in noticeable success?

38. How is your relationship with the customer affected by the size of customer base?

How do you evaluate the quality of relationship with customers?

39. What methods are used to encourage customer complaints?

40. How are employees encouraged to develop a passion to satisfy the customer?

Does the internal customer concept play a part in this?

41. How have you altered manufacturing methods to improve customer orientation?

What benefits have been noticed as a result of such alteration?

42. Which of the following activities have you introduced and what benefits have resulted

(a) quality function deployment

(b) Taguchi methods

(c) J.I.T

(d) Statistical process control

(e) Business process re-engineering

(f) M.R.P

43. What other factors have helped or hindered customer orientation?

Appendix D

Summary of research findings and covering letter sent to companies that participated in the survey.

THE UNIVERSITY
of LIVERPOOL

Department of Industrial Studies

Liverpool
L69 3BX

Telephone Direct:
0151 794
Undergraduate School: 0151 794 4900
Postgraduate School: 0151 794 4681
Facsimile: 0151 794 4693

13th November 1996,

Dear Sir/Madam,

Quality Culture Research

Your company took part in a quality culture research survey carried out by this department. The survey involved a questionnaire survey of 166 companies and structured interviews in 21 companies at different levels of quality culture development. The primary aim of the study is to identify the important factors which influence culture development and also investigate reasons for failure in some companies. The study has now been completed and we are able to provide you with a summary of the main findings as requested.

The findings are presented in two parts - general findings and specific findings. The general findings mainly reflect our observations on current levels of development while the specific findings present the factors that have been associated with successful companies.

We would like once again to thank you for the assistance you gave and we hope that our findings would be of benefit to your organisation. If you require any further information, please feel free to contact me.

Yours sincerely

Dotun Adebanjo.

SUMMARY OF RESEARCH FINDINGS

Research Topic: Factors Affecting Quality Culture Development

Researcher: O. A. Adebanjo

Supervisor: Dr. D.F. Kehoe

Department Of Industrial Studies
University of Liverpool
Liverpool L69 3BX

November 1996

Quality Culture Research

Research carried out by the Department of Industrial Studies, University of Liverpool, investigates problems associated with cultural development in UK industries. The aim of the study is to provide an understanding of the mechanism that facilitates cultural development in a total quality environment.

The study involved a questionnaire survey of 166 companies structured interviews in 21 companies at different levels of quality culture development. This report summarises the findings from the research study.

The findings are presented in two parts - general findings and specific findings. The general findings mainly reflect our observations on current levels of development while the specific findings present factors that have been associated with successful companies.

These findings are the basis of two proposed journal papers. The first of these papers has been sent for review and the second has just been completed and will be sent for review in February 1997.

General Findings

- Companies implementing Total Quality are more likely to have a quality culture. However, implementation of TQ is in itself not sufficient guarantee of success as many failed companies had also implemented TQ.

- Although many failed companies had introduced elements of quality working, the lack of a comprehensive and planned approach has meant that any successes have been limited and inconsistent.

- Both successful and unsuccessful companies had faced similar problems with culture development. The application of change agents is primarily responsible for the differences between success and failure.

- Culture change is a gradual process that will most certainly encounter resistance at many stages and at different levels of the organisation. However, once successful change has been achieved, the new culture becomes norm and is self-propelling.

- Companies that have successfully changed their culture have recorded significant improvements in all-round efficiency.

- Many failed companies are aware of their shortcomings and the benefits that could be gained from Total Quality and the associated culture change. Lack of a long term quality focus, unwillingness to invest in quality programmes, inability to accept the many implications of culture change and a lack of ideas on how to proceed with change are major characteristics of failed companies.

- Successful companies have used a wider range of activities than unsuccessful companies. Although the activities are of a varied nature and differ from company to company, they can be batched into groups of culture change agents. These change agents are common to all the successful companies. The message is that the best companies use more key activities.

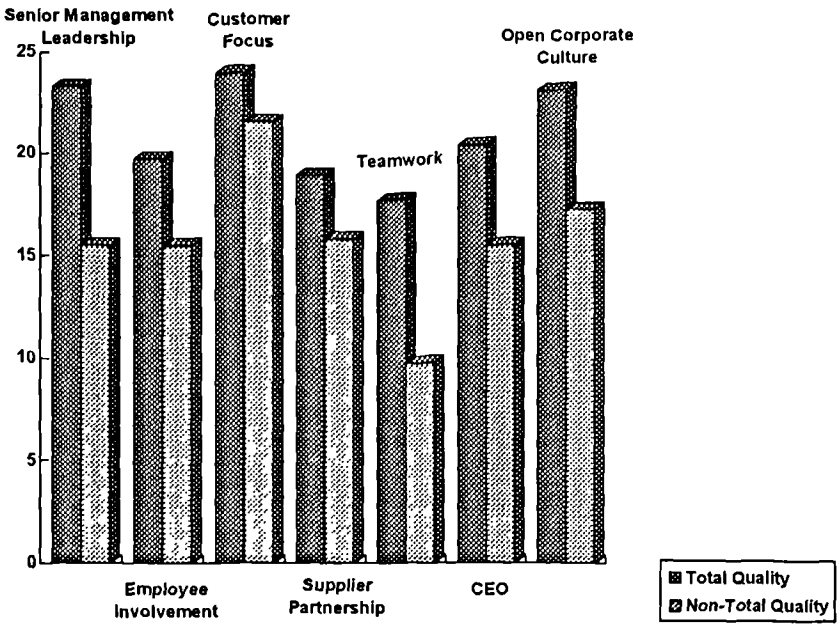

Fig. 1. Differences between TQ and Non-TQ companies (sample size = 166)

Management Leadership

- Education
- Training
- Involvement
- Measures
- Reward & Recognition

Employee Involvement & Empowerment

- Education
- Training
- Encouragement
- Flexibility
- Communication
- Measures
- Recognition

Customer Focus

- Communication
- Employee Focus
- Measures
- Relationship Building
- Reward

Supplier Partnership

- Education
- Communication
- Recognition
- Training

Teamwork

- Education
- Organisational Structure
- Commun ication
- Manufacturing Methods
- Rewards & Recognition
- Teamwork Training
- Facilitation
- Encouragement

CEO

- Education
- Communication
- Measures
- Recognition

Open Corporate Culture

- Communication
- Organisation Structure
- Recreation

Fig. 2 . Main Culture Change Agents Identified for each element of the 'Required Quality Culture'

Specific Findings

Senior management leadership: The major problem faced in this respect was that of resistance to change. However change cannot be successful without the unwavering conviction of all levels of management. The change agents responsible for management leadership are: **Education, Training, Involvement, Measures, Reward and Recognition.** Some of the important change activities associated with these change agents are quality meetings, visits to other companies, quality training courses, steering committees, employee consultation, employee briefings, shop floor visits, managerial involvement in shop floor teams and the encouragement of role model managers. Other activities are setting of quality targets setting, involvement of quality performance in personal appraisal and use of reward schemes, company awards, bonuses, career development and profit share for commendable quality achievements.

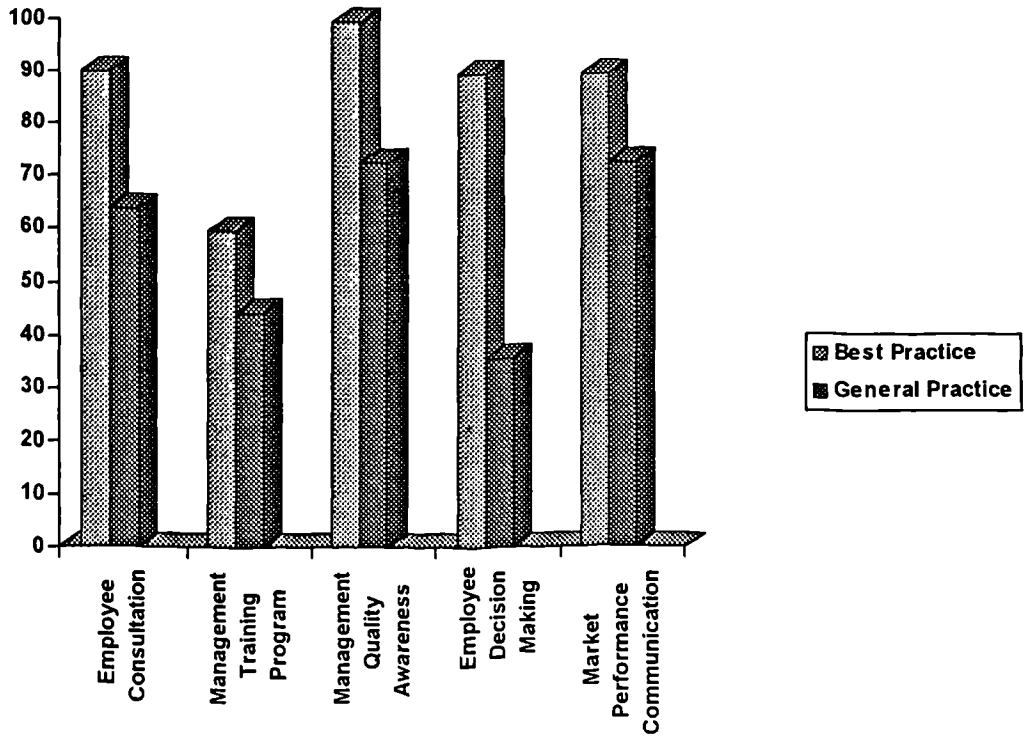

Fig. 3. Relative use of Management-related Change Activities (sample size = 21)

Employee involvement and empowerment: In general, employees are more willing to change once management commitment is established. However, resistance may be encountered if they are not completely aware of the need for new practices and how this will affect their jobs. the change agents for employee involvement and empowerment are: **Education, Training, Encouragement, Flexibility, Communication, Measures and Recognition.** Some change activities associated with these agents are use of company quality presentations, multiskilling, visits to other companies, involvement in company activities, easy access to management, employee suggestion schemes, employee decision making, self inspection, regular departmental and site meetings and use of company notice boards and newsletters. Others are measures for work quality, management relations, employee morale and recognition via letters, noticeboards, company awards, social events, bonuses and gift vouchers.

Customer focus: This element is the most developed in industry and implies that companies in general recognise the importance of the customers. However there still remains a sizeable difference in performance between the average companies and the best practice companies, especially as regards approach to customer-related information. The change agents are: **Communication, Employee focus, Measures, Relationship Building and Reward.** Important activities include two-way customer visits, encouragement of customer complaints, joint design with customers, customer-friendly company structure, internal customer concept, direct contact between customers and shop floor workers, social contact with customers, technical assistance and training for customers, business information sharing and giving of customer awards and loyalty discounts. Comprehensive measures including satisfaction, complaints, product return, delivery performance, customer requirements and benchmarking should be encouraged.

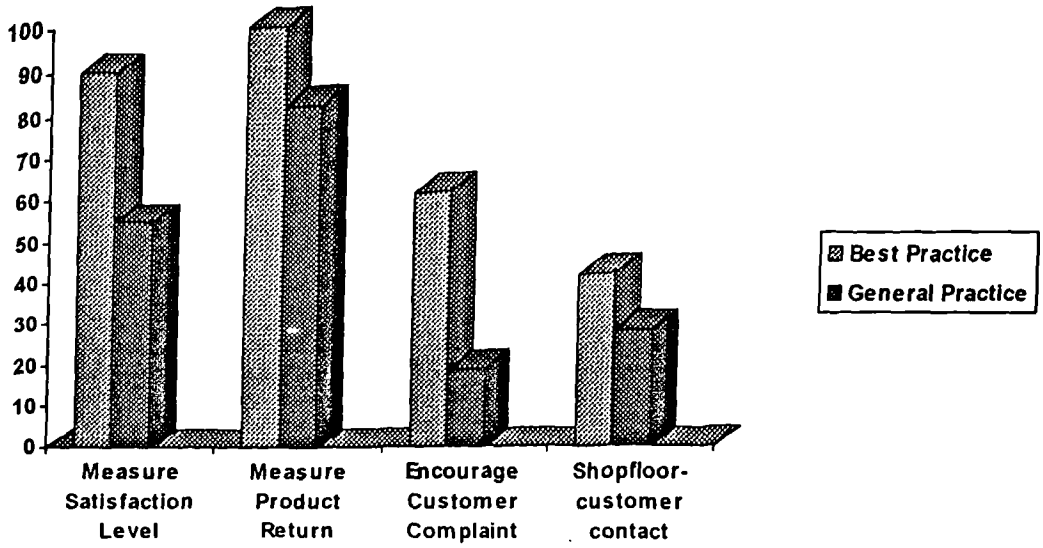

Fig. 4. Relative use of Customer Focus-related Change Activities (sample size = 21)

Supplier partnership: Many companies recognise the importance of their suppliers' quality to their own performance. However, supplier are not involved early in the business process and general communication with suppliers is at best average. Change agents for supplier partnership are: **Education, Communication, Recognition and Training.** Important change activities are regular supplier meetings, joint design teams, problem solving teams, two-way supplier visits, technical training and support for smaller suppliers with limited resources. Providing supplier awards and the development of long-term business plans should also be encouraged.

Teamwork: This is the least developed aspect of quality culture. Many companies find it difficult to encourage their employees to work in specific teams (e.g. problem solving, improvement) or to work as one whole unit without departmental barriers. The change agents for teamwork are: **Education, Organisational structure, Communication, Manufacturing methods, Recognition and Reward, Teamwork training, Facilitation and Encouragement.** Some of the change activities are the use of company presentations, internal customer concepts, flattened management structure, cell structure work groups, interdepartmental meetings and visits, process review, clarification of responsibilities, target setting and departmental briefings. Others include training in problem solving and quality

improvement methods, facilitator training and inclusion in teams, encouragement to volunteer for teamworking, paid overtime for team-related assignments, encouragement of process ownership, consideration of team recommendations, use of teamwork-related awards, appraisals and receptions.

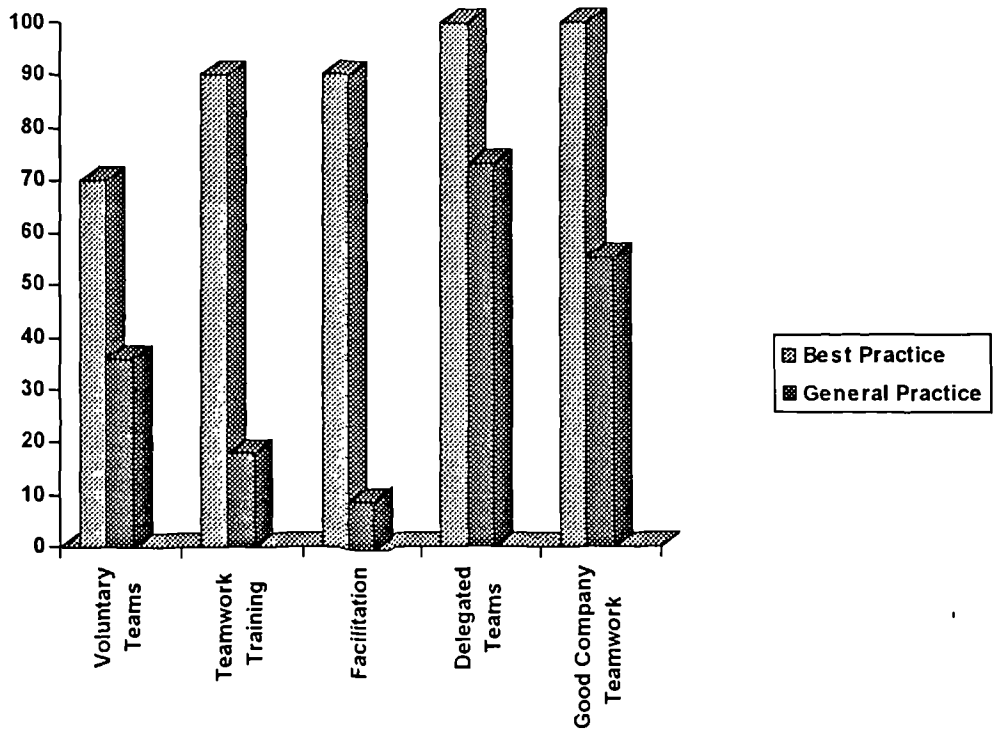

Fig. 5. Relative use of Teamwork-related Change Activities (sample size = 21)

Chief executive officer: The CEO must not only show total commitment to quality improvement but should constantly encourage sceptical managers and make the necessary resources available. The change agents are: **Education, Communication, Measures and Recognition.** Important change activities are setting of long-term quality goals, attendance at quality seminars and presentations, inclusion of quality at all management meetings, shopfloor visits, employee briefings, independent quality audit, quality information feedback and support of recognition and reward schemes.

Open corporate culture: An open corporate culture encourages breakdown of departmental barriers and fosters flexible working among employees. The change agents are: **Communication, Organisational Structure and Recreation.** Some of the change activities

are encouragement of social activities and company clubs, flatter organisational structures, task/function organisational balance, well-defined manager/employee relationships, management review and employee attitude survey.