



**IMPACT OF ORGANIZATION CULTURE
ON TQM IMPLEMENTATION BARRIERS**

A thesis submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy

By

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Brunel University, 2012

Executive Summary

This study examines the relationship between organisational culture and TQM implementation barriers to gain a more comprehensive understanding of the factors affecting TQM implementation. For TQM implementation to take root effectively, the critical role of organisational culture is widely recognised. The existence of pitfalls and obstacles (barriers) to implementing TQM is also widely recognized, as is the importance of understanding these TQM implementation barriers. Nevertheless, whilst many TQM implementation models and frameworks have been designed and proposed, no study has been located in the literature that has systematically examined the relationship between organisational culture and TQM implementation barriers. This theoretical lapse in the TQM literature necessitates an investigation of the direction and significance of the relationship which can help in devising more informed TQM implementation models.

In this context, a quantitative research methodology was adopted to examine the profiles of organisational culture and of TQM implementation barriers in organisations in Bahrain and to examine the relationship between these variables. Bahrain is presently going through a rapid expansion in quality management system adoption. Accordingly, the research uses four constructs of organisational culture as independent variables and six constructs of TQM implementation barriers identified through the literature as dependent variables. A set of hypotheses was developed describing the expected relationships between these two sets of variables. The study adopted a positivist, deductive approach using an online survey questionnaire to obtain quantitative data for hypothesis testing. The research instrument was assessed for validity and reliability through structured interviews. Responses to the survey were obtained from 325 organisations located in Bahrain.

Analysis of Moment Structure (AMOS) version 16.0 was used to test the measurement model using Confirmatory Factor Analysis (CFA), and to test the structural model using Structural Equation Modelling (SEM). Both models showed a very good fit to the data, with good construct validity and reliability. The findings of the study showed that group culture, which is believed to be an 'ideal' culture for TQM implementation helps decrease employee barriers, information barriers and customer related barriers as predicted.

However group culture wasn't found to help decrease top management barriers. Rational culture was found to decrease top management barriers as predicted but it wasn't found to help decrease employee and customer barriers. The findings confirm the significant impact of hierarchical culture in the Bahrain context in decreasing planning and process management barriers. Developmental culture's potential to lower employee and customer barriers was observed but was not found to be statistically significant.

This research makes several contributions in both academic and practical terms. Theoretically, positioning organisational culture as an antecedent of TQM implementation barriers, this study is the first holistic approach that attempts to empirically investigate which type of organisational culture is related to which TQM implementation barriers. Understanding the nature, strength and direction of these relationships can help to inform and support future TQM implementation attempts. Practically, this research will benefit organisations who have not been able to fully realise TQM, or who are in the process of planning the introduction of TQM. The findings of the study can help Bahraini organisations to realise the long term quality objectives of the Bahrain Centre of Excellence's Vision 2030 programme. Furthermore, the study has contributed a new empirically tested scale for measuring TQM implementation barriers - a valuable tool on its own, or in conjunction with the organisational culture profile assessment tool - for both practitioners wishing to examine their readiness for TQM or progress in creating a TQM ethos, and for future researchers wishing to extend our understanding of the influence of TQM barriers and/or culture on major organisational improvement interventions. It is expected that replication of this study in other countries and regions with different culture and context may help in developing an improved model of TQM implementation. Implications for managers and future research are advanced.

Dedication

This thesis is dedicated to my father who died during my PhD studies, to my loving mother, my beloved wife and my wonderful children

Acknowledgement

Praise is to Allah, the Almighty, who gave me the strength and ability to complete this doctoral thesis!

The successful accomplishment of a PhD thesis is not a personal and individual task. It would have been almost impossible for me to overcome the challenges of this project without the help, encouragement, support and motivation that I received from many wonderful and supportive people. Indeed, this achievement is made possible because of them.

The first and most important role in accomplishment of this thesis was of my supervisor, Dr. David Gallear. I will never forget your great contribution, Dr. David. I needed a person to help me through this wonderful transition process, and I was fortunate to have worked with you. I must thank you for your help, guidance and suggestions during the different stages of my research. I learned from your constructive comments on my thesis, and I thank you for straightforward and clear criticism for improving my work. I benefited a lot from your comments and suggestion in developing my research work. Thank you so much for your support, encouragement, and generosity. You have made a great change in my life.

Secondly, I am thankful to my family, my wife, children, brothers and sisters for their support, prayers, and patience. Their support and encouragement were the most important assets for me in doing my research without any tension or pressure. All of you were always supportive, encouraging and enthusiastic, which always motivated me in my studies.

I would like to extend my thanks to Ministry of Defence, Kingdom of Bahrain for funding my doctoral studies. Also, many thanks to all staff of Brunel Business School for their kind support during my PhD studies. I am very much thankful to all the organisations and their staff that participated in this research, for their time and assistance in data collection.

Finally many thanks to all my friends who helped me in one way or another. Their advice and encouragement helped me a lot to accomplish my research.

Declaration

This is to declare that:

- I am responsible for the work submitted in this thesis
- This work has been written by me
- All verbatim extract have been distinguished and the sources specifically acknowledged
- During the preparation of this thesis, some papers were prepared as listed below. The remaining parts of the thesis have not yet been published.

Research Publications:

Aljalahma R. and Gallear D. (2011) “Impact of Organisational Culture on TQM Implementation Barriers “paper presented at Brunel Business School, PhD Doctoral Symposium 2011, Brunel University. (Best final Paper Award)

Aljalahma R. And Gallear D. (2011) “Towards understanding the impact of organisational culture on TQM implementation barriers” International Journal of Business Information Systems (Paper presented)

Aljalahma R. And Gallear D. (2010) “Exploring the relationships in core elements of TQM implementation “European, Mediterranean & Middle Eastern Conference on Information Systems (EMCIS) April 12-13, Abu Dhabi, UAE.

Aljalahma R. And Gallear D. (2011) “Exploring the relationships in core elements of TQM implementation“. Paper presented at "International Conference on Economics, Business Management and Marketing held in Paris, France during June 28-30, 2010. (Accepted for Oral Presentations)

Aljalahma R. And Gallear D. (2011) “Exploring the relationships in core elements of TQM implementation”. Paper presented at Brunel Business School, PhD Doctoral Symposium 2009, Brunel University.

Aljalahma R. And Gallear D. (2011) “Measuring the importance and implementation of TQM practices and identifying TQM implementation barriers in Bahraini industries using Baldrige Criteria of performance excellence” Paper presented at Brunel Business School, PhD Doctoral Symposium 2009, Brunel University.

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List of Abbreviations

TQM	Total Quality Management
CVF	Competing Values Framework
QM	Quality Management
MBNQA	Malcolm Baldrige National Quality Award
EFQM	European Foundation for Quality Management
ASQ	American Society of Quality
NIST	National Institute of Standards and Technology
DP	Deming Prize
CSFs	Critical Success Factors
SPC	Statistical Process Control
QC	Quality Circles
JIT	Just-In-Time
ISO	International Organisation for standardisation
OCAI	Organisational Culture Assessment Instrument
DOCS	Denison Organisational Culture Survey
EDB	Economic Development Board
GCC	Gulf Cooperation Council
IT	Information Technology
PDCA	plan, do, check, act
PDSA	plan, do, study, act
QAA	Quality Assurance Authority
SMEs	Small and Medium Enterprises
AMOS	Analysis of Moment Structure
SPSS	Statistical Package for Social Sciences
CFA	Confirmatory Factor Analysis
SEM	Structural Equation Modelling
ANOVA	Analysis of Variances
M	Mean
CR	Critical Ratio
CFI	Comparative Fit Index
CV	Convergent Validity

DV	Discriminant validity
GFI	Goodness of Fit Index
ML	Maximum Likelihood
RMSEA	Root Mean Square Error Approximation
SE	Standard Error
Sig.	Significant
χ^2	Chi Square
PCA	Principal Component Analysis
CA	Correspondence Analysis
OC	Organisational Culture
BRtm	Top management barrier
BRemp	Employee barrier
Brim	Information barrier
BRpln	Planning barrier
BRProc	Process barrier
BRCus	Customer barrier
Grp	Group culture
Dev	Developmental culture
Rat	Rational culture
Hier	Hierarchical culture
p-value	Probability
df	degrees of freedom
BOF	Badness of Fit
RMR	Root Mean Square Residual
CFI	Comparative Fit Index
RNI	Relative Non-Centrality Index
TLI	Tucker-Lewis coefficient index
IFI	Incremental Fit Index
AVE	Average Variance Extracted
SMC	Squared Multiple Correlations
F	Factor Loadings
CR	Critical Ratio
β	Beta
SD	Standard Deviation

Chapter One: Introduction

1.1 Introduction of chapter

This chapter presents the purpose and background of the thesis. The problem statement is explained and the research questions prompted by the problem statement are defined. Accordingly, the aim and objectives of the research are then presented. After a brief overview of the research methodology used in this study, the main academic and practical contributions of the study are set out. Finally, the organisation of the thesis is discussed.

1.2 Purpose of the study

The main purpose of this study was to develop a better understanding of TQM implementation through the empirical examination of the relationships between two core elements of TQM implementation - organisational culture and TQM implementation barriers. A thorough examination of the literature to date indicates that there is no significant study that has investigated the impact of organisational culture on TQM implementation barriers. This study is the first holistic approach that attempts to investigate the relationship and hence to determine which type of organisational culture is related to which TQM implementation barrier. Understanding the nature, strength and direction of these relationships can help to support future TQM implementation attempts by helping organisations to understand which culture type they might seek to develop that can help to sustain TQM implementation, and likewise which cultural type may impede TQM implementation. It is expected that future replication of this study in other organisations with different culture profiles and contexts will help in developing an improved model of TQM implementation.

1.3 The research background

The increasing effects of globalization and uncertainty in the business world have played a significant role in prompting business managers and academic researchers to question and examine how organisational performance can be improved and how any competitive advantage can be sustained. For performance improvement of organisations, many tools have been developed by academic researchers and practitioners focusing on multifaceted aspects of organisations. Mainly, these tools have tended to address one functional requirement at a time – focused on improving a single aspect or activity, rather than helping to integrate the spectrum of business activities. For example, the focus of one

tool may be to increase the number of trained employees, while another tool may be used to identify and resolve quality problems. This prompted quality practitioners' search for an approach that has the potential to integrate all the improvement tools into a single approach. A well researched tool among them is TQM which can be defined as a synthesis of the organisational, technical and cultural components of any company (Vorley and Tickle, 2001). Many other improvement tools have been developed, but TQM has emerged as a holistic management model which can help transform the organisation to meet consumer needs and their intangible expectations through continuous improvement of the quality of goods and services and the development of integrated business processes across the firm (Prajogo and McDermott, 2005). These features of TQM can facilitate organisational improvement in terms of growth, delighting customers and getting ahead of competitors (Irani et al, 2004).

TQM's history is rich with success stories (Evans and Lindsay, 2001, Krishnan et al., 1993) but many TQM interventions have also been reported to have failed (Smith et al., 1994; Wilkinson et al., 1998; Harari, 1993a; Fuchsberg, 1992; Brown, 1993; Jacob, 1993). Such failures have made some organisations believe that TQM does not deliver according to its promise and that any investment in TQM would be a risk (Shin et al., 1998; Ackoff, 1993; Becker, 1993; Bemowski, 1995). Although TQM failure rates reported in the literature are contradictory, (23% - Kunst and Lemmink, 2000; 7% - Walsh et al. 2002; 41% - Taylor and Wright, 2003; 14% - Sila, 2007) the rate is arguably not an overriding issue since even a single failure is not desirable. Therefore it is very critical to seek to ascertain the reasons why some TQM initiatives still fail (Cândido and Santos, 2008). In this context, previous studies on TQM implementation have, broadly, revealed two salient findings. First, that TQM is often not implemented properly and second, that when properly implemented, TQM undeniably improves performance (Zeitz et al., 1997). Many researchers agree that TQM is a useful philosophy for management if properly planned and implemented (Dayton, 2001; Stephens et al, 2005; Wilson and Collier, 2000). Oakland (2001) argues that if TQM is used properly and is fully integrated into a business, the approach can help any organisation deliver its goals, targets and strategy. Since the TQM approach has and continues to be used by world class companies to achieve organisational excellence (Oakland, 2001), previous research has largely attributed TQM failures to implementation, rather than to TQM theory and method (Huq, 2005). Hence, it can be argued that TQM implementation is a critical factor affecting ability of organisations to improve their performance.

For comprehensive and effective TQM implementation, several researchers have recognized the critical role of organisational culture (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009) and the importance of understanding TQM implementation barriers (Ngai and Cheng, 1997; Salegna and Fazel, 2000; Sebastianelli and Tamimi, 2003; Huq, 2005; Zeng et al., 2007; Angell and Corbett, 2009; Amaral and Sousa, 2009; Bhat and Raj, 2009).

Among several other factors attributed as key determinants of effective TQM, organisational culture is often amongst those listed at the top (Prajogo and McDermott, 2005). It has been argued that in many instances TQM implementation has lacked strategic focus and has been introduced as a bolt-on to unchanged business culture (Zairi et al., 1994). McNabb and Sepic (1995) placed extreme importance on the influence of organisational culture on the effective implementation of TQM. Similarly, in conclusion to their study of cultural effects on TQM implementation, Sousa-Poza et al. (2001) report that TQM implementation is complex and has a strong relationship with the organisational culture. There is broad agreement that culture can greatly influence the understanding, selection, planning, implementation and monitoring of TQM in a country (Kumar, 2006; Tan et al., 2003), and that many TQM implementations have failed, preventing organisations from realizing its potential benefits, because of the ignorance of the cultural factors (Wilkinson et al., 1998).

The TQM literature is rich in contributions that have sought to identify obstacles or barriers affecting TQM implementation (Sebastianelli & Tamimi, 2003; Salegna and Fazel, 2000; Amaral and Sousa 2009; Bhat and Raj, 2009; Angell and Corbett, 2009; Rad, 2005). The main focus of these studies has been to identify the most significant obstacles or barriers in TQM implementation. According to Taylor and Wright (2003), TQM programmes fail because of TQM implementation barriers such as lack of senior management commitment, lack of resources, lack of understanding of TQM, and lack of involvement of employees in TQM practices. Therefore, the rationale of this study is that removing the barriers will help the full and comprehensive implementation of TQM.

One of the intrinsic problems with TQM is that it can take considerable time to establish, gain maturity, and show results (minimum 3-5 years, according to Deming (1986)). Therefore, it is reasonable to argue that any TQM implementation barrier not identified before implementation commences will be discovered late (i.e. during implementation) and after potentially considerable resources and time may have been wasted. When barriers are

identified late in the process their negative implications are likely to have already occurred. For lasting and promising results from TQM implementation, it is desirable that proper planning takes place before implementation, with knowledge of likely barriers, thus preventing problems associated with barriers from occurring in the first place - removing the barriers before TQM implementation process initiates (Oakland, 2004). According to Masters (1996), it is important for all organisations to understand and avoid these barriers both before and during TQM implementation. Therefore, this study also attempts to undertake systematic research on the potential barriers that inhibit the process of TQM development in Bahraini industries.

1.4 Problem statement

As stated in the previous section, there are many studies on organisational culture and TQM; and many on barriers to TQM implementation. Despite an extensive search, no studies have been located in the literature that have investigated the relationships of these sets of variables – TQM implementation barriers and organisational culture - in order to formulate guidance for TQM implementation that explicitly considers their impact on each other. These observations about the existing literature led to the identification of the following critical gap in the TQM literature in relation to TQM implementation:

Many TQM implementation models and frameworks have been developed but none of these models have investigated the impact of organisational culture on TQM implementation barriers. Thus, there is a need to examine these relationships in order to inform efforts to achieve effective TQM implementation.

Figure 1.1 illustrates the state of the existing literature regarding examining the relationship between organisational culture and TQM implementation; and between TQM implementation barriers and TQM implementation. However, despite their importance, no study, model or framework is found in literature that has investigated the impact of organisational culture on TQM implementation barriers.

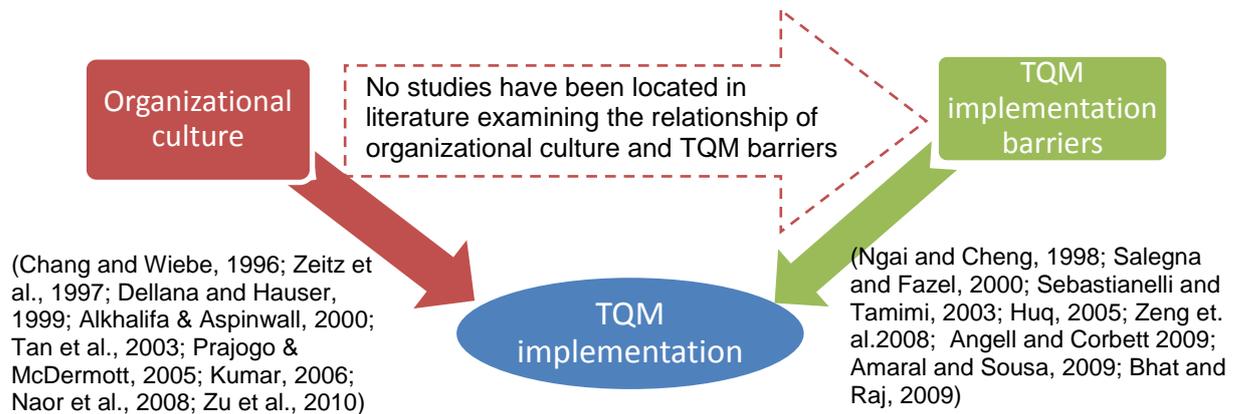


Figure 1.1 State of existing literature on core elements of TQM implementation

This gap in the knowledge base calls for empirically examining the evidence on the relationships between the two sets of core elements of TQM in order to better understand their influence towards full and effective TQM implementation. Knowledge of these relationships will extend present understanding of prevalent barriers and context specific culture; and will contribute towards developing revised models for TQM implementation in future research. This research focuses on getting to the root of the issue instead of treating the symptoms, by finding out what type of supportive culture can either reduce the barriers or offset the effects of these barriers. It is proposed that by tackling the barriers in real time through managing organisational culture, organisation will be able to overcome TQM implementation barriers, eventually enhancing TQM implementation. Therefore, this study identifies the types of organisational culture and significant TQM implementation barriers existing in Bahraini industries. A conceptual framework was developed using types of organisational culture developed by Denison and Spreitzer (1991) and a set of TQM implementation barriers derived from the literature to examine the relationships between organisational culture and TQM implementation barriers.

1.5 The context of the study

The context of this thesis is within the sphere of improvement of business culture and overall economic development of the Kingdom of Bahrain. Recent reviews of Bahrain market and organisational data have shown that standards of quality; employee skills; the employee talent pool; and company performance needs considerable improvement (Ernst and Young, 2009). According to Ernst and Young (2009), overall only 13% of the respondents to their study have implemented QM (Quality Management) in their respective organisations.

According to this report, the businesses in Bahrain lack a culture of quality, resulting in slow development. Another study by D&B (2008) has reported that a lack of skilled employees and training is a key challenge to the economy of Bahrain. Understanding this problem, the government of Bahrain in its long term strategic plan (Vision 2030) has created policies with a special emphasis on meeting challenges such as business culture improvement, increasing government's promotional and investment strategies and creating easier market access to enable enterprise growth.

In this regard, the government of Bahrain has started to implement a number of initiatives, such as setting up a Bahrain Centre of Excellence in Manama in 2008. Under these initiatives, the government has established three organisations to monitor progress and development of education, economy, public sector business excellence and small businesses. The Business Excellence Centre has started to organize workshops, working on themes of excellence and providing training to business leaders. Economy, education and small business growth are managed by an Economic Development Board (EDB), a Quality Assurance Authority (QAA) and by Tamkeen (an Independent Authority for Strategic and Operational plans) respectively (www.bahrainedb.com, 2009). However, the overall rate of adoption and demand for QM among SMEs (Small and Medium Enterprises) is low primarily on account of a lack of awareness among the SMEs on what QM is, how it can be implemented and what benefits the enterprise could derive from implementing it (Ernst and Young, 2009).

Hence, it is recognised by the Bahraini government that the business environment and businesses in Bahrain need extensive quality and cultural improvement (D&B, 2008). The required improvement is likely to be a long term process but can be supported by appropriate use of approaches such as TQM (Ernst and Young, 2009). In order to compete with other countries in the GCC (Gulf Cooperation Council) area and with industrialized economies, Bahrain needs an understanding of how the TQM approach can be implemented with a high rate of success. Therefore, this thesis contributes to the provision of such an understanding by examining the types of organisational culture that would help organisation in the Bahraini context, to overcome TQM implementation barriers. In doing so, consequently the study provides the government of Bahrain with a set of recommendations that seek to enhance effective TQM implementation. In this context, this study will not only close a gap in the TQM implementation literature but also benefit organisations who have not been able to

implement TQM effectively and comprehensively, or who are in the process of planning the introduction of the TQM approach.

1.6 The research questions

This gap in the TQM literature identified in the section 1.4 raises a number of important research questions in the research context:

1. What are the types of existing organisational culture in the industries of Bahrain?
2. What are the significant TQM implementation barriers in the industries of Bahrain?
3. What is the relationship between organisational culture and TQM implementation barriers, based on the culture profile and barriers that exist?

1.7 The aim and objectives of the study

Accordingly, the aim of the study presented in this thesis is to empirically examine evidence on the impact of cultural characteristics on TQM implementation barriers to better understand their influence towards the comprehensive and effective implementation of TQM. The setting for the study is Bahrain, and the key objectives of the study are:

- to identify the types of organisational culture existing in Bahraini companies,
- to identify significant TQM implementation barriers in Bahraini companies,
- to investigate what type of organisational culture is associated with what type of barrier, and
- to establish which types of culture could/should be strengthened or developed to support TQM implementation by the firms seeking to adopt a TQM approach

1.8 Research methodology

Many factors can influence TQM and its implementation but the major relationship to be tested here is between culture of the organisations and TQM implementation barriers. Therefore, based on analysis of literature and drawing from earlier research in the field of organisational culture and TQM implementation barriers, this study proposes a framework and a set of hypotheses which are the central proposition to be tested in this study. The methodology adopted in this study, broadly comprised of the following four elements:

- selection of the research approach and its major elements;

- deriving a sample and designing a data collection instrument ;
- reliability and validity testing of the research instrument that had been designed; and
- selecting and applying the appropriate data analyses tools and methods

The primary research used a quantitative research method to collect empirical data from respondents in companies operating in service and manufacturing industries of Bahrain. This kind of research can be defined as a deductive research approach with a positivism stance. The research approach relates more to a positivism stance as it takes the proposed theoretical concept from theory building to testing the theory using primary and secondary data (Saunders et al., 2007). Data was collected from a sample of service and manufacturing companies in Bahrain ensuring that the sample closely represented the population of businesses operating in Bahrain and could provide the primary data needed to examine the phenomena under inquiry. The researcher used non-probability sampling based on the judgement, experience and convenience for both types of data collection through questionnaires and structured interviews. A non-probability sample is a sampling method in which there is no way of specifying the probability of each unit's inclusion in the sample (Neuman, 2003). According to the nature of this research non-probability samples are particularly relevant and suitable, as discussed in section 4.3. A total of 540 target respondents were selected from the population. The criteria for selecting the respondents from the target population in this survey were based on relevance, qualification and experience. Managers, directors, quality managers, operation managers and policy implementers within the firms were the target respondents. The survey instrument (questionnaire) was developed based on an extensive literature review. The variables identified were used to construct appropriate measures. The respondents of the survey were asked to indicate their perceived level of agreement, or the extent to which a barrier/culture type applies to their organisation. Likert scales were used for each set of measures. The assessment of the measurement model included the determination of construct unidimensionality, convergent validity and discriminant validity.

The external validity of the questionnaire was ensured through pilot testing. Structured interviews were conducted with twelve selected prominent quality practitioners and academics. Thus, feedback on the proposed research instrument was secured from field experts, quality professionals, TQM managers and TQM employees who were similar to the target population of the main survey (Fink and Kosecoff, 1998; Nunnally and Bernstein, 1994). They were asked to comment on the clarity, content, structure and validity of the questionnaire. Using their feedback, the instrument was revised and further refined. The pilot

respondents provided useful information on designing the questionnaire and recommended adding seven indicators of TQM implementation barriers specific to Bahraini industries. After discussion with academics and other quality professionals, five of these indicators of TQM barriers were selected and added to the survey instrument to make it more comprehensive. The survey was administered online and data was collected from 325 respondents, representing a response rate of 60%.

Data validity tests such as missing data, outlier examination, linearity test, normality of data, reliability analysis tests and descriptive statistics were performed (Tabachnick and Fidell, 2007; Hair et al., 2010). Descriptive statistics were used to analyse profiles of organisational culture and TQM implementation barriers; and to examine various demographics of the respondents. Analysis of moment structure (AMOS) 16.0 versions software was used to perform both the confirmatory factor analysis and the structural model testing (Hair et al., 2010).

1.9 Contributions of the study

This research contributes significantly in both academic and practical dimensions. One of the theoretical contributions of this thesis is identifying a gap in literature regarding research on effective implementation of TQM. In order to address this gap, this study attempts to investigate the relationships between organisational culture and TQM implementation barriers to determine which type of organisational culture is related to which TQM implementation barrier. This study enhances the existing knowledge on TQM and its implementation as it is the first study, both in a western and non-western context that has explicitly examined the influence of organisational culture on TQM implementation barriers. Thus, the findings of this research provide for a deeper and richer understanding of the factors affecting the implementation of TQM. Given that the theoretical model was based on literature developed mainly in western contexts (such as the U.S., Europe and Japan), the test of the theoretical model in the context of Bahraini firms also provided a good opportunity for the researcher to evaluate the applicability of culture/TQM barrier theory in a different, non-western national context. Finally, this study has also developed and initially validated a scale to measure TQM barriers based on the synthesis of prior work, identified significant barriers to TQM implementation from literature by a systematic methodology and validated them through structured interviews thus providing a much more robust typology of TQM barriers.

The survey instrument measures the distinct dimensions of both culture and TQM implementation barriers which will allow practitioners to assess the readiness of the organisation's culture to embrace a formal TQM approach. The research will benefit organisations who have not been able to implement TQM comprehensively, or who are in the process of planning the introduction of the TQM approach. More specifically, the framework and survey instrument can be used in any organisational environment in any country or region. Therefore, it is envisaged that this study would help to enhance the success rate of TQM implementation on large scale.

1.10 Thesis organisation

This thesis is structured in seven chapters.

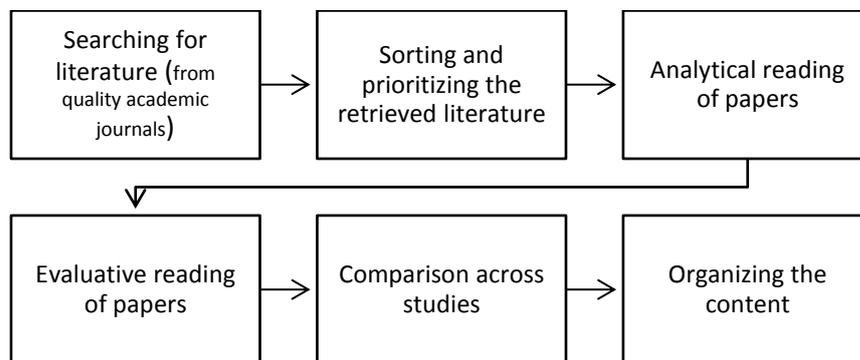
- Chapter 1 Introduction - has outlined the thesis including its purpose, background, context, problem definition, the aim and objectives, research questions, research methodology, and the contribution of the study.
- Chapter 2 Literature Review - provides the review of the academic literature and analysis in order to develop the theoretical background of the research.
- Chapter 3 Conceptual Framework - integrates the theory on organisational culture and on TQM implementation barriers to provide a conceptual framework for TQM implementation and develop hypotheses for testing.
- Chapter 4 Methodology - explains the research methodology and research design adopted for the study.
- Chapter 5 Data analysis and Finding – presents the results from the empirical survey based research.
- Chapter 6 Discussion - discusses the main findings from the results of the primary data analysis.
- Chapter 7 Conclusion – presents the salient conclusions derived from the empirical findings, sets out the contributions of the study and its limitations and recommends directions for future research.

Chapter Two: Literature Review

2.1 Introduction

This chapter comprises a review of the literature on TQM in the context of this study. It provides a broad understanding of the concept of TQM and examination of TQM as a tool for organisational excellence. The chapter examines organisational culture in the context of TQM and the Competing Values Framework (CVF) that seeks to identify the typical organisational culture conducive to TQM implementation. The chapter also includes a critical review of the factors hampering the implementation of TQM, which in turn leads to the identification of the major barriers associated with TQM implementation. This is followed by a review and examination of the impact of underlying cultural characteristics of organisations on TQM implementation barriers, in order to map out their influence towards the effective implementation of TQM. The broad process of reviewing the literature is shown in figure 2.1.

Figure 2.1 Process of reviewing literature



This literature review was carried out using academic and peer reviewed research articles, industry reports, company reports, trade publications and regulatory and certification agencies' data, and relevant textbooks on the subject (where necessary).

The structure of the literature review broadly follows the structure of the research questions presented in section 1.5. The review is divided and organised into a conceptual and thematic structure comprising five main sections. Section (2.2) gives an overview of TQM (Total Quality Management) that includes a brief look at the origins of TQM, various definitions of TQM, core constructs and principles underlying TQM and quality award frameworks based on TQM. Section 2.3 includes the scope of TQM and its implementation and section 2.4 examines the bespoke nature of TQM and its implementation. Core elements

of TQM implementation are discussed in section 2.5. This examination sets the scene for the remainder of the chapter, in which the TQM literature is examined from more specific viewpoints.

Section 2.6 examines the organisational culture and the role of organisational culture in TQM implementation. It includes findings of examination of what organisational culture is, how many types of organisational culture there are, and what specific dimensions of culture each type comprises. Consequently, the review helps to identify a suitable framework (Competing Values Framework) for determining the types of organisational culture that exist in any industry.

Section 2.7 reviews observed causes and consequences of obstacles to the effective introduction of TQM focusing on significant TQM implementation barriers and the role of TQM implementation barriers in the implementation process of TQM. In this connection, the section reviews the research streams on literature dealing with significant TQM implementation barriers and the impact of these barriers on TQM implementation. This review provides a systematically derived set of significant TQM implementation barriers along with their hypothetical significance.

Section 2.8 presents findings of an examination of the relationships between organisational culture and TQM implementation barriers. Findings relating to the strength and direction of relationships between organisational culture and TQM implementation barriers identified in previous research are presented. The section also reviews why the knowledge of culture types is important for TQM implementation and examines the impact of each type of culture on TQM implementation barriers. In this context, research streams for both variables (culture and barriers) are explored in order to establish relationship between them to help in developing and testing hypotheses. The final section (2.9) of the literature review presents a brief summary of the chapter.

2.2 An Overview of Total Quality Management and its Implementation

This section defines and explains the TQM concept from different perspectives and reviews various definitions specified by TQM researchers and practitioners. Commonalities and differences in conceptualization are presented. This review commences with a brief look at the origins of TQM, various definitions of TQM, core constructs and principles underlying

TQM and quality award frameworks based on TQM. The scope of TQM and its implementation, and the bespoke nature of TQM implementation are also discussed.

2.2.1 Origins of the TQM concept

The origin of the TQM concept dates back to Feigenbaum in 1957 and later developed by the works of Ishikawa (1976), Crosby (1979), Juran (1980), Deming (1982), Taguchi (1990) and Oakland (1993). These theorists are regarded as the key founders of TQM philosophy therefore the origin of TQM concept evolves mostly from their work. In order to understand TQM content and its process, study has selected the seminal works of four gurus (Crosby, 1979, 1996; Deming, 1982, 1986; Ishikawa, 1985; and Juran, 1951, 1962, 1974, 1988, 1989, 1992) who had a considerable influence on the development of TQM in organisations throughout the world. Here the approaches of arguably the top four gurus of TQM - Crosby, Deming, Ishikawa and Juran are discussed:

Crosby's concept of TQM

During the late 1970s and into the 1980s North American manufacturers were losing market share to Japanese firms, largely due to the superiority of quality of the Japanese products. Crosby's response to the quality crisis was the principle of "doing it right the first time" (DIRTFT). He included four major principles in this theory:

- quality is conformance to requirements
- the management system is prevention
- the performance standard is zero defects
- the measurement system is the cost of quality

Crosby's audience was primarily top management; he sold his approach to them and stressed increasing profitability through quality improvement. His argument was that higher quality reduces costs and raises profits. Crosby's programme of 14 steps (Crosby, 1979) focuses on how to change the organisation using quality and what specific action plans are required for its implementation. Crosby is acknowledged as great motivator of senior management in helping them to understand how to get the improvement process started. His approach is generally regarded as simple and easy to follow.

Deming's concept of TQM

The theoretical essence of the Deming approach to TQM concerns the creation of an organisational system that fosters cooperation and learning for facilitating the implementation

of process management practices, which, in turn, leads to continuous improvement of processes, products, and services as well as to employee fulfilment, both of which are critical to customer satisfaction, and ultimately, to firm survival (Anderson et al., 1994a). Deming (1986) stressed the responsibilities of top management to take the lead in changing processes and systems. Deming (1986) also emphasized the importance of identification and measurement of customer requirements, creation of supplier partnership, use of functional teams to identify and solve quality problems, enhancement of employee skills, participation of employees, and pursuit of continuous improvement.

Deming's approach is highly statistical and he believed that every employee should be trained in statistical quality techniques. A 14-point approach (Deming 1986) summarizes his management philosophy for improving quality and changing the organisation's culture. Deming's argument was that quality, through a reduction in statistical variation, improves productivity and competitive position. He defined quality in terms of quality of design, quality of conformance and quality of the sales and service function. Deming's main argument was that by improving quality it is possible to increase productivity and this will improve organisational competitiveness. Deming's other main contributions were the PDCA (plan, do, check, act) or the PDSA (plan, do, study, act) cycle of continuous improvement, and pinpointing of the seven 'deadly diseases' (lack of consistency of purpose; emphasis on short term profits; evaluation of performance, merit rating or annual review, mobility of management; running a company on visible figures alone; excessive medical costs and excessive cost of liability). Deming expected managers to develop a partnership with those at the operating level of the business and to manage quality with direct statistical measures without cost of quality measures. Deming's approach to change the organisational culture is closely aligned with Japanese practices.

Ishikawa's concept of TQM

According to Dale et al. (2007), Ishikawa has mainly contributed in three areas: 1) Simplification and use of seven basic quality control tools, 2) The company wide quality movement, and 3) quality circles. Ishikawa argued that quality management extends beyond the product and encompasses after-sales service, the quality of management, the quality of individuals and the firm itself (Ishikawa, 1985). He claimed that the success of a firm is highly dependent on treating quality improvement as a never-ending quest. A commitment to continuous improvement can ensure that people will never stop learning. He advocated employee participation as the key to the effective implementation of TQM. Quality circles, he

believed, are an important vehicle to achieve this (Ishikawa, 1985). Like all other gurus he emphasized the importance of education, stating that quality begins and ends with it. He has been associated with the development and advocacy of universal education in the seven QC tools (Ishikawa, 1985). These tools are listed below:

- Pareto chart;
- Cause and effect diagram (Ishikawa diagram);
- Stratification chart;
- Scatter diagram;
- Check sheet;
- Histogram;
- Control chart.

Ishikawa suggested that the assessment of customer requirements serves as a tool to foster cross-functional cooperation; selecting suppliers should be on the basis of quality rather than solely on price; cross-functional teams are effective ways for identifying and solving quality problems (Ishikawa, 1991). Ishikawa's concept of TQM contains the following six fundamental principles:

- Quality first-not short-term profits first;
- Customer orientation-not producer orientation;
- The next step is your customer-breaking down the barrier of sectionalism;
- Using facts and data to make presentations-utilization of statistical methods;
- Respect for humanity as a management philosophy, full participatory management;
- Cross-functional management.

Juran's concept of TQM

Juran is known as a business and industrial quality "guru," while making significant contributions to management theory, human resource management and consulting as well. Juran is widely credited for adding the human dimension to quality management. He pushed for the education and training of managers. For Juran, human relation problems were the ones to isolate. Resistance to change - or, in his terms, cultural resistance - was the root cause of quality issues. He also developed the "Juran's trilogy", an approach to cross-functional management that is composed of three managerial processes: planning, control, and improvement (Juran and Frank, 1993).

According to Juran, TQM is the system of activities directed at achieving delighted customers, empowered employees, higher revenues, and lower costs (Juran and Frank, 1993). Juran believed that main quality problems are due to management rather than workers. He also emphasized the importance of top management commitment and empowerment, participation, recognition and rewards. According to Juran, it is very important to understand customer needs. Identifying customer needs requires more vigorous analysis and understanding to ensure the product meets customers' needs and is fit for its intended use, not just meeting product specifications. A 10 point plan summarizes his approach. Juran's approach is more consistent with American management practices. He took the existing management culture as starting point and built a quality improvement process from that baseline.

It is evident that each of the three quality gurus has his own distinctive approach. Nevertheless, the principles and practices of TQM proposed by these quality gurus provide a good understanding of the concept of TQM. Their insights offer a solid foundation for conducting this study. Although their approaches to TQM are not totally the same, they do share some common points which can be summarized as follows:

- It is management's responsibility to provide commitment, leadership, empowerment, encouragement, and the appropriate support to technical and human processes.
- It is imperative that management foster the participation of the employees in quality improvement, and develops a quality culture by changing perception and attitudes toward quality.
- The importance of employee education and training is emphasized in changing employees' beliefs, behaviour, and attitudes; enhancing employees' abilities in carrying out their duties.
- Employees should be recognized and rewarded for their quality improvement efforts.
- It is very important to control the processes and improve quality system and product design. The emphasis is on prevention of product defects, not inspection after the event.
- Quality is a systematic firm-wide activity from suppliers to customers. All functional activities, such as marketing, design, engineering, purchasing, manufacturing, inspection, shipping, accounting, installation and service, should be involved in quality improvement efforts.

Each of the approaches given above has its strengths and weaknesses and they are all proven packages. Nevertheless, none of the experts has all the answers to the problems facing organisations. A number of writers (e.g. Bendell, 1989; Fine, 1985; Gerald, 1984) have compared and contrasted the approaches of the experts and their commentaries are helpful in assessing the value of each approach. These experts can be characterized by the main focus of their approach as follows:

- Crosby: company-wide motivation
- Deming: statistical process control
- Ishikawa: focus on continuous improvement by involving everyone
- Juran: project management

All the authors agree to the purpose of quality to delight customers and reduce the cost by process management. It is unanimously agreed by the authors that TQM will not work without the commitment of top management. It is also acknowledged by these authors that employees have to be trained and educated about quality concepts, quality tools and techniques. Similarly, establishing and using teams is recommended by these authors to solve quality problems.

There are other areas where there is partial agreement among the authors. For example, Crosby (1996) does not support the idea to use the statistical tools for analysis to improve control but other three authors stress to use statistical tools. Similarly, Ishikawa and Deming value the focus on long-term plans, but Crosby doesn't give it any precedence, and Juran only stresses the long-range quality programmes. Ishikawa and Juran emphasise product design, but Crosby and Deming don't. All other authors stress on planning except Crosby. Juran covers all aspects of planning, Deming emphasises on action planning, and Ishikawa has a focus on feedback and control. Moreover, the most important concept of modern day TQM, such as empowerment of employee is not given due importance by most of these authors except Juran (1995) who brings up empowerment as major element of quality movement. Despite, these differences, there is complete convergence in their views on the core elements of TQM.

Fine (1985) concludes that the teachings of Crosby, Deming, Ishikawa and Juran have four points in common:

- The top management support and participation
- The workforce training and education

- Planning and involvement
- Continuous quality improvement programmes

These prescriptions of Crosby, Deming, Ishikawa and Juran are certainly reasonable foundation for any organisation introducing TQM. The argument for this approach is that each of these experts has a well-founded and rational package that provides a kind of logical framework to streamline the processes.

2.2.2 Definition of Total Quality Management

The global marketplace has become very competitive because of more informed customers who are demanding superior quality of products and services. Therefore, quality and its management and the associated continuous improvement are looked upon by many organisations as the means by which they can survive in increasingly aggressive markets and maintain a competitive edge over their rivals (Dale et al, 2007). As a result of the efforts made by organisations to respond to these marketplace demands the quality of products, services and processes has increased considerably during the last three decades (Oakland, 2003). Such an improvement is obviously the result of many quality improvement tools developed by researchers and practitioners but quality practitioners were in search of an approach that has the potential to integrate all the improvement tools in one solution. In this context, TQM has emerged as a holistic management model because the concept of TQM is much broader than the traditional quality concepts. It encompasses not only product, service and process improvement but those relating to costs and productivity and to people involvement and development (Dale et al., (2007). TQM has been arguably the most significant approach to the management of organisations and their operations and its improvement and has provided many tools and techniques (Capon et al., 1995; Curkovic et al., 2000; Dean and Bowen, 1994; Evans and Lindsay, 1999; Juran, 1995; Ahire et al., 1996; Flynn et al., 1994; Samson and Terziovski, 1999; Saraph et al., 1989). Oakland (2003) asserts that TQM helps in the management of operational activities and in business process improvement in two ways: Firstly, increasing effectiveness of the organisation by improving the processes that result profit, and secondly, by reducing defects and eliminating extra costs to products and services thus decreasing overall costs and creating extra capital for the development of organisational resources such as human capital.

Much research has been conducted about TQM. However, it is evident from the literature that different researchers have adopted different definitions and frameworks based

on the context of application or the theme of the research. This has resulted in many debates and some lack of agreement on what TQM is, and how it can be used effectively. Therefore, it is necessary from the outset to examine the broad nature of the TQM paradigm, before examining more specific various TQM practices. Table 2.1 presents some salient definitions of TQM found in the literature.

Table 2.1 Definitions of TQM in the literature

S#	Author	Definition
1	Feigenbaum (1957)	TQM is an effective system for integrating the quality development, quality maintenance and quality improvement efforts of the various groups in an organisation so as to enable production and service at the most economical levels which will allow for full customer satisfaction
2	Department of Defence (1988)	TQM integrates fundamental management techniques, existing improvement efforts and technical tools under a disciplined approach focused on continuous improvement
3	Steingard and Fitzgibbons (1993)	TQM can be defined as a set of techniques and procedures used to reduce or eliminate variation from a production process or service-delivery system in order to improve efficiency, reliability, and quality
4	Kanji and Asher (1996)	TQM is a continuous process of improvement for individuals, groups of people, and whole firms that encompasses a set of three principles- delight the customer, fact and people based management and continuous improvement
5	Ross (1993)	TQM can be defined as the application of quality principles for the integration of all functions and processes within the firm
6	ISO 8402 (1994)	TQM is a management approach centred on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction and benefits to all members of the organisation and to society
7	Flynn et al. (1994)	TQM is an integrated approach to achieve and to sustain high quality output, focusing on the maintenance and continuous improvement of processes and defect prevention at all levels and in all functions of the firm, in order to meet or exceed customer expectations
8	Ho and Fung (1994)	TQM is a way of managing to improve the effectiveness, flexibility, and competitiveness of a business as a whole and a method of removing waste, by involving everyone in improving the way things are done
9	Vuppapapati et al. (1995)	TQM is an integrative philosophy of management for continuously improving the quality of products and processes to achieve customer satisfaction

10	Oakland, 2001	TQM is part of a broad-based approach used by world class organisations to achieve organisational excellence, the highest weighted category of all the quality and excellence awards
11	Kaynak (2003)	TQM can be defined as a holistic management philosophy that strives for continuous improvement in all functions of an organisation
12	Dale et al. (2007)	TQM is the mutual co-operation of everyone in an organisation and associated business process to produce value for money products and services which meet and hopefully exceed the needs and expectation of customers
13	Vorley and Tickle, 2005)	TQM can be defined as synthesis of the organisational, technical and cultural components of a company
14	Irani et al. (2004)	TQM can facilitate the organisational improvement in terms of growth, delighting customers and being ahead of competitors

As can be seen there is certain diversity in meaning, application and features of TQM described by various researchers in so many different ways. Pheng (1996) asserted this fact very effectively stating that there is no one, single, universally acceptable definition which managers can adopt; no individual author can claim a monopoly of the set of concepts or ideas which contribute to the overall philosophy and practice of TQM. However, based on an examination of the definitions of TQM found in the literature, it is reasonable to conclude that TQM can be defined as a philosophy or approach that involves the application of quality management principles, practices and techniques to all aspects of the organisation including management, employees, customers and suppliers and their integration with the key business processes. TQM is both a philosophy and a set of guiding principles for managing an organisation to the benefit of all stakeholders. It is a continuous improvement approach that focuses on doing things right first time in order to meet the needs and expectations of both external and internal customers.

2.2.3 TQM and Quality award models

Currently, there is a tendency in organisations to assess their performance against performance excellence standards such as quality award models. Worldwide organisations frequently use three main different types of quality awards as their benchmarks for performance within their industry. The Deming Prize, instituted by the Union of Japanese Scientists and Engineers (JUSE) in 1951, the Malcolm Baldrige National Quality Award started by American Productivity and Quality Centre (APQC) as an annual prize to be awarded in America, and European Foundation for Quality Management (EFQM) started by

14 Western European countries in 1988. Based on the TQM concept two other significant tools, Six Sigma (used for zero defect quality production systems) and Human Sigma (to improve quality at the employee - customer service interface) have also been developed.

Black and Porter (1996) assert that literature studies have often identified key differences between these prescriptions, and no single model has established itself as a basis for Total Quality Management theory. Authors further argue that there is not only an absence of a practical model that could be used by organisations in developing their TQM systems, but also a lack of easily applied methods for identifying areas for improvement in current TQM programmes, resulting in a trend in organisations to use TQM frameworks based upon the assessment criteria from key quality awards such as the Deming Prize in Japan, the Malcolm Baldrige National Quality Award in the U.S. and the European Quality Award. Sunday and Liberty (1992) imply that most of organisations use the criteria to identify which companies utilised the best quality management practices. The large number of requests for copies of the Baldrige Award guidelines indicates the popularity of this award among organisations world wide, making the Baldrige Award the best established framework for TQM practice (<http://www.nist.gov/baldrige/>). However, the European Quality Award assessment model, introduced in 1992, is also gaining approval of organisations wishing to use the criteria for self-assessment of their TQM practice.

The criteria of awards encapsulate a comprehensive and holistic management model covering its various activities, practices and process and provide the mechanism for qualifying an organisation's current state of TQM development by means of points score. Since the establishment of these awards there has been an explosion in published materials describing them and comparing their characteristics. Van der Wiele et al (1996) reports that the five most important reasons for organisations starting self assessment were to:

- Find opportunities for improvement
- Create a focus on a TQM based on either the EFQM or MBNQA model criteria.
- Direct the improvement process
- Provide new motivation for the improvement process
- Manage the business.

This self assessment provides the information on improvement and helps management to understand how business operates. More importantly, it helps to analyze affect of actions on results. However it should be kept in mind that what has not been implemented cannot be

assessed. Therefore, organisations must understand the potential gap that can exist between where they currently stand in relation to TQM and the model of the award being used in order to make comparisons.

Major quality award models

As mentioned in the beginning of this section, there are a number of internationally recognized award models, the main ones being the Deming Application Prize in Japan, the MBNQA in America and the EFQM excellence model in Europe. Although there are some differences between the models, they have a number of common elements and themes. Most of the national and regional awards are more or less duplicates of the international models, with some modifications to suit issues which are of national or local interest. The broad aims of these awards are described as follows (Ghobadian and Woo, 1996):-

- Increase awareness of TQM because of its important contribution to superior competitiveness;
- Encourage systematic self-assessment against established criteria and market awareness simultaneously;
- Stimulate sharing and dissemination of information on successfully deployed quality strategies and on benefits derived from implementing these strategies;
- Promote understanding of the requirements for the attainment of quality excellence and effective deployment of TQM;
- Encourage firms to introduce a continuous improvement process.

Each award model is based on a perceived model of TQM. The award models do not focus solely on either product or service perfection or traditional quality management methods, but consider a wide range of management activities, behaviour and processes that influence the quality of the final offerings (Ghobadian and Woo, 1996). They provide a useful audit framework against which firms can evaluate their TQM implementation practices, seek improvement opportunities, and achieve the end results.

The Deming Prize

The Deming Prize was established by the Board of Directors of the Japanese Union of Scientists and Engineers in 1951. Its main purpose is to spread the quality gospel by recognizing performance improvements flowing from the successful implementation of firm-wide quality control based on statistical quality control techniques (Ghobadian and Woo, 1996). The Deming Prize proved an effective instrument for spreading TQM philosophy throughout the Japanese industries.

There are ten primary elements in the Deming Application Prize (1996), as well as a checklist that is used to evaluate the performance. This checklist emphasizes the importance of top management's active participation in quality management activities and understanding of the main requirements of quality improvement programmes. It also provides senior executives with a list of what they need to do.

The European Model for TQM

The European Quality Award was officially launched in 1991. The primary purpose of the award is to support, encourage, and recognize the development of effective TQM by European firms. The EFQM Excellence Model (www.efqm.org) is used as a basis for self-assessment, an exercise in which an organisation grades itself against a given criteria.

The EFQM's latest, 2010, model consists of 9 criteria that help to understand and analyse the cause and effect relationships between what organisations do and the results they achieve. The model of the European Quality Award is divided into two parts, enablers and results. Five of these criteria are 'Enablers' (Leadership; Policy and Strategy; People; Partnerships and Resources; Processes) and four are 'Results' (Customer Results; People Results; Society Results; and Key Performance Results). The 'Enabler' criteria cover what an organisation does and how it does it. The 'Results' criteria cover what an organisation achieves (www.efqm.org).

Each of the 9 criteria has a definition, which explains the high level meaning of that criterion. To develop the high level meaning further, each criterion is supported by a number of criterion parts. The RADAR logic helps organisations to assess and score the level of each sub-criterion. This exercise helps organisations to identify current strengths and areas for improvement against strategic goals. This gap analysis then facilitates definition and prioritisation of improvement plans to achieve sustainable growth and enhanced performance. Improving the Enablers in turn leads to improved Results.

The Malcolm Baldrige National Quality Award

The purpose of this award is to promote an understanding of the requirements for performance excellence and competitiveness, improvements and to promote the sharing of information on successful performance strategies (NIST, 2008 -www.nist.gov). The criteria for performance excellence are available in business, education and health care divisions. The programme and award are managed by NIST, an agency of the US Department of Commerce. The American Society of Quality (ASQ) administers the MBNQA under contract to National

Institute of Standards and Technology (NIST). The model framework can be used to assess firms' current quality management practices, benchmark performance against key competitors and world class standards, and improve relations with suppliers and customers. The Malcolm Baldrige National Quality Award model framework (2008) includes – Leadership, Strategic Planning, Customer and Market Focus, Measurement, Analysis, and Knowledge Management, Workforce Focus, Process Management, and Results.

The MBNQA, EFQM and Deming prize are most widely recognised award models. These three quality award models provide a universal framework for evaluating aspects of TQM practices in a firm. They also provide a framework for identifying a range of intangible and tangible processes that influence the firm's TQM implementation and the end results. Although each award has its own unique categories and emphasis, there are some common areas:-

- Each award model has two parts: One is the enablers (TQM implementation) and the other is the overall business results. TQM implementation makes overall business results happen.
- All three award models emphasize the importance of leadership, human resources management, employee participation, employee education and training, process management, strategy and policy, information, supplier quality management, and customer focus.
- The three quality award models provide firms with a means to measure their position against a set of universal criteria, and to identify their strengths and weaknesses in the areas of quality management practices and business results.
- These models provide an insight into the practical way of applying TQM, and give a better understanding of the concept of TQM.

2.2.4 Core constructs and principles underlying TQM

Much of the past research on quality management has focused on core constructs and TQM principles (Saraph, et al., 1989; Parker and Porter, 1993; Tamimi and Gershon, 1995; Black and Porter, 1996; Ahire et al, 1996; Pannirselvam et al., 1998; Dow et al, 1999, Wilson and Collier, 2000; Kaynak, 2003). Hackman and Wageman (1995) reviewed TQM definitions given by three quality gurus namely Deming, Juran, and Ishikawa. They identified six interventions as the core of TQM: 1) explicit identification and measurement of customer

wants and needs, 2) creation of supplier partnership, 3) use of functional teams to identify and solve quality problems, 4) use of scientific methods to monitor performance, 5) identify points of high leverage for performance improvement and 6) use process management heuristics to enhance team effectiveness.

Major principles and associated practices covering the complete TQM requirements have also been advanced by Ho and Fung (1994), Mann and Kehoe (1994), Powell (1995), Black and Porter (1996) and Choi and Eboch (1998). These can be listed as top management commitment, leadership involvement, customer satisfaction, employee management, training, empowerment and development of staff, process and quality control, error prevention, team work, stakeholders relationships management, corporate culture, suppliers co-operation and system adoption capabilities. In the TQM literature, these principles are frequently called critical success factors (CSFs).

Perhaps the most remarkable study ever done in relation to the importance of TQM factors was by Black and Porter (1996) in identifying critical TQM factors by self-assessment framework of Baldrige Award to guide quality managers in the development of TQM. Although the 10 factors identified by this empirical analysis do not fit into a convenient taxonomy of the type suggested by the Baldrige framework, the concepts remain consistent with established TQM theory. They were: corporate quality culture, strategic quality management, teamwork structure, external interface management, supplier partnership, operational quality planning, quality improvement measurement system, communication of improvement information, people and customer management, and customer satisfaction orientation.

This study was also reiterated by Dayton (2001) in US with 1000 members of the American Society of Quality. Author made a comparison of TQM critical success factors between UK versus USA firms to identify the current critical success factors in TQM systems in US corporations by empirically measuring the quality professional's perception of which TQM critical factors were the most important. The critical factors identified in the Black and Porter (1996) European study were rated as important TQM critical factors by the US quality professionals.

Schniederjans et al. (2006) made a comparative analysis of Baldrige Criteria to determine if Baldrige criteria constructs are perceived to be of equal importance to quality managers in the countries of India, Mexico, and the US. The study revealed a number of

similarities and differences in the perceptions of the value of nine different quality criteria constructs. The results revealed that there are significant differences in quality management practices when India is compared to either Mexico or the United States, but Mexico and the United States have similar assessments, agreements, perceptions, or opinions on quality.

Saraph et al. (1989) used the concept of developing TQM constructs and this trend was continued by subsequent researchers. Each researcher used their own constructs and added or deleted previous ones, leading to inconsistency in defining the content of TQM constructs. This situation comes out to be a complication while addressing real TQM content. Since, this thesis research was not aimed at developing or validating another set of TQM constructs, the author decided to select small set of a model representative from the previous empirical studies on TQM to act as guidance in subsequent stages of the research development.

Five studies are identified from literature offering a simple, reliable and valid methodology for scientifically examining how TQM systems can be modelled over time. These studies have demonstrated how empirical work provide new insights into Total Quality Management and identify significant TQM factors for implementation to achieve performance excellence. The selected studies and identified significant TQM factors are listed below in table 2.2.

Table 2.2 significant TQM factors given in 5 studies

S#	Author	Significant TQM factors
1	Ho and Fung, 1994	Leadership, commitment, total customer satisfaction, continuous improvement, total involvement, training and education, ownership, reward and recognition, error prevention, and cooperation and teamwork are ten TQM elements
2	Mann and Kehoe, 1994	Ten key elements of TQM are identified as supplier improvement, process control and improvement, internal customer focus, measurement and reporting, leadership, quality system, participation, recognition, education and training, and external customer focus
3	Powell, 1995	Elements of TQM framework: Executive commitment, adopting the TQM philosophy, closer to customers, closer to suppliers, benchmarking, training, open organisation, employee empowerment, zero-defects mentality, flexible manufacturing, process improvement, and measurement
4	Black and Porter, 1996	TQM has ten critical factors: People and customer management, supplier partnership, communication of improvement information, customer satisfaction orientation, external interface management,

	strategic quality management, team-work structure for improvement, operational quality planning, quality improvement measurement systems, and corporate quality culture
5 Choi and Eboch, 1998	Management of process quality, human resources management, strategic quality planning, and information and analysis are the constructs of TQM implementation

2.3 Scope of TQM and its implementation

The TQM literature suggests two common issues/problems associated with the implementation of TQM: 1) TQM implementation barriers (Ngai and Cheng, 1997; Salegna and Fazel, 2000; Sebastianelli and Tamimi, 2003; Huq, 2005; Bhat and Raj, 2009), and 2) unfavourable organisational culture (Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Zu et al., 2010). For example, in order to implement the TQM principle of employee focus, managers need to address employee barriers. In other words, to implement the employee focus principle of TQM, organisations should also consider the attitudes, values and behaviour of employees in relation to quality objectives because managers need to understand which behaviours of employees would have a desirable impact on offsetting the implementation barriers (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999). Identification and resolution of these two issues is considered to be critical in the implementation process (Mann and Kehoe, 1998; Newall and Dale, 1991).

According to Lundquist (1995), TQM implementation is based on three core elements: 1) the TQM philosophy that comprises a set of TQM principles; 2) the organisational culture - the antecedent that influences TQM implementation; and 3) TQM implementation barriers – that hamper effective implementation of TQM. In this respect, accepting the proposition that TQM has valid content, the other two key elements that play a role in effective TQM implementation are organisational culture and TQM implementation barriers. In their efforts to implement TQM, organisations have extensively used implementation models, latest standards, strategies of implementation, tools and techniques, but there is much less evidence that organisations have specifically tried to minimize (or eliminate) the TQM implementations barriers. The relationships between what organisations do (enablers) and what they achieve (results) is the measure of TQM success but often organizations can't do what they want because of barriers in implementing these enablers. Therefore, it is logical to argue that if organisations can minimise the barriers to TQM implementation, there is a greater likelihood that the implementation of enablers can advance successfully. Therefore, exploring the impact of organisational culture on TQM

implementation barriers is logical because the elimination (or minimization) of TQM implementation barriers should lead to more effective TQM implementation (Huq, 2005; Zeng et al., 2008). Therefore, unlike the other studies in this domain, the focus of this study is on TQM implementation barriers instead of enablers.

In his study, Ross (1993) defined TQM implementation as the integration of all functions and processes within an organisation to achieve continuous improvement of the quality of goods and services with the ultimate goal being customer satisfaction. Jung et al. (2008), stated that TQM implementation encompasses and facilitates all functional areas, processes, and systems of business, including design, development, production, distribution, and customer support.

Ahire et al. (1996) made a landmark study in the development, validation and implementation of TQM constructs. Their work points to an underlying theory consisting of interrelated determinants of effective TQM implementation. They conclude that various quality management practices act in synergy to affect product quality. For example, top management commitment appears to influence product quality through improved customer focus and effective human resource mobilization. Techniques such as SPC and benchmarking require effective usage by motivated and quality trained employees.

Still a number of other factors affect the eventual outcome of effective TQM implementation. Oakland (2004) stated that organisations don't achieve the desired performance level from TQM implementation mainly because of two reasons: 1) the programme is not introduced and implemented effectively and 2) during post-implementation the effects are allowed to fade away over time. He pointed out that other factors such as over enthusiasm; uncoupled efforts; lack of commitment, organisational resources, and capabilities; and false underlying assumptions at the time of planning can increase resistance and barriers to the effective implementation. Employee resistance due to various reasons can be the biggest resistance to the introduction and implementation of the TQM, as pointed out by Dale et al. (2007).

2.4 The bespoke nature of TQM and its implementation

All over the world, organisations operate in differing work environments and contexts, with diverse organisational cultures and differing business requirements. Quality initiatives that suit one organisation may not work well for another. Naturally therefore, some TQM practices might not be as applicable to some companies as to others. Such disparity is

likely to exist among companies, countries and regions, mainly due to organisational and national cultures. Flynn and Saladin (2005) made a notable contribution in this respect while examining the relevance of theoretical TQM factors across national cultures. Their findings indicate that national culture plays a strong role in the effectiveness of the Baldrige constructs. Their findings also indicate the need for countries to develop awards and quality initiatives tailored to their national cultures.

When planning TQM implementation, a prevalent question that strikes organisations is “what TQM practices to implement”. Internationally, quality managers have differences in perception of the importance of TQM practices (Rao et al., 1997, Solis et al., 1998, Black and Porter, 1996). Because the managers of each company are knowledgeable about their strengths and weaknesses, they are in the best position to select what is right or wrong for them in terms of the quality activities and practices to implement in their organisations. Accordingly, a set of TQM factors based upon the perceptions of actual industrial practitioners is arguably more valid than a `standard` prescriptive set of activities and practices (Black and Porter, 1996).

According to Oakland (2004), the company leaders and quality managers of many industries may not be specifically familiar with TQM but may be practicing TQM principles routinely without even knowing it. Therefore, any TQM programme in any organisation should be validated by the leaders of the organisation. For this purpose, an appreciation of the perceived importance of TQM factors by managers at every level is required. Further more, the managers should be familiar with the recognized best practices in a TQM programme, and allowed in an informed manner to choose what they feel right for them. As such, their preference in implementation would be based on their practical experience in addition to their knowledge of the TQM theory or any TQM framework.

According to Soltani et al. (2005), there is a great deal of confusion about what TQM actually comprises, and each writer’s version reflects their management background. Soltani et al.(2005), further argue that such variations in TQM practice are also replicated differently in different organisations. Thus, although, it is likely that core TQM principles will be present in one form or another during implementation, complementary practices will differ from organisation to organisation. Therefore, it is important to consider TQM implementation from the perspective of each organisation having different TQM and organisational culture profiles. Each organisation should follow individual implementation strategies that fit its business needs (Ghobadian and Gallear, 2001). Organisations need to develop their TQM

initiatives tailored to their organisational and national cultures and business environment (Oakland, 2003).

An equally relevant argument regarding the bespoke nature of TQM implementation was made by Ghobadian and Gallear (2001). They undertook an empirical examination and proposed a generic model by developing a non-prescriptive model of TQM implementation within which practitioners and researchers can place other evidence in order to enhance their understanding of the complexities. According to Ghobadian and Gallear (2001), organisations have different contingencies in terms of their internal and external environments and thus, the details of implementation, like activities and tactics, may differ substantially.

Shin et al. (1998) also concluded that implementation should be unique to each company. They argued that the success of TQM is a function of many variables (both controllable and uncontrollable), and many of them are unique to the company situation. Therefore, they concluded that each company should tailor its approach to exploit its unique strengths and focus on its particular weaknesses. As cited by Gallear and Ghobadian (2004), a number of researchers and authors have noted that for all the attention TQM has received, there appears to be an apparent neglect of the design issue (Glover, 1993; Tolchinsky and Ranney (1994); Mann and Kehoe (1995). That is to say, there appears to have been little research attention devoted to the development of empirically grounded and practical diagnostic tools that can provide guidance to the TQM implementation designers in their endeavours to appropriately customise their organisation's TQM implementation efforts (Gallear and Ghobadian, 2004).

The arguments put forward in this section support the proposition that organisations should use a rational approach of identifying areas of improvement, identifying existing organisational culture, understanding significant TQM implementation barriers, and dealing with them on a priority basis, in order to help to save effort and money during the TQM implementation.

2.5 Core elements of TQM implementation

It has been repeatedly argued that the most problematic aspect associated with TQM is its implementation (Dale et. al, 2004; Nwabueze, 2001). Although TQM's success rate is not as high as might be desired, evidence in the literature clearly indicates that many organisations have used the TQM approach successfully (Evans and Lindsay, 2001, Krishnan

et al., 1993; Dayton, 2001; Stephens et al, 2005; Wilson and Collier, 2000; Oakland, 2004). This evidence supports the proposition that TQM can and does work and that the failures of TQM in some organisations can't be subjectively linked to deficiencies in the principles of TQM. Hence, there is no need to revisit or re-establish the key principles of TQM as many scholars have already addressed these principles. This study focuses only on implementation issues that have not been fully explored, but are believed to be very critical. Therefore, based on the assumption that TQM principles are valid, TQM failures can be associated with other core factors.

As mentioned earlier, according to Lundquist (1995), TQM implementation is based on three core elements: 1) the TQM philosophy that comprises a set of TQM principles; 2) the organisational culture - the antecedent that influences TQM implementation; and 3) TQM implementation barriers – that hamper effective implementation of TQM. In this respect, accepting the assertion that TQM has valid practices, the other two key elements that play a role in effective TQM implementation are organisational culture which may or may not support TQM implementation and TQM implementation barriers that can restrict the pace and comprehensiveness of effective implementation of TQM. Lundquist's (1995) argument is supported by several researchers who have recognized the critical role of organisational culture for effective TQM implementation (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009) and the importance of understanding TQM implementation barriers (Ngai and Cheng, 1997; Salegna and Fazel, 2000; Sebastianelli and Tamimi, 2003; Huq, 2005; Zeng et. al.2008; Angell and Corbett 2009; Amaral and Sousa, 2009; Bhat and Raj, 2009). The research on both of these key elements in the existing literature is abundant, however it is also clear that to date these two sub-fields have not fully converged, and that the impact of organisational culture on TQM implementation barriers has not yet been adequately examined in the literature.

The next two main sections examine these two key elements in turn. Section 2.6 defines organisational culture and explores how previous studies have defined the role of culture on TQM implementation and how these studies have identified and measured types of organisational culture that generally exist in organisations. Furthermore, the section explores each type of culture in the context of TQM implementation and hence examines how culture is compatible with quality goals of organisations. The subsequent section (2.7) then identifies significant TQM implementation barriers from previous studies. Section 2.8 then examines

what type of culture is associated with what barrier, and hence what broadly, is the impact of each culture type on TQM implementation barriers as evidenced from the literature that is present, but fragmented, on this important issue.

2.6 Culture and TQM

Although culture and TQM have different origins, recently both fields have converged with the idea that in order to achieve excellence and quality, organisations have to change or work with culture (Lewis, 1996a). Zeitz et al. (1997) strongly argued that organisational culture and TQM practices are closely related to each other. Powell (1995) promoted the importance of cultural aspects of TQM and argued that TQM practices have to be implemented within a suitable environment (i.e. culture). There are many studies in the literature that deal with culture in order to achieve TQM (Saraph and Sabetian, 1993; van Donk and Sanders, 1993; Sinclair and Collins, 1994; Smith et al., 1994).

In this context, Van Donk and Sanders (1993) conclude that one of the basic reasons for much of the delay in TQM implementation is that top managers and external consultants are insufficiently aware of the basic issues and values which support the daily practices in the organisation, in other words, organisational culture. Most of the authors who explicitly address TQM and culture see organisational culture as a variable which can be affected by internal and external stimuli and which may be consciously managed by organisations themselves (Lewis, 1996a).

2.6.1 Organisational culture

The role of organisational culture in improving competitiveness and increasing productivity and profits has urged top managers in many organisations to explore ways of managing and changing organisational culture (Cameron and Freeman, 1991). As a result there has been an abundance of research on organisational culture and its associated disciplines, bringing forth diverse definitions of organisational culture and its relevance to other organisational parameters (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2010). Although there are many definitions of culture in the literature, most of these definitions point to organisational culture as comprising commonly held attitudes, value and beliefs of organisation members (Gallear and Ghobadian, 2004). For example, according to Schein

(1985), organisational culture can be defined as the general pattern of mindsets, beliefs and values members of the organisation share in common, and which shape the behaviours, practices and other artefacts of the organisation which are easily observable. Similarly, Munter (1993) defined culture as the dominant and continuing values, attitudes and behaviours of a group; and Martin (1985) defined it as commonly held attitudes, values, and beliefs. However, according to Eagleton (2000), different disciplines define organisational culture differently. This fact is further explained by Maull et al. (2001) (cited by Gallear and Ghobadian, 2004) who identified four views on culture in the organisational culture literature - a belief system, a learned entity, a strategy and mental programming.

From a broader perspective, organisational culture was defined by Jaeger (1986) as a common set of ideas shared by group members of what their fellows know, believe, and mean. By practice, such ideas are transformed into the behaviour of an organisation's members which is built on "commonly held attitudes, values, and beliefs" (Martin, 1985; Schein, 1985; Munter, 1993). Therefore, the behaviour and its artefacts of organisation members are shaped by these patterns of values and ideas (Zammuto and Krakower, 1991). Such day-to-day behaviour of members in the organisation is governed by a core set of assumptions, understandings, and implicit rules that reflect organisational culture (Deal and Kennedy, 1982). Hence, organisational culture is also broadly considered to reflect the behaviour of members of the organisation (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2010), and it is the organisation's culture that helps to shape and determine the behaviour of the members and practices within that organisation (Al-khalifa and Aspinwall, 2000). The same argument was argued by Gallear and Ghobadian (2004), asserting that some scholars view culture as 'shared values' (attitudes, values, and beliefs), a second group view it as a 'way of working' (behaviour) and a third group view it as a combination of 'shared values' and 'way of working' (behaviour based on attitudes, values, and beliefs). They concluded that from a TQM implementation perspective, the view of the third group appears more appropriate as the 'shared values' of a group would in turn, influence its 'way of working'.

Organisational culture is a system of shared meanings that differentiate one organisation from another (Schein, 2005). It is an explanatory variable that can make a distinction between any two organisations (Sathe, 1985). Not only does it vary from organisation to organisation, it also varies from place to place and region to region because there are nationality influenced differences in work values, beliefs and orientations of

organisations across different countries (Hofstede, 1991, 2001; Inglehart et al., 1998; Trompenaars, 1994; Black and Mendenhall, 1989). Work values, beliefs and orientations of the branches of a multinational company like IBM, for example, are different in different countries because of the influence of the national culture on its employees (Hofstede, 2001; Hall, 1990; Harris and Moran, 1996; Rosseau, 1990). Therefore, Schwartz (1994) and Hofstede (1991) strongly argue that the cultural values of each organisation need to be specifically identified, and that reliance on reported values and beliefs from, for example, a parent company in one region may not be a reliable measure of the culture of a subsidiary in another region.

The TQM literature supports the proposition that a change in culture is necessary in order to make the organisational change permanent (Gallear and Ghobadian 2004, Saraph and Sabetian, 1993; Sinclair and Collins, 1994; Kim et al., 1995; Huq and Martin, 2000; Maull et al., 2004). In the TQM implementation process, “hard” aspects such as tools, techniques, and systems can’t be implemented unless “softer” behavioural and cultural aspects of TQM are favourable (Prajogo and McDermott, 2005). This favourable culture has been labelled a ‘TQM culture’ (Kumar, 2006). Therefore, a TQM culture is a culture conducive to TQM implementation and can be developed by using appropriate channels (Kim et al., 1995; Tata and Prasad, 1998, Thompson, 1998, Gallear and Ghobadian 2004,).

A ‘TQM culture’ can be considered to be one which uses teams, promotes pride in workmanship, drives out fear, allows participative management, promotes leadership in place of supervision and promotes long term orientation among the members of the organisation (Deming, 1993; Al-Khalifa and Aspinwall, 2000; Saha and Hardie, 2005). For TQM to take root successfully in the long term, it must have a positive influence not only on employees’ behaviour, but also on their attitudes and values (Ghobadian and Gallear, 2001). Typical cultures that are considered in the literature as suitable for implementing TQM are those related to a flexible, people-oriented style. Such practices as leadership commitment, employee involvement and empowerment, teamwork, customer focus, and continuous improvement are the reflection of people-centred and flexible cultures, or will be best implemented where such cultures prevail (Tata and Prasad, 1998). The study by Westbrook and Utley (1995) provides further support for this argument. They found that creating culture where employees are valued and empowered leads to effective TQM implementation.

The arguments presented above support the proposition that identifying and understanding the organisational culture is necessary before TQM implementation as well as

during implementation, as there is an indication of a positive relationship in the literature stating that an appropriate culture is vital to the success of TQM (McNabb and Sepic, 1995; Sousa-Poza et al, 2001).

2.6.2 The Role of organisational culture in TQM implementation

The founders of TQM and many other researchers have described TQM as a universal philosophy that can fit anywhere (Dale et al., 2007; Oakland, 2003). However, another group of researchers argues that national culture, business environment and organisational behaviour have a great influence on effective TQM implementation (Abraham et al., 1999; Adebajo and Kehoe, 1998; Ho et al., 1999; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Zu et al., 2009). These authors strongly emphasize that the effective implementation of TQM requires effective change in an organisation's culture. Although these researchers have greatly emphasized the impact of culture on TQM implementation, relatively little effort is evident that has explored the intensity and nature of this impact.

Among several factors which have been attributed as key determinants of TQM success, organisational culture is often among those listed at the top (Prajogo and McDermott, 2005). Many TQM implementations have failed, preventing companies from realizing its potential benefits because of ignorance of the cultural factors (Becker, 1993; Dale and Cooper, 1992; Oakland, 1995; Thomas, 1995; Van Donk and Sanders, 1993; Wilkinson et al., 1998). Corporate culture has been frequently blamed for TQM-implementation failures (Utley et al., 1997; Bowen and Lawler, 1992). McNabb and Sepic (1995) place extreme importance on the influence of corporate culture on the effective implementation of TQM. In their conclusion of a study on cultural effects on TQM implementation, Sousa-Poza et al., (2001) reported that TQM implementation is a complex programme that has a strong relationship with the organisation's corporate culture. Furthermore, the literature indicates that culture influences the understanding of TQM in a country and it also affects the operationalisation of TQM in a country (Kumar, 2006; Tan et al., 2003). In his ground breaking research, Powell (1995) argued that for real success, TQM practices need to be implemented within a suitable environment (i.e. culture).

The few studies that have attempted to examine the TQM-culture relationship, such as those by Chang and Wiebe (1996), Zeitz et al. (1997) and Dellana and Hauser (1999) always place organisational culture as the antecedent of TQM practices. As argued by many other

researchers (Maull et al., 2001; McNabb and Sepic, 1995; Westbrook and Utley, 1995), organisational culture tends to determine more the results of TQM implementation rather than the TQM implementation bringing about cultural change. These arguments infer that an appropriate strategy for TQM implementation is one in which TQM needs to be moulded to the organisation's culture before any attempts are made to re-shape the organisation culture to fit TQM (Klein et al., 1995). Thus, although TQM may need profound cultural change, a firm cannot expect to change the culture all at once. Rather culture changes as a result of doing the right things over time (Oakland, 2003)

Moreover, according to Cameron (2004), moving toward one particular type of culture does not mean that other culture types should be abandoned or ignored, it means only that special emphasis must be placed on certain factors if the culture change is to be successful. However, there are potentially many trade-offs in deploying strategies for cultural change, such as abandoning some characteristics of the existing culture, preserving some characteristics of the existing culture, and adopting some attributes of other types of culture (Cameron and Quinn, 1999).

2.6.3 Measuring organisational culture

Measuring culture has presented a challenge to organisational scholars and change agents (Dellana and Hausser, 1997). According to Chatman and Jehn (1994) to establish a robust set of culture dimensions that can characterize organisational cultures is a challenge for researchers, because no single instrument provides a valid measure of a sufficiently large set of generic cultural dimensions. A big challenge in most organisations is whether they know what their culture is and whether it is the right culture to support their strategy. In order to identify the type of culture in organisations, a range of methods and instruments have been designed to describe and assess organisational culture. In this context, Wallach (1983) developed a set of cultural dimensions based upon a synthesis of other major organisational culture indices; an Organisational Culture Profile Scale was developed by O'Reilly et al. (1991); the Competing Values Framework (CVF) was developed by Quinn and Rohrbaugh (1983); and the Organisational Value Congruence Scale was developed by Enz (1986). Some of the instruments that appear to have good validity to assess organisational cultures are presented as follows:

- The Quality Improvement Implementation Survey was developed by Shortell et al. (2000) to examine the impact of culture (and of TQM) on endpoints of care for coronary artery

bypass graft surgery patients. The dimensions in this culture scale are almost the same as the CVF (discussed below) with some terms modified - organisational character, management style, cohesion, prioritization of goals, and rewards - resulting in four different culture types (group, developmental, rational and hierarchical). Respondents divide 100 points between these 20 states to measure the dominant culture profile. The validity of instrument is unknown but has high face validity. Internal consistency for one of the scales was 0.79. The survey is simple and quick to complete.

- The Organisational Culture Inventory was initially developed by Cooke and Lafferty (1987) and later improved and used by Thomas et al. (1990); Seago (1997); and Ingersoll et al. (2000). It measures shared norms and expectations that guide thinking and behavior of group members, resulting in 12 thinking styles of individuals within a group: humanistic-helpful, affiliative, approval, conventional, dependent, avoidance, oppositional, power, competitive, competence/perfectionalist, achievement, and self-actualization (Scott et al. 2003). Analysis of these 12 styles results in three factors - people/security culture, satisfaction culture and task/security culture (Scott et al. 2003). The Survey has an inventory of 120 items measured on a 5-point Likert scale. Internal consistency of items is 0.67-0.92 and convergent and discriminant validity has been established. The instrument has good face validity and is widely used with graphic illustration of results. It has been used in wide variety of different settings and has strong psychometric underpinning.
- MacKenzie's Culture Questionnaire developed by MacKenzie (1995) consists of 12 cultural dimensions - employee commitment, attitudes to and belief about innovation, attitudes to change, style of conflict resolution, management style, confidence in leadership, openness and trust, teamwork and cooperation, action orientation, human resource orientation, consumer orientation and organisational direction. In the 76 item survey, respondents tick each statement which they feel is broadly true of their organisation. The origin of the measurement items is unclear and scientific properties are unknown, but the survey is simple to complete.
- The Survey of Organisational Culture was developed by Tucker et al. (1990). It describes culture in terms of 13 dimensions: orientation to customers, orientation to employees, congruence amongst stakeholders, impact of mission, managerial depth/maturity, decision making/autonomy, communication/openness, human scale, incentive/motivation, cooperation versus competition, organisational congruence, performance under pressure, theory S/theory T. It measures 55 items on a 5-point scale. It has good internal reliability,

but median alpha scores for 14 scales of 0.62- 0.9 (Tucker et al., 1990). Detailed qualitative work was conducted as part of its development and it has been used in the public and private sector. To date it appears to have only used in U.S. and mostly used on senior leaders and managers, rather than on all levels of workforce.

- The Corporate Culture Questionnaire was developed by Walker et al. (1996). It has four principal domains: performance, human resources, decision-making, and relationships. It has a variation of 69 to 126 items measured on 5-point Likert-type scale and is used widely as a management consulting tool (Walker et al., 1996). The internal reliability of the scale is 0.72 - 0.89, with detailed factor analysis performed. This comprehensive instrument was systematically developed from a review of previous instruments.
- The Organisational Culture Survey was developed by Glaser, et al. (1987). It addresses six empirical factors: teamwork and conflict, climate and morale, information flow, involvement, supervision, meetings and measures 31 items on 5-point scale. In this instrument, the Cronbach's alpha value items is 0.82 - 0.91, with extensive reliability testing and comprehensive process of development.
- The Competing Values Framework, developed by Cameron and Freeman (1991); Gerowitz et al. (1996) and Gerowitz (1998) has four key dimensions of staff climate, leadership style, bonding systems, and prioritization of goals. Assessment results in four different culture types, described as: clan, adhocracy, hierarchy, and market types. Each organisation usually has more than one of these types. It has a 16 item scale with the description of dominant characteristics of each dimension of culture. Respondents divide 100 points between these states depending on how similar each scenario is to its own organisation. It has high face validity, strong theoretical basis, assesses both congruence and strength of culture and also simple and quick to complete. Originally it was developed for use in educational organisations.

In the context of the above discussion of various models, it was proposed that the criteria for selecting a model for measuring organisational culture as part of this research study should be:

- Does the instrument measure all the dimensions of culture?
- Whether instrument has been tested for validity and reliability?
- Whether the instrument has been used in TQM context?

Consistent with Denison and Spreitzer (1991), this research employed Quinn and Rohrbaugh's (1983) approach of the Competing Values Framework to describe and measure

organisational cultures. The competing values framework (CVF) is one of the models that predominantly meet these criteria as explained below:

- Does the instrument measure all the dimensions of culture?

The competing values framework was initially developed by Quinn and Rohrbaugh (1983) to measure organisational effectiveness. The framework focuses on competing tensions and conflicts inherent in any human system. Primary emphasis is placed on the conflict between stability and change and the conflict between internal organisation and external environment (Denison and Spreitzer, 1991). By focusing on the inherent tensions of organisational life, the model allows for the conceptualization of both paradoxical and linear phenomena, and for analysis of both transformation and equilibrium (Denison and Spreitzer, 1991).

The CVF has proven to be a useful framework for assessing and profiling the cultures of organizations because it helps identify the underlying cultural characteristics that exist in organizations. CVF has four orientations (control vs. autonomy and internal vs. external) in four quadrants representing four culture types. Each culture type further consists of six commonly accepted dimensions (organizational character; leadership demonstration; management style; binding force; organizational emphasis; and success criteria). Therefore, the structure of CVF is manageable and has broad implications.

- Whether instrument has been tested for validity and reliability?

Since its introduction, the CVF has proved itself as an effective tool for mapping out complex management issues. The robust approach of competing values has frequently been used across many applications and has proved a reliable tool as a measurement instrument for organisational culture. Perceiving the usefulness of this framework, academic researchers have used it to examine many organisational aspects such as model organisation forms (Quinn and Hall, 1993); organisation life cycles (Quinn and Cameron, 1983); leadership roles (Quinn, 1994); organisational climate (Zammuto and Krakower, 1991); human resource policies (Yeung, et al, 1991; Giek and Lees, 1993); strategy (Bluedorn and Lundgren, 1993); organisational change (Hooijberg and Petrock, 1993); and management information systems (Cooper and Quinn, 1993). Quinn and Kimberly (1984) extended the framework to examine organisational culture for the first time and it was very successful in measuring organisational culture as it enabled variations in culture to be identified and profiling of culture in categories according to its major characteristics. Another landmark study on measuring organisational

culture was undertaken by Quinn (1988) which presented what is arguably the most comprehensive form of this framework. Many studies on organisational culture e.g. (Denison, 1990; and Cameron and Freeman, 1991) were developed based on this study. Nevertheless, the framework suggested by Denison and Speitzer (1991) is better established, more widely accepted and has been more extensively used than the others. It is important to note that the cultural factors in other studies and those in Denison and Speitzers (1991) study are very similar in content (mainly with differences only in terminology). More recently, many other studies have used CVF framework for profiling organizational culture (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Alkhalifa and Aspinwall, 2000, 2001; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009). These high impact studies have tested the CVF instrument for validity and reliability.

- Whether the instrument has been used in TQM context?

This study is examining relationship between culture and TQM barrier, therefore another concern of author about measuring the cultural profile was to find studies that relate culture and TQM because the methodology adopted in such studies would be more relevant and applicable in conducting this study. Although in the past, research on organisational culture has been perceived to be closely linked with qualitative and ethnographic methods, the use of quantitative measures in the research of organisational culture gathered a momentum in the early 1990s when the CVF framework based on quantitative measures was repeatedly used by researchers. This alternate approach, based on a common set of quantitative measures, has been applied across a variety of organisational settings by Yeung et al. (1991); Zammuto and Krakower (1991); and Quinn and Spreitzer (1991). Each of these three studies recognized that the use of a quantitative methodology in identifying organisational culture was reliable, and represents an integrated set of studies that are grounded in the Competing Values Framework. Therefore, the CVF framework based on quantitative measures was frequently used by researchers to measure relationships of culture and TQM. The studies by Chang and Wiebe (1996), Zeitz et al. (1997), Dellana and Hauser (1999), Prajogo and McDermott (2005); Stock et al. (2007), Naor et al., (2008); and Zu et al. (2009) are profiling both culture and TQM to examine their relationships. Therefore, the relevance of CVF in TQM context is also substantiated by these studies.

Above discussion implies that CVF is empirically validated in cross-cultural research and a large number of empirical studies have established the reliability and validity of the CVF. In addition, CVF is also used with GCC and Asian samples (e.g., Alkhalifa and

Aspinwall, 2000; Deshpande and Farley, 2004; Kwan and Walker, 2004). The 24 item questionnaire based on organizational characteristics is very concise and to the point. This questionnaire is very convenient for practical use.

The Competing Values Framework has proven to be a helpful framework for assessing and profiling the dominant cultures of organisations because it helps identify types of culture that exist in organisations (Cameron 2004). Many researchers have used this framework for assessing and profiling the dominant cultures of organisations (Denison and Neale, 2000, Cameron and Quinn, 1999, Denison and Spreitzer, 1991). Table 2.3 sets out the culture type typologies used in these three seminal studies.

Table 2.3 Ideal types of culture used in CVF framework

Author	Culture type1	Culture type2	Culture type3	Culture type4
Denison & Neale, 2000	Involvement	Adaptability	Mission	Consistency
Cameron and Quinn, 1999	Clan	Market	Adhocracy	Hierarchy
Denison and Spreitzer, 1991	Group	Developmental	Rational	Hierarchical

Adapted from Denison and Neale, 2000; Cameron and Quinn, 1999; Denison and Spreitzer, 1991

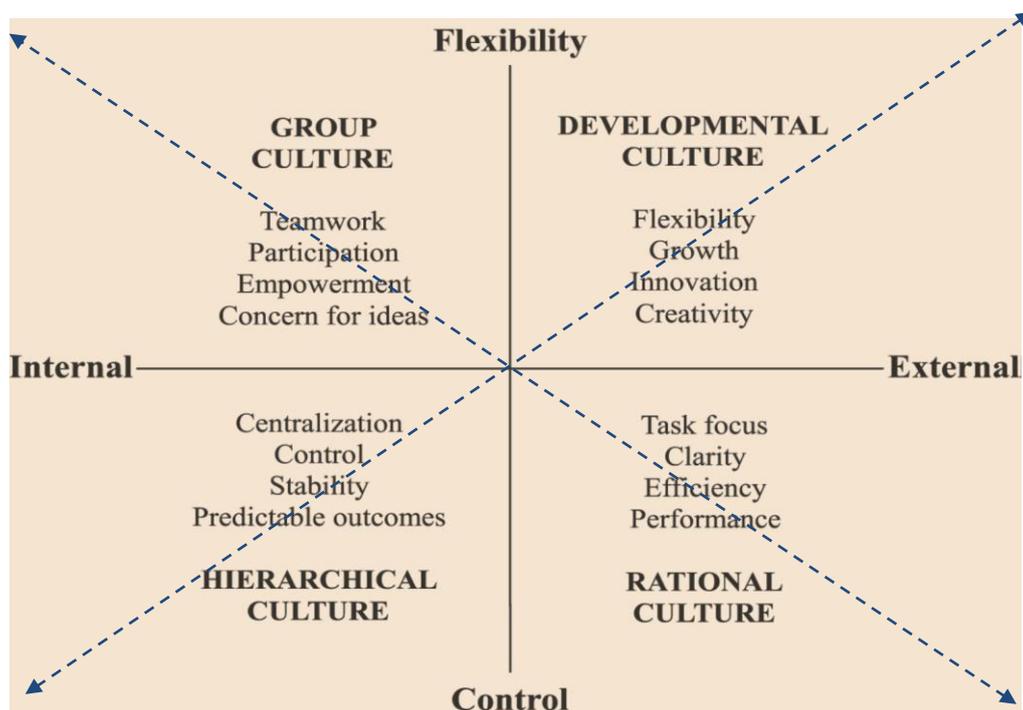
The set of four ideal types of cultures used by each of these authors is broadly the same in content that is to say in the specified dimensions of each type of culture, however, the naming convention is different. In order to examine the CVF framework, further in the next section the author draws on the characteristics of the four culture types (group, developmental, rational and hierarchical) developed by Denison and Spreitzer (1991) and widely accepted and used in many studies (Chang and Wiebe, 1996;, Zeitz et al., 1997; Dellana and Hauser, 1999; Alkhalifa and Aspinwall, 2000; Prajogo and McDermott, 2005; and Zu et al. 2010).

2.6.4 The Competing Values Framework

The CVF framework is built upon two axes each representing a superordinate continuum as shown in Figure 2.2. The first axis is the flexibility-control axis that describes two contrasting orientations between that which reflects flexibility and spontaneity and that which reflects stability and control. In other words, this dimension differentiates a focus on flexibility, discretion, and dynamism from a focus on stability, order, and control. Some organisations are effective if they are changing, adaptable, and organic, whereas other organisations are effective if they are stable, predictable, and mechanistic (Denison and

Spreitzer, 1991). This dimension ranges from organisational versatility and flexibility at one end to organisational steadiness and stability at the other. The second axis is the internal-external axis that also describes two orientations, one being oriented towards maintenance and improvement of the existing organisation and the other being focused on adaptation and interaction with the external environment. Logically, this dimension differentiates a focus on an internal orientation, integration, and unity from a focus on an external orientation, differentiation, and rivalry. That is, some organisations are effective if they have harmonious internal characteristics, whereas others are effective if they focus on interacting or competing with others outside their boundaries (Denison and Spreitzer, 1991). This dimension ranges from organisational harmony and unity at one end to organisational separation and independence at the other. These axes reflect several classics of organisational theory such as Thompson (1967) and Lawrence and Lorsch (1986).

Figure 2.2 Competing Values Framework for profiling organisational culture



Source: Denison and Spreitzer (1991)

What is notable about these dimensions is that they represent opposite or competing assumptions. Each continuum highlights a core value that is opposite from the value at the other end of the continuum - i.e., flexibility versus stability, internal versus external. The

dimensions, therefore, produce quadrants that are also contradictory or competing across the diagonals. The upper left quadrant identifies values that emphasize an internal, organic focus, whereas the lower right quadrant identifies values that emphasize an external, control focus. Similarly, the upper right quadrant identifies values that emphasize an external, organic focus whereas the lower left quadrant emphasizes internal, control values. These competing or opposite values in each quadrant give the name for the model the Competing Values Framework. The combination of the two dimensions results in four quadrants of cultural dimensions, namely group, developmental, hierarchical, and rational.

Adopting the conception of organisational culture propounded by Cameron and Quinn (1998), organisational culture refers to the taken-for-granted values, underlying assumptions, expectations, collective memories, and definitions present in an organisation. It reflects the prevailing ideology people carry inside their heads, it conveys a sense of identity to employees, provides unwritten and, often, unspoken guidelines for how to get along in the organisation, and enhances the stability of the social system that they experience (Cameron and Quinn, 1998). As was discussed in section 2.6.1 organisational culture can be expressed in many ways such as values, norms, behaviours, responses, communication, work ethics, moral and ideology. Organisational culture thus conceived has many manifestations. While the shared cognitive assumptions of organisational members are difficult to measure, cultural values, manifestation of beliefs and artefacts can be systematically assessed (Yeung et al., 1991). With the instrument developed by Denison and Spreitzer, (1991) and Cameron and Quinn (1999), the value orientations of cultural members can be extracted and represented in cultural profiles. These cultural profiles are ideal types that can be used to characterize the organisational culture. The main characteristics of the ideal types were given in Table 2.3. Although there are four distinctive cultural categories, in reality, organisations are unlikely to reflect only one cultural type. To be effective, the adoption of some elements of each of the four ideal culture types is necessary (Zammuto and Krakower, 1991; Cameron and Quinn, 1998). The implications of each culture type are summarized as follows:

2.6.4.1 Group culture

According to Denison and Spreitzer (1991), group culture places emphasis on flexibility and internal orientation. Organisations with emphasis on this culture promote the development of human resources, emphasizing openness, participation, cohesiveness and commitment to membership. Such organisations are typified as a friendly place to work

where people share a lot. It is akin to an extended family with best friends at work. Leaders are thought of as mentors, coaches, and, perhaps, even as parent figures. The organisation is held together by loyalty, tradition, and collaboration. Commitment is high. The organisation emphasizes the long-term benefits of individual development with high cohesion and morale being important. Success is defined in terms of internal climate and concern for people. The organisation places a premium on teamwork, participation, and consensus.

2.6.4.2 Developmental culture

According to Denison and Spreitzer (1991), developmental culture also emphasizes flexibility but with more focus on the external environment. The orientation is towards growth, creativity stimulation, resource acquisition, innovation, and continual adaptation to the external environment. Organisation with development culture is characterized as a dynamic, entrepreneurial, and creative workplace. People stick their necks out and take risks. Effective leadership is visionary, innovative, and risk-oriented. The binding force that holds the organisation together is commitment to experimentation and innovation. The emphasis is on being at the leading edge of new knowledge, products, and/or services. Readiness for change and meeting new challenges are important. The organisation's long term emphasis is on rapid growth and acquiring new resources. Success means producing unique and original products and services.

2.6.4.3 Rational culture

According to Denison and Spreitzer (1991), the rational culture is also focused on the external environment but is control-oriented. It emphasizes productivity, performance, goal achievement, and one of the primary motivating factors is competition. Such organisation is a results-oriented workplace. Leaders are hard-driving producers, directors, and competitors. They are tough and demanding. The binding force that holds the organisation together is an emphasis on winning. The long-term concern is on competitive actions and achieving stretch goals and targets. Success is defined in terms of market share and penetration. Outpacing the competition, escalating share price, and market leadership dominate the success criteria.

2.6.4.4 Hierarchical culture

According to Denison and Spreitzer (1991), the hierarchical culture is both control and internal oriented. It emphasizes rules and regulations, and standardization to achieve

control and stability. Such organisation is characterized as a formalized and structured place to work. Procedures and well-defined processes govern what people do. Effective leaders are good coordinators, organizers, and efficiency experts. Maintaining a smooth-running organisation is important. The long-term concerns of the organisation are stability, predictability, and efficiency. Formal rules and policies hold the organisation together.

2.6.5 Summary of CVF

Denison and Spreitzer (1991) stress that the four cultures in their typology should be viewed as ideal types, meaning that organisations are characterized by some combination of these four cultures – although some types could be more dominant than the others. Thus, as scales have been developed and validated to empirically measure this, the items are allowed to vary independently (Quinn and Spreitzer, 1991). As McDermott and Stock (1999) noted in a later study using the CVF, “as such, a high rating on one dimension (e.g. internal orientation) does not exclude a high rating at the other end (e.g. external orientation)”.

The review of the literature on the competing value framework reveals that the following characteristics describe each type of culture:

- Group culture - Supporting and mentoring leadership, employee involvement and empowerment, employee participation in decision making, continuous improvement, teamwork, development of human resources, emphasizing openness, participation, cohesiveness and commitment to membership
- Developmental culture - Growth, creativity, innovation, resource acquisition, continual adaptation to the external environment/risks, visionary leadership, innovative and risk-oriented, commitment to experimentation and innovation, being at the leading edge of new knowledge, products, and/or services, readiness for change and meeting new challenges, long term emphasis, rapid growth, producing unique and original products and services
- Rational Culture - Productivity, performance, goal achievement, competition, competitive actions, achieving stretch goals and targets, market share and penetration, outpacing the competition, escalating share price, and market leadership
- Hierarchical culture - Emphasis on rules/regulations and standardization to achieve control and stability, procedures and well-defined processes, stability, predictability, and efficiency

2.6.6 Organisational culture in the context of Bahraini industries

As highlighted in section 2.6.1, the literature indicates that organisational culture is influenced by national culture (Hofstede, 1991, 2001; Inglehart et al., 1998; Trompenaars, 1994; Black and Mendenhall, 1989) and that organisational culture affects TQM implementation (Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Zu et al., 2010). In addition, the literature indicates that there are many cultural traits in Arab nations in general and in GCC nations in particular that promote the implementation of some specific TQM practices (Alkhalifa and Aspinwall (2000). However, there may equally be other TQM practices that won't find GCC countries favourable place to flourish. From a practical viewpoint, these practices need to be identified for effective implementation of TQM.

Taking the case of Bahraini industries, the observed organisational culture seems to be dominated by rational and hierarchical cultures. This was verified by Dedoussis (2004) who examined Middle Eastern societies (including Bahrain) and discovered that their cultures are supportive of many of the TQM principles highlighted by TQM scholars, but have a negative impact on the development of other TQM principles. According to Dedoussis (2004), Middle Eastern cultures are highly receptive towards teamwork, promote a high degree of trust and loyalty between the organisation and its workers and can produce strong leaders. Dedoussis (2004) further argues that these cultures are not naturally disposed to the use of participatory leadership and management and they tend to discourage employee involvement in decision making. This observation is supported by Al-Khalifa and Aspinwall (2000), in their study of the national culture in Qatar that concluded that companies in Qatar (a Middle Eastern country sharing many cultural characteristics with Bahrain) would find great difficulties in implementing TQM since they tend to be dominated by rational and hierarchical cultures. Although the results of these studies are useful points of departure for this study, the results can't be generalized to fit Bahraini industries because culture is unpredictable and varies from place to place (Hofstede, 1991). Schwartz (1994) and Hofstede (1991) strongly argue that it is crucial to measure the cultural values of the particular sample being studied and not to rely on reported values from other samples, even if they are for what are perceived to be the same cultural area or grouping. These observations support the need for an empirical investigation to identify the types of organisational culture existing in Bahraini industries.

Having examined organisational culture in the context of TQM implementation, and identified a suitable model for examining organisational culture, discussion now moves to the next factor - examining the literature on TQM implementation barriers.

2.7 TQM implementation barriers

Shin et al (1998) observed that although the principles of quality management appear obvious, many organisations have found them difficult to execute because the implementation is cumbersome, time consuming, and frequently lacking in focus. This view is supported by Rahim (1994) who stated that “although the TQM practices appear obvious and common sense, they are in reality difficult to execute and very time consuming. A TQM philosophy must be driven throughout the entire organisation as it requires major changes in the way companies operate.”

One of the inherent characteristics of TQM is that it takes considerable time to mature and bring results (Deming, 1993; McConnell, 2007, Oakland, 2003; Taylor, 1998). If TQM implementation barriers are not identified before implementation and necessary strategies to offset these barrier are not adopted then considerable efforts can be expended and time wasted during reactive after-the-event quick fixes (Dale, 2007). In the TQM implementation process, the detection of barriers at a late stage is likely to significantly hamper the effectiveness of the TQM implementation and they can potentially be much more difficult to minimize or remove at a later stage (Oakland, 2003). The TQM literature supports the view that lasting and promising results of TQM implementation can best be achieved through proper planning and preventing problems from occurring at source (Dale, 2007).

It is reasonable to argue, based on the literature on TQM in general, that TQM implementation can be conceptualised as being underpinned by two parallel processes. On the one hand the process of identifying practices or policies that are working properly, identifying how to sustain them and seeking to further enhance their performance through continuous improvement initiatives; and on the other hand, the process of identifying practices or policies that are problematic, ineffective or inadequate and improving or re-engineering them (Dale, 2007). Both processes, but arguably more so for the latter, require the systematic identification of actual or potential barriers that do or can inhibit the process of TQM development.

One thing that is prevalent from a cursory examination of the TQM literature is the citing of problems that have been encountered or the obstacles and barriers that have had to

be addressed or overcome in the adoption of the TQM approach. The 1990s in particular saw a raft of prescriptive contributions dedicated to the reasons for TQM failure (Whiteley, 1991; Steele, 1993; Summers, 1993; Harari, 1993a; and Tolchinsky and Ranney, 1994). Many studies also provided anecdotal empirical evidence of one or more barriers based on case studies. For example, Mallinger (1993) reported that lack of trust, particularly between top management and employees and the absence of commitment at all levels was, in part, responsible for failure to create change through TQM at a large fortune 500 manufacturer in the aerospace industry. Pitman et al. (1994) suggested that two major complications in TQM implementation are: 1) learning how to define a problem and 2) how to measure the process. Roufaiel and Meissner (1995) suggested that behavioural and diversity issues are the factors that hinder TQM implementation. Similarly, Wilshaw and Dale (1996) studied a marketing and service industry and outlined a number of problems in the introduction of TQM, such as lack of senior management understanding of TQM and involvement; departments failing to follow through agreed actions and objectives; lack of support to teamwork; and failure to match up improvement projects to the skills and resources in the project team.

Other survey-based empirical work has also highlighted obstacles encountered as part of their more wide-ranging investigations on quality and TQM. Newall and Dale (1991) proposed that despite the considerable amount of literature there was lack of information on the problems that companies may expect to encounter during introduction, development and advancement of TQM and measurement of progress. In their study of eight UK organisations, six were identified with a major problem with management commitment, and four cited poor education and training, a general lack of awareness of quality, and lack of understanding customer needs. Longenecker and Scazzero (1993) reported the results of their research conducted to assess why a medium sized US manufacturing company that had formally introduced TQM was struggling in its quality improvement efforts. As a result of combined findings of an employee survey and management interviews, the authors concluded that the organisation failed to realise its potential for success through TQM because management at all levels didn't create a climate for quality.

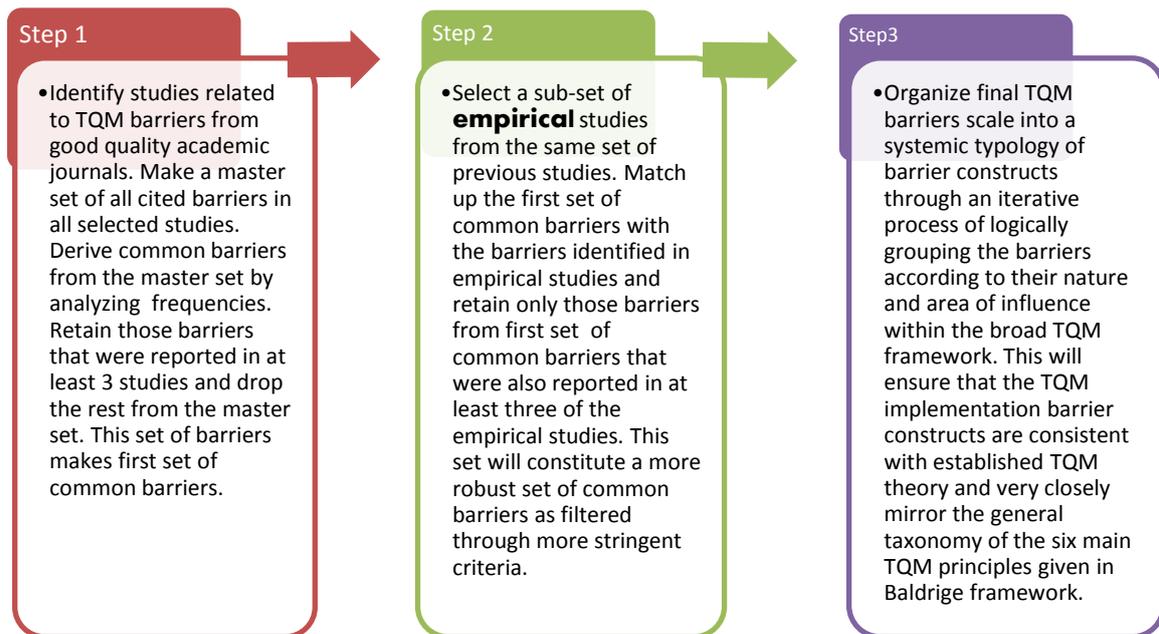
Coulson-Thomas (1992) reported from a survey of quality priorities and barriers that the main barrier was top management commitment and other significant barriers such as narrow understanding of quality, horizontal boundaries between functions and specialisms, vested interests, organisational politics, cynicism, organisational structure and customer expectations. Clemmer (1991) reported five major TQM implementation problems. They

were: inability to get top management support; inward focus of organisations; misconception of skill training (how to apply improvement technologies and methods); short term efforts; and less dynamic plans, strategies and policies. Radovilsky et al (1996) reported from their survey of TQM implementation, that the problems most frequently faced in implementing TQM were: lack of management commitment to quality improvement, poor communication between departments and a perception of TQM as one more campaign rather than as a real working system.

More recently, a number of scholars have focused their empirical work more specifically towards identifying the barriers to TQM in various settings and locations. These studies are reviewed in the remainder of section 2.7. What became clear early in the review of these studies is that while they all focus on the TQM barriers, there is variation, (often significant) in the barriers that they report. In other words it is evident that while attention has been devoted to examining TQM barriers, the level of consensus amongst the various contributions when they are compared with each other was inconsistent. This pointed to a gap in the literature, that is to say the need for a secondary examination of the multiple contributions to derive a clearer and less fragmented understanding of barriers.

Given this observation about this body of literature, it was therefore decided that alongside reviewing this body of literature on TQM barriers, to use a systematic process to make sense of the contributions. In other words, to use a systematic process that would enable the most common barriers to be identified and to organise them in a meaningful typology. This process was important for another reason, as firstly it derived a set of TQM barrier constructs that would subsequently be needed to more clearly define the set of hypotheses describing the relationship between organisational culture and TQM barriers (see Chapter 3) and, secondly, it derived the set of measures (scales) for each main TQM implementation barrier construct that would be needed for the empirical work to be subsequently undertaken (see section 4.4.2). Accordingly, in the rest of the review, the research used a three step process to identify the most commonly cited barriers from the literature and organize them in a meaningful way. This three -step process is illustrated in figure 2.3.

Figure 2.3 Three-step process for identifying significant TQM implementation barriers



During the literature review of studies on TQM implementation barriers, it was noted that there are scores of TQM implementation barriers reported in various studies. One of the objectives of this study was to measure the existence of common barriers in the target companies. Therefore, the barriers from good quality academic journals relevant to this research, having quality of research design and accuracy of findings were filtered through three steps.

In step one, the author searched for literature on TQM implementation barriers from good quality academic journals and identified studies related to potential TQM barriers considering the relevance to this research, and quality of the research design. Fifteen studies met these criteria. All the cited barriers in these 15 studies were extracted. This constituted a master set of all cited barriers in all selected studies. In order to derive what are common barriers from this set, the master set was analyzed for frequencies and those barriers that were reported in at least 3 studies were retained, while dropping those barriers from the master set

that appeared in less than 3 contribution. This derived set of 55 barriers constituted the first set of common barriers. See section 2.7.1 for detail.

In step two, the author selected a sub-set of empirical studies from the same set of 15 previous studies that were deemed to be of particularly high quality. They were selected considering the relevance to this research and the clarity/robustness of the methodology (see table 2.4 below). Only five studies met these criteria. The distinctive features of these five studies and rational in selecting these studies are given in detail in section 2.7.2. The author then matched up the first set of 55 common barriers with the barriers identified in these five empirical studies and only those barriers from first set of 55 common barriers were retained that appeared in at least three of the five empirical studies also. This set constituted a more robust set of common/significant barriers as filtered through more stringent criteria. Hence, a final set of 32 TQM barriers was derived, guided by the findings of those studies (i.e. a subset of all empirical studies) that exhibited particularly high clarity and robustness in their empirical methodological approaches.

In step 3 of the process the barriers were organized into a systemic typology of barrier constructs. As mentioned previously, this was crucial in order to derive a set of TQM barrier constructs and hence be able subsequently (see chapter 3) to identify and define the set of hypotheses describing the relationship between organisational culture constructs and TQM barrier constructs. Each of the final 32 items (see table 2.8 below) represented a TQM barrier indicator. Organizing them into TQM barrier constructs involved an iterative process of logically grouping the barriers according to their nature and area of influence within the broad TQM framework. This helped to ensure that the TQM implementation barrier constructs remained consistent with established TQM theory. This was further guided by those studies that had previously attempted to put forward higher level barrier construct, namely the study by Ngai and Cheng (1997) which identified four barrier categories. The result of these iterative processes was the derivation of six TQM implementation barrier constructs: top management barriers, employee barriers; customer barriers; planning barriers; process management barriers; and information management barriers. It is interesting to note that the resulting barrier constructs very closely mirrored the general taxonomy of the six main TQM principles identified in the Baldrige framework. See section 2.7.3 for detail.

2.7.1 Profiling commonly cited barriers from previous studies

For **step 1** of the process, the author identified literature on barriers from good quality academic journals. Based on this criteria, a total number of 15 studies related to potential barriers that inhibit the process of TQM development were identified (Ngai and Cheng, 1997; Sebastianelli and Tamimi, 2003; Rad, 2005; Huq, 2006; Salegna and Fazel, 2000; Adebajo and Kehoe, 1998; Jones, 2008; Masters, 1996; Bhat and Raj, 2009; Amaral and Sousa, 2009; Zeng et al., 2007; Jun et al., 2004 ; Ali et al., 2008; Mosadegh, 2006; Amar and Zain, 2002).

These studies were selected for detailed review as the most likely candidates to profile TQM implementation barriers. The 15 studies are reviewed in table 2.4. The table examines – title, authors/year of publication, stated aim(s) / hypotheses, main modelling and main finding to help author evaluate quality of research design and accuracy of findings in these studies.

Table 2.4 Profiling previous studies on TQM implementation barriers

	Study 1	Study 2	Study 3	Study 4	Study 5
Title	Potential barriers to TQM using PCA and CA	Understanding the Obstacles to TQM Success	Barriers to successful TQM implementation in health care	Managing change: a barrier to TQM implementation	Obstacles to implementing quality
Authors/ year	E.W.T. Ngai and T.C.E. Cheng April, 1996	Rose Sebastianelli and Nabil Tamimi, 2003.	Ali Mohammad Mosadegh Rad, 2005	Ziaul Huq, 2006	Gary Salegna, Farzaneh Fazel. Jul 2000.
Publication	International Journal of Quality & Reliability Management, Vol. 14 No. 4, 1997, p. 391-408,	46 QMJ VOL. 10, NO. 3/© 2003, ASQ University Of Scranton	Leadership in Health Services Vol. 18 No. 3, 2005	MSQ, 15,5 page 452 College of Business Administration, University of Nebraska	Quality Progress. Milwaukee: Vol. 33, Iss. 7; pg. 53, 5 pgs
Stated aim(s) / stated hypotheses	Identify the relevant attributes which made up the potential barriers to TQM implementation and determine the underlying dimensions	Identifying barriers associated with managing a successful quality transformation and examining the relationships between barriers and several different measures of the perceived success (or failure) of TQM through a survey-based research.	To investigate the success of TQM and barriers to its successful implementation in health care services organisations in Isfahan province, Iran, 2004.	This paper focuses on six change management issues that address quality management practices in the service sector, difficulty in taking a holistic approach to TQM implementation and the challenges of delivering organisational reform through TQM.	Examines the severity of commonly reported obstacles to implementing TQM by comparing survey feedback from companies that have implemented TQM with those that have no QMS in place.

Main Modelling	Self-completion questionnaire was distributed to quality practitioners of 750 companies. A total of 179 complete questionnaires were received	A survey was done on 874 companies of ASQ in USA obtaining respondents' opinions about a series of statements representing both barriers to TQM as well as potential undesirable outcomes	This descriptive and cross-sectional research was done via two questionnaires (TQM success and its barriers). The population of this research consists of managers of health care organisations who implemented TQM	The study employs a quasi-qualitative case study methodology. Twenty service companies from health care, insurance, consulting, and banking and financial services were studied over a period of two years to assess their change management practices for implementing TQM	A survey was done on 2000 randomly selected firms and 109 usable responses received from company presidents and CEOs who were asked to rate the degree to which each listed obstacle represented a problem during TQM implementation.
Main finding	PCA results produced four orthogonal dimensions to potential barriers to TQM Implementation (Cultural and employee barriers, Infrastructure barriers, Managerial barriers, Organisational barriers). CA was then applied in order to corroborate the findings	Derived following Four factors from their 17-item scale: 1) cultural and employee barrier, 2) infrastructure barrier, 3) managerial organisational barrier. These four factors offer more refinement and consequently, a better understanding of the	In correlation analysis between the barriers to TQM and the problem dimensions, human resource, strategic and structural problems were the most important barriers to TQM successful implementation.	Among other issues, unrealistic expectations of employee commitment, absence of process focus, lack of organisation around information flow, holes in education and training, and failure to create a continuous improvement culture contributed	Study reveals that non-TQM companies perceive the severity of problems differently from TQM counterparts. Majority of failures involve the process by which the TQM philosophy is implemented rather

of PCA.	various types of management-related obstacles to TQM.	significantly towards failure.	than flaws in the principles of TQM itself.
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Table 2.4.Cont... Profiling previous studies on TQM implementation barriers

	Study 6	Study 7	Study 8	Study 9	Study 10
Title	An evaluation of quality culture problems in UK companies	TQM implementation and change management in an unfavourable environment	Overcoming the barriers to TQM's success	An empirical study of barriers to TQM implementation	Barriers to internal benchmarking initiatives
Authors/year of publication	Dotun Adebajo and Dennis Kehoe, 1998	Jefferey P. Jones, University of Glamorgan, Pontypridd, UK	Masters, Robert J. Quality Progress, 1996	K. Subrahmanya Bhat. Jagadeesh Rajashekhar	Paulo Amaral Rui Sousa
Publication	International Journal of Quality Science, Volume: 3, Number: 3, Year: 1998, pp: 275-286	Journal of Management Development, Vol. 27 No. 3, 2008. pp. 291-306	Milwaukee: May 1996. Vol. 29, Iss. 5; pg. 53, 3 pgs	The TQM Magazine Vol. 21 No. 3, 2009 pp. 261-272	Benchmarking: An International Journal, Vol. 16 No. 4, 2009 pp. 523-542
Stated aim(s) / stated hypotheses	Study focuses on the nature of problems faced in the attempt to develop a quality	Examine the barriers and potential for successful TQM implementation in a	Identify distinct barriers to TQM that are common to all types of organisations and	Identify the barriers of total quality management (TQM) implementation, in	Identification of barriers to the implementation of benchmarking

	culture and the results will form the basis for a structured approach to culture change.	“theoretically” unfavourable TQM environment, and what can be expected from such implementation if it is successful.	within all management levels.	order to make them known to the managers of Indian industries.	initiatives.
Main Modelling	Questionnaire and the structured interview questions were derived from an extensive review of research and practitioner literature and sent to 630 manufacturing organisations and 166 valid responses were recorded.	The development of TQM in a company is examined and successes and failures in the implementation process are evaluated. The degree of success in implementing TQM is assessed through the changes that resulted in internal performance indicators and an external evaluation.	Through an extensive literature review 15 distinct barriers to TQM that are common to all types of organisations and within all management levels were found. The eight that plague organisations most often are sorted out for detail analysis.	In order to achieve this objective, an extensive literature review has been carried out to understand the barriers to TQM implementation. This was followed by a survey of quality award winning industries in India.	This paper systematically develops a categorized list of barriers to internal benchmarking based on the literature; and validates and enriches them with an in-depth case study of an internal benchmarking initiative.
Main finding	An evaluation of cultural problems and the targeting of areas for change was identified and better understood from the survey results.	It is possible to implement TQM principles in an environment deficient in factors that are generally accepted as critical to its successful implementation. Study	Identified barriers can be used in the planning and implementation phases of TQM to increase awareness and understanding of the principles. It can be used by organisations	Factor analysis of the 21 potential barriers to TQM implementation revealed the following five underlying constructs: lack of customer orientation, lack of planning for	Barriers to internal benchmarking initiatives of different types are found: organisational barriers (people, culture, and context), benchmarking project

concludes that reaction to cultural barriers is central to a successful TQM implementation.

that have been involved in TQM for some time to evaluate progress and to improve existing systems.

quality, lack of total involvement, lack of management commitment, and lack of resources.

management barriers (planning and implementation, leadership, and business pressures) and benchmarking data barriers (difficulty to access/compare data).

Table 2.4.Cont... Profiling previous studies on TQM implementation barriers

	Study 11	Study 12	Study 13	Study 14	Study 15
Title	Overcoming Barriers to implementations of the ISO 9002 system	Obstacles to TQM Implementation in Mexico's Maquiladora Industry	People resistance in TQM implementation: a qualitative study on Malaysian universities	The impact of organisational culture on the successful TQM implementation	Barriers to implementing TQM in Indonesian manufacturing organisations
Authors/year of publication	S.X. Zeng,P Tian, C.M Tam	Minjoon Jun, Shaohan Cai and Robin T. Peterson	Noor Azman Ali, Mohamed Zairi, Fauziah Mahat	Ali Mohammad Mosadegh Rad	Kifayah Amar, Zuraidah Mohd Zain, 2002
Publication	Managerial auditing journal 2007,Vol 22.3,pg 244-254	Total Quality Management, Vol. 15, No. 1, 59–72, January 2004	International Journal of Productivity and Quality Management Volume 3, No 1 / 2008, Pg.1 – 11	The TQM Magazine Vol. 18 No. 6, 2006 pp. 606-625	The TQM Magazine, Vol.14, issu6
Stated aim(s) / stated hypotheses	This study aims to explore the barriers to implementation of ISO 9000 in China, and to identify how these barriers can be overcome.	The purpose of this paper is to empirically investigate barriers that firms in the Maquiladora industry experience.	To discuss the theoretical and research evidence related to the issue of people barriers concerning problems and pitfalls in Total Quality Management (TQM) implementation.	To determine the impact of cultural values on the success of TQM implementation in Isfahan University Hospitals (IUHs), Iran.	This study examines the barriers faced by Indonesian manufacturing organisations in the implementation of TQM.
Main Modelling	Using a structural questionnaire survey, this paper examines the	Study was based on 25 potential obstacles to TQM success, and	A qualitative survey on seven universities in Malaysia was made.	Data was collected on the characteristics of organisational	A multi-response survey conducted on a total sample size of

	main barriers for enterprises in effective implementation of the ISO 9001 standard.	to compare findings with prior research done with US firms.		Culture and the degree of TQM success and its implementation in IUH hospitals	364 selected organisations, 78 organisations responded.
Main finding	short-sighted goal for “getting certified”; over-expectation on the ISO 9001 standard; lack of commitment from some certifying bodies; excessive competition between certifying bodies; and offering of a total packaged service from consultancy to certification by certifying bodies.	High employee turnover, lack of employee training, failure to tie management’s compensation to achieving quality goals, and employee resistance to change.	The main reasons for people resistance are lack of knowledge and information on the quality program, lack of motivation and complacency attitudes, and the quality program being perceived to cause more burden rather than benefit.	Human resource problems, performance appraisal and strategic problems were the most important obstacles to TQM success respectively.	Identified barriers that are most frequently faced by the local organisations related to human resource, management, attitude towards quality, organisational culture, interdepartmental relations, raw materials, machines and equipment, information, method and training.

The barriers reported in each of these 15 studies were listed in a large Excel sheet and organized according to content to enable comparison across the fifteen studies. This table is not shown due to space issues. However, through a literature process of comparison across the studies, 55 commonly cited barriers (barriers that appeared in at least three studies) were extracted. These are listed below in table 2.5

Table 2.5 List of commonly cited significant barriers extracted from 15 studies

S#	Barrier indicators
1	Inability to change organisational culture
2	Lack of management commitment
3	Lack of resources
4	Lack of continuous training and education
5	Incompatible organisational structure
6	Disorganized individuals/departments
7	Ineffective measurement techniques
8	Lack of access to data and results
9	Conflicting organisational culture
10	Lack of social responsibility
11	Inadequate strategic planning
12	Lack of customer focus and satisfaction
13	Lack of quality information and performance
14	No benchmarking practices
15	Lack of employee involvement
16	Lack of employee empowerment
17	Lack of employee satisfaction
18	Lack of teamwork
19	Lack of employee appraisal, rewards, and recognition
20	Lack of workforce participation
21	Lack of process control
22	Lack of product/service design
23	Lack of supplier management
24	Lack of continuous improvement
25	Lack of quality culture
26	Lack of communication
27	Lack of quality systems
28	Lack of flexibility
29	Conceptual weakness as failures occurring because organisations make only “superficial” attempts at change
30	Design flaws occurring when TQM systems are not designed to fit the cultural circumstances of the organisation

31	Ineffective implementation resulting when “TQM becomes so much extra work instead of a new way of doing things
32	Lack of recognizing that TQM requires a true organisational transformation with change in management evaluation and reward policy
33	Managers are not sure their evaluations, and subsequent pay increases and bonuses, are dependent on having high levels of quality, satisfied staff and consumers, and successful TQM implementation in their respective areas of responsibility
34	Incompatible management style and shared values
35	Management style that inhibits a learning culture, is based on fear or intimidation, and creates barriers between departments.
36	Lacking a vision
37	Not communicating the vision
38	Not empowering others to act on the vision
39	Not planning for short-term wins
40	Not institutionalizing new approaches.
41	Strategic plans do not include quality goals.
42	There are excess layers of management
43	Quality is treated as a separate initiative (quality is not everyone’s responsibility)
44	Employees are not trained in problem identification and problem-solving techniques.
45	Quality is not effectively measured
46	Quality is not defined by the customer
47	Employees are not trained in group-discussion and communication techniques
48	Quality action plans are often vague
49	The strategic plan is not customer driven
50	There are not adequate resources to effectively employ TQM
51	Employees and/or teams are not recognized for achievements in quality improvement.
52	Top management is not visibly and explicitly committed to quality
53	The time constraints prohibit effective TQM implementation
54	Employees are resistant to change
55	Employees are not trained in quality improvement skills

Extracting these 55 barriers from the 15 studies completed **step 1** of the process of identifying the common significant barriers to TQM implementation.

2.7.2 Review of core empirical studies on TQM implementations barriers

Step 2 of the process consisted of profiling a subset of empirically based studies on TQM implementation barriers, studies exhibiting precision of modelling, adequate population, appropriate sample size, robust data collection methodologies and precise analytical methods. The following 5 studies were selected from the 15 original studies based on the stricter aforementioned criteria, in order to help profile the commonly cited TQM Implementation barriers.

1. The objective of the first empirical study by Sebastianelli and Tamimi (2003) was to identify barriers associated with managing a successful quality transformation and examining the relationships between barriers and several different measures of the perceived success (or failure) of TQM through survey-based research. A survey was done on 874 companies who were member of the ASQ in USA, obtaining respondents' opinions about a series of statements representing both barriers to TQM as well as potential undesirable outcomes. Factor analysis was used to empirically derive barriers from scale items that represent commonly cited barriers. This study extended previous work by examining the causal relationships between these derived barriers and the perceived barriers. Measures used were: inadequate human resource development and management; lack of planning for quality; lack of leadership for quality; inadequate resources for TQM; lack of customer focus. Because the scale used in this study emphasized barriers associated with managing the quality transformation, these four factors offer more refinement and consequently, a better understanding of the various types of management-related obstacles to TQM. The study derived five TQM implementation barriers - inadequate human resources development and management, lack of planning for quality, lack of leadership for quality, inadequate resources for TQM and lack of customer focus. This study covered all TQM elements except Information System. It is clear that Sebastianelli and Tamimi's (2003) study met the criteria of relevance to this research and the clarity/robustness of their methodology.
2. The objective of study by Salegna and Fazel (2000) was to examine the severity of commonly reported obstacles to implementing TQM by comparing survey feedback from companies that have implemented TQM with those that have no quality management in place. A survey was done on 2000 randomly selected manufacturing firms and 109 usable

responses were received to test the hypotheses. The survey was addressed to company presidents and CEOs who were asked to rate, on a scale of 1 to 7 the degree to which each listed obstacle represented a problem during TQM implementation. Analysis of covariance was used to test for statistical differences between the degree of severity of the obstacles for TQM and non-TQM companies. The results revealed the several commonly reported obstacles to implementing TQM and concluded that a majority of TQM failures involve the process by which the TQM philosophy is implemented rather than flaws in the principles of TQM itself. It is clear that study of Salegna and Fazel (2000) met the criteria of relevance to this research and the clarity/robustness of their methodology.

3. The objective of the study by Ngai and Cheng (1997) was to identify the relevant attributes which made up the potential barriers to TQM implementation and determine the underlying dimensions. This study used self-completion questionnaires that were distributed to quality practitioners of 750 companies in an attempt to understand potential barriers to TQM implementation. A total of 179 completed questionnaires were received. PCA (Principal component analysis) was first applied to determine the underlying structure of the potential quality barriers to TQM implementation. CA (correspondence analysis) was then used to provide a study of the relationships between the potential barriers in TQM in order to reduce the complexity of the data and identify their possible association with different types of industry. Measures used in the research were: employee and cultural barriers, infrastructure barriers, managerial barriers and organisational barriers. Multivariate statistical techniques, PCA and CA were used on real data – “the potential barriers data set” to demonstrate their use. PCA was conducted on the set of survey data and produced four orthogonal dimensions to potential barriers to TQM implementation. CA was then applied in order to corroborate the findings of the PCA. Also CA showed how the potential barriers relate to one another and to the different types of industry, interpreting the data and making inferences from a more informed perspective.

A highly reliable part of Ngai and Cheng’s (1997) work was that they produced four orthogonal dimensions associated with managing a successful quality transformation, as given in table 2.6 below. Obviously the study of Ngai and Cheng (1997) met the criteria of relevance to this research and the clarity/robustness of their methodology.

Table 2.6 Potential barriers to TQM implementation and underlying dimensions by Ngai and Cheng (1997)

Dimensions	Barriers
Cultural and employee barriers	Change of culture, fear/resistance to change, lack of employee commitment, and lack of confidence by employees
Infrastructure barriers	Insufficient quality training and education, lack of customer feedback systems, lack of recognition and reward systems, underdeveloped measurement of quality and lack of expertise in quality management
Managerial barriers	Lack of top management commitment, no proper vision and mission, high turnover/changes in key executives, and lack of leadership
Organisational barriers	ineffective internal and external communication network, territorialism, and organisational politics

4. The purpose of the study by Bhat and Rajashekhar (2009) was to identify the barriers of total quality management implementation, in order to make them known to the managers of Indian industries. In order to achieve this objective, an extensive literature review was carried out to understand the barriers. This was followed by a survey of quality award winning industries in India. A total of 41 completed questionnaires were received and the overall response rate was 31 percent. The findings of this survey suggest that the most important TQM barriers in Indian industry are: “no benchmarking of other company’s practices” and “employees are resistant to change”. Factor analysis of the 21 potential barriers to TQM implementation revealed the following five underlying constructs: lack of customer orientation, lack of planning for quality, lack of total involvement, lack of management commitment, and lack of resources. The author proposed that this empirical research presented a solution to the difficulties faced by the managers while implementing TQM effectively in their industries. Apparently the study of Bhat and Rajashekhar (2009) met the criteria of relevance to this research and the clarity/robustness of their methodology.
5. The purpose of the study by Jun et al. (2004) was to empirically investigate barriers that firms in the Maquiladora industry experience. The study was based on 25 potential obstacles to TQM success, and the findings were compared with prior research done with US firms. The findings of this study suggest that a prevalent TQM barrier in the Maquiladora industry is high employee turnover. Obstacles to TQM implementation that

are common to both Maquiladora and US firms included lack of employee training, failure to tie management's compensation to achieving quality goals, and employee resistance to change. The study also analyzed the managerial implications of these obstacles. It appears that the study of Jun et al. (2004) met the criteria of relevance to this research and the clarity/robustness of their methodology

In this process, all the barriers reported in these 5 empirical studies were extracted. The author then matched up the first set of 55 common barriers with the barriers identified in these five empirical studies and only those barriers from the first set of 55 common barriers were retained that appeared in at least three of the five selected empirical studies also. This set constituted a more robust set of common/significant barriers as filtered through more stringent criteria. Table 2.7 present the final set of 32 barriers along with the studies that identified that barrier.

Table 2.7 List of 32 barriers identified in 5 studies

	TQM barrier statements	Sebastianelli & Tamimi (2003)	Salegna & Fazel (2000)	Ngai & Cheng (1996)	Bhat & Raj (2009)	Jun et al. (2004)	Freq
1	Lack of visible commitment and support to quality by senior managers	√	√	√	√		4
2	Senior managers don't communicate quality awareness within the organisation		√	√	√		3
3	Senior managers do not allocate adequate resources for employees' training	√		√	√	√	4
4	Management style slows down learning culture	√	√			√	3
5	Frequent turnover of managers	√		√		√	3
6	Excess layers of management in the organisation	√			√	√	3
7	Employees are not empowered to implement quality improvement effort	√	√		√	√	4
8	Employee are not involved in improvement projects	√	√		√		3
9	Employees are not trained in quality improvement skills	√		√	√	√	4
10	Training employees in group discussion and communication techniques is not considered necessary	√		√	√		3
11	Employees and teams are not recognized for achievements in quality improvement	√		√	√	√	4
12	Employee's satisfaction across the	√	√		√		3

	organisation is low						
13	Employees tend to be resistant to change	√		√		√	3
14	No effective system to measure customer satisfaction		√	√	√		3
15	Customers' needs and expectations are not assessed		√	√	√		3
16	Lack of effective customer feedback system		√	√	√		3
17	Close contact with key customers is not considered necessary		√	√	√		3
18	The strategic plans are not customer driven	√	√		√	√	4
19	The organisation's strategic plans do not include quality goals	√	√		√		3
20	There are no specific ways of institutionalizing new approaches/ tools/ techniques	√	√		√		3
21	There are no joint planning activities with suppliers	√			√	√	3
22	Lack of a comprehensive quality programme	√	√	√	√		4
23	Quality is treated as a separate initiative (not everyone's responsibility)	√	√		√	√	4
24	Communication with our external network of stakeholders is not ineffective	√		√		√	3
25	Adequate resources to effectively employ TQM are not available	√		√		√	3
26	Cross functional teams are not used	√			√	√	3
27	Poor inter-organisational communication		√	√		√	3
28	Individuals don't liaise with people outside of their own departments		√	√	√		3
29	Quality and performance information is not disseminated widely in the organisation	√			√	√	3
30	Quality performance is not effectively and frequently measured	√			√	√	3
31	The best practices / or products of other companies are not benchmarked	√			√	√	3
32	Not enough time to implement quality programme	√	√		√		3

Step1 and **step 2** of the process provided the author with a list of 32 common barriers found to be significant in five empirical studies and also reported in a wider set of 15 studies. Hence, the final barrier list derived from the studies considered to be those that are from high quality journals and also exhibit the most focused and robust methodological approach.

2.7.3 Identification of the barrier constructs

In step 3 of the process the barriers were organised into a systemic typology of barrier constructs. As mentioned previously, this was crucial in order to derive a set of TQM barrier constructs and hence be able subsequently (see chapter 3) to identify and define the set of hypotheses describing the relationship between organisational culture and TQM barriers. Each of the final 32 items (see table 2.8 below) represented a TQM barrier indicator. Organising them into TQM barrier constructs involved an iterative process of logically grouping the barriers according to their nature and area of influence within the broad TQM framework. This helped to ensure that the implementation barrier constructs remained consistent with established TQM theory. This was further guided by those studies that had previously attempted to put forward higher level barrier constructs, namely the study by Ngai and Cheng (1997) which identified four barrier categories. The result of these iterative processes was the derivation of six TQM implementation barrier constructs: top management barriers, employee barriers; customer barriers; planning barriers; process management barriers; and information management barriers.

An objective of this categorization was that the resulting barrier constructs should closely mirror a generally accepted taxonomy of TQM principles identified in the Baldrige framework. This was done for three reasons: first, according to Curkovic et al. (2000), the wide adoption of Baldrige criteria in many countries around the world strongly suggests that the Baldrige criteria have comprehensively captured the major dimensions of TQM practices as envisioned by its proponents, such as Deming, Juran, and Crosby. Second, the Baldrige criteria are applicable to both manufacturing and non-manufacturing firms, which were the focus of this study. Third, categorization of TQM implementation barriers according to taxonomy of six main TQM principles in Baldrige criteria would enable practitioners to identify what barriers are expected in implementing a TQM principle and to avoid unexpected barriers to surface in the midst of the implementation process. Therefore, this unique categorization of TQM implementation barriers guided by an established taxonomy of TQM principles has both theoretical and practical significance. Table 2.8 shows the 6 TQM implementation barrier constructs with their indicators.

Table 2.8 Categorizing identified TQM implementation barrier indicators into higher order barriers constructs

Barrier construct	S#	Barrier indicator
Top Management Barriers	1	Lack of visible commitment and support to quality by senior managers
	2	Senior managers don't communicate quality awareness within the organisation
	3	Senior managers do not allocate adequate resources for employees' training
	4	Management style slows down learning culture
	5	Frequent turnover of managers
	6	Excess layers of management in the organisation
Employee Barriers	7	Employees are not empowered to implement quality improvement effort
	8	Employee are not involved in improvement projects
	9	Employees are not trained in quality improvement skills
	10	Training employees in group discussion and communication techniques is not considered necessary
	11	Employees and teams are not recognized for achievements in quality improvement
	12	Employee's satisfaction across the organisation is low
	13	Employees tend to be resistant to change
Customer Barriers	14	No effective system to measure customer satisfaction
	15	Customers' needs and expectations are not assessed
	16	Lack of effective customer feedback system
	17	Close contact with key customers is not considered necessary
Planning Barriers	18	The strategic plans are not customer driven
	19	The organisation's strategic plans do not include quality goals
	20	There are no specific ways of institutionalizing new approaches/ tools/ techniques
	21	There are no joint planning activities with suppliers
Process Management Barriers	22	Lack of a comprehensive quality programme
	23	Quality is treated as a separate initiative (not everyone's responsibility)
	24	Communication with our external network of stakeholders is not effective
	25	Adequate resources to effectively employ TQM are not available
	26	Cross functional teams are not used
Information Management Barriers	27	Poor inter-organisational communication
	28	Individuals don't liaise with people outside of their own departments
	29	Quality and performance information is not disseminated widely in the organisation
	30	Quality performance is not effectively and frequently measured
	31	The best practices / or products of other companies are not benchmarked
	32	Not enough time to implement quality programme

The literature confirms that potential TQM implementation barriers specific to organisations exist in many types of organisations in many regions of the world (Angell and

Corbett, 2009). Hence, Bahraini industries are no exception. These barriers need to be identified and addressed to help develop high-performance management practices in Bahraini industries. These barriers needed to be further investigated in a target population in Bahrain in order to empirically verify the existence of the barriers, and hence direct effort to build strategies for overcoming them.

2.7.4 Review of the most common/significant barriers

In this section, the 32 TQM implementation barriers making up the six implementation barrier constructs identified through the process described in the previous sections are reviewed. In each case, the literature supporting the significance of each of the barriers is identified.

2.7.4.1 Top management barriers

1. Lack of visible commitment and support to quality by senior managers

Researchers agree that the leadership and commitment of top management is a key driver of TQM (Powell, 1995; Black and Porter, 1996; Ahire et al., 1996; Flynn et al., 1994; Samson and Terziovski, 1999). In a study of Malcolm Baldrige National Quality Award (MBNQA) winners, Matta et al., (1996), found that the only factor that 100 percent of the MBNQA winners considered critical to the success of TQM was top management's commitment and involvement. In a study of companies that won the Australia Quality Award, Abraham et al. (1999) found the key factor in achieving a successful change to a quality culture was management support. They stated that "managers must be clearly perceived to support the change through communication, resource allocation and recognition/reward" (p. 127). Research by TQM scholars (e.g. Wilkinson et al., 1993; Dale & Cooper, 1994; Lakhe & Mohanty, 1994; Gudim & Meer, 1995; Soltani et al., 2003) has identified low commitment of senior management as a roadblock and major challenge to TQM success. Accordingly to Glover (1993), TQM definitely fails when it becomes so much extra work for management instead of a new way of doing things.

The importance of top management commitment and support to quality for TQM implementation is emphasized by many researchers such as Gobadian and Gallear (1996);

Flynn et al., (1994), Hellsten, (2000); Ahire,(1998); Ahire et al., (1996); Motwani, (2001). Hence, lack of top management commitment and support to quality is a significant TQM implementation barrier and is frequently reported in several previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Bhat & Raj, 2009; Jun et al., 2004; Amar and Zain, 2002; Amaral and Sousa 2009; Master, 1996; and Zeng et al., 2007). In addition to the TQM barrier studies selected in this research, there are several other previous studies that have indicated the significance of this TQM implementation barrier (Lua and Idris, 2001; Al-Khalifa and Aspinwall, 2000; Al-Zamani et. al, 2002; Dale, 1994; MacDonald, 1992; Bhanugopan, 2002; and Soltani et al., 2008).

2. Senior managers don't communicate quality awareness within the organisation

The quality goals and objectives can only be set when managers recognize the importance of quality improvement for the success of their organisation and this understanding would develop through quality awareness (Oakland, 2003). More successful companies create this awareness through development of information systems, fliers, bulletins, notices, and, of course, through education and training (Huq, 2005). However, according to Jones and Seraphim (2008), creating TQM awareness by defining the company's strategy, mission and vision are also highly successful approaches in TQM implementation. Additionally, raising an awareness of the benefits of TQM is foremost crucial action required in TQM implementation (Bardoel and Sohal, 1999). Furthermore, the diffusion of TQM can also raise awareness of TQM among employees (Rogers, 1995).

Any lack of insight about the importance of quality awareness is considered a significant barrier in TQM implementation. This barrier indicator is evaluated as critical for TQM implementation in several previous studies (Salegna and Fazel, 2000; Ngai and Cheng, 1997; Bhat & Raj, 2009). The significance of this barrier is complemented by the results of many other previous studies on TQM implementation barriers (Shaohan and Robin, 2004; Kotey and Slade, 2005; Thomas and Armstrong, 2004; Tannock et al., 2002; Soltani et al, 2008; Zairi et al., 2008 ; Walsh et al., 2002). For example, according to Tannock et al (2002), management and information issues (awareness) are vital barriers in TQM implementation. Similarly, Lau and Idris (2001) concluded that lack of organisational information (awareness) and data on the critical success factors is an obstacle in implementing TQM effectively and comprehensively.

3. Senior managers do not allocate adequate resources for employees' training

The importance of skilled employees for the success of any organisation can't be overstated (Rice and Simard, 1996; Lau and Idris, 2001; Huq, 2006; Amar and Zain, 2002; Oakland, 1997; Master, 1996; Adebajo and Kehoe, 1998; Al-zamani et al., 2002; Sayle, 1994; Whalen and Rahim, 1994; Shaohan and Robin, 2004; Kotey and Slade, 2005). These studies also found that inadequate resources for training is an obstacle for employee training programmes that in turn adversely affects effective TQM implementation. The significance of the barrier of inadequate resources for training in TQM implementation is verified in four empirical studies (Ngai and Cheng, 1997; Sebastianelli and Tamimi, 2003; Jun et al., 2004; and Bhat and Raj, 2009), which is consistent with the previous findings of Tamimi and Sebastianelli (1998) who found several factors working against TQM implementation, one of them was inadequate resources for employee training

The significance of this barrier in TQM implementation is also consistent with the findings of Masters (1996) who found that insufficient training resources were working as a factor leading to ineffective TQM implementation. Al-Khalifa and Aspinwall (2000) mentioned that an obstacle faced in implementing quality in Qatar was limited resources to implement change, including employee training. In addition many other authors such as Oakland (1997), Amar and Zain (2002), Whalen and Rahim (1994), Sayle (1994), and MacDonald (1992) have reported that a lack of resources for employee training is considered to hinder quality management implementation. Finally, Yusof and Aspinwall (1999) identified training resources as a critical factor, unique to organisations, that impacts TQM implementation. They argued that if all TQM practices are considered important, then limited resources have to be spread out across all of them.

4. Management style slows down learning culture

Manager's management skills should enhance the learning experience of employees in order to keep them engaged and on-task. Managers can develop a learning culture by actively observing the employees' progress through the activity and participating in the learning process. Such kind of management style speeds up learning culture. Developing a learning culture is critical for organisational growth as reported by previous studies (Amaral and Sousa 2009; Angell and Corbett 2009).

Based on several company case studies, Kanji (1996) compiled a list of 12 poor management practices that are key contributors to failed TQM initiatives and these included “management style that inhibits a learning culture”. Hence, management style that inhibits a learning culture is a significant TQM implementation barrier and is frequently reported in several empirical studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Jun et al., 2004). Ghobadian and Gallear (1996) observe that the biggest obstacle to the introduction of TQM is the inability of management to modify their management style to one that would facilitate TQM implementation.

5. Frequent turnover of managers

Frequent turnover of managers is reported as a high level barrier in many previous studies. The frequent turnover of executives adversely affects the consistency of policies and consequently overall performance (Ngai and Cheng, 1997; Sebastianelli and Tamimi, 2003; Jun et al., 2004). For example, changes in key executives (high turnover), is one of the key barriers in the study by Ngai and Cheng (1997). While evaluating the relative significance of management-related obstacles to TQM success, Deming (1986) listed the turnover of management as the fourth deadly disease that impedes transition to a stable total quality environment. Turnover of managers is perhaps the simplest and yet one of the most deadly diseases because frequent changes in top management means continuous improvement efforts will be broken and disjointed as the new leaders come on board because with changes in leadership, there is frequently a change in management philosophy (Deming, 1986; Schwinn, 2002). Supporting this argument, Sebastianelli and Tamimi (2003) argued that one of the critical potential barriers to TQM implementation is frequent turnover of management because it breaks down or slows down the momentum of the change process.

Several other researchers have argued that frequent turnover of managers is not a healthy precursor for TQM implementation and its development (Amaral and Sousa 2009; Bhat and Raj, 2009; Angell and Corbett, 2009; McFadden et al., 2006). Given that the top management is considered to be the necessary driver for any quality initiative, leadership instability can only lead to unfavourable outcomes (Tamimi and Sebastianelli, 1998 and Salegna and Fazel, 2000).

6. Many layers of management

In flat organisations with very few layers of management, top management is highly visible and close to the point of delivery. This kind of faster communication line helps to faster a quick decision-making process and faster implementation due to short decision-making chain. The system with fewer layers of management allows flexibility and fast response to customer needs which is important in TQM (Powell, 1995; Black and Porter, 1996; Ahire et al., 1996; Samson and Terziovski, 1999). Excessive layers of management can create communication gaps and are a potential cause of delayed decision processes which result in missing opportunities, particularly in fast paced business activities (Sebastianelli and Tamimi, 2003; Bhat and Raj, 2009; and Jun et al., 2004). Therefore, the TQM implementation barrier “existence of many layers of management” is significant and frequently reported in TQM literature.

2.7.4.2 Employee barriers

1. Lack of empowerment to apply quality improvement efforts

The Concept of employee empowerment has almost become synonymous with TQM (Reed et al. 2000). The Extant TQM literature has identified employee empowerment as a critical factor of TQM implementation (Li et al., 2001; Claver et al., 2001; Davidson et al., 2001; Dale et al., 2001; Zhang et al., 2000; Rao et al., 1999). Among the founders of TQM, the idea of empowerment was highlighted by Feigenbaum and then supported by Deming but only Juran (1995) promoted the concept of empowerment more forcefully. Acknowledging some differences among quality award models, there is complete convergence in their content about empowerment. Hence, empowerment of employees in terms of delegating them more responsibility is recognized as a key source of giving them a greater sense of confidence and self-esteem (Zu et al., 2010). As defined by Huq, (2005), empowerment means respecting the employees and their ideas; as well as drawing upon their expertise and talents to meet the objectives of organisations.

Therefore, the barrier indicator “lack of empowerment of employees to apply quality improvement efforts” is a reflection of centralized control in decision making and other job related functions which adversely affects organisation goals. Several previous studies on TQM implementation barriers have identified this barrier as significant (Huq, 2005; Rad,

2004; Amar and Zain, 2002; Amaral and Sousa 2009; and McFadden et al., 2006). This barrier is also considered significant in the findings of four empirical studies on TQM implementation barriers (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Bhat and Raj, 2009; and Jun et al., 2004).

2. Lack of involvement in improvement projects

TQM is an integrated management philosophy that emphasizes increased employee involvement and teamwork (Ross, 1993). Employee involvement in the TQM implementation process is critical to TQM success (McAdam and Kelly, 2002; Lawler et al., 1995; Buch and Rivers, 2002). Full involvement of the entire workforce is essential if TQM is to be successfully implemented (McAdam et al., 2004). An open culture that encourages employees to participate in development of visions, strategies, and plans has to be created by management to increase employee involvement (Rad, 2005). Employees won't feel that they are responsible for customer satisfaction if they are excluded from such decision making activities.

Therefore, lack of involvement of employees in improvement projects reflects centralized control in decision making and other job related functions. If there is a lack of involvement of employees in organisation activities, employees can feel neutral to the organisation's mission, aim and objectives (Lawler et al., 1995). The findings of three empirical studies on TQM implementation barriers have identified this barrier as significant (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Bhat and Raj, 2009).

3. Lack of training in quality improvement skills

Quality experts universally agree that training of management, supervisors, and hourly workers greatly enhances the chances of success in implementing a TQM strategy (Kassicieh and Yourstone, 1998). Training can move an organisation beyond preventing errors to a point at which breakthrough achievements are realized (Juran and Frank, 1993). Easton (1993) stated that organisations receiving high scores on TQM award applications have delivered basic quality training to all their employees. The implementation of most, if not all quality programmes means more involvement and teamwork, which require more responsibility and a greater level of skill and knowledge by the employees (Ross, 1993). This should be achieved through proper, formal and systematic training and education (Brown et al., 1994).

Depending on the needs of a particular organisation, training and education should cover the entire workforce as part of an ongoing process and more attention should be attributed to management techniques and quality management issues (Yusof and Aspinwall, 2000).

Tamimi and Sebastianelli (1998) confirmed the presence of two major barrier indicators in their study of US firms - “employees are not trained in quality improvement skills” and “employees are not trained in problem identification and problem solving techniques”. An associated resource factor limiting effective TQM is the lack of sufficient funds to mobilize TQM driven activities such as instituting training programmes, and providing quality resources,. The significance of this barrier is consistent with the studies of Oakland (1997), Masters (1996), Adebajo and Kehoe (1998), Amar Mohd Zain (2002), Al-Zamani et al. (2002), Sayle (1994), and Whalen Rahim (1994) who found identical results.

The significance of this barrier is also supported by the findings of many authors in the wider TQM literature, such as Sebastianelli and Tamimi (2003); Ngai and Cheng (1997); Bhat and Raj (2009); and Jun et al. (2004). All these authors insist that there is a need for training programmes in any business and advocate that the lack of sufficient quality training and education has a negative effect on the quality of business. They also conclude that lack of quality training and education programmes are the main obstacles that many organisation face in establishing an improvement ethos.

4. Lack of employee training in group discussion and communication techniques

Employees need to be trained in group discussion and communication techniques, as these are regarded as the basic tools of quality and process improvement, and problem identification/Problem-solving skills (Sebastianelli and Tamimi, 2003). Ghobadian and Gallear (1996) reported ineffective communication as a main obstacle in TQM implementation. Similarly, Gunasekaran (1999) examined the enablers of TQM implementation in a British manufacturing company using structured interviews of employees and found that major enabler of TQM implementation was communication between managers/supervisors and staff, and that poor communication between departments was a real barrier to implementing TQM. It has been observed in many organisations that supervisors and workers possess technical skills, but lack the communication skills to ensure success in today's complex operations (Dale, 2007). A good balance of technical skills and managerial skills is required for success which can be done through specific training programmes for improvement of group discussion and communication techniques (Oakland,

2003). Lack of training in group discussion and communication techniques adversely affects TQM implementation as reported by four empirical studies that identified this barrier as significant (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Angell and Corbett 2009; and Minjoon et al., 2004).

5. Lack of recognition for achievements in quality improvement

Recognition for achievements in quality improvement is usually facilitated through performance appraisal and reward system. During performance appraisal management sets priorities and goals for individual employees, provides performance feedback, identifies individual strengths and weaknesses; and identifies training needs (Murphy and Cleveland, 1991). Based on performance appraisal, employees are rewarded for improvement that can positively affect employee morale and loyalty. Glover (1993) argues that without a change in management evaluation and reward policy, TQM cannot be taken seriously. He advocated that “managers will need to know that their evaluations, and subsequent pay increases and bonuses, are dependent on having high levels of quality, satisfied staff and consumers, and effective TQM implementation in their respective areas of responsibility” (p. 63). In an empirical study by Rad (2005), the performance appraisal and reward system problems were found significant barriers of TQM implementation. The study found that the problems in these organisations were due to lack of mechanisms for measuring organisation’s activities, lack of continuous quality control, and lack of feedback from customers. Subsequent research, based on both case studies and surveys, has led to similar conclusions regarding the performance evaluation and reward system in the success of TQM (Powell, 1995; Black and Porter, 1996; Ahire et al., 1996; Flynn et al., 1994; Samson and Terziovski, 1999).

Employees need to be empowered to implement quality improvement efforts, and, when successful, they need to receive appropriate recognition for their achievements (Oakland, 2003). Without such opportunities and a supportive environment, employees might feel frustrated, thereby contributing to more frequent turnover (Ngai and Cheng, 1997). A critical lack of recognition of employees for achievements in quality improvement affects morale and motivation (Kassicieh and Yourstone, 1998). The findings of various previous studies have verified the significance of lack of recognition for achievements in quality improvement as a significant TQM implementation barrier (Lau and Idris, 2001; Oakland, 1997; Adebajo and Kehoe, 1998; Al-zamani et al., 2002; Sayle, 1994; Whalen and Rahim, 1994; Shaohan and Robin, 2004; Kotey and Slade, 2005; Huq, 2006; Amar and Zain, 2002; Amaral and Sousa

2009). The significance of this barrier is also established by four of the five selected empirical studies namely Sebastianelli and Tamimi (2003), Ngai and Cheng (1997), Bhat and Raj (2009), and Jun et al. (2004).

6. Lack of job satisfaction

According to Rad, (2004a), optimum outcome quality is linked with job satisfaction. When employees are not satisfied with their job, there will be frequent cases of employee turnover (Oakland, 1997; Al-zamani et al., 2002; Dale, 2007; Shaohan and Robin, 2004; Kotey and Slade, 2005; Huq, 2006; Amaral and Sousa 2009). Various studies have used employee turnover rate (lack of job satisfaction) to measure TQM success (Ahmadi and Helms 1995; Guimaraes 1997). TQM creates an environment that requires and nurtures job satisfaction (Gunasekaran, 1999; Youssef et al., 1996; Rad, 2003, 2004c). Hence, lack of job satisfaction inhibits the TQM implementation process. The lack of job satisfaction can occur due to multiple factors such as inappropriate performance evaluation and reward system (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000); lack of empowerment and participation (Ngai and Cheng, 1997; Amaral and Sousa 2009; and Angell and Corbett 2009); low motivation (Salegna and Fazel, 2000); poor work environment and lack of incentives (McFadden et al., 2006).

7. Resistance to change

The TQM implementation barrier resistance to change is frequently reported in the literature. Comparing the results with previous studies in TQM implementation, Bhat and Raj, (2009) found that “employees are resistant to change” was a main barrier in Indian industries. According to Amar and Zain (2002), TQM programmes are often viewed with scepticism, and are destined to fail if they do not get the full support of the entire work force. They argued that organisations that score highly on items such as “employees are resistant to change” and “quality is not everyone’s responsibility” most likely have leaders who have failed at communicating their commitment to quality in concrete ways (for example, preparing employees for changing roles and job responsibilities in a TQM environment). In such environments, managers might see little possibility of success, leading eventually to more frequent employee turnover (Ali et. al., 2008). In change management, the attitude of employees towards quality is seen to be one of the greatest barriers in many organisations. It has been reported that it is very difficult to change the mindset of the employees with regards

to quality (Oakland, 2003). If employees believe that quality is a needless task and added cost, they are unlikely to accept it as an integral part of the job (Dale, 2007).

Buchanan (1989) argued that it is the lack of sufficient training in TQM techniques due to which people will resist or at least be less committed to any change initiatives. Employees' resistance to change or low commitment can be justified on human considerations (Crosby, 1979; Deming, 1986; Ishikawa, 1985). Wilkinson et al. (1998) argues that the emphasis of TQM is on autonomy, creativity, active cooperation and self-control for employees, with employee involvement a key theme, but the evidence overwhelmingly shows that managers do not take action to engage the employees to recognize the TQM philosophy and its benefits – that consequently results in resistance to change and failure of TQM. Soltani et al. (2008), refers to a 2002 article in Gallup Management Journal that concludes that more than half of the employees may not be engaged with their work. According to Wilkinson et al. (1998), management is charged with ultimate responsibility for quality because 85 percent of failures are reckoned to be the fault of inadequate management systems that generate employee resistance. Therefore, employee resistance is relative rather than absolute, and whatever the roots of this barrier might be, it is a significant barrier in TQM implementation. This barrier is found significant in three empirical studies (Sebastianelli and Tamimi, 2003; Ngai and Cheng, 1997; Jun et al., 2004).

2.7.4.3 Customer barriers

1. Lack of effective system to measure customer satisfaction

Total quality management (TQM) is philosophy which aims to provide organisations with a template for success through customer satisfaction (Rad, 2004a). Many TQM researchers have concluded that core objective of TQM is to delight the customers. According to Kanji and Asher (1996), the first one of eight core concepts of TQM is customer satisfaction. Many other researchers have identified customer satisfaction as a core factor of TQM implementation (Deming, 1986; Crosby, 1989; Oakland and Porter, 1994; Rao et al., 1996; Spring et al., 1998; Oakland, 2000; Kanji, 1998a, b; Zairi, 1999a, b, 2000; Winser and Corney, 2001; Li et al., 2001; Nakata, 2002; Hitchcock and Willard, 2002).

Adebanjo and Kehoe (1998), who studied TQM implementation in UK manufacturing organisations, identified upper management not insisting on the systematic measuring of customer satisfaction as a key quality problem. Customer satisfaction is generally measured

by direct contact with customers, e.g. using surveys or focus groups, or indirect inferences about customer satisfaction from the complaint data or measurement of repeat business. The main problem appears to be associated with lack of measurement of key indicators (i.e. measuring customer satisfaction) and the absence of information infrastructures which enable senior executives to understand the effectiveness of their TQM implementations (Taylor, 1997). Lack of such measurement has adverse implications on TQM implementation and its success.

Grant et al. (1994) point out that customer focus and the measurement of customer satisfaction has a vital implication on long-run profitability of an organisation. The barrier “lack of effective system to measure customer satisfaction” is thus highly significant, as has been established by Sebastianelli and Tamimi,(2003); Salegna and Fazel(2000), Bhat and Raj (2009) and Jun et al. (2004).

2. Needs and expectations of customer not assessed

The business environment is getting more and more dynamic and the future is full of challenges for managers because it is getting difficult to manage competition and customer expectations. Quality has moved from exceeding customer expectations (Parasuraman et al., 1985) towards delighting the customer (Peters, 1989) but needs and expectations of customer are scantily assessed in order to find ways and means to delight the customer. Flynn et al. (1994) defined the main TQM objective as to “meet or exceed customer expectations”. Deming (1986) stressed that quality should be aimed at the needs of the consumer, both present and future. Quality then is simply meeting the customer requirements and this has been expressed in many ways by many other authors as well.

Reviewing the theories of three quality gurus (Deming, Juran, and Ishikawa), Hackman and Wageman (1995) identified six interventions as the core of TQM and first and foremost was the “explicit identification and measurement of customer wants and needs”. For TQM implementation, it is recommended that particular attention is given to customer expectation and the benefits to be gained (Ghobadian and Gallear, 2001). An organisation cannot be said to be truly practicing total quality if it is not actually measuring important attributes such as customer satisfaction (Taylor, 1997), organisations such as these ought to focus on developing their knowledge infrastructure by providing knowledge of customer

needs and expectations, customer satisfaction levels and business performance relative to competitors.

The barrier indicator “needs and expectations of customer not assessed” thus also has a high significance, as has been established by Bhat and Raj, (2009) Angell and Corbett (2009) Sebastianelli and Tamimi, (2003) Salegna and Fazel (2000) and Jun et al., (2004).

3. Lack of effective customer feedback system

Oakland (2003) suggests that implementing an effective and efficient system of quality management, continuous monitoring and evaluation of processes and getting good feedbacks from customers are the most important factors in success of TQM. Getting the feedback is a process of self-assessment that highlights strengths and improvement opportunities, and drives continuous improvement (Oakland, 2000; Conti, 1999). The works of two of five TQM gurus, Feigenbaum and Ishikawa mainly concentrate on feedback and control. However, Deming also argues for continuous process improvement based on feedback and measurement system (plan do check act) and the same idea is implicit in Crosby's 14th step which exhorts managers to ensure that the quality process never ends. Kearney (1991) underlined the importance of measurement to get feedback from customers and give feedback to employees about how the organisation is doing and to engender employee involvement. However, in a later report the same author highlighted the absence of feedback and measurement system in a large number of TQM organisations (Kearney, 1992). Therefore, the barrier indicator of lack of effective customer feedback system exists in TQM organisations with all its harmful implications.

A major underlying principle of customer focus in TQM is the requirement to collect customer information and analyze their feedback (Powell, 1995; Black and Porter, 1996; Ahire et al., 1996; Flynn et al., 1994; Samson and Terziovski, 1999). The findings of some previous studies such as Tamimi and Sebastianelli (1998), Nagi and Cheng (1997), and Adebajo and Kehoe (1998) concerning customers' requirements and feedback signify this barrier. Many authors have considered the “lack of customer requirements and feedback system” as one of the very important barriers facing the organisations in their pursuit of TQM (Bhat and Raj, 2009; Angell and Corbett 2009; Sebastianelli and Tamimi, 2003; Salegna and Fazel; and Jun et al., 2004).

4. Lack of contact with key customers

Customers' real requirements and future needs should be determined as a goal, and close contact with the customers should be maintained to identify their changing needs and requirements regularly via such methods as focus groups, and customer site visiting, and performance should be measured against those requirements on a continuous base (Deming, 1986; Johston and Daniel, 1991; Hackman and Wageman 1995; Bullington et al., 2002). A number of scholars have found that maintaining vibrant contact with customer is significantly and positively related to customer satisfaction (Grandzol and Gershon, 1997; Forza and Flippini, 1998; Nair, 2006). According to Chong and Rundus's (2004), and Fuentes's et al. (2004) studies, it is imperative that organisations know their customers' current and future needs and are in close contact with their customers to enhance TQM improvement in TQM implementation.

According to Zehir and Sadikoglu (2007), customer satisfaction is the extent of the perceptions of the customers in meeting their needs and requirements by the products and services. An example of this is "customer-driven focus" as the customer is the "final arbiter of quality" and the attributes of the product and service determine customer satisfaction and demand (Anderson et al. 1994; Evans and William, 1993). Deming (1994, 1981-82, 1986) claims that dissatisfied customers can be harmful to the company performance so the workers who are in contact with the customers should be given high priority to satisfy the customer. Satisfied customers can become loyal and thus improve well-being of the company. Internal customers, whose work depends on the prior work, are also important and employees must view themselves as customers of and suppliers to other employees (Evans and William, 1993; Dean and Bowen, 1994).

An organisation can establish a good understanding of what the customer wants through keeping close customer contact and obtaining customer feedback. Furthermore, it should be recognized that customers are not only those to whom organisations sell products/services but are also their internal staff (Deming, 1986). The significance of this barrier was established by Bhat and Raj, (2009); Angell and Corbett (2009); Sebastianelli and Tamimi(2003); Salegna and Fazel(2000); and Jun et al.(2004).

2.7.4.4 Planning barriers

1. Strategic plans are not customer driven

Among the quality gurus, with the exception of Crosby, all pay substantial attention to customer driven quality planning, but their emphases are very different; where Juran covers all aspects of quality planning, Deming is mostly concerned with action planning. Planning is one of the key stepping stones to accomplish any task while strategic planning is one of the key factors of TQM practices (Wilson and Collier, 2000; Sadikoglu and Zehir, 2007; Parast et al., 2006). Feng et al. (2006) in their comparative study found that customer driven strategic planning in TQM practice does have significant impact on organisational performance. Quality gurus and writers strongly emphasize the importance of customer driven strategic planning process based on total quality (Deming, 1986; Zairi, 1994, 1999a; Oakland, 1993; Ahire et al., 1996; Sinclair and Zairi, 2001; Dayton, 2001; Martinez-Lorente et al., 1998; Sureshchandar et al., 2001; Crepin, 2002; Hitchcock and Willard, 2002).

There appears to be a multitude of reasons why companies fail in their effort to implement a quality management system, however, a common problem appears to be a lack of customer driven strategic planning (Sebastianelli and Tamimi, 2003). The TQM barrier “strategic plans are not customer driven” is widely cited in the literature, as established by Sebastianelli and Tamimi, (2003); Salegna and Fazel, (2000); Ngai and Cheng, (1997); Amaral and Sousa (2009); Bhat and Raj, (2009); Whalen and Rahim, (1994); Rad, (2004); McFadden et al., (2006); and Jun et al., (2004).

2. Strategic plans don't include quality goals

Developing strategic planning without considering quality goals is reported as important barriers of TQM success in various previous studies (Shaohan and Robin, 2004; Kotey and Slade, 2005; Thomas and Armstrong, 2004; Tannock et al., 2002; Soltani et al, 2008; Zairi et al., 2008 ; Walsh et al., 2002). These barriers included lack of planning and long-term quality policies, lack of mechanisms for formulating strategic quality plan, non-clarity of quality objectives, inflexibility of organisation toward environment and technology change and lack of legal elements for providing quality services. In order to meet quality goals of the organisation, strategic quality planning, customer-driven quality, aligning process to improve customer satisfaction, and monitoring and evaluation of quality are all

necessary (Lau and Idris, 2001; Oakland, 1997; Adebajo and Kehoe, 1998; Al-zamani et al., 2002; Sayle, 1994; Whalen and Rahim, 1994; Shaohan and Robin, 2004; Kotey and Slade, 2005; Huq, 2006; Amar and Zain, 2002; Amaral and Sousa 2009). Therefore, strategic plans that don't include quality goals are likely not to be successful and act as barrier to TQM implementation.

The TQM barrier indicator of “strategic plans don't include quality goals” is highly significant. As established by Ngai and Cheng (1997); Amar and Zain (2002); Amaral and Sousa (2009); Bhat and Raj (2009); McFadden et al. (2006); Jun et al. (2004); Ali et al. (2008); and Zeng et al. (2008).

3. Lack of institutionalizing new approaches/tools/techniques

According to Sousa-Poza (2000), implementation of the “philosophy” of TQM is more difficult because it requires alignment in the way the members of the organisation think and behave. However, application of the management tools can be relatively straightforward, since it requires limited modification in attitude and behavior. TQM is associated with a number of management tools or methodologies, such as statistical process control (SPC), quality circles (QC), just-in-time (JIT), and benchmarking. According to Shaba et al (1993) TQM is not merely “an abstract philosophy” but includes both concepts (a philosophy) and practices (tools). These tools are evolving with respect to change in business environment and change in technology. Therefore, organisations need to institutionalize new approaches/tools/techniques.

Katter (1995) identified eight common management errors and “not institutionalizing new approaches” was one of them. The TQM barrier “lack of institutionalizing new approaches /tools /techniques” has been reported as significant in many previous studies (Keya and Zain, 2002; Amaral and Sousa 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006). Furthermore, three of the selected empirical studies support the significance of this barrier (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Bhat and Raj, 2009).

4. Not enough joint planning activities with suppliers

The TQM barrier indicator of “not enough joint planning activities with suppliers” is reported as significant in literature. TQM is an integrated management philosophy and set of practices that emphasizes increased closer relationship with suppliers (Ross, 1993; Brown, 1992). The focus on suppliers and partners and their involvement is critical for TQM success (Rad, 2003, 2004b). TQM demands improved relations with suppliers, a true working partnership (Gunasekaran, 1999; Youssef et al., 1996). In the case of TQM, firms' actions are driven by the relationships with suppliers (Reed et al., 2000). According to Taylor (1997), improvement of any business is dependent to some extent on the quality of its suppliers and sub-contractors (Taylor, 1997). The involvement of external suppliers in TQM development efforts is reported as an important TQM success factor (Kanji, 1998). Lack of long-term supplier relationship is reported as a barrier impeding the implementation of TQM (Rajashankar, 1999). Bhat and Raj (2009) reported in their study that lack of joint planning with suppliers was assessed as a critical TQM implementation barrier in Indian industries.

This indicator was found significant in many previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1998; Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Minjoon et al., 2004).

2.7.4.5 Process management barriers

1. Lack of a comprehensive quality programme

The TQM barrier indicator of lack of a comprehensive quality programme means that quality initiatives do not include all organisational functions/departments. A quality management system in any form is all inclusive, and quality initiatives should include all organisational functions/departments. TQM implementation spans the entire range of activities deemed critical by TQM authors (e.g. Saraph et al., 1989; Flynn et al., 1994; Powell, 1995; Ahire et al., 1996; Black & Porter, 1996; Zeitz et al., 1997). These authors suggest that in a comprehensive quality programme, there are no short-cuts to quality, no quick fixes, and that improvement requires full commitment and support from the top, extensive training and participation of all employees. Lakhe and Mohanty (1994); Macdonald (1995); and Kanji (1995) suggest the lack of comprehensive quality improvement programme is a roadblock and major challenge to TQM implementation efforts in organisations. The TQM implementation barrier of lack of a comprehensive quality programme was found

significant in many previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Jun et al., 2004).

2. Quality initiative is delegated to selected individuals only

When the TQM initiative is only delegated to selected individuals, it loses its momentum. Therefore, TQM is best developed in a team environment through organisation-wide effort, which involves the entire workforce to concentrate on continuous improvements (Bounds et al., 1994). TQM is associated with a single “homogeneous” culture and TQM is promoted as a set of organisation-wide practices that unify mindsets and perceptions among members of an organisation (Prajogo and McDermott, 2005). Hence, it is imperative that the existing quality management system is all-encompassing and pervasive. TQM is more successful when top management, the middle management, and the workforce at every level participate as a team in decisions affecting their work (Crosby, 1989; Kanji and Asher, 1993; Cebeci and Beskese, 2002; McAdam and Kelly, 2002; Everett, 2002; Mehra et al., 1998). A participative work culture is developed when quality becomes everybody’s responsibility by involving everyone in improving the way things are done (Ho and Fung, 1994).

TQM barrier indicator of “quality initiative is delegated to selected individuals only” is found significant in previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Minjoon et al., 2004).

3. Ineffective communication with stakeholders

Emphasizing people-oriented factors, such as teamwork and empowerment, Gunasekaran (1999), found that poor communication between departments was a real barrier to implementing TQM in a British manufacturing company. Poor inter organisational communication was found to be a critical barrier to TQM implementation by Salegna and Fazel (2000). Ngai and Cheng (1997) found that organisational issues such as ineffective internal and external communication network were significant barriers in TQM implementation. According to Soltani et al. (2008), ineffective internal communication

between management and employees (poor managerial systems), and low engagement of other levels of management within the organisation is a significant obstacle in TQM implementation. Effective communication is important for the success of any quality initiative and is critical from the beginning of a change effort (Martinez-Lorente et al., 1998; Sureshchandar et al., 2001; Magurez et al., 2001). According to Ghobadian and Gallear (2001), the vast majority of references to the implementation initiative emphasize the need to develop communication channels. These authors further state that solving quality problems requires cross-functional communication at various levels throughout the organisation, which typically means establishing and using teams. Similarly, Sebastianelli and Tamimi (2003); Kifyah and Zain (2002); Amaral and Sousa (2009); Bhat and Raj (2009); Huq (2005); Rad (2004); and Jun et al. (2004) have also demonstrated that ineffective communication with stakeholders is a valid barrier in TQM implementation.

4. Inadequate resources to effectively deploy TQM

While identifying the constraints on resources available for effectively implementing TQM, Sebastianelli and Tamimi (2003) concluded that “inadequate resources for TQM” is a major obstacle to TQM implementation. One of such resources is inadequate human resource development and management. These authors argue that organisations that wish to pursue TQM and be successful in its implementation need to develop their employees by providing training in group discussion and communication techniques, the basic tools of quality and process improvement, and problem identification/ problem-solving skills. Similarly, it is difficult for managers to implement TQM practices without top management devoting the necessary tangible resources such as time and money (Sebastianelli and Tamimi, 2003). They further argue that an environment that does not invest in the resources necessary to make the implementation of TQM successful undoubtedly sends the message that the benefits derived from TQM are not worth the cost, representing a short-term focus. In short-term thinking, the leaders are viewing the allocation of resources to TQM as “cost” rather than “investment” in the future viability of the organisation. Management must provide adequate resources in every aspect of TQM to ensure effective and efficient use of all available resources (Zadry and Yosuf, 2006). These authors argue that most of the TQM training programmes fail due to lack of financial resources. Ghobadian and Gallear (1996) also argued that the extent of training in organisations is limited because of financial constraints.

TQM barrier indicator of “inadequate resources to effectively employ TQM” is also reported as common barrier other researchers (Salegna and Fazel, 2000; Ngai and Cheng, 1997; Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Minjoon et al., 2004).

5. Cross functional teams are not used

Sebastianelli and Tamimi (2003) found that “Cross functional teams are not employed” is a critical barrier in TQM implementation. The management literature tells us that teams are appropriate when there is a need for the coordination of activities, where work needs to be creative, or where major breakthroughs in performance are required (Reed, et al., 2000). Creation of cross-functional teams with the goals to ensure that jobs, systems, and roles in quality improvement are understood help eliminate other barriers (Rad, 2005). This author further states that these cross-functional teams continuously evaluate systems and processes to ensure that they work efficiently and effectively. Also, research has shown that in addition to providing an innovative approach to solving production problems, cross-functional teams also can help reduce product development times (Eisenhardt and Tabrizi, 1995). It has been argued that team composition, the demographic and functional diversity of team members, affects performance and outcomes (Bettenhausen, 1991). When teams are composed of members with varying organisational perspectives, there should be better information available about potential future problems (Eisenhardt and Tabrizi, 1995; Gold, 1987; Imai et al., 1985). It has also been concluded that heterogeneity in teams is related to creativity and, ultimately, to decision-making effectiveness (Jackson et al., 1991). Bantel and Jackson (1989) found that organisational innovations were positively associated with the increased functional heterogeneity of teams. The ability to generate better solutions to problems, creativity, better decision-making, and organisational innovation are all difficult (if not impossible) to codify. The literature implies that they emerge from the chemistry among team members which, if correct, represents a strong form of tacitness.

The TQM barrier indicator of “cross functional teams are not used” is a significant barrier as identified by Sebastianelli and Tamimi, (2003); Salegna and Fazel, (2000); Ngai and Cheng, (1997); Kifyah and Zain, (2002); Amaral and Sousa (2009); Bhat and Raj, (2009); Whalen and Rahim, (1994); Angell and Corbett (2009); Huq, (2005); Rad, (2004); McFadden et al., (2006); and Minjoon et al., (2004).

2.7.4.6 Information management barriers

1. Poor inter-organisational communication

There is an increasing recognition that non-technical skills such as delegation of tasks, communication, management and leadership are all important within organisations. As Al-Khalifa (2000) highlighted, regular and effective communication is necessary for all phases of the change process, as this will enable the new change to be clarified and to ensure that those who will be affected by the change are kept informed from the early stages, about progress and about their particular role in the process. Communication therefore needs to be managed coherently and honestly.

Salegna and Fazel (2000) argued that inter organisational communication plays an important role in TQM implementation. Inter organisational communication is maintained by high use of user manuals, technical documentations, media, corporate portal to disseminate the TQM ideas and an effective feedback/suggestion system (Huq, 2004). Maleyeff (2006) found that internal communication systems have numerous common structural characteristics, including the importance of information, process flows across functions, many hand-offs of information and that lack of such characteristics results in communication breakdowns. Maleyeff (2006) further emphasized that poor coordination and communication between functions; for example, lack of understanding between functions, lack of information from other departments especially when trying to solve problems for the customers or silo mentality - focus on just own bit are critical inter organisational communication barriers. Masters (1996) emphasized that open, non-threatening communication is critical for TQM implementation and required everyone in the organisation to work to implement TQM principles by communicating company vision, mission, and goals; and providing open communication about the company's new focus. Kassiech and Yourstone (1998) reported that a significant barrier to quality improvement is a lack of communication throughout the organisation, arguing that lack of communication of the need to change the organisation is likely to negatively affect the outcome and only training can be a very effective means by which to communicate the tools and strategy for change.

The TQM barrier indicator of “poor inter-organisational communication” in Bahraini industries is highly significant. This indicator was also found significant in many previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997;

Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Jun et al., 2004).

2. Individuals do not liaise with other departments

Lacking a good communication and information system negatively affects the industry operation. This implies that co-ordination and co-operation both internal and external are essential. This argument is consistent with some authors' opinion such as Oakland (1997), Ngai and Cheng (1997), Salegna and Fazel (2000) and Al-Zamani et al (2002). These authors also mentioned that ineffective internal and external communication networks in an organisation put a lot of barriers in the way of improving business.

The attributes of practices and information that act as diffusion barriers within organisations are its leakiness and stickiness - information travels more easily between organisations (information is leaky) than within organisational departments (information is sticky) (Brown and Duguid, 1991). Organisational practices are difficult to replicate across departments and individuals do not frequently liaise with other departments because diffusing information among groups with similar professions is easier than moving it across heterogeneous departments within a firm (Brown and Duguid, 1991; Davenport and Prusak, 1998). However, TQM demands individuals to liaise with other departments in order that all departments have the same direction and same objectives. For example, HR department and engineering department do have employees with different academic qualification and technical skills sets but they have identical objective of TQM implementation. Therefore liaison among different departments in terms of process flow across departments is very critical. The TQM barrier indicator of "individuals do not liaise with other departments" was found to be significant in many previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Minjoon et al., 2004).

3. Lack of disseminating quality and performance information

Disseminating quality and performance information has been identified as one of the most important managerial issues of the late 1990s (Szulanski, 1996). Successful companies

are those that consistently create new knowledge, disseminate it through the organisation, and embody it in technologies, products, and services (Earl and Scott, 1999). The proliferation of information and communication technologies has fuelled organisational interest in the possibilities of knowledge management (Chumer, et al. 2000). Indeed, there is a growing importance of being able to identify and transfer knowledge in organisations. Disseminating quality and performance information is an important aspect of organisational improvement (O'Dell and Grayson, 1998). However, organisations often fail to “know what they know” (Huber, 1991; O’Dell and Grayson, 1998). Grant (1996) states that knowledge should be disseminated throughout the organisation at the direction of top management through education and training programmes that goes with activities such as the setting up of teams and provides cues for individuals to react to the problems. Top managers believe that awareness and understanding of TQM would transfer gradually to the employees through their managers and supervisors, however these people themselves need to have more understanding of quality issues to be able to educate or train the others in order to create awareness about quality needs. The TQM barrier indicator of “lack of disseminating quality and performance information” was found significant in many previous studies (Kifyah and Zain, 2002; Amaral and Sousa 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006). This indicator was also found significant in three of the selected empirical studies (Sebastianelli and Tamimi, 2003; Bhat and Raj, 2009; Jun et al., 2004).

4. Quality performance is not measured

There are many reasons for the poor implementation of TQM initiatives but the barrier of lack of performance measurement has received very wide support from researchers (Johnson, 1992; Johnson and Kaplan, 1987; Wruck and Jensen, 1994). Performance measurement systems are the means of gathering data to support and co-ordinate the process of making decisions and taking action throughout the organisation (Schalkwy, 1998). Appropriate measurement systems are crucial to ensure the successful implementation and execution of strategies such as TQM, since measurement provides the link between strategy and action (Sinclair and Zairi, 1995). What you measure is what you get – measures ... drive what people do and shape the results they achieve (Johnson, 1992, p. 105).

Many companies that have implemented TQM strategies are using traditional performance measurement systems that rely heavily on financial and accounting data for

monitoring and controlling the processes in the company. However, financial data often does not identify complex issues that affect performance because poor financial results may indicate the existence of problems, but offer no insights into the sources of waste or the opportunities for improvements and cost savings through continuously linking and improving processes (Johnson and Kaplan, 1987). Many traditional performance systems completely ignore measuring the client satisfaction, employee motivation, and employee training. The performance measurement system must place significant emphasis on the quality strategies of the company such as total customer satisfaction and continuous improvement in quality, flexibility and responsiveness throughout the organisation. Every company needs to identify a unique set of key indicators which will measure its performance in terms of overall success as strategic quality goals (Hodgetts, 1993). And finally, employees should be given access to all the information they need to carry out their tasks as far as possible (McNerney, 1996). The TQM barrier indicator of “quality performance is not measured” is a significant barrier. This indicator was found significant in across many previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1998; Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Jun et al., 2004).

5. The best practices/products of others are not benchmarked

Benchmarking is a powerful management concept that is usually linked to TQM. It is seen within the context of TQM as an accelerator towards achieving TQM by learning from the best (Al-Khalifa, 2000). Benchmarking is more than a way of gathering data on ones' own company and comparing it with others to improve processes and hence meeting customers' expectations. Its processes provide a management tool for measuring and comparing parts of an organisation against the best which leads to excellent performance on a continuous basis.

Organisations are using quality management frameworks as a benchmark to compare their products, services, and processes against those of the toughest competitors or those of organisationally renowned world class or industry leaders (Camp, 1989). Hence, benchmarking is a key component of the TQM (Whiting, 1991).

The TQM barrier indicator of “the best practices/products of others are not benchmarked” is significant. This indicator was found to be significant by Sebastianelli and Tamimi, (2003); Salegna and Fazel, (2000); Ngai and Cheng, (1997); Kifyah and Zain,

(2002); Amaral and Sousa (2009); Bhat and Raj, (2009); Whalen and Rahim, (1994); Angell and Corbett (2009); Huq, (2005); Rad, (2004); McFadden et al., (2006); and Jun et al., 2004).

6. Lack of enough time to implement quality initiatives

It has been observed that many TQM organisations are looking for the “short cut” to success without investing the time and costs associated with full-fledged TQM (Huq, 2004). Author further argues that the root problems with this myopic view appear to be twofold: insisting on viewing TQM from a limited, industry specific perspective rather than a generic perspective; and overvaluing past experience and success – corporate and individual – so that they take precedence over desired TQM behavior. As a result, many of the key precepts and demands of TQM, and their inherent benefits, are rationalized away.

The TQM barrier indicator of “lack of enough time to implement quality initiatives” is significant. Lack of time to devote to quality initiative is found critical by Salegna and Fazel, 2000. This indicator was also found significant in many previous studies (Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006). Other empirical studies also verified the significance of this barrier (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Jun et al., 2004).

Summary

This section (2.7) has identified and examined the obstacles and inhibitors to TQM success and has developed and explained a systematically argued typology of common/significant TQM implementation barriers. The next section extends this analysis in relation to organisational culture.

2.8 Relationships between organisational culture and TQM implementation barriers

This section reviews the nature of the relationships between organisational culture and TQM implementation barriers. The section provides an overview of these relationships found in the literature. In chapter 3, more detailed evidence from the literature on these relationships is provided, during the formulation of the study hypotheses.

As discussed in chapter one, one of the proposed flaws in TQM implementation plans is that the implementers of TQM haven't considered the impact of underlying cultural

characteristics and TQM implementation barriers during the implementation cycle, and consequently any remedial strategies that are needed to overcome such barriers are not introduced. In order to better understand this fact the aim of this research was to empirically examine the relationship between the two sets of core elements of TQM implementation (culture and barriers) to better understand their influence towards the effective TQM implementation. Thus far in this chapter, a suitable framework for assessing organisational culture in this context has been identified; and the prevalent TQM implementation barriers have been identified. Therefore, this section examines what type of organisational culture is associated with what type of barriers. Knowledge of these relationships is needed in order to help implementers of TQM to develop a model for TQM implementation that extends present knowledge by integrating an understanding of prevalent barriers within the context of specific culture types. This review starts with a discussion of the proposed relationships found in literature between organisational culture and TQM implementation barriers. The characteristics of these relationships according to the works of previous researchers are discussed. This part of the review sets the foundation for the aforementioned more detailed review of the relationships underpinning the presentation of the study's hypothesis, and consequently the theoretical framework, in chapter 3.

As mentioned earlier, many studies are found in the literature in the context of culture-TQM relationships but no study is found that specifically addresses culture-barrier relationships. Therefore, the predicted relationships in this study are largely and necessarily based on inference drawn from culture-TQM relationships that have been investigated in many previous works. In this context, the researcher constructed TQM implementation barriers on the typical structure of TQM principles, (see section 2.7) therefore empirical findings on culture-TQM relationships are also applied in building culture-barrier relationships through implied logic. For example, by assuming that group culture will increase implementation of the TQM factor of employee focus, one logically justified or assumed (through formal assumptions) interpretation could be that group culture will decrease employee barriers. Such interpretations, assumptions, logic and predictions are frequently used in justifying the rationale behind the development of relationships and hence hypotheses.

Having established the distinction between TQM practices and organisational culture, the discussion now focuses on the relationship between the two. The first issue in this context is the causal direction of the relationship between TQM and organisational culture, and which

one is the antecedent of the other. A review of the literature suggests that there is a substantial disagreement on the nature of this relationship with one group arguing that TQM practices bring cultural change, and the other that it is organisational culture that affects TQM implementation and its results (Prajogo and McDermott, 2005). Some researchers have supported the first argument stating that TQM can have a dramatic impact on the culture of an organisation (Deming, 1986; Juran, 1989; Hackman and Wageman, 1995; Lawler et al., 1998; and Flood, 1993). That is, that the application of TQM practices results in cultural transformation, and involves a major cultural change in the organisation (Entrekin and Pearson, 1995). According to Schein (1997) an underlying requirement for TQM interventions to take root is a fundamental transformation of the organisation's culture. This includes the transformation of the organisation's culture, processes, and beliefs, among employees. Therefore, TQM is a complete change in an organisation's culture and the way people behave at work.

On the other hand, many researchers (Maull et al., 2001; McNabb and Sepic, 1995; Westbrook and Utley, 1995) argue that organisational culture determines the results of TQM implementation rather than the TQM implementation bringing about cultural change. Organisational culture appears to be a crucial factor in understanding the ability of any organisation to perform and compete (Peters and Waterman, 1982; Cicmil and Kekale, 1997; and Deal and Kennedy, 1982). This study is based on the latter argument, suggesting that it is the organisational culture that will determine the progress and possibly the outcome of TQM. The few studies that have attempted to examine the TQM-culture relationship, such as those by Chang and Wiebe (1996), Zeitz et al. (1997), Dellana and Hauser (1999), Prajogo and McDermott (2005) and Zu et al. (2010), all place organisational culture as the antecedent of TQM practices.

According to Alkhalifa and Aspinwall (2000), organisational culture is a set of commonly held attitudes, values, and beliefs that guide the behaviour of an organisation's members. Since these attributes differ from place to place, therefore each organisation will have a unique type of organisational culture and each type of organisational culture will have a specific set of associated TQM constructs that need to be empirically measured. In this context, Dellana and Hauser (1999) undertook a significant study on the culture-TQM relationship and concluded that a high TQM "score" is significantly related to group and developmental culture. They suggested that managers faced with implementing TQM should focus on participation, teamwork and a sense of belonging to ensure TQM success. The

empirical evidence presented by these authors suggests that attributes of developmental culture generally engender a more suitable environment for TQM success. However, there are many controversial findings in the literature on relationships between culture and TQM. For example Deshpande et al. (1993) found that no such relationship exists while Westbrook and Utley (1995) claim the existence of strong relationship. This controversy is further aggravated in many other studies but is limited to selected constructs only.

According to Zu et al., (2010) the group culture is significantly related to top management, employee focus and process management. Rational culture supports top management, customer focus, employee focus, information management, and process management. The TQM practice of employee focus is found to be supported by the group and rational cultures and TQM core practice of information management is supported by the rational culture, whereas process management is supported by the rational culture as well as the group culture. However, no significant relationship was found between developmental and hierarchical cultural constructs and any of the TQM constructs. Specifically, the hierarchical culture was found to have no significant links to TQM constructs. The lack of significance of hierarchical culture for organisational effectiveness has been noticed in prior studies as well. For example, Cameron and Freeman (1991) found that the hierarchical culture was not related to any measures of organisational effectiveness in US higher education institutions. Also, Yeung et al. (1991) and Quinn and Spreitzer (1991) found that those organisations that over emphasized the hierarchical culture were the worst performers and their employees reported a low quality of work life. This literature evidence supports the argument that compared with the other three CVF culture types; the hierarchical culture is the least influential for implementing TQM practices. However, the findings by Prajogo and McDermott (2005) suggest that hierarchical culture does have a high correlation with strategic planning, information and analysis, and process management. Such controversy over hierarchical culture in literature is found in a few other studies, such as Stock et al. (2006).

Prajogo and McDermott (2005) also found that six TQM variables correlate at fairly similar degrees to group, developmental and rational culture, and less strongly with hierarchical culture, although all correlation coefficients were significant. The variables such as leadership, customer focus, and people management showed a relatively stronger correlation with all culture types than the other TQM practices.

Despite a few controversies, there are many studies that support the proposition that organisational culture has an impact on TQM implementation and consequently the performance of an organisation. McNabb and Sepic (1995) place extreme importance on the influence of corporate culture on the effective implementation of TQM. In their conclusion of a study on the effects of culture on TQM implementation, Sousa-Poza, et al (2001) report that TQM implementation is a complex programme that has a strong relationship with the organisation's corporate culture. Many TQM implementations have failed, preventing companies from realizing its potential benefits because of the ignorance of the cultural barriers (Becker, 1993; Dale and Cooper, 1992; Oakland, 1995; Thomas, 1995; van Donk and Sanders, 1993; Wilkinson et al., 1998).

Culture influences the understanding of TQM in a country and it also affects the operationalisation of TQM in a country (Kumar, 2006; Tan et al., 2003). Corporate culture has been frequently blamed for TQM-implementation failures (Utley et al., 1997; Bowen and Lawler, 1992). TQM is directly influenced by organisational culture (Zeitz 1997; Jabnoun 2001; Hyland et al. 2000). Collins (1994) considers TQM to be a culture-based approach to quality. It is generally believed that culture change or at least culture awareness is a necessary prerequisite for “excellence” and “quality” (Lewis, 1998). Some even argue that organisations achieve acceptable business results just by instilling an appropriate quality culture without formally adopting TQM programmes (Smith, et al., 2002; Kanji and Yui, 1997).

A number of studies have highlighted that cultural variables drive TQM success (Katz et al., 1998; Nasierowski and Coleman, 1997; Tata and Prasad, 1998; Dean and Bowen, 1994; Hackman and Wageman, 1995; Powell, 1995; Sahney and Warden, 1991; and Metri, 2005). TQM programmes are more likely to succeed if the prevailing organisational culture is compatible with the values and basic assumptions proposed by the TQM discipline. Organisational culture is a major variance-causing factor in TQM implementation programmes that inhibits or allows the success of such a programme and the success of TQM as an organisational change will depend a lot on the organisational culture (Rad, 2006). Effective implementation of TQM requires a significant change in values, attitudes and culture of the organisation and thus many organisations attempt to shape their cultures as a means of improving organisational fitness (Deal and Kennedy, 1999).

For implementation of TQM, an organisation must have a culture that is capable of fully supporting it (Kerlavaj et al., 2008). Dellana and Hauser (1999) have termed it as TQM

culture. They state that embracing a TQM philosophy requires a shift from current culture to TQM culture. Many reports claim that TQM culture is the main ingredient in implementing a TQM programme (Saraph and Sebastian, 1993). A further review of TQM literature shows that TQM culture can be considered to be one which uses teams, promotes pride in workmanship, drives out fear, allows participative management, promotes leadership in place of supervision and promotes long term orientation among the members of the organisation (Al-Khalifa and Aspinwall, 2000; Saha and Hardie, 2005).

2.9 Chapter summary

In the context of this research thesis, the literature review is a critical synthesis of previous research and the evaluation of the literature that leads logically to the research questions discussed and addressed. It provides a comprehensive synthesis of available literature with a critical evaluation of previous works using rigorous and consistent method of review. Previous research on TQM implementation reflects that one of the major sources of barriers is unfavourable organisational culture (Prajogo and McDermott, 2005). Therefore, author has carefully examined the TQM literature, and on the bases of the findings it is reasonable to conclude that TQM can be successfully achieved with a favourable culture.

It began with an overview of TQM and its origins, various definitions of TQM, core constructs and principles underlying TQM and quality award frameworks based on TQM. Additionally, the scope and the bespoke nature of TQM and core elements of TQM implementation were reviewed. After a description of organisational culture, various theoretical frameworks to identify type of existing organisational culture were examined. This included Denison's research, which was adopted as the framework for this thesis. The end result of the literature review is that it has been demonstrated that past research suggests that improvements in key traits of organisational culture can improve TQM implementation by eliminating TQM implementation barriers. However, there is a substantial lack of research specifically on impact of organisational culture on TQM implementation barriers. In this context, author has reviewed the existing literature on how previous research suggests an association between organisational culture and TQM implementation. This investigation shows a positive and strong relationship between culture and TQM implementation and hence an inferentially negative relationship of culture with TQM implementation barriers. To this end, this literature review predicts how each characteristic of culture is associated with each

barrier indicator by examining the strength and direction of relationship between both variables in order to determine which type of culture supports TQM implementation and which one inhibits the implementation process. As mentioned previously, this is done in chapter 3, as an integrated part of developing the study hypotheses. The outcome of this review is development of a set of hypothesized relationships between the constructs of culture and TQM implementation barriers used in subsequent empirical testing.

In this research, existing organisational culture is determined using CVF (competing values framework). TQM implementation barriers were derived from an extensive review of the literature. The relationships between organisational culture types and TQM implementation barriers are predicted based on evidence in order to determine type of organisational culture having a specific set of associated TQM implementation barriers. Establishing this relationship will enable the researcher to determine the type of organisational culture that would support implementation of TQM. For effective TQM implementation, the identified TQM implementation barriers need to be overcome by deploying appropriate strategies to obtain favourable culture.

From the discussion in this chapter, one can infer that organisational culture and TQM implementation barriers are two very important factors that influence the success of TQM implementation. This is particularly true in the case of Gulf countries such as Bahrain as they differ much from the industrialised countries in terms of organisational culture. The skills and attitudes of employees in a professional setting mark this difference. Therefore, organisations in these countries should judge what areas of their organisational culture to emphasize depending on what aspects of TQM they wish to improve. This might be done by identifying existing organisational culture so that favourable cultural characteristics are adopted and strengthened, and unfavourable ones are addressed, consequently reducing barriers in the TQM implementation. It is reasonable to propose that the removal or reduction of negative impacts of barriers would lead to facilitate the swift implementation process towards successful adoption of the TQM approach. As mentioned earlier, many studies are found in the literature in the context of culture-TQM relationships but no study is found that specifically addresses culture-barrier relationships.

Chapter Three: Conceptual Framework

3.1 Introduction

The literature review indicated that previous studies on TQM implementation fundamentally suggest two findings. Firstly, that TQM is often not implemented properly and secondly, that when properly implemented, TQM undeniably improves performance (Dellana and Hauser 1999). This study has found evidence in the literature suggesting that adopting and developing specific characteristics of organisational culture may facilitate enhancing TQM implementation, by reducing the barriers associated with TQM implementation (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009).

In this context, in this chapter the author has developed a framework that describes the proposed relationships between culture and TQM barrier variables. This framework incorporates four constructs of organisational culture as conceptualised by Denison and Spreitzer, (1991) and six constructs of TQM implementation barriers derived from the literature (section 2.7) Following the findings of Prajogo and McDermott (2005), this study positions organisational culture as an antecedent of TQM implementation barriers influencing TQM implementation in an organisation, and assumes TQM implementation barriers are largely the consequences of the type of dominant culture.

This chapter first revisits key findings and concepts from the literature review that are concerned with identifying the type of existing organisational culture and the TQM implementation barriers in an organisation. Evidence from the literature on the proposed relationships between types of organisational culture and TQM implementation barriers is evaluated and presented. Based on this evidence, the conceptual framework is proposed and the hypotheses are developed.

3.2 Key concepts from the literature review

TQM is a proven and useful philosophy for management if properly used and implemented (Oakland, 2004). The widespread success of TQM in Japan, and in many other organisations around the world is evidence of this statement. According to Bowen and Lawler (1992), Japan has used TQM principles successfully primarily because of a supportive culture that helped to remove TQM implementation barriers. It is reasonable to argue that all

organisations planning to successfully adopt a TQM approach need to consider the impact of underlying cultural factors that either create or reduce TQM implementation barriers during the implementation process.

In the context of TQM implementation, several researchers have recognized (a) the critical role of organisational culture (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2010) and (b) the influence of TQM implementation barriers (Amaral and Sousa 2009; Bhat and Raj, 2009; Angell and Corbett 2009; McFadden et al., 2006). Nevertheless, to date, each of these two sets of variables have been examined in the literature largely separately, as was noted in section 2.8. There is a scarcity of existing research that investigates the impact of underlying cultural characteristics on TQM implementation barriers. Thus, there is a need to examine these relationships to gain a better understanding of the factors affecting TQM implementation. This research has attempted to address this critical gap, and can thus help in developing more informed TQM implementation frameworks based on empirical evidence, concept and theory.

The extant TQM literature suggests that TQM implementation barriers inhibit the effective implementation of TQM (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Amar and Zain, 2002). In order to address these barriers, many strategies have been suggested in the literature (Rad, 2005; Huq, 2005; Oakland, 1995; Kotey and Slade, 2005), but the role of existing organisational culture in addressing these barriers has not so far been investigated analytically. As discussed in the literature review (section 2.3), TQM implementation is broadly based on three foundations:

1. The TQM philosophy that comprises a set of TQM principles;
2. The organisational culture - the antecedent that influences TQM implementation; and
3. TQM implementation barriers – that hamper effective implementation of TQM

A number of studies have investigated each of these foundations and associated variables individually but none of the studies have related these sets with each other. The underlying assumption in the proposed conceptual framework presented in this chapter is that TQM implementation is influenced by the existing characteristics of organisational culture that is to say, that the culture factors shape the TQM implementation approach and not vice versa.

The main motivation for this research was that despite differences in cultural background and implementation barriers, the literature supports the proposition that organisations can enhance the likelihood of an effective implementation of TQM by understanding the impact of organisational culture on TQM implementation barriers. In order to accomplish this task, organisations need to know which type of culture can help to remove which barriers. Therefore, the need to identify variables of organisational culture and TQM implementation barriers and to establish the relationships between these two variables through empirical evidence, so that they can be built into implementers models for TQM implementation, forms the specific rationale for this study.

3.2.1 Identifying type of existing organisational culture

Identifying and understanding the organisational culture is necessary before TQM implementation as there is a clear indication of a positive relationship in the literature stating that an appropriate culture is vital to the success of TQM. In order to empirically examine the relationship between organisational culture and TQM implementation barriers, it was necessary to select a suitable model of organisational culture. Hence, in this study, the author used the competing values framework (CVF) proposed and tested by Denison and Spreitzer (1991), to identify the type of organisational culture present in Bahraini industries. This model was deemed to have the capacity to provide an understanding of the culture in the organisations under study. Following the works of Chang and Wiebe (1996), Dellana and Hauser (1999), Prajogo and McDermott (2005); and Alkhalifa and Aspinwal (2000), the competing values model developed by Denison and Spreitzer (1991) was selected as the organisational culture model to operationalise the measurement of four types of organisational culture, namely group culture, developmental culture, hierarchical culture, and rational culture.

The CVF has proven to be a useful framework for assessing and profiling the dominant cultures of organisations because it helps identify the underlying cultural characteristics that exist in organisations (Cameron, 2004). Most studies that adopted the CVF have used a survey questionnaire to empirically profile the types of organisational culture and operationalise its measurement. The author has used the research methodologies of Dellana and Hauser (1999) and Prajogo and McDermott (2005) for guidance. In the survey questionnaires used in these studies, each respondent selects the level of his/her agreement/disagreement on a set of 24 statements for measuring the 4 types of culture. Each

type of culture is measured on six dimensions. The six dimensions are defined as organisational character; leadership demonstration; management style; binding force; organisational emphasis; and success criteria. The score on each dimension is aggregated, in turn, for each of the four types of culture, resulting in a single overall measure for each of the four organisational culture constructs.

3.2.2 Identifying existing TQM implementation barriers

Many organisations earnestly commit to quality by implementing the TQM practices but usually overlook potential implementation barriers of TQM (Oakland, 2004). Therefore, it is important for all organisations to understand and avoid these barriers as far as is possible both before and during TQM implementation (Masters, 1996).

A comprehensive review of the literature revealed many TQM implementation barriers identified in various studies (section 2.7). Despite this large body of literature, there appeared to be little consensus amongst the researchers on what comprised a definitive set of the prevalent TQM implementation barrier constructs. In order to examine the relationship between organisational culture and TQM implementation barriers, it was therefore necessary first to develop a set of TQM implementation barrier constructs and associated measures. These TQM implementation barriers were investigated through a systematic analysis of secondary data in order to derive an understanding of the most significant barriers, as discussed in detail in chapter two (section 2.7). In this regard, empirical studies were explored to identify - commonly cited TQM implementation barriers. This process resulted in identifying 32 significant barriers. As will be discussed later in chapter 4, five more barriers were added specific to Bahraini industries, as suggested by practitioners and academia during a phase of refining the survey instrument through structured interviews, making a total of 37 barriers. The studies used in identifying the significant TQM implementation barriers were discussed in section 2.7. The barriers identified in these studies were then grouped into the following barrier constructs (section 2.7.3 and table 3.1):

-
- 1 Top management barriers (comprising 9 barriers items)
 - 2 Employees barriers (comprising 8 barriers items)
 - 3 Customer barriers (comprising 4 barrier items)
 - 4 Process management barriers (comprising 6 barriers items)
-

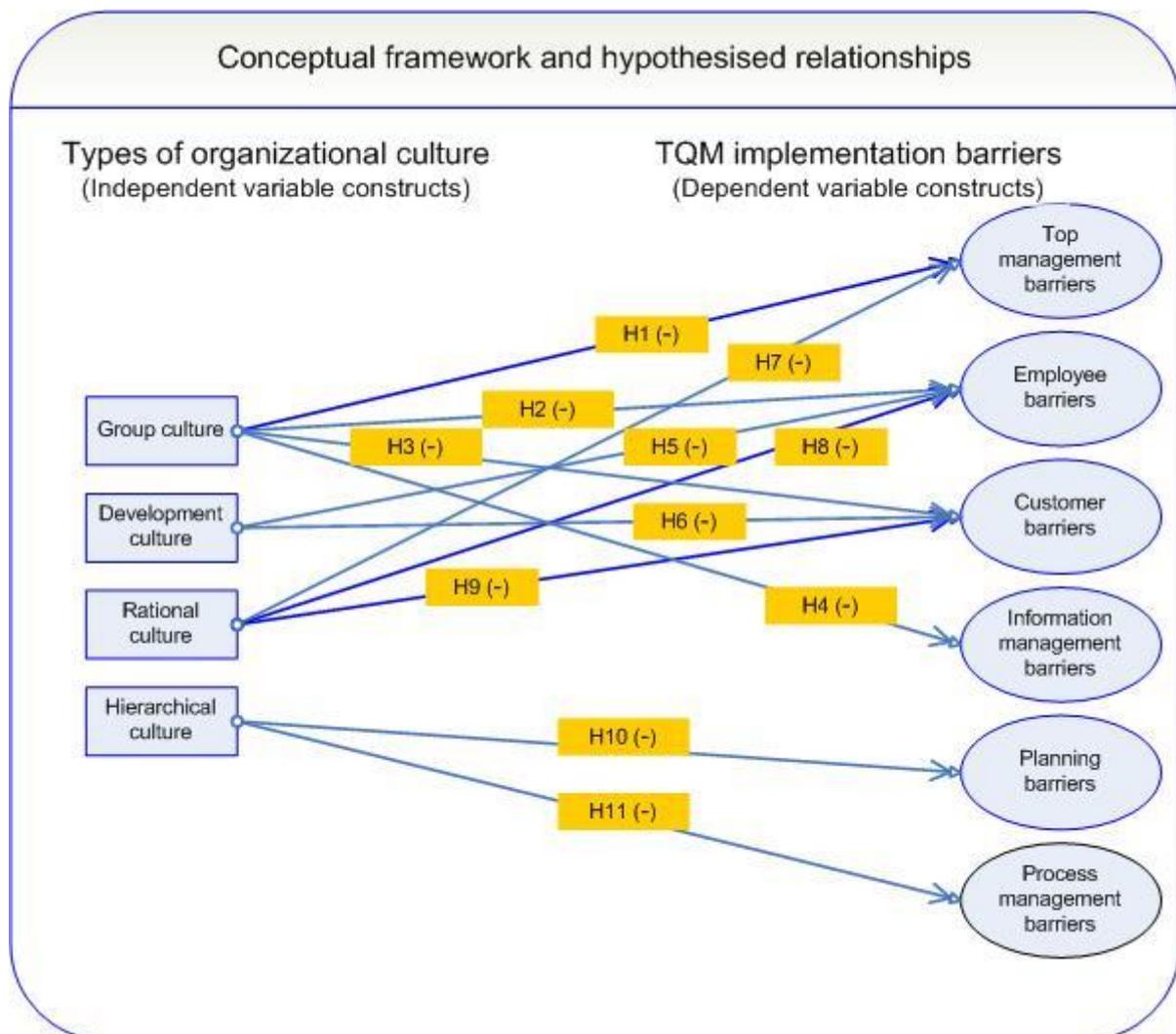
-
- 5 Planning barriers (comprising 4 barriers items)
 - 6 Information management barriers (comprising 6 barrier items)
-

Table 3.1 Constructs of barriers

3.3 Proposed conceptual framework and hypotheses development

Based on the review of TQM and the TQM implementation literature, the following conceptual framework was proposed. As shown in Figure 3.1, a set of four antecedents (organisational culture constructs) are hypothesized to be related to a set of six consequences (TQM implementation barriers constructs).

Figure 3.1 Conceptual framework and hypothesised relationships



As stated earlier, each of the 4 constructs of organisational culture comprise 6 measurement dimensions (thus, 24 indicators in total) and each TQM implementation barrier construct has multiple measurement indicators (37 indicators in total). In total, eleven relationships (regression paths) were identified based on examination of the literature. According to the theory underpinning the conceptual framework, the hypothesised regression paths of all the hypotheses are negative. This means that when the score on any type of organisational culture goes up (i.e. stronger presence of that culture) then the score on the barriers goes down (i.e. the presence of the barrier reduces), thus showing a negative (negatively signed) relationship.

3.4 Developing research hypotheses

A hypothesis is a suggested explanation of a phenomenon, or a reasonable explanation of a correlation between phenomena (Hair et al., 2010). It is a statement that a researcher can test/prove. This statement can be adjusted, refined or changed based on the research findings. In this research, the hypothesis is a concept that has yet to be verified, but if found true would explain certain facts associated with the implementation of TQM. Table 3.2 lists the eleven hypotheses identified in the conceptual framework that were derived from the TQM literature presented in chapter 2.

Table 3.2 list of hypotheses

H#	Hypothesis description
H1	Group culture decreases top management barriers
H2	Group culture decreases employee barriers
H3	Group culture decreases customer barriers
H4	Group culture decreases information barriers
H5	Developmental culture decreases employee barriers
H6	Developmental culture decreases customer barriers
H7	Rational culture decreases top management barriers
H8	Rational culture decreases employee barriers
H9	Rational culture decreases customer barriers
H10	Hierarchical culture decreases planning barriers
H11	Hierarchical culture decreases process barriers

This list constitutes the set of hypotheses that describes the relationship between TQM implementation barriers and type of organisational culture. As is evident from figure 3.1 and table 3.2 the literature review indicated that group culture was associated with the reduction/removal of four barrier constructs, that developmental culture was associated with

the reduction/removal of two barrier constructs, that rational culture was associated with the reduction/removal of three barrier constructs, and that hierarchical culture was associated with the reduction/removal of two barriers constructs.

3.5 Examining relationships between organisational culture and TQM implementation barriers and formulating hypotheses

Organisational culture, as previously defined in section 2.6.1, is a set of commonly held attitudes, values, and beliefs that guide the behaviour of an organisation's members. Each organisation will have a unique type of organisational culture and each type of organisational culture will have a specific set of associated TQM implementation barriers. Denison and Spreitzer (1991) state that the four cultures in their typology can be viewed as ideal types of cultures which means that organisations can be characterized by some combination of these four cultures, although some cultures can be more dominant than the others. In this context, in the hypothesis articulation sections that follow (3.5.1 to 3.5.4) the author first briefly recaps on the salient characteristics of each type of culture in the CVF and then examines how these characteristics are believed to decrease the presence of the various TQM implementation barrier constructs identified in table 3.1.

As mentioned earlier, many studies are found in the literature in the context of culture-TQM relationships but there are no studies that were found that explicitly discuss or measure culture-TQM barrier relationships. Therefore, the formulation of the hypotheses in this study had to be based on logical inferences drawn from the culture-TQM relationships that have been investigated in many previous works. For example, taking the literature finding that group culture helps to facilitate the implementation of the TQM element of employee focus, it is logical therefore to propose that the presence of group culture will [also] help to decrease employee barriers. Such interpretations, logic and predictions are frequently used in constructing and justifying the rationale behind the development of hypotheses in this study. This concept is precisely stated by Wacker (2004) as follows:

According to Wacker (2004), there are three theoretical justifications for formulation of the hypotheses (conceptual relationships): interpretive, logical, and predictive. Interpretive conceptual relationships are those relationships that can be directly interpreted from the formal conceptual definition. For example, TQM factor of workforce development demands delivering education and training to employees using diverse modern methods. However, a large number of unskilled employees in an organisation may indicate lack of employee training, which can further be interpreted as lack of resources for training – a barrier to TQM

implementation. Similarly, logical conceptual relationships are deduced from the interpretive relationships and the formal conceptual definition, therefore logically deduced relationships may also be assumed to be true (Wacker, 2004). For example, a visible commitment and support to quality by senior managers is required for TQM implementation. Since lack of commitment and support to quality by senior managers is related to the implementation concept, it is a logical relationship (an empirically testable relationship). According to Wacker (2004), logical relationships are those relationships that are analytically tied to other concepts and must be analytically justified or assumed (through formal assumptions). The predictive relationships are similar to the logical relationships but give predictions if the theory conditions are fulfilled. However, predictive relationships differ from the logical properties since they typically build on the logical properties of the theory to predict specific outcomes (Wacker, 2004).

The interpretive, logical, and predictive theoretical justification for formulation of the hypotheses (conceptual relationships) is deductive in nature. It allows deriving TQM barriers from TQM implementation status. In other words, deduction is the process of deriving the consequences of what is assumed. Given the truth of the assumptions, a valid deduction guarantees the truth of the conclusion. For example, if an organisation continuously seeks to build active relationships with customers, but that customer satisfaction is very low, it can be deduced that customer barriers still exist in that organisation.

In the next four sections (3.5.1 to 3.5.4), each type of culture is taken in turn and each of the associated hypotheses is presented. In each section, the author first briefly describes the salient characteristics of the culture type, and then examines, using the literature as described above, how these characteristics are related to the presence of the TQM implementation barriers.

3.5.1 Group culture and TQM barriers – hypotheses 1, 2, 3 and 4

The main emphasis of group culture is on flexibility and internal integration. According to Denison and Spreitzer (1991), group culture values belonging, trust, and participation, and its strategies are oriented toward developing human relations through cohesiveness, openness, commitment, and attachment. These characteristics of group culture can help to decrease communication barriers between top management and employees, and encourage a participative structure that avoids many layers of management.

In the group culture, the leaders tend to be supportive and participative, encourage empowerment and interaction through teamwork, and have concern for employees' ideas. This supportive and participative leadership style provides the organisation with top management support necessary for its quality improvement (Cameron and Quinn, 1999). As such, these characteristics can decrease the management barrier of lack of commitment and support to quality. By creating a climate of open communication about the implementation progress, group culture will enable learning and further change, and can help to appropriately direct the needed investment in training to help employees increase their knowledge, skills and ability (Beer, 2003). Therefore group culture will also help to remove the common top management barrier of inadequate resources for employee training.

Group culture is characterized by teamwork, consensus and participation. It promotes leadership in place of supervision, and promotes long term orientation among the members of the organisation (AlKhalifa and Aspinwall, 2000; Saha and Hardy, 2005). This orientation can create attachment, a sense of commitment, and involvement of each employee in the problems faced by the organisation. Leaders act as mentors, coaches, and, perhaps, even as parent figures (Denison, and Spreitzer, 1991). These characteristics of group culture will thus help to decrease the prevalence of a management style of leaders that slows down learning culture. Participation, cohesiveness and openness help middle managers to provide an effective link between the top managers and junior operatives and communicate quality awareness and support improvement.

Group culture, helps remove TQM implementation barriers through personal participation of top management in TQM implementation. These arguments from the literature support the presentation of the following hypothesis:-

H1 – Group culture decreases top management barriers.

In a successful quality management implementation organisation, employees are valued and empowered. Therefore, effective organisations empower and engage their people, build their organisation around teams, and develop human capability at all levels (Cameron and Quinn, 1999). By promoting group culture, such organisations give empowerment to individuals to have the authority, initiative, and ability to manage their own work that creates a sense of ownership and responsibility toward the organisation (Denison et al., 2005). Logically therefore, employees empowerment can be achieved through prevalence of group

culture, that will eventually decrease the TQM barrier of employees are not being empowered to implement quality improvement effort.

Due to open and participative nature of group culture, organisational members feel that they have at least some input into decisions that will affect their work and feel that their work is directly connected to the goals of the organisation. This high involvement of employees allows organisations to rely on informal, voluntary and implicit control systems (Denison et al., 2005). The group culture's emphasis on cohesion, morale and the long-term benefit of human resource development are consistent with establishing the organisational environment supporting employee learning, collaboration, and involvement for the effective implementation of quality initiatives (Cameron and Quinn, 1999; Detert et al., 2000; Naor et al., 2008; Ouchi, 1981). The main emphasis of group culture is on flexibility and internal integration and it would create attachment, a sense of commitment, faith, and involvement of each employee in the general and strategic issues of organisation (Denison and Spreitzer, 1991). Accordingly, group culture can help to motivate employees to work at their full capacity by decreasing employee barriers of lack of employee involvement in improvement projects.

Organisations with group culture continually invest in the development of employee's skills in order to stay competitive and meet on-going business needs. Denison and Spreitzer, (1991) argue that a major concern of firms emphasizing the group culture is the development of human potential, teamwork and member commitment as a means towards better decisions and overall output. The organisation would be investing in training to help employees increase their knowledge, skills and ability and help them in their career development. These characteristics of group culture will help decrease TQM implementation barriers of employees not trained in quality improvement skills and lack of training in group discussion and communication techniques.

The organisations having dominant group culture focus on developing human relations through participation, cohesiveness and openness. Top management encourages employees to bring innovative ideas for organisational development and participate in the decision making process (Denison and Spreitzer, 1991). This strategy brings about a sense of belonging and employees feel they are doing something for themselves. Their devotion to work is high and they are ready to take on extensive obligations, as one would do for his/her family (Cameron and Quinn, 1999). These characteristics of group culture will induce in employees the commitment to organisational goals. In this way, group culture helps to

remove TQM implementation barriers such as lack of workforce participation, lack of workforce empowerment, and lack of involvement and communication.

Organisations with group culture stress the need for training of employees, employee involvement in decision-making, communicating with them consistently in order to create awareness of organisational goals for quality improvement and rewarding employees for quality performance (Kaynak, 2003). Therefore the group culture would help decrease employee barriers of lack of recognition for achievements in quality improvement, lack of appropriate performance evaluation and reward system, and consequently, the lack of employee satisfaction across the organisation.

TQM is a philosophy of change and resistance to change by employees and even management is not unexpected. Inadequate communications of the intended changes in the organisation may result in resistance expressed through resentment about management's approach, doubts and uncertainty, and fear that employees may lose their jobs (Huq, 2004). One of the characteristics of group culture of establishing the communications to create awareness of organisational goals for quality improvement (Flynn et al., 1994) will help to decrease employee resistance to change.

Effective implementation of TQM in an organisation demands building teamwork, providing employees with appropriate training, involving them in decision-making and rewarding them for quality performance (Dale, 2007). The literature supports the propositions that group culture helps to address each of these elements. Therefore:

H2 – Group culture decreases employee barriers

One of the founders of the TQM concept Feigenbaum (1957) stated TQM is an effective system when it ensures full customer satisfaction. Many TQM researchers have concluded that a core objective of TQM is to delight the customers. According to Kanji and Asher (1996), the first one of eight core concepts of TQM is 'customer satisfaction'. Hackman and Wageman (1995) argued that "explicit identification and measurement of customer wants and needs" is the first and foremost of six TQM interventions. Flynn et al. (1994) defined the main TQM objective as "meeting or exceeding customer expectations". Deming (1986) similarly stressed that quality should be aimed at the needs of the consumer, present and future. Many authors have considered the lack of attention to customer requirements and feedback system as one of the very common barriers facing the

organisations, and hence in the way of adopting quality management system techniques (Bhat and Raj, 2009; Angell and Corbett 2009; Sebastianelli and Tamimi, 2003; Salegna and Fazel; and Jun et al., 2004).

These customer barriers can be effectively addressed by the presence of group culture because the management style in the group culture is characterized by teamwork, consensus, participation, open communication and empowering employees to deal with customers (Yeung et al., 1991; Denison and Spreitzer, 1991; Prajogo and McDermott, 2005; Zu et al., 2009). These characteristics of group culture facilitate identifying customer concerns through open communication in order to seek feedback and measure customer satisfaction level (Quinn and Kimberly, 1984; Quinn, 1988; Cameron and Freeman, 1991). As the group culture stresses commitment, cooperation and open communication, therefore it results in building strong relationships with customers and suppliers (Denison and Spreitzer, 1991). Consequently it can help to decrease TQM implementation barriers such as lack of effective system to measure customer satisfaction, lack of feedback system from customers, lack of assessment of customers' needs and expectations and lack of close contact with key customers.

Naor et al. (2008) suggests that an emphasis on group culture may enhance the involvement of customers and suppliers in organisational activities. Customers (and suppliers) are outside the boundary of the organisation, but they are the key parties of the overall supply chain of the products and services delivered to the end users (Zu et al., 2009).

One of the characteristics of group culture is that customers are best thought of as partners (Cameron and Quinn, 1999). Authors propose that measuring customer preferences before and after product/service delivery; creating partnerships with customers; and enhancing competitiveness by involving customers in planning and design are all supported by group culture. According to Alkhalifa and Aspinwall (2000), group culture tends to be flexible and customer oriented. Jabnoun and Sedrani (2005) concluded that customer oriented TQM practices with the infusion and reinforcement of employ oriented culture (i.e. group culture) will significantly increase the performance of a company. Therefore, the group culture will decrease customer barriers associated with these traits.

In group culture, success is defined in terms of sensitivity to customers and concern for people (Denison and Spreitzer, 1991). Some of the activities encouraged by group culture, such as empowerment, team building, employee involvement, human resource development,

and open communication are indirectly related with customer satisfaction because the products and services that delight customers are delivered by employees. Similarly, a participative management style empowers employees to take any necessary action to ensure customer satisfaction (Rad, 2004).

Hackman and Wageman (1995) suggest that in quality management, it is essential to maintain close links with customers and suppliers. The internal focus of continuous improvement, characterized in a group culture belongs to improvement in internal processes and environment that directly affect external relationship. For organisations emphasizing the group culture, they would apply their belief in trust, commitment and open communication to their relationship with their customers and suppliers (Zu et al., 2010). An organisation should have a good understanding of what the customer wants through keeping customer contact and obtaining customer feedback. It should be recognized that customers are not only those to whom organisations sell products/services but are also their internal staff. In this context, Naor et al., (2008) emphasizes the ability of group culture to enhance the involvement of customers in organisational activities. Consequently group culture can help to decrease TQM implementation barriers such as lack of effective system to measure customer satisfaction, lack of feedback system from customers, lack of assessment of customers' needs and expectations and lack of close contact with key customers. It is then proposed that:

H3 – Group culture decreases customer barriers.

Identifying quality problems and solving them comprehensively through exchange of ideas is the key to effective TQM implementation. Group culture fosters the exchange of ideas through its focus on participation and communication. Employees will be more willing to make efforts in identifying and solving problems, and to take more responsibility for improvement projects when they know that their ideas and thoughts will be valued by management (Naor, 2008). This process can generate useful data on quality and performance that can be used for improvement.

Regular and effective communication is necessary for all phases of change processes and communication therefore needs to be managed coherently and honestly. Gunasekaran (1999) found that a major enabler of TQM implementation was communication between managers/supervisors and staff, and that poor communication between departments was a real barrier to implementing TQM. Hence, ineffective internal and external communication

networks and lack of information exchange in an organisation put a lot of barriers in the way of improving business.

The intent of information exchange in group culture is to foster an environment where individuals feel comfortable in discussing TQM related problems, and then information and knowledge is shared freely (Stock et al.2006). This can therefore help to decrease the barriers of poor inter-organisational communication and lack of disseminating quality and performance information. According to Kaynak (2003), inter-organisational communication can further enhance cooperation between departments through teamwork to exchange ideas; enhance joint efforts of management and employees in process management activities; identification and solving quality problem; effective measurement of process and product performance; and project coordination. However, without a systematic method for discovering and identifying TQM related problems, TQM implementation is generally doomed to failure (Naor et al., (2008). This systematic method may include reporting TQM problems, open discussion about TQM problems and statistical analysis of TQM implementation data. Group culture supports the development of these characteristics through participation, involvement, empowerment and communication. Therefore, group culture may help to decrease the information management barrier of lack of information on quality and performance.

Open communication fostered by the group culture is also expected to facilitate the liaison with people outside of their own departments (Klein et al., 1995). This will help decrease the information management barrier of lack of disseminating quality and performance information. According to Hackman and Wageman (1995), openness in the group culture is consistent with the principle of management by fact in quality management through systematic quality data collection, reporting, analysis and measurement in a problem-solving cycle. Accordingly, this will help to remove information management barrier of lack of measuring quality. The preceding arguments support the presentation of the following hypothesis:

H4 – Group culture decreases information management barriers.

3.5.2 Developmental culture and TQM barriers - hypotheses 5 and 6

The organisation character in the developmental culture type is very dynamic and entrepreneurial - people take risks by trying new things that promote innovation (Denison and Spreitzer, 1991). Organisations with a developmental culture emphasize acquiring new resources and creating new challenges by trying new things and prospecting for opportunities that can result in the identification of unique or new products/services, and the organisation becoming a product leader and innovator (Cameron and Quinn, 1999). These authors further argue that organisations with developmental culture support adaptation and innovation activities that may lead to product and service advantage and profitability. Developmental culture allows employees to bring innovative ideas for organisational development and to participate in decision making processes. Detert et al. (2000) state that in such innovative organisations, there is a push for constant, continuous improvement and doing things better, thus they encourage the behaviour of constantly studying the processes for improvement. As these processes and products belong to an employee domain, developmental culture therefore is genuinely associated with employee barriers, or more precisely with helping to remove them.

In order to be a product leader and innovator, an organisation needs more involvement and teamwork, which requires more responsibility and a greater level of employee skill and knowledge. This can be achieved through proper, formal and systematic training and education. Therefore, lack of employee training in quality improvement skills is a major TQM barrier. Developmental culture, through its focus on innovation, gives importance to employee training. Hence, the organisations with developmental culture insist on the need for comprehensive training programmes because the lack of sufficient quality training and education has a negative effect on the quality of business and as such is the main obstacle any organisation faces in the way of getting improvement. Developmental organisations invest in training programme to take the lead in market share and hence decrease (or remove) the employee barrier of lack of training.

Any training programme needs resources and developmental culture tends to focus on providing necessary resources to execute innovative projects. Yeung et al. (1991) assert that focus on innovation and adaptation increases the allocation of organisational resources for employee training so as to improve their knowledge and skills to meet the changing requirements of customers. Therefore, empowered, involved and well-trained employees,

who in turn are more satisfied and less resistant to change, help remove employee barriers in a developmental culture.

Denison and Spreitzer (1991) argue that the developmental culture is always looking for new resources and external support for growth. Therefore, developmental culture will focus on adoption of new tools, technology and other improvement approaches. But, such adoption is only possible through training, empowerment, participation and involvement. Therefore developmental culture will also help to remove barriers such as lack of skills, participation, involvement and empowerment of employees. It is therefore proposed that:

H5 – Developmental culture decreases employee barriers.

While describing the developmental culture, Cameron and Quinn (1999) state that flexibility and change according to those in the external environment (figure 2.2) is a main characteristic of developmental culture, which has a focus on innovation, resource acquisition, and the development of new markets, and fosters the activities that can help to delight customers, anticipate customers' needs, and implement creative solutions to problems and produce new customer preferences. Customers demand quality products/services and companies who can meet this demand equitably are likely to obtain larger market shares because high quality of products/services can result in loyalty and satisfaction of customers and eventually increase in sales. The increased contact with customers provides better information about the market or greater brand loyalty, which in turn leads to a rise in sales and margins (Tena, 2003). A focus on customers' needs and expectations is one of the fundamental principles of TQM and there should be a mechanism of information exchange to obtain the necessary information for identifying customer requirements and feedback on the quality of products/services (Dellana and Hauser, 1999). Developmental culture emphasizes adapting to changing customer demands over time and thus it helps to remove the TQM barrier of lack of feedback system from customers/stakeholders.

In a developmental culture, an external focus of innovation on customer desires is highly evident (Choi and Behling, 1997). Organisations with a developmental orientation tend to lead their companies to long-term quality programme success because they treat future customers just as important as their current customers, and guide the company in the direction of future customers through product innovation (Dellana and Hauser, 1999). Organisations with developmental culture also direct internal efforts toward their customers

through an increasingly external focus (Chang and Wiebe, 1996). As stated earlier, customers demand quality products/services and organisations who can meet this demand equitably would obtain larger market shares, thus creating a drive for companies to invest in quality improvement to achieve market advantage (Zu et al., 2009). This is a major characteristic of developmental culture, which is heavily focusing on customer satisfaction and development of new markets and thus decreasing the TQM implementation barriers of lack of effective system to measure customer satisfaction, lack of assessment of customers' needs and expectations, lack of an effective customer feedback system and lack of close contact with key customers.

In organisations emphasizing the developmental culture, the belief in external adaptation and development of flexibility and diversity stimulates the members' interests in pursuing and understanding customer needs and market requirements and brings them into frequent and close contact with their customers (Denison and Spreitzer, 1991). Such organisations tend to build a strong relationship with customers because customer focus is well developed throughout the organisation, supported by effective customer satisfaction tracking (Al-khalifa and Aspinwall, 2001). The developmental culture type, which emphasizes a more external focus characterized by change and risk-taking, could decrease customer barriers such as lack of effective system to measure customer satisfaction, lack of assessment of customers' needs and expectations, and lack effective customer feedback system and close contact with key customers, consequently improving customer focus of organisation. These arguments support the presence of the following hypothesis:

H6 – Developmental culture decreases customer barriers.

3.5.3 Rational culture and TQM barriers - hypotheses 7, 8 and 9

According to Denison and Spreitzer (1991), organisations with a rational culture are very result oriented places - a major concern is with getting the job done through competitive and achievement oriented people. The leadership can be aggressive and result-oriented and its management style is characterized by, high demands, and achievement. There is an emphasis on achievement and goal accomplishment by hitting stretch targets and winning in the marketplace (Denison and Spreitzer, 1991).

Many researchers (Powell, 1995; Black and Porter, 1996; Ahire et al., 1996; Flynn et al., 1994; and Samson and Terziovski, 1999) broadly agree that the leadership and commitment of top management is a key driver of TQM. Rational culture is goal-oriented and demands a challenge focused leadership to achieve those goals. Leaders are expected to build up comprehensible objectives and strategies to realize procedures and traditions that would lead to high levels of productivity and profitability. Leaders are required to provide guidance and control to realize the corporate vision and goals that demand a high level of commitment throughout the organisation. Therefore, it is reasonable to argue that rational culture would help remove the barrier of lack of commitment by top management to achieve quality goals by taking responsibility for quality (Denison and Spreitzer, 1991).

The goals and objectives of quality improvement can only be set and achieved when managers recognize the importance of quality improvement for the success of their organisation and this understanding would develop through quality awareness. The focus of rational culture to achieve competitiveness through quality improvement can therefore help to decrease the lack of quality awareness barrier within the organisation.

Similarly, the barrier indicator of the lack of allocation of adequate resources for employees training by managers is also very significant. This top management barrier indicator has been evaluated as critical for TQM implementation in several previous studies (Minjoon et al., 2004; Kotey and Slade, 2005; Tannock et al., 2002; Soltani et al., 2008; Walsh et al., 2002). Since the major concern of leadership in rational culture is getting the job done through competitive and achievement oriented people, therefore leadership in rational culture is highly likely to focus on quality improvement by allocating adequate resources for employees' training, thus decreasing the TQM implementation barrier of lack of allocating adequate resources for employees' training.

As stated before, many layers of management in any organisation can create communication gaps and are a potential cause of delayed decision processes and decision making which can result in missing opportunities, particularly in fast paced business activities. The importance of addressing this barrier for TQM implementation is emphasized by many researchers such as Ghobadian and Gallea (1996); Flynn et al. (1994), Hellsten (2000); Ahire (1998); Ahire et al., (1995) and Motwani (2001). The aggressive and result-oriented nature of rational culture demands an instantaneous and swift management style that characterizes the high demands and achievement of a rational organisation, thus breaking through the barrier of many layers of management.

Kaynak (2003) states that top management demonstrates its commitment to the achievement of the quality goals by taking responsibility for quality and being evaluated based on quality performance. This statement is also supported by Cameron and Quinn (1999) and Denison and Spreitzer (1991). They argue that leaders in the goal-oriented rational culture are tough and demanding in achieving competitiveness, they tend to develop clear objectives and aggressive strategies to drive practices and behaviours leading to productivity and profitability. It is therefore proposed that:

H7 – Rational culture decreases top management barriers.

Naor et al. (2008) argues that rational culture regards incentives as an integral tool used to motivate the workforce to pursue better performance and achieve organisational goals. Such incentives and rewards delivered by management are used to increase employee participation in continuous improvement and to enhance employees' ownership in their jobs and quality improvement activities. Therefore, rational culture would help remove TQM implementation barrier of lack of recognition of employees and teams for achievements in quality improvement. Employees need to be empowered to implement quality improvement efforts, and, when successful, they need to receive appropriate recognition for their achievements. Without such opportunities and a supportive environment, employees might feel frustrated, thereby contributing to more frequent turnover (Ngai and Cheng, 1997). The lack of recognition for achievements in quality improvement is reported as significant barrier in the literature (Ngai and Cheng, 1997; and Amaral and Sousa 2009). A lack of recognition of employees for achievements in quality improvement affects morale and motivation. Flynn et al. (1995) and Henderson and Evans (2000) argue that TQM uses the compensation policies including incentives for group performance, quality-based incentives and compensation based on breadth of skills. Authors further argue that compensation of executives for the achievement of TQM goals and rewards is given based on the outcomes of the improvement projects that they are accountable for. Naor et al. (2008) states that such incentives and rewards delivered by management are used to increase employee participation in continuous improvement and to enhance employees' ownership in their jobs and quality improvement activities. These performance-contingent compensation policies are compatible with the strategies characterizing the rational culture (Cameron and Quinn, 1999).

The barrier indicator of lack of empowerment of employees to apply quality improvement efforts is a reflection of centralized control in decision making and other job related functions. Empowerment to employees in terms of delegating them more responsibility would give them a greater sense of confidence and self-esteem. Similarly, the barrier indicator of lack of involvement of employees in improvement projects also reflects centralized control in decision making and other job related functions. The control-oriented characteristic of rational culture doesn't enhance empowerment and involvement of employees and if there is a lack of involvement of employees in organisation activities, employees can feel neutral to organisation's mission, aim and objectives (Naor et al., 2008). However, empowerment and involvement of unqualified employees is unlikely to bring with it useful results. Therefore, the implementation of any quality programme means more involvement and empowerment, which require more responsibility coupled with greater level of skill and knowledge of the employees. Depending on the needs of a particular organisation, training and education should cover the entire workforce as part of an ongoing process. This should be achieved through proper, formal and systematic training and education which is salient characteristics of rational culture (Denison and Spreitzer, 1991). By focusing on training, rational culture decreases TQM implementation barriers of lack of employees training in quality improvement skills and lack of employee training in group discussion and communication techniques.

If employees are not satisfied with their job, there is likely to frequent cases of turnover. A lack of satisfaction can occur due to multiple factors such as inappropriate performance evaluation and reward system (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000); lack of empowerment and participation (Ngai and Cheng, 1997; Amaral and Sousa 2009; and Angell and Corbett 2009); low motivation (Salegna and Fazel, 2000); poor work environment and lack of incentives (McFadden et al., 2006). According to Amar and Zain (2002), TQM programme are often viewed with scepticism, and are destined to fail if they do not get the full support of the entire workforce. Authors further argue that organisations that score highly on item such as "employees are resistant to change" and "employee's satisfaction across the organisation is low" most likely have leaders who have failed at communicating their commitment to quality in concrete ways. According to Denison and Spreitze (1991), in the rational culture, the leaders are hard-driving producers, directors, and competitors. They are tough and demanding. They emphasize productivity, performance and goal achievement as one of the primary motivating factors. These characteristics of

rational culture will therefore be highly likely to help decrease employee barriers such as employee satisfaction across the organisation and employee resistance to change”. In change management, the attitude of employees towards quality is seen to be one of the greatest barriers in many organisations. It has been reported that it is very difficult to change the mindset of the employees with regards to quality because employees may believe that quality is a needless task and added cost, and hence may not accept it as an integral part of the job (Oakland, 2004). Rational culture has the potential to ensure change management that can happen effectively by virtue of its results-oriented characteristic.

The preceding discussion supports the proposition that rational culture would help remove TQM implementation barriers of lack of empowerment to employees to implement quality improvement effort, employee are not involved in improvement projects, employees are not trained in quality improvement skills, training employees in group discussion and communication techniques is not considered necessary, employees and teams are not recognized for achievements in quality improvement, employee's satisfaction across the organisation is low and employees tend to be resistant to changes. It is then proposed that:

H8 – Rational culture decreases employee barriers

The creation of partnerships with customers (and suppliers) in a TQM environment is compatible with the rational culture because organisations emphasizing the rational culture pursue productivity, profit and impact supported by the measurement of customer preferences (Denison and Spreitzer, 1991). According to Flynn et al. (1994), the focus of rational culture on customers supports the organisations to work closely with their customers to understand their needs and expectations so as to better position their products and services in the market. Hence, top management needs to establish close contact with key customers to achieve desired quality objective.

As mentioned previously, one of the founders of TQM concept Feigenbaum (1957) stated that “TQM is an effective system when it ensures full customer satisfaction”. As also mentioned previously, many TQM researchers have concluded that the core objective of TQM is to delight the customers, such as Kanji and Asher (1996) and Adebajo and Kehoe (1998). Many other researchers have identified achieving customer satisfaction as a core factor in TQM implementation, for example, through the identification and measurement of customer wants and needs (Hackman and Wageman, 1995) and meeting or exceeding

customer expectations (Flynn et al., 1994). Deming (1986) stresses that quality should be aimed at the present and future needs of the consumer. Since in the rational culture, the organisation focuses on winning in the marketplace and outpacing the competition, it is highly focused on expanding the customer base through competitive market leadership driven by understanding customer needs and expectations.

The major principle of customer focus in TQM requires collection of customer information and analyzing their feedback. Previous studies such as Tamimi and Sebastianelli (1998), Nagi and Cheng (1997), and Adebajo and Kehoe (1998) all emphasize on collecting customers' requirements and feedback. Many authors have considered the “lack of customer requirements and feedback system” as one of the very important barriers facing organisations, and hampering adopting quality management system techniques (Bhat and Raj, 2009; Angell and Corbett 2009; Sebastianelli and Tamimi, 2003; Salegna and Fazel; and Minjoon et al., 2004). Therefore, an organisation should have a good understanding of what the customer wants through keeping customer contact and obtaining customer feedback. Since, the organisations with rational culture have one of their primary focuses on customer orientation, such organisations, according to Bowersox and Cooper (2007), seek opportunities to collaborate with key customers and suppliers through strategic partnerships to leverage strategic position and improve operating efficiency and productivity. The focus of rational culture on the external market/resources can help to develop close relationships with customers.

Consequently, the focus of rational culture on the external market/resources would develop close relationships with customers and suppliers that would help remove the TQM implementation barriers of lack of effective system to measure customer satisfaction, lack of assessment of customers' needs and expectations, lack of effective customer feedback system and lack of customer focus. It is then proposed that:

H9 – Rational culture decreases customer barriers.

3.5.4 Hierarchical culture and TQM barriers –hypotheses 10 and 11

According to Denison and Spreitzer (1991), an organisation with hierarchical culture is a very controlled and structured place with formal procedures for coordinating, organizing and smooth-running efficiency. There is security of employment, conformity, predictability,

and stability in relationships that ensures permanence, stability, efficiency, control and smooth operations. The outcome of these characteristics is dependable delivery, smooth scheduling and low-cost production (Denison and Spreitzer, 1991).

Further describing the characteristics of hierarchical culture, Cameron and Quinn (1999) state that the hierarchical culture tends to use strategies of clear rules, close control, and routinisation, and clear lines of decision making authority, standardized rules and procedures, and control and accountability mechanisms are valued as the keys to success. Correspondingly, TQM planning practices require using the formalized problem-solving approach to plan and conduct projects with clear steps. Therefore, planning activities are likely to truly flourish in a hierarchical culture.

Quinn and Kimberly (1984) state that in organisations with hierarchical culture, individuals and departments will abide by organisational policies (plans) when formally stated and enforced through rules and regulations. Supporting this statement, Cameron and Quinn (1999) argue that organisations emphasizing the hierarchical culture are characterized by a formalized and structured place to work where procedures govern what people do. Therefore, employees of organisations with hierarchical culture will feel secure to use the prescribed tools to plan well. Thus, the inherent characteristics of hierarchical culture such as predictable outcomes, consistency and adherence to standardized guideline are expected to facilitate organisations to put planning procedures to good effect. However, the strategic plans should be customer driven and should include quality goals by institutionalizing new approaches/tools/techniques (Bhat and Raj, 2009; McFadden et al., 2006; Jun et al., 2004; Zeng et al., 2008). Therefore, the hierarchical culture is highly likely to decrease planning barriers such as: strategic plans are not customer driven, organisation's strategic plans do not include quality goals, there are no specific ways of institutionalizing new approaches/ tools/ techniques and there are no joint planning activities with suppliers. It is then proposed that:

H10 – Hierarchical culture decreases planning barriers.

Quality of product/service can be improved through process management that would result in less scrap and rework, less production costs and hence lower price for the consumer. The bottom-line results of this practice would be the improved quality performance and higher efficiency and productivity, and in turn better financial and market performance, higher customer satisfaction, and competitive advantage (Kaynak, 2003). Hierarchical culture

values these bottom-line results and hence emphasizes system policy to improve process management and thus would help remove the TQM implementation barrier of inefficient process management due to lack of a comprehensive quality programme.

The main characteristics of hierarchical culture are control, centralization, routinisation, formalization and structure, stability, continuity, order and predictable performance outcomes (Naor, 2008). Organisations with hierarchical culture have rules and regulations with a focus on control and stability, achieved through stability of processes. Predictable work loads, scheduled production and statistical process control would increase efficiency. Therefore, it is reasonable to argue that hierarchical culture would capitalize on process control and help remove TQM implementation barrier of lack of a comprehensive quality programme.

The hierarchical culture tends to have fixed organisational structure, with formal rules, close control, clear lines of decision-making authority and a mechanism for accountability (Dension and Spreitzer 1991). Departments work in harmony using the formalized problem-solving approach. There are clear step-by step instructions, prescribed tools and laid down procedures. The Quality management system in such organisations tends to be all inclusive and quality initiatives include all organisational functions/departments. Therefore, it is imperative that the existing quality management system is all-encompassing and pervasive because TQM is promoted as a set of organisation-wide practices that unify mindsets and perceptions among members of an organisation (Prajogo and McDermott, 2005). This ethos will help remove TQM implementation barriers of lack of a comprehensive quality programme. The TQM barrier indicator of “lack of a comprehensive quality programme” was found significant in many previous studies (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Amaral and Sousa 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Jun et al., 2004).

Similarly, the TQM” barrier indicator of “quality is treated as a separate initiative” is also found significant in previous studies (Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006). These authors also state that ineffective communication with stakeholders is also a significant barrier in TQM implementation. Other researchers such as Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Kifyah and Zain, 2002; Jun et al., 2004, also report the TQM barrier indicator of “inadequate resources to effectively employ TQM’ as significant. Another TQM barrier indicator of “cross functional teams are

not used” is identified as significant barrier (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000; Ngai and Cheng, 1997; Kifyah and Zain, 2002; Amaral and Sousa 2009; Bhat and Raj, 2009; Whalen and Rahim, 1994; Angell and Corbett 2009; Huq, 2005; Rad, 2004; McFadden et al., 2006; Jun et al., 2004).

The hierarchical culture emphasizes control and stability and its main focus is internal. The emphasis on internal efficiency is achieved through standardization of procedures and a strict observance of rules and regulations (McDermott and Stock, 1999). Cameron and Quinn, (1999) suggest that in order to achieve a high level of quality, organisational environment of hierarchical culture is favourable as it adequately supports the process control. Kaynak (2003) asserts that process management in TQM focuses on improving internal process stability (or to say reducing process variability) through preventive maintenance, production schedules, and statistical process control. These process management techniques are more likely to be implemented and maintained in the organisations having dominant hierarchical culture because this culture pursues efficiency and stability through error detection and measurement. Therefore, it is proposed that the hierarchical culture will help decrease the process barriers of lack of a comprehensive quality programme, quality being treated as a separate initiative (not everyone's responsibility), and ineffective communication with external network of stakeholders, adequate resources to effectively employ TQM not being available, and cross functional teams not being used. It is then proposed that:

H11 – Hierarchical culture decreases process management barriers.

3.6 Chapter summary

Evidence in the literature suggests that the type of existing organisational culture has an impact on TQM implementation barriers. A conceptual framework has been developed that presents proposed relationships between the variables of organisational culture and TQM implementation barriers incorporating four constructs of organisational culture conceptualized by Denison and Spreitzer, (1991) and six constructs of TQM implementation barriers derived from extant literature (chapter 2 section 2.6 and 2.7). This proposed structure suggests 24 possible relationships, but only 11 relationships are hypothesized because these are the only ones that are strongly supported based on close examination of TQM implementation literature.

Following the findings of Prajogo and McDermott, (2005), this study assumes that organisational culture is an antecedent of the TQM implementation barriers influencing TQM implementation. In other words it assumes TQM implementation barriers are largely a consequence of certain types of culture. The hypotheses were therefore developed to test negative relationships between the variables. For example high score on group culture in an organisation indicates that this organisation emphasises suitable training of employees, employee involvement in decision-making, rewarding employees for quality performance and communicating with them consistently in order to create awareness of organisational goals for quality improvement. Therefore, theoretically, an increasing score on group culture is hypothesized to result in decreasing score on employee barriers of lack of participation, lack of empowerment and involvement and lack of employee motivation. These hypotheses are stated to indicate the direction and significance of the relationships to be measured. The structural parameter estimates in the subsequent analysis should be less than zero to show a negative relationship.

Chapter Four: Research Methodology

4.1 Introduction

The main aim of this chapter is to outline the detailed methodologies implemented in the research process that was adopted in this study. This research broadly aims to investigate the factors that influence TQM implementation. The extant TQM literature suggests that TQM implementation barriers will inhibit the effective implementation of TQM. In order to address these barriers, many strategies have been suggested, but the role of existing organisational culture to address these barriers has, to date, not been investigated systematically. In the previous chapter the author proposed a number of relationships between organisational culture and TQM barriers. In this context, the author proposed a framework that integrates four constructs of organisational culture as conceptualised by Denison and Spreitzer, (1991) and six constructs of TQM implementation barriers derived from a systematic review of the literature. In order to examine its validity in the Bahraini context, the proposed framework was empirically tested using a robust methodology as outlined in this chapter. The considerations and steps involved in selecting and justifying the research methods were discussed. Consequently, this chapter explains how this study was conducted and why it was conducted in this way. Accordingly, the chapter is broadly divided into and structured according to the following elements of the overall research design:

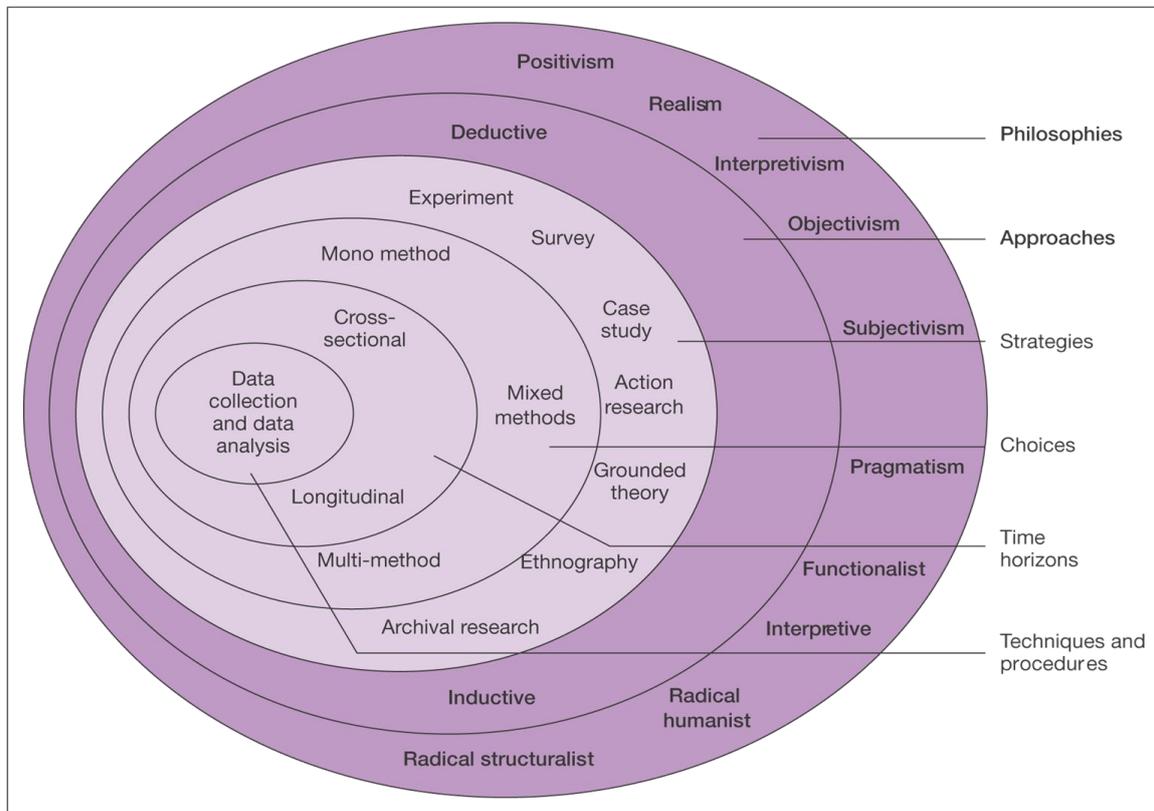
- Selection of research method and its major elements;
- Deriving a sample;
- Designing a data collection instrument;
- Reliability and validity test of the designed research instrument;
- Selecting data analysis tools and methods

4.2 Selection and rationalization of the research process

This section discusses the selection and rationalization of the research process adopted in this research. The areas discussed here are therefore: research philosophy, specifically positivism; research approach which refers to deduction or induction; research method, that is to say quantitative or qualitative; research strategy, for example survey or case study; data collection methods, including mono, mixed and, multi methods; time horizons (cross sectional or longitudinal); and techniques and procedures for data collection and data

analysis. Figure 4.1 illustrates these constituents showing the major elements of the research process.

Figure 4.1 the research ‘onion’



Source: Saunders, Lewis and Thornhill (2007)

4.2.1 Research philosophy

Research philosophy refers to the way a researcher thinks about and addresses the development of knowledge (Saunders et al., 2007). Positivism, realism, objectivism, subjectivism, interpretivism, pragmatism and many more philosophies can be involved in a research process. However, in the business and management research methodology domain, there tend to be two main research philosophies that are adopted, namely positivism and phenomenology (Easterby-smith et al., 1991; Hussey and Hussey, 1997).

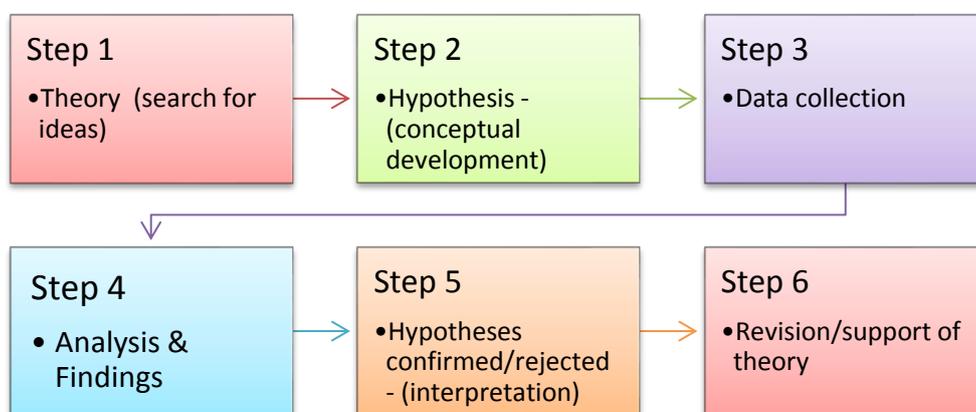
Positivism is defined as a highly structured method to allow replication and quantitative analysis which can lead to statistical solutions (Saunders et al., 2007). The basic assumption in positivistic research is that the researcher and the topic are independent of one another and hence do not have any effect on each other (Remenyi and Williams, 1998). According to Saunders et al. (2007), the positivism philosophy refers to quantitative research

which is the systematic empirical investigation of quantitative properties and phenomena and their relationships which develops and employs mathematical models, theories and/or hypotheses pertaining to phenomena. Authors further explain that positivism is based on scientific methods, a body of techniques that investigates phenomena; develops new knowledge; and corrects and integrates previous knowledge. In scientific methods, data is collected through observation; experimentation; and formulation and testing of hypotheses. According to Gilbert (2001), the positivist philosophy is used to develop valid and reliable ways of collecting “facts” about society that can then be statistically analysed in order to produce explanations about how the social world operates. The positivist researcher will likely use a highly structured methodology in order to facilitate replication (Gill and Johnson, 2002).

As the positivist philosophy almost always involves numerical data collection, the emphasis of the researcher is on quantifiable results by means of statistical analysis. In this paradigm, researchers apply theories and hypotheses. A theory is conceptually defined as a fully explained set of conceptual relationships that can be used for empirical tests. All theory has four essential earmark properties: formal conceptual definitions, theory domain, explained relationships, and predictions (Wacker, 2004). Research hypotheses are predictive statements about the relationship between variables in quantitative research.

From a philosophical stance, a positivism paradigm uses deduction - beginning with theory, and ending with drawing inference for supporting or revising a theory. The positivism paradigm initiates a quantitative design to accept or reject hypotheses. The process of deduction as described by Lee and Lings (2008) is illustrated in figure 4.2.

Figure 4.2 the process of deduction in positivism paradigm



Source: Lee and Lings (2008)

In the present research, the researcher has reviewed the extant TQM literature that suggests that TQM implementation barriers impede effective implementation of TQM. Many strategies to address these barriers were reviewed which revealed that there is a lack of research on the role of existing organisational culture to address TQM implementation barriers. It was observed that some characteristics of organisational culture may facilitate reducing these barriers and therefore a framework that integrates organisational culture and TQM implementation barriers was developed from the literature. This framework was empirically validated in the context of Bahraini industries by testing the stated hypotheses and a predetermined structured research instrument was required. This main research process in this study, that is to say the testing of the proposed conceptual framework, therefore replicated a positivism philosophy.

It helps reveal people’s values, interpretive schemes and belief systems by gaining understanding of human behaviours (Cavana *et al.*, 2001). As mentioned earlier, a positivism paradigm uses quantitative design that initiates from theory, developing hypotheses, collecting and analyzing data and then accepting or rejecting hypotheses. In this context, deductive approach represents the positivistic paradigm (Saunders et al., (2007). The features of both positivistic paradigm are presented by Hussey and Hussey (1997) given in table 4.1.

Table 4.1 Features of the positivistic paradigms, source: Hussey and Hussey (1997)

Positivistic (quantitative) paradigm
Tends to produce quantitative data
Uses large samples
Concerned with hypothesis testing
Data is highly specific and precise
The location is artificial
Reliability is high
Validity is low
Generalizes from sample to population

According to the research questions given in Chapter 1, the best choice was to follow the positivistic paradigm. Since this study uses deduction that starts with theory, developing hypotheses based on theory and collecting data to support the hypothesis, therefore a positivism research philosophy is appropriate for this research. However, the rationale to select this positivism paradigm was also based on the following considerations recognized by Hussey and Hussey (1997) and listed in table 4.1.

- produces quantitative data that would fit well with the survey strategy (explained in section 4.2.3);

- enables large samples to be included for hypothesis testing that corresponds with sampling method (discussed in section 4.3);
 - is concerned with hypothesis testing that fits well with deductive approach (discussed in section 4.2.2);
 - data is highly specific and precise because of well structured survey questionnaire;
 - high reliability of data enhances the reliability of results;
- Low validity of data can be countered (and was) by structured interviews to validate the survey instrument, validity tests of measurement model and validity test of the constructs that constitute measurement model including face validity, convergent validity, discriminant validity and nomological validity (explained in section 5.3.2.2).

4.2.2 Research approach

Research approach refers to the broad approach that has been adopted to conduct the research. It involves selection of an appropriate path of research that can be taken to build or to test the phenomena, concept, theory or framework under study (Saunders et al., 2007). Approach essentially refers to whether the research involves a deductive or an inductive approach. If the researcher uses the deductive approach, he/she develops a theory and hypotheses, and designs a research strategy to test these hypotheses. As shown in figure 4.3, deduction starts with theory, then moves on to observations/findings. Induction on the other hand, starts with observations/findings and then moves on to theory. The complete process of deduction includes: developing a theory, constructing hypotheses, collecting data, analyzing data, testing the hypotheses, establishing the main findings, drawing conclusions and presenting the results, in order to develop knowledge (Lee and Lings, 2008).

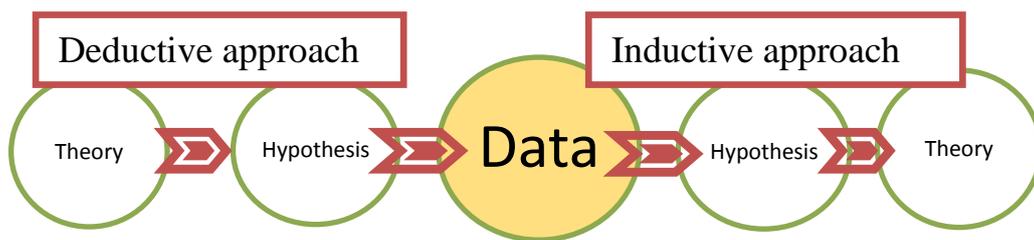
The features of positivistic/deductive paradigm are identified by Saunders et al. (2007) and Hussey and Hussey (1997), as given in table 4.2.

Table 4.2 Features of positivistic/deductive paradigm

Positivism	Deductive
	A highly structured approach that moves from theory to data using scientific principles
	The collection of quantitative data
	The application of controls to ensure validity of data
	Selection of samples of sufficient size in order to generalize conclusions

While choosing a research approach, the most important point to keep in mind is to consider the nature of the research topic (Saunders et al., 2007). This research considers organisational culture as an antecedent of TQM implementation and its purpose was to investigate the relationships between type of existing culture and TQM implementation barriers to enhance our understanding of the factors that are considered important in developing TQM implementation plans. Having developed a conceptual framework and defined the associated hypotheses for the relationships in the framework, logically this research moves in a deductive manner, from theory → hypotheses → data, as shown in figure 4.3. Accordingly, having developed specific hypothesis relating to relationships between well developed constructs, it was a deductive approach that was adopted, being the most suitable for this kind of study.

Figure 4.3 deductive and inductive approaches



To summarise the rationale for selecting this deductive paradigm was also based on the following considerations identified by Saunders et al. (2007), but was primarily governed by the need to structurally test the developed hypotheses.

- The research required a highly structured approach that moves from theory to data using scientific principles;
- The collected data required was quantitative;
- The data would benefit from being validated by applying controls; and
- A sufficient size of samples was needed in order to generalize conclusions.

4.2.3 Research strategy

There are many research strategies that can be used for many different types of research. These strategies include experiment, survey, case study, action research, grounded theory, ethnography and archival research strategies. Each of these strategies can be used for exploratory, descriptive and explanatory research (Yin, 2003). Moreover, any one or a

combination of more than one can be used according to the needs of the researcher, the research questions and objectives, the extent of existing knowledge, the amount of time and other resources available and the philosophical stance of researcher. To determine the appropriate research strategy, the focus of this research needs to be reviewed with regards to its stated aims and objectives.

Identifying the relationship between the organisational culture and TQM implementation barriers would add an additional and important level of understanding that can help in facilitating TQM implementation. This is the main premise on which the proposed conceptual framework (chapter 3) was based. Three main research questions as stated in chapter one are to: 1) find out the type of existing culture, 2) find out the barriers inhibiting the implementation of TQM and 3) investigate the relationships between the types of existing culture and TQM implementation barriers to enhance our understanding of the factors that are considered important in developing TQM implementation. This would help to determine the type of supportive culture which can either reduce these barriers or offset the effects of these barriers. These data collection and hypotheses testing needs pointed strongly to the need for a positivism research philosophy and deductive research approach that in turn pointed strongly towards the need for a survey based methodology. Therefore, the survey research strategy was appropriate to be used in this research process, mainly because of the deductive approach requirement.

The survey strategy allows collection of large amount of data from a sizable population in a highly economic way. Often obtained by using a questionnaire administered to a sample, these data are standardized, allowing easy comparison (Saunders et al., 2007). The authors further stated that the survey strategy is authoritative in general and is both comparatively easy to explain and understand. This strategy can provide robust results when the sample is representative of the population under study, the data collection instrument is effective and the response rate is acceptable. The following excerpt from Saunders et al. (2007, p 138) explains this strategy very effectively:

The survey strategy allows you to collect quantitative data which can be analyzed quantitatively using descriptive and inferential statistics. In addition, data collected using a survey strategy can be used to suggest possible reasons for particular relationships between variables and to produce models of these relationships. Using a survey strategy should give you more control over the research process and when sampling is used, it is possible to generate findings that are representative of the whole population at a lower cost than collecting the data for the whole population.

In line with the above statement that corresponds closely to the aim, objectives and research questions of this research, it was logically appropriate to use the survey strategy in this research. The survey methodology has been extensively applied in research examining aspects of TQM (Tamimi and Gershon 1995; Black and Porter 1996; Wilson and Collier, 2000; Kaynak, 2003), organisational culture (Chang and Wiebe, 1996; Al-Khalifa and Aspinwall, 2000; Dellana and Hauser, 1999) and relationships between different TQM constructs (Prajogo and McDermott, 2005, Stock et al., 2006; Zu et al., 2010).

4.2.4 Research method

Tashakkori and Teddlie (1998) propose that there are three methods in research: quantitative, qualitative and mixed methods. The quantitative method collects numeric data through experimentation or survey strategy. The qualitative approach collects open ended textual data using case study strategy through interviews. The mixed methods involve collecting data one time or one at a time using a mixture of both quantitative and qualitative methods. According to Matveev (2002), quantitative methods can provide a high level of measurement precision, statistical power, and high levels of reliability of data, while qualitative methods can supply a greater depth of information about the nature of data. In order to utilize the statistical power of the quantitative method the data is analyzed using statistical (quantitative) analysis procedure. Therefore, the research method used in this study was a single quantitative data collection method in the form of survey questionnaire along with quantitative data analysis procedures.

Being a deductive study, this research study followed the process of scientific studies where causal relations can be established between different variables. This was suitably achieved by quantitative data analysis that enabled the author to formulate and to understand the relationships, and hence impact of the variables in the proposed framework. As the hypotheses were stated and tested in their operational form, the outcome allowed the author to infer the central meaning, directions and strengths of relationships between culture and TQM implementation barriers.

4.2.5 Data collection method

According to Saunder et al., (2007, p 145), quantitative (method) is predominantly used as a synonym for any data collection technique (such as questionnaire) or data analysis

procedure (such as graphs and statistics) that generates or uses numeric data. In quantitative studies, paper-based survey instruments or electronic survey instruments are generally used for data collection. Data obtained through paper-based surveys can be collected through personal interviews, telephone interviews or by sending the survey questionnaire through postal mail. Electronic surveys are commonly administered via the web or through email.

In this research, an electronic survey method was selected and a survey questionnaire was administered via a web-based technique. According to Cobanoglu et al. (2001), the cost savings associated with eliminating the printing and mailing of survey instruments as well as time and cost savings of having returned survey data already in an electronic format are the possible advantages of using web-based surveys. Karakoyun and Kurt (2010) argue that the advantages of web surveys are: a fast response rate; ease of sending notification to users through group emails; the option of putting questions in a random order; and the ease of importing responses into database applications. The main reasons for selecting a web mode of survey in this study was the ease of internet survey design, ease of management and administration of the survey, straightforward implementation, lower cost and potentially faster results. This kind of survey is beneficial for studying populations with full access to the Internet and respondents having essential Internet browsing skills (Dillman, 2009). Considering the literacy rate of 91% and internet usage of 52% (World Bank report, 2008), the population of Bahrain was considered to be well-resourced for web-based surveys. Furthermore as explained in the following sections, the sample consists of highly educated respondents, therefore issues of access to the Internet and respondents having essential Internet browsing skills were not deemed to be prohibitive using a web-based survey. Nevertheless, there are some issues such as SPAM/Privacy of respondents, some technical issues in submitting multiple submissions and not having an expert present to clarify questions that represent acknowledged potential disadvantages. Despite these disadvantages, web-based surveys are cost efficient with faster delivery, having many design options, having dynamic controls, have the ability to track, quick response time and above all have many design options with response error control options (Dillman, 2009). It may be argued that the most desirable aspect of web survey from a researcher's perspective is that data is collected in an electronic format that can be employed for analysis straight away.

4.3 Sampling method

A sample is a subset or relatively small fraction of the total elements in the population (Zikmund, 2003) and is a crucial function of the research methods selection. In this study, as in most business research studies, analysing all elements of the population is not possible therefore the use of a sample was the most practical research approach. It was necessary to select the sample in order that it provides enough primary data for analysis of the fact under inquiry and represent the targeted population. Therefore, it was planned to obtain responses from many types of organisations from manufacture/service industries within Bahrain so that generalisation of the findings could be established.

Two major classifications of sampling design are probability and non-probability methods. Probability sampling permits specifying the probability that each sampling unit will be included, and the non-probability sample is a sampling method in which there is no way of specifying the probability of each unit's inclusion in the sample (Neuman, 2004). Based on criterion such as analysis tests; research approach; data availability; expected response rate; data restriction; randomness; sampling stratum; population clusters; and probability, samples can be drawn with a central characteristic. This kind of non-probability sampling involves a procedure that uses a small number of items or a portion of the population to make a conclusion regarding the whole population (Zikmund, 2003). Therefore it is very seldom that the sample has exactly the same characteristics as the population.

The target respondents for this survey were managers, directors, quality managers and operations managers who are decision makers, policy implementers and policy receivers in both manufacturing and service industries of Bahrain. The respondents were selected based on relevance, qualification and experience. Therefore the probability that each sampling unit would be included was not possible because selection was partly judgemental. According to the nature of this research, therefore non-probability sampling was particularly relevant and suitable and was the approach used.

Nevertheless, the data was collected as per the following stratification based on non-probability sampling theory to achieve as best as possible representation of the industry population, and to ensure reliability and validity of the data. The target sample was divided into ten segments of service industry and eight segments of manufacturing industries. This stratification was based on categories (service, manufacturing) and sizes of the organisations

(small, medium, large), three levels of management (top, middle and operational), three operation types (local operation, local branch operation, multinational operation), and types of QM (TQM, Six Sigma and ISO 9000). In this study, ISO 9000 is considered as closely relating to TQM because the latest version of ISO aims to help companies to bridge the gap between quality assurance and TQM, and thus it has been argued that ISO 9000 closely reflects the basic principles of TQM (Karthi 2002). The eight principles of ISO 9000:2000 also closely resemble the enablers for TQM implementation. Surveys conducted on relationship between TQM practices and ISO principles showed that they both complement one another and as such ISO 9000 is considered a starting point for broader TQM implementation (McAdam and McKeown, 1999). Many researchers have reported prevalence of sustainable TQM practices in ISO certified organizations and therefore, ISO 9000 is now generally recognised as a launching pad for implementation of TQM (Khanna et al. 2002). Similarly, Six Sigma is also described as a TQM term because practices in Six Sigma complement the traditional TQM practices in improving quality (Zu et al., 2009).

This stratification provides more obvious representation of the population. The maximum possible responses were targeted from each stratum using the questionnaire to collect the required responses to make statistical inferences possible. Details regarding the design of the questionnaire and its administration are discussed in the following section. As shown in table 4.3, data was collected from managers, directors, quality managers and operation managers in 10 categories of service industries and 8 categories of manufacturing industries to ensure that the sample was drawn from a more representative population.

Table 4.3 Sample stratification by industry- target and actual

Industry Categories	Sample Target	Sample Actual
<i>Service</i>		
Public services	50	45
Information and communication	15	15
Professional, scientific and technical activities	80	82
Health and social activities	20	18
Wholesale and retail trade	70	66
Education	25	26
Construction and real estate	25	27
Accommodation and food service activities	40	32
Administrative and support services	40	45
Banks	40	37
Other services	15	12

Total service response	420	405
<i>Manufacture</i>		
Chemicals and chemical products	30	31
Food product	20	18
Metal and fabricated metal products	20	20
Non-metallic products	30	26
Oil & Gas	10	9
Paper, wood product	10	11
Textile products	10	12
Other products	10	8
Total manufacturer response	140	135
Total Number	560	540

The questionnaires were administered to both organisations who have already adopted TQM successfully or unsuccessfully, and also to organisations yet to use the TQM concept explicitly. Therefore, one segment of the sampling frame was the data collection from organisations yet to explicitly use TQM concept. The argument for including these firms draws upon literature evidence. The company leaders and quality managers of such organisations may not be specifically familiar with TQM but may be practicing TQM principles routinely without even knowing it (Oakland, 2004). This would mean that their frame of reference in answering the survey questionnaire about TQM barriers would be their practical experience of quality rather than necessarily their knowledge of a defined quality standard. Therefore, data from all three categories of organisation strata (organisations with successful TQM, organisations with unsuccessful TQM and organisations not yet explicitly claiming to use the TQM concept) was collected through the same survey questionnaire.

Another sampling issue concerned the size of the sample. Typically, large samples are more precise than small samples, but if proper sampling is implemented, a small proportion of the total population will give a reliable measure of the whole (Zikmund, 2003). There are two types of sample sizes to determine:

- Sample size determination used to find the number to have enough participants to be representative of a population; and
- Sample size determination to achieve statistical power.

Population representation is determined through many variables such as population size, estimated variance in population and desired precision level based on confidence level (Dillman et al., 2009 p-56). The population size from which this study's sample was to be

drawn was 2000 service and manufacturing companies of Bahrain. According to Dillman et al. (2009 p-57), the completed sample size needed for the above population parameters was therefore at least 219 responses. Therefore, a minimum number of 219 responses were required to get reliable statistics on prevalence of culture and barriers; and represent population. However, for a more precise representation of a population, sample stratification was used to include respondents from all population segments.

Other sample size determination is to achieve statistical power. In order to assess this type of sample size the researcher needs to know what type of statistical analysis will be conducted because, for example, the sample size calculation for an ANOVA is different than the sample size for a correlation or factor analysis. Tabachnick and Fidell (2007) recommend that for SEM, sample size depends on the number of independent variables available for testing in the proposed theoretical framework that the author wishes to apply. According to this method, it is $N > 50 + (8 \times m)$ where m = number of independent variables and N is the size of the sample. Considering all of the variables as per the theoretical framework described in chapter 3, this study required more than $50 + (8 \times 24) = 242$ respondents. To reduce any errors arising out of data insufficiency, the author targeted twice this number of responses that is to say 484 (further rounded up to 500).

4.4 Survey instrument and measurement scale

In order to measure the impact of underlying cultural characteristics on TQM implementation barriers, the author needed to collect information on the type of organisational culture and the significant TQM implementation barriers that exist in Bahraini industries. This section explains the design of the survey instrument including the associated measurement scales. This operationalisation of the survey instrument provided the empirical evidence from the sample population.

A questionnaire is the set of questions arranged in a specific structure to extract information (Dillman, 2009). These can be self-completion or personally administered. According to Bryman and Bell (2007), survey questionnaires are very popular among researchers because:

- they take less time to administer and less cost to carry out,
- they enable quick extraction from respondents,
- they permit flexibility of time and place arrangements when used online or in a mail survey,

- software tools are readily available for data analysis, for example SPSS,
- large sampling frames are possible through World Wide Web, and
- they can limit the effects of biases compared to observation and interviewing methods

A poorly designed questionnaire can't provide good data because it may increase respondents' bias and it might have not addressed the research questions or hypotheses in its structure (Saunders et al., 2007). To prepare the questionnaire to be fit for purpose, one must consider how the collected information is to be used and analysed. The tests and analysis to be performed should be known in advance before finalizing and launching the questionnaire.

4.4.1 Survey questionnaire design

The following best practice criteria were followed while designing the questions (Kline, 2005):

- no negatively worded questions;
- no jargon or double meaning words used;
- no cultural or abbreviated words applied no emotionally loaded questions; and
- to the point and direct questions

Based on the construction of the theoretical framework with its underlying proposed hypotheses, the questionnaire was designed to ascertain the current personal and organisational profile of the respondents; type of existing organisational culture; and existing TQM implementation barriers. Accordingly, the questionnaire was structured into the following three sections in order to provide empirical evidence to test the hypotheses and answer the research questions given in chapter 1. The full questionnaire is provided in Appendix A.

4.4.1.1 Part I – survey questions on organisational and respondent profile

The first section of the survey instrument consisted of questions gathering personal and organisational profile information of the respondents.

- Questions 1-5 included job title to verify relevance; qualification to verify ability of respondent to understand and respond to the questions rationally; work experience to verify familiarity and understanding of the respondent; and quality experience to verify the practice of respondent.

- Questions 6-11 included size of the organisation, type of industry, type of operation, service provided, type of product, type of quality programme in place, duration of programme, and whether the firm was explicitly using TQM or not.

The questions on personal and organisational profile provided data on demographics and magnitude and distribution of TQM practices within the sample. This data has thus provided current knowledge of the status of organisational culture and TQM barriers in organisations in Bahrain.

4.4.1.2 Part II – survey questions on organisational culture

The objective of this section of the questionnaire was to identify type of dominant culture in the organisations and its characteristics. In this context, and as referred to in section 2.6.3, there are many models for the assessment of organisational culture but three have been frequently used by researchers and practitioners. These were given in chapter 2, table 2.3.

As shown in table 2.3, researchers have developed their instruments for assessing the organisational culture profile based on the definition of culture types. This was efficiently done by Cameron and Quinn (1999) when they designed the Organisational Culture Assessment Instrument (OCAI). Although types of culture were named differently than those put forward by Denison and Spreitzer, (1991), the content was according to the definitions of Denison and Spreitzer (1991). Denison and Neale (2000) later developed the Denison Organisational Culture Survey (DOCS), renaming the culture types as shown in table 2.3. This instrument was also mostly based on the same content as Denison and Spreitzer (1991). In this model, each of these orientations of culture represents one of the four models of organisational theory, comprehensively defining the characteristics of each type of culture along with underlying assumptions like motivation, leadership and effectiveness. The main assumption in this framework is that an organisation can be characterized according to cultural traits or dimensions. In this study, the competing values model used by Chang and Wiebe (1996) and Dellana and Hauser (1999) was selected as the organisational culture model. However, in order to operationalise the measurement of four types of culture (group, developmental, hierarchical and rational) the model developed by Denison and Spreitzer (1991) was used and operationalised with the corresponding measurement items in the OCAI (Cameron and Quinn, 1999). The same instrument was used by Al-Khalifa and Aspinwall, (2000), Prajogo and McDermott, 2005, Stock et al., (2007) and Zu et al., (2009).

The CVF is used for assessing and profiling the dominant cultures in organisations because it helps individuals to identify the underlying cultural factors that exist in their organisations. CVF is used to measure the four types of organisational culture from six underlying dimensions (organisational character, leadership character, management style, binding force, emphasis of organisation and success criteria). Question 12-17 were developed to measure the score on each of the four cultures types from these six dimensions. The respondents were asked to select the level of his/her agreement/disagreement in each case. Following the work by Chang and Wiebe (1996) and McDermott and Stock (1999) the measurement scale used was a Likert type scale 1 to 5 (1- Strongly disagree to 5- Strongly agree).

4.4.1.3 Part III – survey questions for identifying significant TQM implementation barriers

The questions in Part III covered the TQM implementation barriers. As already discussed in section 2.7, in order to develop survey questionnaire, the author identified studies related to TQM barriers from good quality academic journals and made a master set of all cited barriers in all selected studies. From this list, the author derived a more robust set of common barriers as filtered through more stringent criteria. The derived set of TQM barriers was organized into a systemic topology of barrier constructs through logically grouping the barriers according to their nature and area of influence within the broad TQM framework. This ensured that the TQM implementation barrier constructs were consistent with established TQM theory and very closely mirrored the general taxonomy of the six main TQM principles given in the Baldrige framework.

Thus, the author derived barrier constructs comprising thirty two individual indicators and sought to find their level of existence in the target population. Six main questions (18-23) were composed on barriers in which respondents to the survey questionnaire were asked to indicate their agreement/disagreement on the existence of the TQM implementation barriers in their organisations. A Likert-type (1 to 5) scale with end points of “strongly disagree” and “strongly agree” was used. In order to calculate an overall score for each barrier construct, the score of each of its barrier indicators was summed and then averaged.

4.4.2 Summary of measurement scales

Thus, in this research, independent and dependent variables were used to measure the organisational culture profile and TQM implementation barrier profile respectively. One validated existing scale of 24 items was adopted for measuring the organisational culture

profile. This survey instrument for assessment of organisational culture used in this study was a tried and tested instrument in the organisational culture arena (Al-Khalifa and Aspinwall (2000); Prajogo and McDermott (2005); Stock et al. (2007); and Zu et al. (2009)). The other measurement scale for measuring the TQM implementation barrier profile, originally consisting of thirty two items was developed from previous studies by Sebastianelli and Tamimi (2003); Salegna and Fazel (2000); Ngai and Cheng (1997); Bhat and Raj (2009); and Jun et al. (2004). The measurement scale and survey instrument was validated for comprehensiveness through structured interviews before administering the main survey.

4.4.3 Pilot structured interviews to validate the survey instrument

Pilot structured interviews are a good way of testing and taking feedback on content, clarity and style of the questionnaire (Dilman et al., 2009). Therefore, the adapted scales were tested through structured interview from quality practitioners and academics in Bahrain. The validity of these questions in terms of content, clarity and structure was sought from researchers and academia with 12 selected prominent quality practitioners and academics. The targeted quality practitioner respondents for the structured interviews were selected based on their industry experience. Managers, directors, quality managers, operation managers who were decision makers, policy implementers and policy receivers were the respondents of the structured interviews. In addition to these practitioners, the views of academics with experience in quality management and TQM were also sought. These reviewers were chosen because they were experienced quality/TQM practitioners and/or experienced quality/TQM researchers. Feedback on the survey questionnaire was thus taken from field experts and quality professionals, who were similar to the target population (Fink and Kosecoff, 1998; Nunnally and Bernstein, 1994), for their comments on clarity, structure and validity of the content. The aim was to establish whether the questionnaire measured what it intended to measure (Saunders et al., 2007).

The purpose of the structured interviews was to enable the researcher to identify any deficiencies in the survey questionnaire. Questions relating to personal and organisational profile were located in many previous studies in different formats. In addition, question banks such as the ESRC Question Bank were searched to find questions and coding schemes in order to appropriately design and word these questions. Using these sources for guidance questions on personal and organisational demographic related profile were developed. The questions on organisational culture profile were adopted from other studies and thus were

already assessed for ‘content validity, criterion-related validity and construct validity’ (Blumberg et al., 2005). Conversely, the questions on TQM implementation barriers were developed by the author thus testing the internal validity was ensured through a pilot test of the survey questionnaire in structured interviews. Suggestions on leading, offending, ambiguous or misunderstood questions were sought. The following checklist (partially taken from Saunders et al., 2007) was provided to help the scrutinizers undertake their task.

Overall questionnaire

- Instruction set with questionnaire is understood;
- Questionnaire measures what it intends to measure;
- Is there any area not addressed in questionnaire that should be;
- Coding of questionnaire is appropriate;
- The order and flow of questionnaire is logical;
- Layout of questionnaire is friendly and attractive;
- Measurement scales are understood and valid;
- How well each scale captures the construct that it intended to measure; and
- Structure of the questionnaire.

Individual questions

- Wording is familiar, unambiguous and not confusing the respondent;
- Wording is not offensive and doesn’t embarrass the respondent;
- Questions are not longer than necessary and easy to answer;
- Questions are not ‘double-barrelled’ or double negative;
- Questions or not biased and not leading to correct answer or prevent certain answers;
and
- Categories of options (where needed) are appropriate.

Using their feedback, the instrument was revised further to ensure that the questionnaire was comprehensive, understandable and valid from these experts’ perspective. The respondents provided useful information on the design of the questionnaire and recommended to add 5 more indicators in the barriers that they deemed to be critically important in light of the target Bahrain population. After discussion with the academics and other quality professionals, the suggested additional 5 barrier indicators were added in the survey instrument to make it more comprehensive. Table 4.4 lists these 5 additional barrier indicators along with the associated barrier constructs. It also provides references to studies

where they have been mentioned once or twice and as such were not included in the original selection. These references do however add extra weight to including these barriers as advised by the pilot interviewees.

Table 4.4: List of 5 barriers indicators suggested by structured interviews

Construct	S#	Barriers Indicators
Top management barriers	1	The leaders in our organisation don't set goals and objectives for quality improvement (Sebastianelli and Tamimi, 2003; Minjoon et al., 2004)
	2	Middle managers don't provide an effective link between top manager and operators (Thomas and Armstrong, 2004)
Employees barrier	3	Lack of internal TQM expertise (Ngai and Cheng, 1998; Amaral and Sousa, 2009)
	4	Lack of an appropriate performance evaluation and reward system (Ngai and Cheng, 1998; McFadden et al., 2006)
Process management barriers	5	Organisation tends to have many uncoordinated (ad hoc) quality initiatives (Huq, 2005; Amaral and Sousa, 2009)

The final survey instrument used in this research is given in appendix A.

4.5 Data collection

Secondary data from literature was initially required in this research by the author to gain initial insight into the research problem and identify key issues that would be addressed by the research. Secondary research consisted of investigation of quality and its movement; TQM origin and concept; TQM standards, TQM Award models; cultural perspective of TQM; TQM principles; and TQM implementation barriers. This secondary data collection was taken mainly from paper based books, magazines, journals, periodicals, industry research papers and conference papers. Electronic online databases like Emerald, Elsevier Science, and ABI Inform Global (ProQuest Direct) and many other internet sources were used to aid the search for the relevant literature. The findings from this literature review led to the specification of the conceptual framework and the research hypothesis.

In order to collect primary data, 560 target respondents were selected but only 540 questionnaires were delivered. For ascertaining the target respondent contact information, all available resources were used to select the respondents based on relevance, qualification and experience. The email and phone numbers were collected in a database with stratification details. The Dillman (2009) "tailored design" approach was used to administer the survey. Four emails (pre-notice email, survey release email, reminder email and follow-up survey email thanking both the respondents and the non-respondents) were sent at appropriate

intervals. Before the survey release the targeted respondents were sent an email message to seek their approval. Subject to their approval, the URL address of the online survey questionnaire was sent to them.

The participation was voluntary through the invitational and reminder emails given in the appendix A. A total number of 325 respondents (60%) responded to the survey. It should be noted that although internet access and computer skills of the target respondents were adequate, as Dillman (2009) explains, there is always the possibility that wide-spread distrust of internet communication and increased occurrence of cyber crimes such as phishing scams, identity theft, potential virus threat, and unwanted and offensive email ads, may limit online survey response especially when the respondent is asked to click to another website link. Nevertheless, the benefits of the web survey approach took precedence. In a similar study done in the USA by Dellana and Hausser (1999), the response rate was just 21.9%. Another study on TQM-culture relationship was performed in Australia by Prajogo and McDermott (2005) and yielded a 22.8% response rate. In this context, the 60% response rate in this study is considered excellent and quite acceptable for this type of survey (Dilman, 2009).

4.6 Data analysis

This section provides details of the data management, data screening prior to analysis, treatment of missing data, outlier examination, normality test and reliability analysis tests and selection of statistical analysis tools for data analysis.

4.6.1 Data management

Once the survey was administered and the data were collected from the 325 respondents, the data was downloaded from the online survey website in CSV format. Data was converted to MS Excel (XLS) format and merged into an SPSS database to be analyzed. The dataset exported to SPSS didn't include any information (e.g., name, e-mail address, home or office address) that could identify the individual respondent who provided the information. The only link to respondent information was a reference code that was known by the researcher in case of a need to contact the respondent for any verification. Further to this, all data would be reported in aggregate to avoid any identification of individual responses.

4.6.2 Data management in MS Excel

Q 17.5 and Q 25.7 were deleted because there was no data in these 2 columns. These columns were used as place holders of notes to respondents. Job title was an open ended question and respondents provided various job titles. In order to manage this, answers were scanned for common themes and the given job titles were categorized into 4 groups by the researcher - top management, middle management, quality professionals, and supervisors. In education level, some respondents didn't use the education level categories given in the questionnaire (HSSC, Diploma, Bachelor, Masters and PhD). Instead they gave this information in others field by writing their education level in an open ended text box provided for this purpose. This information was matched with the 5 existing educational level categories for equivalence and the appropriate level was assigned.

4.6.3 Data management in SPSS

The format of the Data file was first prepared in SPSS according to the required data formats. All data elements were completed such as Variable Name, Data Type (numeric, string), width (number of characters), decimals (decimal places), Labels (short description of variables), Values (descriptive value labels of numeric codes to represent non-numeric categories), missing (data missing because the question didn't apply to that respondent), columns (width), alignment, and Measures (scale, nominal, ordinal). Using the SPSS data editor, the data file was prepared defining and labelling the variables and assigning numerical format to each of the questionnaire responses, such as assigning short names to variables; assigning descriptive labels to variables (descriptive labels are self explanatory and act as code book); assigning numerical values to categorical variables (value label e.g. 0=No, 1=yes); and assigning type of measures to each variable (scale, ordinal, nominal).

Once the formatting of the data file structure was prepared, the Data was copied from the Excel sheet and pasted into SPSS. A careful process of sampling was undertaken then to verify the data in the columns and rows for accuracy during the transfer. It was confirmed that all data was in the correct positions.

4.6.4 Data screening prior to analysis

A general precondition of analyzing the data is the accuracy of data. Data errors can occur at both respondent and researcher level - where a respondent may key wrong information e.g. (10 instead of 1) or where the researcher may enter erroneous data (enter the

data in the wrong column/row). Although minimal data entry errors were expected as a result of using the web based survey technique, data screening was undertaken thoroughly, including error checks, handling of missing data, and checking outliers and normality, as any of these may impact on the analysis and hence findings.

4.6.4.1 Checking data for errors

Error checks were made by looking for values that were out of range for a defined value of categorical variables. Using descriptive statistics, frequencies were checked using central tendency, distribution and dispersion methods and no out of range values were detected. Descriptive statistics was also performed to find mean, sum, minimum and maximum by using distribution and dispersion methods. No out of range values were detected. More errors were searched for by selecting and displaying specific pieces of information for each case by summarizing the cases. In addition errors were searched for by sorting cases by each variable in ascending/descending order of their data values. No errors were detected. Duplicate cases were searched for and no duplicate cases were found.

4.6.4.2 Missing data

Missing data is the second critical issue in data analysis. It is a fairly common occurrence in certain areas of research which can affect the results (Tabachnick and Fidell, 2007). In part I of the survey (demographics) there was no missing data observed in the work experience and quality management experience field. However, some data was missing in terms of number of employees. Instead of using statistical techniques to replace this missing data, the researcher used a more proactive and realistic strategy. Respondents were contacted by phone and asked about the number of employees in their company. The number of employees provided by them was used to replace missing data. Some missing data was observed in company type, operation type and QM type. This missing data was carefully replaced using information in 'others' text box where the respondent had supplied an open ended answer (free text). However, some missing data was expected in production process type and product type because these two questions were specific to manufacturers and were not applicable to service industries. Questions on existing organisation culture and TQM implementation barriers were on a likert scale (1 to 5) and answers to these questions were mandatory. Therefore, no missing data error was found in these questions.

4.6.4.3 Checking for Outliers

Outliers are the cases with a value well above or below the majority of cases in the respondent sample (Pallant, 2007 p.62). They occur with an extreme value on one variable or a combination of scores on two or more variables to deviate the statistics (Tabachnick and Fidell, 2007). According to Hair et al (2006, p.73) an outlier is judged to be an unusually high or low value on a variable, or a unique combination of values across several variables that make the observation stand out from the others. As many statistical techniques are sensitive to outliers and an outlier is a score with a distinct characteristic from the rest of the data, therefore the potential outliers need to be checked and assessed.

The web survey software used for data collection had the characteristic to get mandatory response (however, to avoid the bias respondents were provided the option to stay neutral if he/she was not sure of the answer). This strategy circumvented possible outliers to a great degree. Only one response set that involved numeric data was left open and that was for the number of employees in the organisation. Possible outliers were checked using descriptive statistics and selecting histogram plots. All relevant variables were checked and the scores appeared to be reasonably normally distributed. Normal probability plots also supported this result. (The tables and plots of relevant variables are not shown in this thesis for space issues, but are available upon request).

In this study, outliers were assessed using descriptive statistics in SPSS. First all variable of organisational culture were selected and checked for outliers. In the histogram of each variable given in appendix D (figure D1), tails of distribution have no data points sitting on extremes and score drops in an even slope. As shown in the box plots given in the appendix, there were no extreme points. If the boxes in the box plots extend more than 1.5 box-lengths from the edge of the box then it is a sign of potential outliers. Seven such outliers were identified and four of them were marked with asterisks as extreme points that extend more than three box-lengths from the edge of the box. The data file was first checked, and it was found that their scores were genuine and not errors. In addition, the scores were within the range of possible specified scores of the associated variables (mean value and 5% Trimmed Mean value are similar) and as such would not distort the statistics. The same check was undertaken on all variables of TQM barriers. In the histogram of each variable given in appendix D (figure D2), two such outliers were identified, in case number C004 and C013.

The data file was checked and it was found that the scores were genuine and not errors. In addition, the scores were within the range of specified score of these variables.

In order to assess how problematic these few outliers could be, descriptive statistics were run again and a 5% trimmed mean was checked. It was observed that there was no significant difference between the trimmed mean and mean value of these variables. Therefore the identified outlier cases were retained in data file.

4.6.4.4 Normality check

Normality in the distribution of scores is another key assumption in measuring variables. For analysing the data, it is not always required, but is generally regarded as preferable if the variables are normally distributed (Tabachnick and Fidell, 2007). Normality of data can be assessed by statistical methods (Tabachnick and Fidell, 2007 and Hair et al., 2007). It can be measured by Kurtosis and Skewness test and Kolmogorov and the Shapiro method (Field, 2005; Tabachnick and Fidell, 2007; Hair et al., 2007). Initially descriptive statistics were applied in SPSS to assess the skewness and kurtosis (Table D7 – Appendix D). Skewness provides an indication of symmetry of distribution while Kurtosis shows the peakedness of distribution. If the skewness is positive then the scores will be clustered in the left side of graph and if it is negative then scores will be clustered in the right side of graph. Positive Kurtosis scores will be clustered in the centre. If Kurtosis values are below zero then the distribution is flat – having cases in the extremes. Furthermore, the skewness and kurtosis test are sensitive to sample size and therefore researchers suggest inspecting the shape of the distribution using a histogram (Tabachnick and Fidell, 2007). All variables were found to be normally distributed but values for skewness were found mostly negative indicating clustering of scores on right hand side of graph. However, with a large sample like in this study, skewness will not make any substantive difference in the analysis process (Tabachnick and Fidell, 2007 p80). Kurtosis values were mixed negative and positive. Positive Kurtosis means that distribution is peaked (clustered in the centre). Negative Kurtosis indicates a distribution that is flat (too many cases in the extremes). Both negative and positive Kurtosis can result in an underestimate of the variance, therefore Kurtosis score clustered in the centre is desirable. However, this risk is reduced with a large sample (N=325) like this study (Tabachnick and Fidell, 2007 p80 recommends 200+ cases). In addition, Kolmogorov and Shapiro test (Field, 2005) was applied to find the data normality. Results of this test (Table D1 and D2 in appendix C) were found significant for all variables, which might be due to

large sample size (e.g. n=325 in this study) because this test is very sensitive to large sample size and minor deviation from normality show this test as significant, hence the significant K-S test does not reveal departure from normality of data (Field, 2005, p. 93).

4.6.4.5 Main analysis

First part of main analysis consists of analysis of personal and organization demographics; profile of culture; and profile of barriers. Descriptive statistics in SPSS is used for this analysis. Second part of analysis is measuring relationships between organisational culture and TQM implementation barriers.

Generally researchers use regression analysis to examine the relationship between a dependent variable and one or more independent variables. More specifically, regression analysis can be used to understand which independent variables are related to the dependent variable, and to explore the forms of these relationships. This study uses Structural Equation Modelling (SEM) to measure the relationships between the constructs. SEM has become more and more a recognized method for examining the hypotheses and has additional functionality and power over and above regression analysis. The choice of SEM as the analytical tool for this study was based on two major reasons. First, in this study TQM implementation barriers were considered as constructs (or latent variables) that cannot be measured directly or represented by a single metric unit. To the best of knowledge of author, only SEM allows the explicit representation of a distinction between observed and latent variables. Secondly, because it was important to examine several structural relationships between multiple dependent and independent variables simultaneously (i.e. between the four measures of organisational culture and the six constructs of TQM), and this can be done only by using SEM. Due to this characteristic of SEM, it is frequently used in popular, high academic journals as a method of choice because it simultaneously handles multiple dependent variables. It also empirically examines the relationship between many dependent variable and many independent variables of a structural model by combining both measurement model and structural model in one analysis. It will take information about measurement into account while testing the structural relationships. Therefore the design of structural model emerges from measurement model which is latest technique and more reliable.

4.7 Chapter summary

This chapter has presented an overview of the research methodology, the design of which was driven by the research objectives. Various research approaches, strategies, processes and methods were considered, selected and analysed. The population and sample were carefully chosen and the questionnaire was designed to ensure that the maximum response rate was received. The survey instrument was reviewed and tested to ensure validity and reliability. The scales for the study were developed primarily on the basis of a thorough literature review. The item pool for the barriers scale was subjected to quantitative refinement. Content and face validity was assessed in structured interviews in which participants were asked to give their opinions about the items. The participants of the structured interviews were top professionals, and academics who had substantial experience in the area of TQM research. The survey instrument was assessed through participants of the structured interviews for the clarity, comprehensiveness and relevance of the scale items, and items were refined. Data error checks, treatment of missing data, outlier examination, normality test and reliability analysis tests were all carried out. Statistical analysis tools were considered and selected for data analysis. The summary of each research element selected for this study is summarised below in table 4.5.

Table 4.5 Summary of selected research design elements

Research element	Selected type	Reasons for selection
Method	Quantitative	The study measures the relationships between the variables which can be effectively accomplished through quantitative methods.
Philosophy	Positivism	The positivism paradigm initiates a quantitative design to accept or reject hypotheses. This philosophy was replicated in this research by testing the hypotheses to validate theory
Approach	Deductive	Research begins with theory, developing hypotheses, collecting data, analyzing data, presenting findings and drawing inference for supporting a theory. This theory to data approach is deductive
Strategy	Survey	The survey strategy was used in this research because it allows quantitative data to be collected which can be analyzed quantitatively using descriptive and inferential statistics. Data collected using a survey strategy can then be used to suggest possible reasons and produce models for particular relationships between variables
Time	Cross	Single data collection using primary and secondary data

horizon	Sectional	
Sampling	Non-probability	The criteria of including population in this survey were based on relevance, qualification and experience of industry leaders who were decision makers and policy designers/implementers. Therefore non-probability sampling was used because selection was judgmental and probability that each sampling unit would be included was not possible.
Data Collection	Survey questionnaires/ interviews	Online questionnaire was sent to quality practitioners, managers and leaders of organisations through web survey and data was collected online. Structured interviews were conducted with academia and quality professionals
Data Analysis	Quantitative	Descriptive statistics done in SPSS TM 15.0. CFA and SEM undertaken using AMOS TM version 16.0

The web based survey mode administered in this study was inspired by the book “Internet, mail and mixed-mode survey - The tailored design method” by Dillman et al. (2009). This text book was frequently used by author to design and administer the web based survey, increase response rate and design questionnaire.

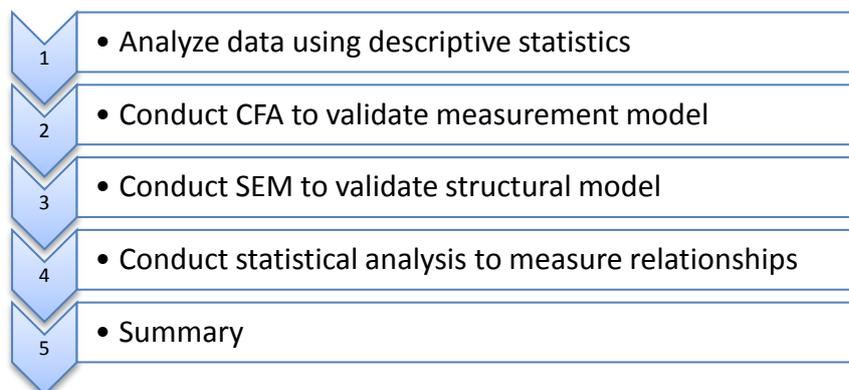
The next chapter presents the context for the research and details the data analysis and results generated from the methodology described above. Results of analysis are used in testing hypotheses and consequently answering the research questions.

Chapter Five: Data Analysis and Findings

5.1 Introduction

This chapter analyses and examines the relationships between the constructs of organisational culture (independent variable) and TQM implementation barrier (dependent variable). A full account of the research methodology was provided in the previous chapter. A quantitative method was applied and data was collected through a survey questionnaire. This data is analyzed in this chapter and findings are presented for further discussion. The analysis comprises data analysis results of descriptive statistics, reliability coefficients for the instrument scales and statistical procedures performed to answer the research questions. As such, the reported results include descriptive statistics of the demographic characteristics of the respondents and their organisations, confirmatory factor analysis (CFA) of the proposed measurement model, and structural equation modelling (SEM) of the construct relationships. The proposed measurement model is assessed on the basis of overall model fit, construct validity and reliability. The structural model is assessed using overall model fit. SEM is used to investigate the relationships between independent variables of organisational culture constructs (group culture, developmental culture, rational culture, and hierarchical culture) and dependent variables of TQM implementation barrier constructs (top management barriers, employee barriers, customer barriers, planning barriers, information management barriers, and process management barriers). The chapter comprises six sections – introduction; analyzing data using descriptive statistics; conducting CFA to validate measurement model; conducting SEM to validate structural model; measuring relationships and summary of the chapter. The overall data analysis process is illustrated in Figure 5.1.

Figure 5.1 Flow chart of data analysis process (Source: author)



5.2 Analyzing data by descriptive statistics

This section will present findings on the demographics of the respondents and their associated organisations; the organisational culture profile of the respondent organisations and the TQM implementation barrier profile of the respondent organisations. The organisational culture and TQM implementation barrier profiles are also examined in relation to the respondent organisation demographics.

5.2.1 Demographic of the respondents

Demographic statistics include personal information, such as job level, education level, work experience and quality experience of respondents. Some demographics relating to organisational information are also included such as number of employees, company type, operation type, production type, production process type and QM type. Many researchers have measured multiple demographic variables (e.g. age, education level, marital status and gender) and used them as control variables, particularly in regression analyses. However, in this study the effects of personal and organisational characteristics are removed from the regression analysis because these variables may undesirably impact on the core relationship examination, that is, the effects of the independent variable of organisational culture on the dependent TQM implementation barriers. Therefore, data on these variables was collected and analyzed only for descriptive purposes. For exploratory purposes, data related to organisational demographics is however, explored to investigate any relationship between the main study variables and organisational demographics which might be of interest for future researchers.

5.2.2 General demographic profile of the respondents

Table 5.1 shows the number of respondents and percentage response rate according to the service and manufacturing sectors that the respondents represent.

Table 5.1 Categories of respondent organisations in service and manufacturing sector

Industry Categories	Questionnaires sent	Questionnaires received	Percentage
<i>Service</i>			
Public services	45	21	47%
Information and communication	15	10	67%
Professional, scientific and technical activities	82	52	63%
Health and social activities	18	12	67%

Wholesale and retail trade	66	39	59%
Education	26	17	65%
Construction and real estate	27	15	56%
Accommodation and food service activities	32	18	56%
Administrative and support services	45	25	56%
Banks	37	22	59%
Other services	12	9	75%
Total service response	405	240	59%
<i>Manufacture</i>			
Chemicals and chemical products	31	20	65%
Food product	18	10	56%
Metal and fabricated metal products	20	14	70%
Non-metallic products	26	18	69%
Oil & Gas	9	5	56%
Paper, wood product	11	6	55%
Textile products	12	7	58%
Other products	8	5	63%
Total manufacturer response	135	85	63%
Grand total	540	325	60%

As shown in table 5.1, data was collected from managers, directors, quality managers and operation managers of 10 categories of service industries and 8 categories of manufacturing industries to ensure that the sample was drawn from a representative population of Bahraini industries and commerce. The sample size of 325 respondents (with a very healthy response rate of 60%) was large enough to represent the population for reliably examining the correlations and prediction power of factors in the measurement models (Tabachnick and Fidell, 2007; Hair et al., 2007).

Table 5.2 illustrates the general demographic profile of the respondents by management level, education level, work experience level and quality experience level. The table also shows findings relating to organisation size, company type and company operation type.

Table 5.2 General demographic profile

Category	Sub category	N	%
Management level	Top management	68	20.9
	Middle Management	106	32.6
	Quality Professional	140	43.1
	Supervisor	11	3.4
	Total	325	100

Education level		
HSSC	2	.6
Diploma	34	10.5
Bachelor	94	28.9
Masters	163	50.2
PhD	32	9.8
Total	325	100
Work experience level		
Less than 1 year	2	0.6
1 to 3 years	8	2.5
4 to 7 years	29	8.9
8 to 15 years	137	42.2
More than 15 years	149	45.8
Total	325	100
Quality experience level		
Less than 1 year	31	9.5
1 to 3 years	50	15.4
4 to 7 years	137	42.2
8 to 15 years	69	21.2
More than 15 years	38	11.7
Total	325	100
Organisation size		
Small	132	40.6
Medium	133	40.9
Large	60	18.5
Total	325	100
Company type		
Primary Manufacturer	92	28.3
Professional Service	112	34.5
Mass service	121	37.2
Total	325	100
Company operation type		
Single	208	64.0
Branch	57	17.5
Multinational	60	18.5
Total	325	100

Table 5.2 shows that the respondents represent different management levels (20.9% belonged to top management, 32.6% to middle management and 43.1% to quality professionals). In terms of their qualification, the respondents are very well educated (9.8%

hold PhDs, 50.2% were Master degree holders and 28.9% had Bachelor degrees. Only 10.5% were diploma holders). In terms of work experience, the respondents represented a class of highly experienced personnel (45.8% respondents had more than 15 years experience, 42.2% had 8 to 15 years of experience and only 8.9% had 4 to 7 years experience). Similarly, in terms of quality management experience, despite the relative short history of QM in the country, the respondents overall had a very high level of quality management experience, one third having 8 or more years experience and three – quarters having at least four years experience.

The demographic results show a relatively balanced representation of organisations by size (small 40.6%, medium 40.9 % and large 18.5%) and by company type (primary manufacturer 28.3%, professional service 34.5%, and mass service 37.2%). In terms of company operation type, single entity local operations accounted for the majority (64.0%), with multi-branch local operations (17.5%), and multinational operations (18.5%) accounting almost equally for the remainder.

One of the important demographic characteristics of the survey sample is the status of the existing quality programme types and their duration. Although the results of these demographic characteristics are not being used as control variables in testing the relationships, this information will be very useful while assessing the TQM readiness of organisations for implementing TQM initiatives. This information is significant in terms of setting a baseline for TQM readiness assessment. Table 5.3 illustrates the results by quality programme type and duration.

Table 5.3 Specific quality program types and their duration

	Quality program type	Not yet	Less than 1 year	1 to 4 years	4 to 7 years	More than 7 years	Total Organisations having this QM type
1	TQM	106	32	141	25	21	219
2	ISO 9000	128	13	27	113	44	197
3	Six sigma	290	6	11	11	7	35
	Total instances	524	51	179	149	72	451

According to the analysis in table 5.3, 219 Bahraini organisations in the sample have TQM, 197 have ISO 9000 and 35 have Six Sigma, with different durations. This table also shows that 32 organisations reported that they had been implementing TQM for less than 1 year. It was argued in section 1.3 that TQM implementation generally takes at least three

years, and often considerably longer. Thus, it is clear that there was a sub-group of organisations in the Bahraini sample who were early on in their TQM implementation journey. However, this more limited experience did not affect these respondents' ability to identify the culture existing in the organisations or the barriers to TQM, because identifying both was not contingent on the amount of TQM experience. Table 5.3 shows that a large number of organisations (187) have TQM in place for at least 1 year. This result is partially out of line with a study by Ernst & Young (2009) on QM Readiness Assessment for organisations in Bahrain, which reported that the overall rate of adoption and demand for QM among organisations is low. It appears that in the last two years demand for more formally specified quality management systems and their adoption has increased measurably in Bahrain. It is also observed that many organisations reporting presence of ISO 9000 are also reporting the presence of TQM.

5.2.3 Organisational culture profile

This section analyses the overall mean scores of each organisational culture type, the mean value of each culture type by each dimension of cultural characteristics, and the mean value of each culture type according to organisation size, operation type, and TQM duration. Table 5.4 presents the overall means, ranking and std. deviation. It also presents the reliability statistics of each organisational culture construct, using the recognized Cronbach alpha method that measures internal consistency, based on the average inter-item correlation (Cronbach, 1951; De Vaus, 2002), together with the number of measurement items in each construct.

Table 5.4 Overall mean of organisational culture types

Type of organisational culture	Mean	Ranking	Std. Deviation	Cronbach's Alpha N-item, 6	N
Hierarchical	4.0	1	.6177	0.789	325
Rational	3.9	2	.6524	0.978	325
Group	3.2	3	1.0923	0.943	325
Developmental	2.9	4	1.0211	0.923	325

In testing the reliability of constructs, Cronbach's Alpha values equal to or above 0.70 are considered to be an acceptable level of reliability (Nunnally, 1978; De Vaus, 2002). The table shows that the reliability of each of the scales is well above the minimum recommended

alpha value (Tabachnick and Fidell, 2007; Hair et al., 2006; Hair et al. 2010). According to the results in table 5.4, hierarchical culture is the most dominant (mean = 4.0), rational culture with a mean score of 3.9 is the second most dominant, while group culture is third in ranking with a mean score of 3.2. Finally, developmental culture was the weakest (mean = 2.9). Table 5.5 illustrates the mean value of cultural characteristics for each of the six dimensions in the CVF framework for each of the culture types.

Table 5.5 Mean value of each six dimensions for each of culture type

	Organisation character	Leadership character	Management style	Binding force	Organisation emphasis	Success criteria
Group	3.0	3.2	3.3	3.2	3.1	3.3
Developmental	2.8	2.9	2.7	2.9	3.1	3.0
Rational	4.0	4.0	4.0	3.9	4.0	4.0
Hierarchical	4.0	4.0	3.9	4.0	4.0	4.0

Overall, table 5.5 shows that the scores on all of the dimensions of cultural characteristics for group and developmental cultures are relatively low. In other words, the relatively low overall mean scores for group and developmental culture types (table 5.4) are not caused by any particular cultural characteristics dimension. Conversely, the score on all dimensions of cultural characteristics for rational and hierarchical culture is relatively high. An important point to note is that the score on each dimension in group, developmental, rational and hierarchical is exceedingly consistent and no significance variance in these scores is observed.

Descriptive statistics tests were also performed to determine the mean scores of organisational culture constructs according to industry sector, type and size which are given in table 5.6.

Table 5.6 Mean value of each culture type by organisation size, type and operation

	N	%	Group	Develop	Rational	Hierarch
Organisation size						
Small	132	40.6	3.1	2.9	4.1	4.0
Medium	133	40.9	3.1	2.8	3.9	4.1
Large	60	18.5	3.6	3.3	3.8	3.9
Total/Average	325	100	3.2	2.9	4.0	4.0
Organisation type						
Primary Manufacturer	92	28.3	2.3	2.1	4.2	4.3
Professional Service	112	34.5	3.6	3.4	4.1	3.9
Mass service	121	37.2	3.5	3.1	3.7	3.8

Total/ Average	325	100	3.2	2.9	4.0	4.0
Operation type						
Single	208	64.0	2.9	2.7	4.0	4.1
Branch	57	17.5	3.5	3.1	3.7	3.8
Multinational	60	18.5	3.8	3.5	4.1	3.9
Total/ Average	325	100	3.2	2.9	4.0	4.0

For comparative purpose there was no previous study found that had measured the cultural profile of Bahraini industries, therefore the results in tables 5.4 and 5.6 couldn't be compared to any previous findings from Bahrain, however, Al-Khalifa and Aspinwall (2001) investigated the cultural profile of Qatar industries, using the CVF framework and the same survey instrument. Additionally, Qatar is an Arab country in Middle East, a Gulf state very close to Bahrain both culturally and geographically. Therefore, comparing results of the present study with Al-Khalifa and Aspinwall (2001) study is valuable. Largely, the results of both studies are the same; however there are slight differences as explained below.

According to results of this study given in the table 5.6, for group culture, the primary manufacturing sector has a low score (2.3) but professional services and mass services sectors have comparatively higher scores (3.6, 3.5). Single local organisations also have a low score (2.9) but local branches that are part of a larger branch network and multinational organisations have significantly higher scores (3.5, 3.8). Small and medium size organisations have relatively low scores (3.1, 3.1) while large size organisations have a higher score (3.6). The study conducted by Alkhalifa and Aspinwall (2001) didn't reveal any difference in score between manufacturing and service industries of Qatar (3.1, 3.0) or between small, medium and large size industries (3.1, 3.2 and 3.0). However, the overall score on group culture of organisations is low (3.1, 3.2) in both Alkhalifa and Aspinwall (2001) study and this study respectively.

In this study, for developmental culture, the primary manufacturing sector has the lowest score (2.1) while the professional services and mass services sector have comparatively higher scores (3.4, 3.1). The mean score is low for single local organisations (2.7), higher in organisations being part of a local branch network (3.1) and significantly higher in multinational organisations (3.5). Small and medium size organisations have relatively low scores (2.9, 2.8) but large size organisations have a higher score (3.3). The study conducted by Alkhalifa and Aspinwall (2001) didn't reveal any difference in score for manufacturing and service industries of Qatar (2.9, 3.0) or for small, medium and large

industries (2.9, 3.1 and 2.9). However, the overall score on developmental culture in both the Alkhalifa and Aspinwall (2001) and this study is relatively low (3.0, 2.9 respectively).

In this study, for rational culture, the primary manufacturing and professional services sectors have high scores (4.2, 4.1) while the mass services sector has a lower but still relatively high score (3.7). The mean score is observed to be high in single local organisations (4.0), a little lower in organisations that are one part of a local branch network (3.7) and highest in multinational organisations (4.1). Small organisations also have a high score (4.1), medium size organisations a little lower (3.9), and large size organisations have a little lower but still relatively high score (3.8). The study conducted by Alkhalifa and Aspinwall (2001) didn't reveal any difference in score in manufacturing and service industries of Qatar (3.4, 3.4) but found a slight difference between small, medium and large size industries (3.4, 3.6 and 3.3 respectively). However, the overall score on rational culture in both studies is relatively high, but higher in the Bahraini sample (4.0) than the Qatar sample (3.4).

For hierarchical culture, the primary manufacturing sector had the highest score (4.3) while the professional services and mass services sector had comparatively lower but nevertheless still high scores (3.9, 3.8). The Score is high in single local organisations (4.0), and a little lower in both organisations that are one part of a local branch network and multinational organisations (3.8, 3.9). Small organisations had a high score (4.0), with medium size organisations a little higher (4.1) and large size organisations a little lower (3.9). As was the case for group, developmental and rational culture types, the study conducted by Alkhalifa and Aspinwall (2001) didn't show any difference in score for manufacturing and service industries of Qatar (3.4, 3.4) and no difference between small, medium and large industries (3.4, 3.4 and 3.4). The overall score on hierarchical culture in their study and this study is relatively high, however it was found to be quite higher in this study (4.0) compared to Qatar's 3.4 (table 5.4).

According to Bardoel and Sohal (1999), attention to the organisational culture is a key requirement for the effective implementation of TQM. It is therefore imperative that organisations understand what cultural make up they have in the first place. It is reasonable to argue therefore that measurement, using CVF, of the different types of culture in each organisation, and of the culture profile across different sectors and types of organisations, and comparison of any differences is valuable to generating a clearer understanding of factors affecting TQM implementation. The preceding analysis provides such an understating for

practitioners and future researchers. In summary, this analysis indicates that in Bahraini industry and commerce, hierarchical and rational culture types dominate the organisational culture profiles, but the difference between these and group and developmental culture is less pronounced in large, or mass service, or multinational organisations.

5.2.4 TQM implementation barriers profile

Table 5.7 presents ranking, overall mean, and std. deviation of the TQM barrier constructs. It also presents the reliability statistics of each barrier construct, using recognized Cronbach's alpha method that measures internal consistency, based on the average inter-item correlation (Cronbach, 1951; De Vaus, 2002).

Table 5.7 Overall mean and std. deviation of TQM barrier constructs

Barrier Construct	Ranking	Mean	Std. Deviation	Cronbach's Alpha	N items In construct	N
Top Management barriers	1	4.3	.5729	0.921	8	325
Employees barriers	2	3.7	.5609	0.850	9	325
Customer barriers	3	3.7	.8461	0.960	4	325
Information Management barriers	4	3.6	.5214	0.769	6	325
Planning barriers	5	3.6	.6560	0.928	4	325
Process management barriers	6	2.2	.7511	0.969	6	325
Mean of all constructs		3.5				
Difference between maximum and minimum value		2.0				

As mentioned previously, in testing the reliability of constructs, Cronbach's Alpha values equal to or above 0.70 are considered to be an acceptable level of reliability (Nunnally, 1978; De Vaus, 2002). The table shows that the reliability of each of the scales is well above the minimum recommended alpha value (Tabachnick and Fidell, 2007; Hair et al. 2010). Overall, the results show relatively high mean scores on five of the TQM implementation barrier constructs (top management barriers, employee barriers, customer barriers, planning barriers and information barriers), reflecting the perceived existing barriers in the survey population. It is reasonable to propose that the existence of these barriers may hamper the full implementation of TQM in the survey population. However, the score was lower on the process management barrier construct suggesting good process management efforts and outcomes within the survey population.

Descriptive statistic test was performed to determine the mean scores of each barrier construct according to industry sector, type and size. The result of mean score on each barrier construct according to industry sector, type and size are given in table 5.8.

Table 5.8 Mean value of each barrier construct by organisation size, type, operation and TQM duration

	Top management barriers	Employees barriers	Customer Barriers	Planning barriers	Process management barriers	Information management barriers
Organisation size						
Small	4.2	3.8	3.8	3.6	2.1	3.7
Medium	4.2	3.8	3.7	3.6	2.2	3.7
Large	4.3	3.5	3.4	3.8	2.5	3.5
Average	4.3	3.7	3.7	3.6	2.2	3.6
Organisation type						
Primary Manufacturer	4.0	3.9	4.1	3.1	1.8	3.8
Professional Service	4.3	3.6	3.5	3.9	2.4	3.5
Mass service	4.3	3.7	3.5	3.7	2.3	3.6
Average	4.3	3.7	3.7	3.6	2.2	3.6
Operation type						
Single	4.2	3.8	3.9	3.5	2.1	3.7
Branch	4.4	3.5	3.4	3.7	2.5	3.6
Multinational	4.3	3.6	3.4	3.9	2.4	3.4
Average	4.3	3.7	3.7	3.6	2.2	3.6
TQM duration						
Not yet	4.4	3.6	3.5	3.8	2.5	3.5
Less than 1 year	4.1	3.6	3.8	3.6	2.5	3.5
1 to 4 years	4.2	3.8	3.9	3.5	1.9	3.7
4 to 7 years	4.1	3.8	3.4	3.5	2.3	3.7
More than 7 years	4.4	3.6	3.7	3.8	2.3	3.7
Average	4.3	3.7	3.7	3.6	2.2	3.6

The top management barrier construct has same score (4.2) in small and medium size organisations and a slightly higher score (4.3) in large size organisations. Small and medium size organisations have the same score of the employee barrier construct (3.8) but large size organisations have a slightly lower score (3.5). The Customer barrier construct score in small size organisations is high (3.8) in medium size organisations a little lower (3.7) and lowest in large size organisations (3.4). The Score on the planning barrier construct in small and medium size organisations was the same (3.6, 3.6) but large size organisations had a slightly higher score (3.8). Process management barriers have lowest score in small size organisations (2.0) a little higher in medium size organisations (2.2) and highest in large size

organisations (2.5). The information barrier construct score was highest in medium size organisations (3.7), slightly lower in small size organisations (3.6) and lowest in large size organisations (3.5).

Comparing the barrier score by organisation type in table 5.8, mass services and professional service organisations had the highest top management barrier construct score (4.3) whilst primary manufacturing organisations had a slightly lower score (4.0). Employee barrier construct was the highest in primary manufacturers (3.9); slightly lower in mass services organisations (3.7) and lowest in professional services organisations (3.6). The customer barrier construct score in primary manufacturers was high (4.1) but a little lower (3.5) in mass services organisations and professional services organisations. The score on planning barrier construct was highest in professional services organisations (3.9), lower in mass services organisations (3.7) and lowest in manufacturing organisations (3.1). The process management barrier construct had the lowest score in primary manufacturing organisations (1.8); slightly higher in mass services organisations (2.3) and highest in professional services organisations (2.4). The information management barrier construct score was highest in primary manufacturing organisations (3.8), slightly lower in mass services (3.6) and lowest in professional services (3.5).

Comparing the barrier score by operation type in table 5.8, organisations that are part of a larger branch network had the highest top management barrier construct score (4.4), multinational organisations had slightly lower (4.3) and single entity local organisations had the lowest (4.2). The employee barrier construct score was highest in single entity local organisations (3.8), lower in multinational organisations (3.6) and lowest in organisation that are part of a larger branch network (3.5). The customer barrier construct score was high (3.9) in organisations that are one part of a larger branch network organisations, but lower (3.4) in multinational and single entity local organisations. The score on the planning barrier construct was highest in multinationals organisations (3.9), lower in organisations that are one part of a larger branch network (3.7) and lowest in single entity local organisations (3.5). The Process management barrier construct had lowest score in single entity local organisations (2.1); slightly higher in multinational organisations (2.4) and highest in organisations that are one part of a larger branch network organisations (2.5). The Information management barrier construct score was highest in single entity local organisations (3.7), lower in organisations that are one part of a larger branch network (3.6) and lowest in multinational organisations (3.4).

Comparing the barrier score by TQM duration in table 5.8, companies not yet having TQM deployed and those with more than 7 years TQM experience were found to have the highest top management barrier construct score (4.4), 1 to 4 years slightly lower (4.2), less than 1 year slightly lower still (4.1), and 4 to 7 years had the lowest score (4.0). One notable observation in these results is that logically organisations with more TQM duration might be expected to have a low score on TQM barriers, however the result indicate that organisations with more than 7 years TQM duration have a higher top management barrier construct score than organisations with 4 to 7 years TQM duration. The reasons for this observation are not immediately clear. In employee barrier construct, the score is: not yet (3.6), less than 1 year (3.6), 1 to 4 years (3.8), 4 to 7 years (3.8), and More than 7 years (3.6). This is another unexpected finding showing that organisations with less than 1 year duration have a lower employee barrier construct score than organisations with 4 to 7 years duration. Again, the reasons for this are not immediately obvious. However, this may be due to the waning of TQM momentum (and organisations may need to refresh their TQM initiatives) (Oakland, 2003). In customer barrier construct: not yet is low (3.5), less than 1 year has high (3.8), 1 to 4 years has the highest (3.9), the 4 to 7 years has the lowest score (3.4) and more than 7 years has high (3.7). In planning barrier construct the companies having TQM not yet has high (3.8), less than 1 year has low (3.6), 1 to 4 years has low (3.5), 4 to 7 years having the lowest score (3.5), for more than 7 years have the highest score (3.8). In process management barrier construct, the companies not yet deployed TQM are having the highest score (2.5), less than 1 year (2.5), the lowest score in 1 to 4 years (1.9), and 4 to 7 years and more than 7 years (2.3). In information management barrier construct, companies having lowest score in companies not yet deployed TQM (3.5), less than 1 year (3.5), 1 to 4 years of TQM duration have the highest score (3.7), 4 to 7 years (3.7), More than 7 years (3.7).

Summarizing the barrier score, in terms of organisation size, in small size organisations employee and customer barrier constructs are higher in score than in medium size organisations, information management barrier construct are higher in score than large size organisations, but top management, planning and process management barrier constructs are highest in large organisations. According to organisation type, in primary manufacturing, employee, customer and information barriers construct are higher, in professional service organisations, planning and process barriers are higher and in mass service organisations top management barriers are higher. According to organisation operation type, in single entity local operation organisations; employee, customer and information management barriers

construct are higher, in local multi-branch organisations, top management and process management barriers construct are higher and in multinationals planning management barrier construct are higher. According to TQM duration, companies that have not yet deployed TQM have the highest score on top management and process management barrier construct, the companies having 1 to 4 years have the highest score on employee, customer and information management barriers and companies having more than 7 years of TQM duration have high score on planning barrier construct.

For completeness, tables 5.9 through 5.14 show the mean scores for each of the individual barrier measurement items for each of the six barriers constructs.

Table 5.9 Individual barrier results of top management barrier construct

Top management barriers	Mean	Std. Deviation	Variance	Valid N
-lack of commitment and support to quality	4.3	0.70	0.48	325
-inadequate resources for employee training	4.4	0.72	0.52	325
-lack of goals and objectives for quality improvement	4.3	0.67	0.45	325
-frequent turnover of managers	4.1	0.74	0.55	325
-many layers of management	4.2	0.73	0.53	325
-management style slows down learning culture	4.2	0.74	0.54	325
-ineffective link of middle management	4.3	0.68	0.46	325
-lack of quality awareness and improvement by managers	4.2	0.73	0.53	325
Overall Mean	4.3			

Table 5.9 shows the mean, standard deviation, and variance of the individual barrier indicators for the top management barrier construct in the Bahraini sample. The results show that all the barrier indicators have a high score, thus showing a lack of commitment and support to quality (4.3), inadequate resources for employee training (4.4), lack of goals and objectives for quality improvement (4.3), frequent turnover of managers (4.1), many layers of management (4.2), management style that slows down learning culture (4.2), ineffective link of middle management (4.3) and lack of creating quality awareness and improvement by middle managers (4.2). Therefore, there is a consensus in the sample population that all indicators of the top management barrier construct are equally high in Bahraini industries.

Table 5.10 shows the results of individual barrier indicators for the employee barriers construct.

Table 5.10 Individual barrier results of employee barrier construct

Employee barriers	Mean	Std. Deviation	Variance	Valid N
-lack of empowerment to apply quality improvement efforts	3.8	0.86	0.73	325
-lack of involvement in improvement projects	3.7	0.85	0.73	325
-lack of training in quality improvement skills	3.6	0.76	0.58	325
-lack of employee training in group discussion and communication techniques	3.8	0.87	0.76	325
-lack of recognition for achievements in quality improvement	3.6	0.77	0.59	325
-lack of job satisfaction	3.8	0.84	0.71	325
-resistance to change	3.8	0.84	0.71	325
-lack of internal TQM expertise	3.7	0.83	0.70	325
-Inappropriate performance evaluation and reward system	3.8	0.85	0.73	325
Overall Mean	3.7			

The individual indicators mean scores will not be repeated here in the text, however, as can be seen, each of the nine individual barrier indicators are thought to contribute largely equally in the organisations sampled in this study. Gauging from these responses there is little doubt as to why Bahraini industries and commerce's quality performance is perceived to lag a significant way behind other countries (Ernst & Young, 2009). Table 5.11 shows the individual barrier indicator results for customer barrier construct.

Table 5.11 Individual barrier results of customer barrier construct

Customer barriers	Mean	Std. Deviation	Variance	Valid N
-lack of effective system to measure customer satisfaction	3.7	0.90	0.80	325
-needs and expectations of customer not assessed	3.7	0.88	0.77	325
-lack of effective customer feedback system	3.7	0.90	0.81	325
-lack of contact with key customers	3.7	0.91	0.82	325
Overall Mean	3.7			

All four individual barrier indicators have the same mean score of (3.7), indicating that each contributes equally. The results show that customer satisfaction still has not been addressed properly in the organisations in the survey population. It appears that the organisations in the survey population haven't yet fully grasped the importance of customer focus in doing business. These organisations appear not to be adequately measuring customer satisfaction, assessing the needs and expectations of customers, or gathering customer feedback, and have insufficient frequent contact with key customers. Table 5.12 shows the individual barrier indicator results for the planning barrier construct.

Table 5.12 Individual barrier results of planning barrier construct

Planning barriers	Mean	Std. Deviation	Variance	Valid N
-strategic plans are not customer driven	3.7	0.69	0.48	325
-strategic plans don't include quality goals	3.6	0.74	0.54	325
-lack of institutionalizing new approaches/tools/techniques	3.6	0.72	0.52	325
-not enough joint planning activities with suppliers	3.6	0.74	0.55	325
Overall Mean	3.6			

The barrier indicator “strategic plans are not customer driven” has the highest score of (3.7); with the other three very slightly lower (3.6). The results show that in the planning barrier construct all individual barrier indicators have a relatively high score. The result suggests that planning processes are underdeveloped and have not been given sufficient attention by the leaders of Bahraini organisation. It is reasonable to argue that these high scores on all barrier indicators of the planning barrier construct should be a source of apprehension for leaders in these firms. Table 5.13 presents the results of mean scores of individual barrier indicator for the process management barrier construct.

Table 5.13 Individual barrier results of process management barrier construct

Process management barriers	Mean	Std. Deviation	Variance	Valid N
-quality initiatives do not include all organisational functions/departments	2.2	1.17	1.36	325
-quality initiative is delegated to selected individuals only	2.2	1.18	1.40	325
-ineffective communication with stakeholders	2.2	1.10	1.20	325
-inadequate resources to effectively employ TQM	2.3	1.18	1.40	325

-cross functional teams are not used	2.2	1.13	1.29	325
-many uncoordinated quality initiatives	2.2	1.16	1.36	325
Mean	2.2			

As can be seen, the mean score for all six indicators are virtually identical, however, as noted in table 5.7 the mean is much lower as compared to the other five barriers constructs. The findings reflect a consensus among the study population that process management barriers to TQM implementation in Bahraini organisations are much less prevalent and much less of a concern. The findings suggest that despite the prevalence of top management, employee and planning barriers, quality initiatives are relatively well distributed throughout the organisations at an operational process level within the firm, shared across a broad range of individuals, and coordinated, and that communication with stakeholders is relatively effective. Therefore, all indicators of process management barrier construct are equally and significantly low and can be a source of satisfaction for leaders of industries. Table 5.14 shows the individual barrier indicators results of the information management barrier construct.

Table 5.14 Individual barrier results of information barrier construct

Information barriers	Mean	Std. Deviation	Variance	Valid N
-poor inter-organisational communication	3.7	0.76	0.58	325
-individuals do not liaise with other departments	3.7	0.76	0.58	325
-lack of disseminating quality and performance information	3.6	0.72	0.52	325
-quality performance is not measured	3.5	0.82	0.67	325
-the best practices/products of others are not benchmarked	3.7	0.78	0.60	325
-lack of enough time to implement quality initiatives	3.7	0.75	0.56	325
Mean	3.6			

Poor inter-organisational communication (3.7), individuals not liaising with other departments (3.7), a lack of disseminating quality and performance information (3.6), quality performance not being measured (3.5), the best practices/products of others not being benchmarked (3.7) and a lack of time to implement quality initiatives (3.7) are all broadly equal contributors to the information barrier construct of TQM implementations evident in the sample of Bahraini firms..

Overall, the preceding analysis of the individual barrier indicators shows that each contributes virtually equally to their respective barrier constructs. No single individual barrier indicator was significantly more prevalent than the others making up the construct. This observation adds weight to the robustness of each of the six barrier constructs systematically developed in the preceding phase of this study (section 2.7).

5.3 Data analysis of hypothesized model using CFA/SEM

In chapter 2 and chapter 3, the researcher specified the factor structure of organisational culture and TQM implementation barriers on the basis of extant literature theory. This factor structure firstly depicts the first part of the measurement model relating to organisational culture that consists of a set of 4 constructs (group, developmental, rational and hierarchical) as the independent variable. As mentioned previously, each construct is made up of six dimensions of organisational characteristics. These constructs have been previously validated by many researchers (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Alkhalifa and Aspinwall, 2001; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009). However, further validation was required in this research as is protocol in all such studies before attempting to examine the hypothesised relationship between the independent and dependent variables. The measurement model has another set of 6 constructs. These are the TQM implementation barrier constructs (top management barriers, employee barriers, customer barriers, planning barriers, process management barriers, information management barriers) which are the dependent variables. Each barrier construct has multiple indicators as discussed in section 2.7, 3.2.2 and 5.2.4.

Therefore, the model has two sets of constructs – organisational culture (4 constructs) and TQM implementation barriers (6 constructs). The hypothesized relationships between these two sets of constructs were developed in chapter 3 and based on the theoretical background reviewed in chapter 2. In order to determine whether the hypothesized relationships exist between the two sets of constructs, the model was tested as is explained in the next two sections (5.3.1 and 5.3.2). The data analysis in this research used AMOS 16.0 software in a two-step process following Hair et al., (2006):

Step 1: Validate Measurement Model of two sets of constructs using CFA (Confirmatory Factor Analysis) – section 5.3.1; and

Step 2: Evaluate Structural Model and examine hypothesized relationships between two sets of constructs using CFA/SEM (Structured Equation Modelling) – Section 5.3.2.

5.3.1 Validating the Measurement Model using CFA

Before evaluating the hypothesized relationships between the two sets of constructs, it was first necessary to validate the constructs. Construct validity is the extent to which a set of measured items actually reflect the theoretical latent construct they are designed to measure. Confirmatory Factor Analysis (CFA) is an appropriate tool to quantitatively assess the construct validity of a proposed measurement theory (Hair et al., 2010). Many researchers have used CFA to determine whether there is empirical support for the proposed theoretical factor structure of constructs or not. CFA provides quantitative measures that assess the construct validity and construct reliability of the theoretical model (Hair et al., 2010).

Following the guidelines of Hair et al. (2010), the stages of validating the measurement model were performed in the following order:

1. Specifying a measurement theory;
2. Constructing the measurement model for two-dimensional measurement structure for a set of six and another set of four constructs ;
3. Performing assessment of the measurement model for overall fit using CFA; and analyzing the reliability and validity of the constructs using CFA.

5.3.1.1 Measurement theory

Generally, two types of measurement theories are used in designing a CFA/SEM model – reflective measures theory and formative measures theory (Hair et al., 2010). In this model, two sets of latent constructs have path estimates that represent the relationships between constructs, similar to beta weights in regression analysis. The measured variables are represented by loadings (termed as standardized regression weights in AMOS) that correspond to the relationships from constructs to variables as in factor analysis.

The model assumes that the constructs cause the measured indicator variables. For example, that top management causes the TQM barrier indicators such as lack of commitment and support to quality and the employees cause barriers like resistance to change. Therefore the measurement theory applied in this model is reflective because:

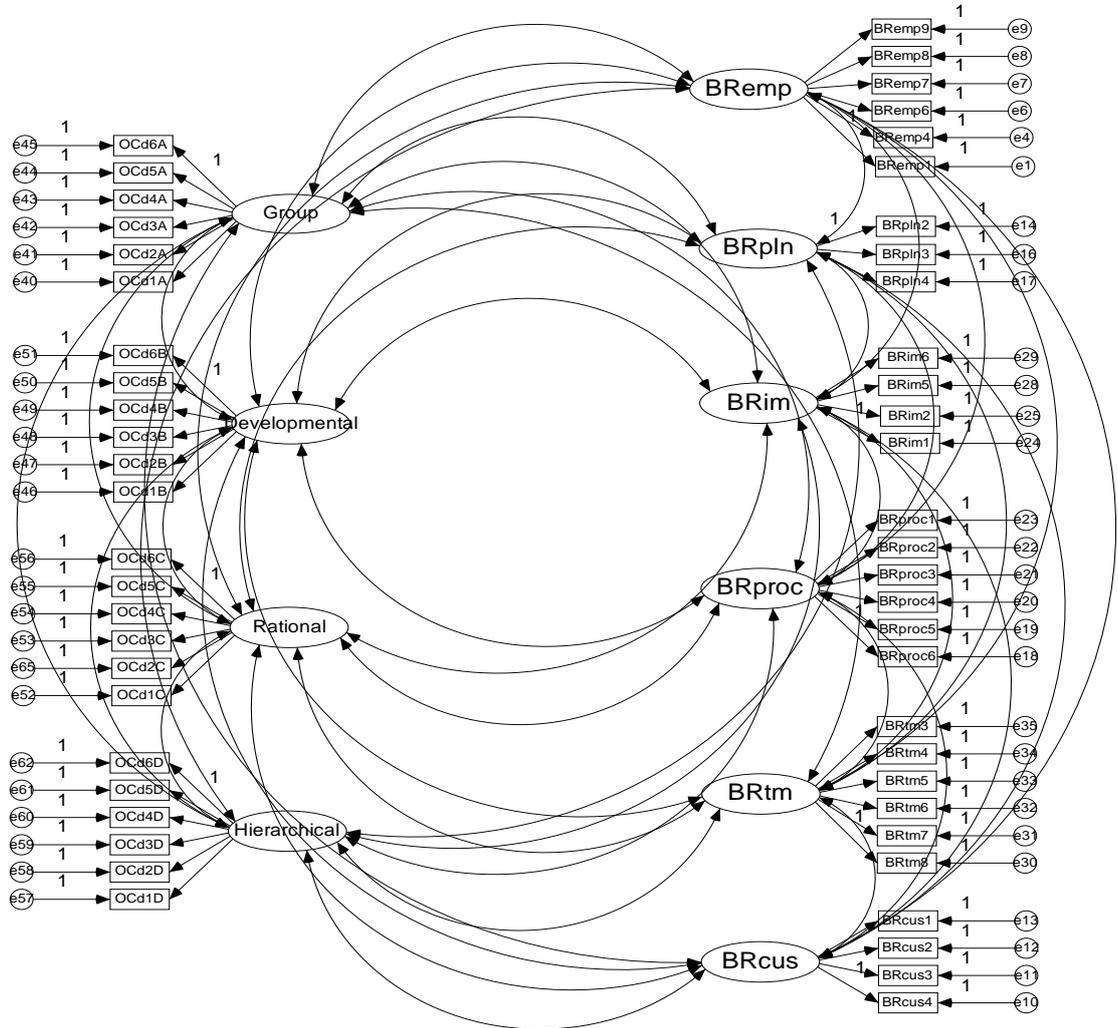
- the indicators are the reflection of constructs, and arrows are drawn from the latent construct to the measured indicators ;
- all indicators of the constructs reflect a common conceptual base;
- all indicators of the constructs highly covary with each other ;
- all indicators of the constructs relate to each other in a similar way; and

- the direction of relationship from constructs to variables also causes an error term that is the direct result of the inability of the construct to fully explain the indicators (Hair et. al., 2010)

5.3.1.2 *Constructing the model*

Figure 5.2 below shows the 10 construct measurement model of culture and barriers. The measured variables are shown as a box with labels corresponding to those shown in the questionnaire. Latent constructs are an oval. Each measured variable has an error term. Two headed connectors indicate covariance between constructs. One headed connectors indicate a causal path from a construct to an indicator (measured) variable without cross-loadings. The assumption of no cross-loadings is based on the fact that the existence of significant cross-loadings is the evidence of a lack of unidimensionality and therefore a lack of construct validity, i.e. discriminant validity. However, in the measurement model all connectors between constructs are two-headed covariances/correlations (Hair et al., 2010).

Figure 5.2 Graphical display of 10 Construct Measurement Model



Note: BRemp = employee barrier, BRcus= customer barrier, BRpln= Planning barrier, BRpro= process barrier, BRim=information barrier, BRtm= top management barrier, Grp= group culture, Dev= developmental culture, Rational= rational culture, Hier= hierarchical culture

After constructing the model, the model was given a test run and the results obtained showed factor loading of 5 variables, BRemp3 (-0.387), BRemp5 (-.399), BRim3 (-.224), BRim4 (0.428) and BRtm2 (0.250) well below the cut-off value (0.5) and hence these were candidates for deletion from the model. According to Hair et al. (2010 p725), factor loadings below the suggested cut-off value should be evaluated for deletion provided that other diagnostic measures are supportive of this action. The sum of their modification indices and residual terms also indicated to make these paths free for testing CFA. According to Hair et al. (2006 p787), for any reflective construct the assumption is that all indicator variables should be caused by the same latent construct and should be highly correlated with each

other. Theoretically then, the individual items are interchangeable and any single item can be left out without changing the construct as long as two conditions are met: 1) the construct must have sufficient reliability and 2) at least three items must be specified to avoid a model identification problem in each latent construct. Therefore, items with low factor loading can be dropped in reflective model without serious consequences as long as the associated construct retains a sufficient number of indicators (Hair et al., 2006). Therefore, the 5 indicators above were removed for testing the CFA model and achieving an acceptable fit. However, further investigation of the modification index and Standardized Residual Covariance matrix revealed that Emp2, BRtm1 and BRpln1 are the most offending variables having high modification index and residual error and therefore these also needed to be removed from the model. Therefore, a total of 8 items were candidates for deletion. Hair et al., (2006 p797) recommend dropping a maximum of 2 out of 15 items. That means in a 60 item model as in this study, the researcher can delete 8 items. This model had 61 items and 8 items were removed from the model (BRemp2, BRemp3, BRemp5, BRim3, BRim4, BRtm1, BRtm2 and BRpln1). Dropping 8 items from such a large battery of items is less consequential (Hair et al., 2006). After modifying the measurement model, accordingly the test was run again, which showed a CFA result above the cut-off value.

So far in this section the author has constructed the measurement model, tested and modified four constructs of TQM implementation barrier by dropping the items with low-factor loadings using standardized estimates and modification indices.

In order to perform assessment of the measurement model, Maximum Likelihood Estimation (MLE) was used for model fit with output of minimization history, standardized estimates, squared multiple correlations and modification indices. The Full AMOS output of CFA is given in Appendix 4, tables 4A, 4B, 4C and 4D.

5.3.1.3 Overall fit test

CFA output includes many fit indices. Table 5.15 presents selected fit statistics from the CFA output. The literature suggests that for model fit, at least one absolute fit index and one incremental fit index is required, in addition to χ^2 results (Hair et al., 2010). Based on the results in Table 5.15, key fit indices including χ^2 measures, absolute fit measures and incremental fit measures are discussed below.

Table 5.15 overall fit indices of CFA

Test	Value	Acceptable value
Chi-square (χ^2)		
Chi-square	2353	
Degrees of freedom	1280	
Significant p-value	<.001	>0.05
Absolute fit measures		
Normed Chi-square	1.839	<5.0
RMR	0.039	<0.080
RMSEA	0.051	<0.070
Incremental fit index		
CFI	0.946	>0.90
TLI	0.942	>0.90
IFI	0.946	>0.90

▪ χ^2 (chi-square) test

The overall model χ^2 was 2353 with 1280 degrees of freedom. The p-value associated with this result should be >0.05 and it is <0.001, suggesting bad chi-square fit. Probability (p-value) is non-significant (χ^2 (1280, N=325) = 2353, p<0.001), suggesting that the proposed model is not consistent with the observed data. However, χ^2 is very sensitive to sample size and model complexity. With large sample size and model complexity such as this, the chi-square values will be inflated (statistically significant), thus might erroneously imply a poor data-to-model fit (Schumacker and Lomax, 2004). In order to make it less dependent on sample size and model complexity, normed chi-square is used which is the ratio of the chi-square fit index divided by degrees of freedom. Therefore, a normalised chi-square (χ^2/df) is recommended as a measure of model fit because of the sensitivity of χ^2 to sample size and complexity (Kline, 2005).

Normed Chi-square is a measure of absolute fit index related with χ^2 . Normed Chi-square is the ratio of Chi square value and degrees of freedom and is measured by χ^2 value divided by the degree of freedom (2353/1280=1.839). Wheaton et al. (1977) suggests that a ratio of approximately five or less is reasonable. However, χ^2 to degrees of freedom ratios in the range of 2 to 1 or 3 to 1 are indicative of an acceptable fit between the hypothetical model and the sample data. Different researchers have recommended using ratios as low as 2 or as

high as 5 to indicate a reasonable fit (Marsh and Hocevar, 1985). However, Hair et al. (2010, p721) suggests that the cut-off value of normed chi-square is 5.0, suggesting any value less than 5.0 is acceptable. Hair et al. (2010) further suggest that a number smaller than 2.0 is considered very good and between 2.0 and 5.0 is acceptable. In this case the normed chi-square value of 1.839 indicates a very good fit.

▪ **Absolute fit measures**

RMSEA (root mean square error of approximation): The RMSEA is a BOF (badness of fit) measure. According to the guidelines provided by Hair et al. (2010), in terms of an absolute fit index, RMSEA provides a reasonable assessment of fit. A value of the RMSEA of about 0.05 or less would indicate a close fit of the model in relation to the degrees of freedom (Browne and Cudeck, 1993). However, the authors further state that this value is based on subjective judgment and it cannot be regarded as infallible or correct, but it is more reasonable than the requirement of exact fit with the $RMSEA = 0.0$. In this context, a value of about 0.08 or less for the RMSEA would indicate a reasonable error of approximation, and any researcher would not want to employ a model with RMSEA greater than 0.1 (Browne and Cudeck, 1993). Thus, authors suggest that a RMSEA value of 0.08 or less would indicate an acceptable model fit. However, models with error values less than 0.05 would indicate an excellent fit (Jöreskog and Sörbom, 2001). Hair et al. (2010 -p721) suggest that the cut-off value of RMSEA should be <0.070 for sample of the size and with the number of observed variables as there are in this study. RMSEA is an absolute fit index and its value in this model is 0.051. This value is well below the cut-off line of 0.070, set by Hair et al. (2010) and 0.080 set by Browne and Cudeck (1993). Thus, RMSEA provides additional support for model fit.

RMR (root mean square residual): The root mean square residual (RMR) is also a badness of fit (BOF) measure. Simply stated, it is the difference between the observed correlation and the predicted correlation. Therefore, the smaller the RMR is the better. An RMR of zero indicates a perfect fit. According to table 5.15, results show an RMR value of 0.039. The cut-off value of RMR is <0.08 (Hair et al., 2010 -p721). In this case the RMR value of 0.039 is considerably less than the cut-off value of 0.080, and thus RMR provides additional support for model fit.

In summary, both absolute fit indices (RMSEA and RMR) signify a very good fit of the measurement model.

- **Incremental fit measures**

One key GOF measure CFI (comparative fit index) is a very widely used index for incremental fit index (Hair et al., 2010). CFI compares the discrepancy, the degrees of freedom and the non-centrality parameter estimate for the model being evaluated, and the baseline model. The CFI is identical to the McDonald and Marsh (1990) relative non-centrality index (RNI), except that the CFI is truncated to fall in the range from 0 to 1. CFI values close to 1 indicate a very good fit. However, CFI values less than 0.90 are not usually associated with a model that fits well (Hair et al., 2010). In this CFA model, CFI was found to be 0.946 – higher than the cut-off line of 0.90 set by Hair et al. (2010) for a model of this complexity and sample size. Two other associated incremental fit indices, the TLI (Tucker-Lewis coefficient index) and IFI (incremental fit index) were also found to have value of 0.942 and 0.946 respectively - both higher than the cut-off line of 0.90. Thus, three incremental fit tests also provide reasonable evidence of good fit of measurement model.

In summary, GOF (goodness of fit) measures CFI, TLI, IFI and Factor loading were all found to be in the acceptable range and three BOF (badness of fit) measures (Normed Chi-square, RMSEA and RMR) were also acceptable. Therefore, the CFA results suggest that this measurement model provides good fit and that it is suitable to proceed to further tests such as construct validity of the model.

In this section the results have confirmed one of the major validity tests of overall fit of the measurement model. The second major validity test of construct validity of the measurement model is discussed in the next subsections.

5.3.1.4 Construct validity

Construct validity has four main components, face validity, convergent validity, discriminant validity and nomological validity, along with reliability statistics (Hair et al., 2010).

- **Face validity**

Face validity is widely considered to be the most important validity test (Tabachnick and Fidell, 2007). Face validity is the extent to which the content of the item is consistent with the construct definition, based solely on researcher's judgment and it must be established before theory testing (Hair et al., 2010). Without an understanding of an item's

content and meaning, it is impossible to express and specify a measurement theory (Hair et al, 2010 p 710). According to Wacker (2004), face validity is a logical test to determine if the measures are accurate representations of the properties of the formal conceptual definition. If these measures do not make sense, then they do not accurately represent the concept.

The measurement model has two sets of constructs – organisational culture (4 constructs) and TQM implementation barriers (6 constructs). The set of 4 constructs of organisational culture is developed from the CVF framework. This framework has been validated and used by many researchers and has been proved as a reliable framework for determining organisation culture as explained in chapter 2, section 2.6.3. Therefore, there is no need to revalidate this set of constructs. However, the 6 constructs of TQM implementation barriers did require a consideration of face validity test.

The systematic methodology adopted in this study for deriving the commonly cited significant TQM implementation barriers from literature is a unique contribution. The author performed systematic secondary research on the potential barriers that inhibit the process of TQM development. The study focused on identifying the barriers that plague organisations in relation to TQM implementation, and used a three step process as discussed in chapter 2, section 2.7 to identify the most commonly cited barriers from the literature. In addition to the above validation through the literature, the content validity of the constructs was ensured through the pilot testing of the survey questionnaire through structured interviews with 12 selected prominent quality practitioners and academics, taking their feedback on content, clarity and style of the questionnaire (chapter 4, section 4.4.3). This feedback on the survey questionnaire was taken from field experts, quality professionals and TQM managers and who were similar to the target population. The aim was to establish whether the content of the items was consistent with the construct definition or not. The targeted respondents for the structured interviews were selected based on relevance, qualification and experience. The structured interviews confirmed the content validity of items and face validity of the constructs.

- **Convergent validity**

A Convergent validity test ensures that the items are indicators of a specific construct and converge or share a high proportion of variance in common (Hair et al., 2010). The model has 10 constructs, each having multiple indicators and therefore, needed to be tested for convergent validity. Convergent validity can be estimated by three measures – factor loading, AVE (average variance extracted) and reliability.

Table 5.16 shows loading estimates, AVE and reliability for measurement model using following three cut-off values:

1. Standardized loading estimates should be 0.5 or higher and ideally 0.7 or higher;
2. AVE of >0.5 indicates adequate convergence; and
3. Reliability should be 0.7 or higher.

- **Factor loading**

High loadings on a factor indicate that they converge on a latent construct. At a minimum, all factor loadings should be statistically significant. Nevertheless, even a significant loading could also be fairly weak in strength. Therefore standardized loading estimates should be 0.5 or higher and ideally 0.7 or higher. Table 5.16 presents the Standardized Regression Weights of each construct. It shows high factor loadings, mostly > 0.7 with none less than 0.5. Therefore, factor loading confirmed convergent validity. (As a reminder, the AMOS output of CFA is given in Appendix 4, table 4A, 4B, 4C and 4D.)

- **Average Variance Extracted (AVE)**

With CFA, AVE is calculated as the mean variance extracted for the items loading on a construct. AVE is calculated as the total of all squared standardized factor loadings (squared multiple correlations) divided by the number of items. An AVE of >0.5 indicates an adequate convergence. In table 5.16, AVE for 9 out of 10 constructs is > 0.6 and one construct is slightly less than 0.5. Therefore, AVE strongly confirms convergent validity.

Table 5.16 - Convergent validity – AVE and reliability for CFA model													
	BRem	BRcus	BRpln	BRpro	BRim	BRtm	Grp	Dev	Rational	Hier	squared factor loading	std. item	Delta SE
BRemp1	0.97										0.95		0.05
BRemp4	0.87										0.75		0.25
BRemp6	0.99										0.97		0.03
BRemp7	0.89										0.79		0.21
BRemp8	0.91										0.83		0.17
BRemp9	0.96										0.93	4.29	0.07
BRcus1		0.92									0.85		0.15
BRcus2		0.86									0.74		0.26
BRcus3		0.99									0.98		0.02
BRcus4		0.93									0.86	3.43	0.14
BRpln2			0.96								0.92		0.08
BRpln3			0.75								0.57		0.43
BRpln4			0.93								0.87	2.36	0.13
BRproc1				0.95							0.91		0.09
BRproc2				0.92							0.84		0.16
BRproc3				0.91							0.83		0.17
BRproc4				0.93							0.86		0.14
BRproc5				0.88							0.78		0.22
BRproc6				0.91							0.83	5.04	0.17
BRim1					0.75						0.56		0.44
BRim2					0.98						0.96		0.04
BRim5					0.79						0.63		0.37
BRim6					0.96						0.92	3.06	0.08
BRtm3						0.78					0.60		0.40
BRtm4						0.57					0.32		0.68
BRtm5						0.99					0.98		0.02
BRtm6						0.84					0.70		0.30
BRtm7						0.67					0.44		0.56
BRtm8						0.99					0.97	4.03	0.03
OCd1A							0.74				0.54		0.46
OCd2A							0.86				0.74		0.26
OCd3A							0.88				0.77		0.23
OCd4A							0.89				0.79		0.21
OCd5A							0.88				0.78		0.22
OCd6A							0.89				0.79	4.41	0.21
OCd1B								0.81			0.65		0.35
OCd2B								0.85			0.72		0.28
OCd3B								0.71			0.50		0.50
OCd4B								0.86			0.74		0.26
OCd5B								0.88			0.77		0.23
OCd6B								0.79			0.62	4.01	0.38
OCd1C									0.93		0.86		0.14
OCd2C									0.94		0.88		0.12
OCd3C									0.97		0.94		0.06
OCd4C									0.95		0.89		0.11
OCd5C									0.97		0.93		0.07
OCd6C									0.88		0.78	5.28	0.22
OCd1D										0.60	0.36		0.64
OCd2D										0.71	0.51		0.49
OCd3D										0.53	0.29		0.71
OCd4D										0.63	0.40		0.60
OCd5D										0.78	0.61		0.39
OCd6D										0.51	0.26	2.43	0.74
Avg. factor loading	0.93	0.93	0.88	0.92	0.87	0.80	0.86	0.82	0.94	0.63			
AVE	0.72	0.86	0.79	0.84	0.76	0.67	0.74	0.67	0.88	0.40			
Reliability	0.98	0.96	0.92	0.97	0.93	0.88	0.94	0.92	0.98	0.80			

Table 5.16 Convergent Validity – AVE and reliability for CFA model

Note:BRem = employee barrier, BRcus= customer barrier, BRpln= Planning barrier, BRpro= process barrier, Brim=information barrier, BRtm= top management barrier, Grp= group culture, Dev= developmental culture, Rational= rational culture, Hier= hierarchical culture

- **Construct reliability**

Reliability is computed from the squared sum of factor loadings for each construct and the sum of error variance terms for the construct:

$$\text{Construct reliability} = \frac{(F1 + F2 + F3 + F4 + F5 + F6)^2}{(F1 + F2 + F3 + F4 + F5 + F6)^2 + (SE1 + SE2 + SE3 + SE4 + SE5 + SE6)}$$

Where F is the value of each factor loading and SE is the error variance term for each factor loading value. Reliability should be 0.7 or higher to indicate adequate convergence or internal consistency (Tabachnick and Fidell, 2007; Hair et al., 2006). Table 5.16 shows reliability of 8 constructs >0.9 and 2 constructs > 0.8, indicating a high degree of reliability of constructs. The high construct reliability indicates that internal consistency exists and the measures consistently represent the same latent construct.

- **Discriminant validity**

Discriminant validity is the extent to which a construct is truly distinct from other constructs (Hair et al., 2006). The main attribute of discriminant validity is that individual items should represent exactly one latent construct without having cross-loading. Thus any indication of cross-loading, points towards a discriminant validity problem. The most rigorous test of discriminant validity is by comparing the average of variance extracted (AVE) for any two constructs with the square of correlation estimates between them.

Table 5.17 examines the inter-construct covariance, but after standardization the covariances are expressed in correlations. For establishing the discriminant validity AVE estimates are compared with the squared inter-construct correlations of each factor. For discriminant validity, the AVE estimates should be greater than the squared correlation estimates (Hair et al., 2006). In this research, the AVE (shown in bold italics in table 5.17) is larger than any squared correlation of the constructs, which significantly supports discriminant validity. In addition, all correlations confirm the discriminant validity (see table 5.17). Secondly, estimated correlations among factors are less than or very close to the recommended value of 0.85 (Kline, 2005), which also supports discriminant validity. Therefore, the adopted measurement model appears to exhibit discriminant validity and does not feature any cross-loading among measured variables.

Table 5.17 Discriminant validity

	Hierarchical	Rational	Developmental	Group	BRtm	BRim	BRproc	BRpln	BRcus	BRemp
Hierarchical	0.40									
Rational	0.268	0.88								
Development	0.008	0.022	0.67							
Group	0.002	0.021	0.231	0.74						
BRtm	0.016	0.013	0.073	0.092	0.67					
BRim	0.003	0.016	0.213	0.237	0.013	0.76				
BRproc	0.046	0.000	0.106	0.095	0.002	0.036	0.84			
BRpln	0.007	0.000	0.265	0.259	0.059	0.095	0.020	0.76		
BRcus	0.028	0.003	0.116	0.130	0.024	0.047	0.059	0.047	0.86	
BRemp	0.024	0.000	0.123	0.126	0.017	0.058	0.054	0.048	0.375	0.72

Note: BRemp = employee barrier, BRcus= customer barrier, BRpln= Planning barrier, BRproc= process barrier, BRim=information barrier, BRtm= top management barrier, Group= group culture, Developmental= developmental culture, Rational= rational culture, Hierarchical= hierarchical culture

▪ **Nomological validity**

For nomological validity, the constructs are expected to relate to one another significantly in the predicted direction (Hair et al., 2006). Nomological validity demonstrates that empirical findings match hypothesised patterns. In order to ensure nomological validity of the measurement model, the correlations between the factor scores for each construct should relate to one another significantly in the predicted direction. In the table 5.18 the correlation between hypothesized factor scores for 11 hypothesised relationships is highlighted showing the direction and significance of relationships. The results support that these constructs are related to one another as hypothesized theoretically in the chapter 3 (section 3.4) and thus provide evidence of nomological validity.

Table 5.18 Nomological validity

	Hierarchical	Rational	Developmental	Group	BRtm	BRim	BRproc	BRpln	BRcus	BRemp
Hierarchical	1									
Rational	0.518	1								
Development	-0.092	0.148	1							
Group	-0.04	0.146	0.265	1						
BRtm	-0.126	-0.115**	0.271	0.303***	1					
BRim	0.051	-0.125	-0.461	0.487***	-0.115	1				
BRproc	-0.215***	-0.021	0.325	0.308	-0.045	-0.191	1			
BRpln	-0.083*----	0.021	0.515	0.509	0.242	-0.308	0.14	1		
BRcus	0.166	0.054*-	-0.341*-	0.360***	-0.156	0.217	-0.242	-0.216	1	
BRemp	0.154	-0.007*-	-0.351*-	0.355***	-0.13	0.241	-0.233	-0.218	0.612	1

***Significant at 0.001 level. ** Significant at 0.01 level. * Significant at 0.05 level.

Note:BRemp = employee barrier, BRcus= customer barrier, BRpln= Planning barrier, BRproc= process barrier, Brim=information barrier, BRtm= top management barrier, Group= group culture, Developmental= developmental culture, Rational= rational culture, Hierarchical= hierarchical culture

5.3.1.5 Summary of assessment of measurement model

In this section, the author has confirmed the validity of the measurement model of two sets of constructs using CFA by drawing the measurement model with the six and four constructs respectively, assessing the goodness of fit by performing CFA on the data and analyzing and assessing the reliability and construct validity of the measurement model. Moreover, the empirical results suggest that a 2-set construction of the model comprising 10 constructs (4 constructs of organisational culture as independent variable and 6 constructs of TQM implementation barrier as dependent variable) provide the best fit for the data, supporting a two-dimensional measurement structure. As a result, the measurement model shows a reasonable fit for the data collected in the target population (see table 5.16, 5.17 and 5.18). Thus, this model can be used for all subsequent analysis and hypotheses testing.

After successful assessment of the measurement model through CFA, in the next stage of data analysis the evaluation of the structural model and investigation of hypothesized relationships between the two sets of constructs was performed using SEM.

5.3.2 Testing the structural model using SEM

The measurement model provides the foundation for all further theory testing and provides a basis for assessing the validity of the structural model (Tabachnick and Fidell, 2007; Hair et al., 2006). The measurement model was developed based on theory and then tested with CFA. Therefore, in the second step, the structural theory was tested.

The structural theory is a conceptual representation of structural relationships between both sets of constructs. It is expressed in terms of a structural model that represents the theory with structural equations, and is depicted with a visual diagram (Figure 5.3). The structural relationships between any two constructs from each set of constructs are represented empirically by the structural parameter estimates or path estimates. The structural model applies structural theory by specifying which constructs are related to each other and the nature of the relationship. These relationships can be expressed as regression coefficients.

SEM is used to estimate an empirical measure of the relationships between both sets of constructs to assess how well the theory fits the data (Tabachnick and Fidell, 2007; Hair et al., 2006). The results of this model fit allow us to contrast theory against reality in terms of the data collected from the target population.

For testing the structural theory, structural parameter estimates should be statistically significant in the predicted direction (Tabachnick and Fidell, 2007; Hair et al., 2006). They should be greater than zero for a positive relationship and less than zero for a negative relationship. According to the theory in this research (see conceptual framework in section 3.4) each type of organisational culture (group, developmental, rational and hierarchical) existing in an organisation has an impact on certain TQM implementation barriers. Following the guidelines of Hair et al. (2010), the next stages of validating the structural model were performed in the following order:

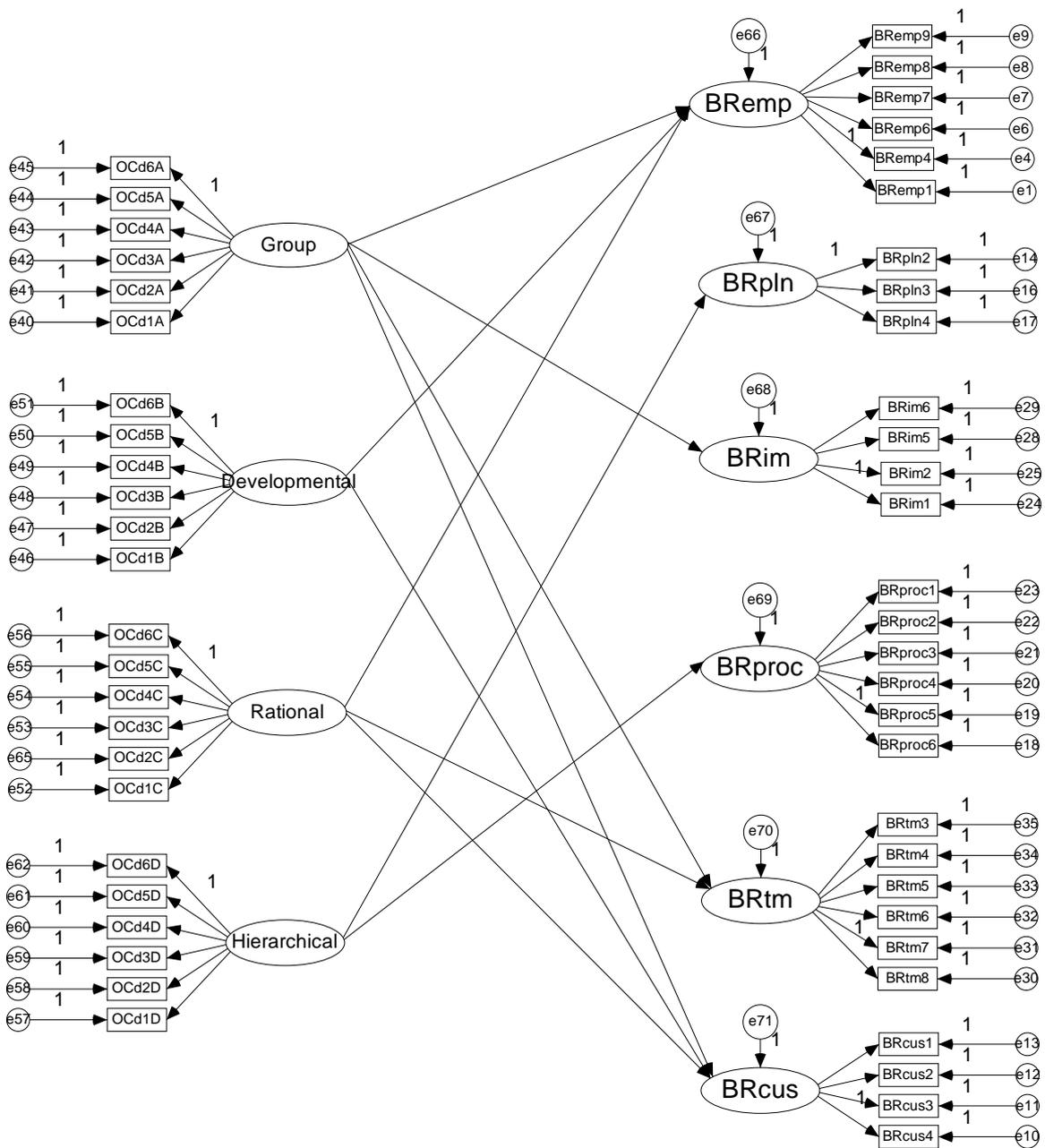
1. Constructing a structural model,
2. Validating structural model for overall fit using CFA/SEM, and
3. Investigating hypothesized relationships between two sets of constructs using SEM.

5.3.2.1 Constructing a structural model

In testing the structural model, the primary focus shifts to the relationships between constructs. SEM empirically examines the structural model by combining both measurement model and structural model in one analysis. In SEM, the correlational relationships are replaced with dependence relationships. Therefore the design of the structural model emerges from the measurement model. It takes information about measurement into account while testing the structural model (Hair et al., 2006).

The path diagram in figure 5.3 is a graphical representation that employs arrows and parameters to depict the relationships that link both sets of constructs. In this model, there are two types of free parameter connections – exogenous constructs and endogenous constructs. The four exogenous constructs of organisational culture (group culture, developmental culture, rational culture and hierarchical culture) appear on the left-hand side of the model (fig 5.4) and are represented as independent variables. Endogenous constructs in this model are considered as outcome of exogenous constructs as hypothesized. The six endogenous constructs of TQM implementation barriers (top management barrier, employee barriers, customer barrier, planning barriers, process management barrier and information management barrier) appear on the right-hand side of the model (see Figure 5.3).

Figure 5.3 Graphical display of 10 construct structural model



Note: BRemp = employee barrier, BRcus= customer barrier, BRpln= Planning barrier, BRpro= process barrier, BRim=information barrier, BRtm= top management barrier, Grp= group culture, Dev= developmental culture, Rational= rational culture, Hier= hierarchical culture

5.3.2.2 Assessment of structural model (SEM)

The Structural model is tested in the same way as the CFA model (previous section 5.3.2). More than one fit indices were used to test the model. In this assessment, one absolute fit index, one incremental index and χ^2 was used as a minimum.

- Overall model fit

The SEM output includes many fit indices. This research checked key fit indices including χ^2 statistics, the CFI and the RMSEA to provide an assessment of fit. Table 5.19 presents the selected fit statistics from the SEM output.

Table 5.19 Overall fit indices – hypothesized structural model

Test	Value SEM	Acceptable value
Chi-square (χ^2)		
Chi-square	3275	
Degrees of freedom	1314	
Significant p-value	<0.001	>0.05
Absolute fit measures		
Normed Chi-square	2.493	<5.0
RMSEA	0.068	<0.070
Incremental fit index		
CFI	0.901	>0.90
TLI	0.902	>0.90
IFI	0.901	>0.90

- χ^2 (chi-square) test

The overall model χ^2 was 3275 with 1314 degrees of freedom. The p-value associated with this result should be >0.05 and it is <0.001, suggesting bad chi-square fit. Probability (p-value) is non-significant (χ^2 (1314, N=325) = 3275, p<0.001), suggesting that the proposed model is not consistent with the observed data. As explained in section 5.3.2.1, in large complex samples with many variables and degrees of freedom such as this sample, the observed chi-square will nearly always be statistically significant, even when there is a reasonably good fit to the data. Therefore, chi-square statistic is used more as a descriptive index of fit, rather than as a statistical test. In order to make it less dependent on sample size and complexity, normed chi-square is used which is the ratio of the chi-square fit index divided by degrees of freedom. Therefore, a normalised chi-square (χ^2/df) is recommended as a measure of model fit because of the sensitivity of χ^2 to sample size and complexity (Kline, 2005).

Normed Chi-square is the ratio of Chi square value and degrees of freedom and is measured by χ^2 value divided by the degree of freedom ($3275/1314=2.493$). Hair et al. (2010, p721) suggests that the cut-off value of normed chi-square is 5.0, suggesting any value less than 5.0 is acceptable. Authors further suggest that a number smaller than 2.0 is considered very good and between 2.0 and 5.0 is acceptable. In this case the normed chi-square value of 2.493 indicates an acceptable fit.

Absolute fit measures

As discussed in section 5.3.1.3, for model fit at least one absolute fit index and one incremental fit index is required, in addition to the normed chi-square results (Hair et al., 2010). RMSEA is an absolute fit index and its value was found to be 0.068 (table 5.19). This value is below the cut-off line of 0.070 as recommended by Hair et al., (2010). Thus, the RMSEA provides additional support for model fit. More literature evidence regarding the cut-off value for RMSEA was provided in section 5.3.1.3.

Incremental fit measures

In the incremental fit indices, CFI is the most widely used index. In this SEM model, CFI is 0.901 – higher than the recommended cut-off line of 0.90 for a model of this complexity and sample size (Hair et al., 2010). As given in table 5.19, two other incremental fit indices TLI and IFI also returned values of 0.902 and 0.901 respectively, both higher than the cut-off line of 0.90. More literature evidence regarding cut-off value was provided in section 5.3.1.3.

As structural model is based on CFA therefore, if the structural model test results are substantially different than those of CFA, then it is argued that the structural theory lacks validity (Hair et al., 2006). In this context, the results of the CFA and the structural model were also compared, as shown in table 5.20.

Table 5.20 Comparison of results of CFA and SEM

Test	Value CFA	Value SEM	Acceptable value
Chi-square (χ^2)			
Chi-square	2353	3275	
Degrees of freedom	1280	1314	
Significant p-value	<0.001	<0.001	>0.05
Absolute fit measures			
Normed Chi-square	1.839	2.493	<5.0
RMSEA	0.051	0.068	<0.070
Incremental fit index			
CFI	0.946	0.901	>0.90
TLI	0.942	0.902	>0.90
IFI	0.946	0.901	>0.90

The comparison of both models doesn't show any significant difference in fit statistics. Furthermore, comparing the loading estimates also didn't indicate any problem with the structural model, as shown in Appendix 6, (Table 6A that shows standardized Regression Weights of all variables in terms of CFA and SEM having no significant difference in output).

In summary the, overall fit statistics of Chi-square, CFI, TLI, IFI and factor loading are all within the acceptable range and BOF (badness of fit) measures, Normed Chi-square and RMSEA are also acceptable. Therefore, the SEM model results suggest that this structural model provides a good fit, and that it was found suitable to proceed to further examination of testing the relationships.

5.3.2.3 Evaluating hypothesized relationships using SEM

The successful evaluation of the structural model as above, confirmed that model could be used for all subsequent analysis and hypothesis testing. In constructing the structural model, the researcher had systematically added direct paths from the four cultural constructs to six TQM implementation barrier constructs as shown in figure 5.4 to verify what type of culture variables contribute directly to the TQM implementation barrier constructs under study and to answer the main research question in this study. The complete AMOS output is given in Appendix 5, table 5A, 5B and 5C, and summarized in table 5.21. This table also shows standard error, critical ratio, statistical significance and direction of regression path.

Table 5.21 Hypothesis test results

Structural Relationship (Regression path)	Standardized Regression Weights (β)	S.E.	C.R. (t-value)	ρ
BRtm \leftarrow Group	.323	.034	5.918	***
BRemp \leftarrow Group	-.316	.039	-5.716	***
BRcus \leftarrow Group	-.362	.040	-6.569	***
BRim \leftarrow Group	-.489	.028	-8.406	***
BRemp \leftarrow Developmental	-.073	.046	-1.318	.187
BRcus \leftarrow Developmental	-.030	.046	-.558	.577
BRtm \leftarrow Rational	-.159	.053	-3.007	.003**
BRemp \leftarrow Rational	.048	.060	0.901	.368
BRcus \leftarrow Rational	.110	.061	2.079	.038*
BRpln \leftarrow Hierarchical	-.086	.019	-7.895	***
BRproc \leftarrow Hierarchical	-.215	.168	-3.301	***

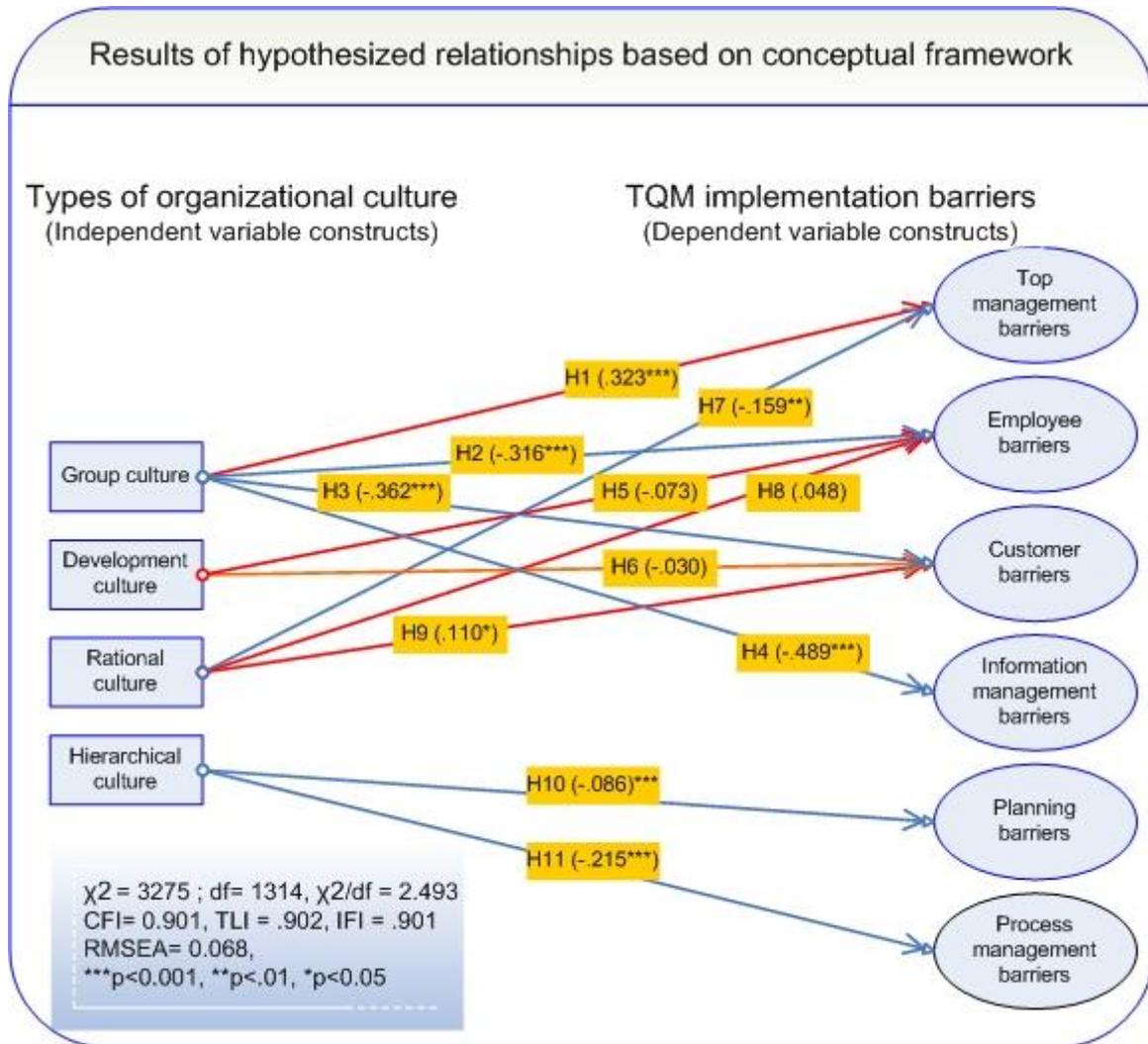
***Significant at 0.001 level, ** Significant at 0.01 level, * Significant at 0.05 level.

Note: BRem = employee barrier, BRcus= customer barrier, BRpln= Planning barrier, BRpro= process barrier, BRim=information barrier, BRtm= top management barrier

After running the model in AMOS, the results as presented graphically in Figure 5.4 were obtained showing the hypothesised structural model of the antecedent and consequences of the TQM implementation related constructs. In addition to fit indices, the structural model needs further evidence to support the theory proposed. One of the fundamental conditions in hypothesis testing of this nature is that the parameter estimates should be statistically significant and in the predicted direction.

As shown in figure 5.4, the path coefficients (highlighted in yellow) were not as comprehensively conclusive as those regarding the fit indices. For example, the direction of correlation parameter estimations between group culture and the top management barrier construct; rational culture and the customer barrier construct; and rational culture and the employee barrier construct are not as was originally predicted. Nevertheless, despite these unexpected outcomes, the rest of the variables in the standardised solution show reasonable correlation parameter estimates in the predicted direction. As such, these findings support the vast majority of the hypotheses. Additionally, most of the parameter estimates are statistically significant at the 0.001, 0.01 and 0.05 levels of significance, as shown in table 5.21. Figure 5.4 below shows the path diagram of constructs, estimates of standardized regression weight with significance and direction.

Figure 5.4 Hypothesised structural model of organisational culture and TQM barrier constructs



Using path estimates, 11 hypotheses were examined in this study, 6 hypotheses were supported and 5 were not supported as shown in table 5.22. For accepting a hypothesis, the independent variable should be negatively and significantly related to the dependent variable.

Table 5.22 Summary of Results of Hypotheses Testing

Hypotheses	Result
H1- Group culture decreases top management barriers	Not Supported
H2- Group culture decreases employee barriers	Supported
H3- Group culture decreases customer barriers	Supported
H4- Group culture decreases information barriers	Supported
H5- Developmental cultures decreases employee barriers	Not Supported
H6- Developmental culture decreases customer barriers	Not Supported
H7- Rational culture decreases top management barriers	Supported
H8- Rational culture decreases employee barriers	Not Supported
H9- Rational culture decreases customer barriers	Not Supported
H10- Hierarchical culture decreases planning barriers	Supported
H11- Hierarchical culture decreases process barriers	Supported

The findings for each hypothesis are presented in turn below:

- **Group culture and TQM implementation barriers**

- H1. Hypothesis H1 proposed that the presence of group culture decreases top management barriers. Figure 5.4 and table 5.21 show that the independent predictor variable of group culture to top management barriers was found to be positively and significantly related to the dependent variable ($\beta = +.323$, $P < 0.01$, $t = 5.918$). Hypothesis H1 therefore is not supported because the regression path is positive (+.323). This means that when group culture goes up by 1 standard deviation, top management barriers also go up by 0.323 standard deviations, showing a positive relationship, contrary to the hypothesized direction. Therefore hypothesis H1 was not supported.
- H2. Hypothesis H2 proposed that group culture decreases employee barriers. Figure 5.4 and table 5.21 show that the independent predictor variable of group culture to employee barriers was negatively and significantly related to the dependent variable ($\beta = -.316$, $P < 0.01$, $t = 5.716$). All the statistics are within acceptance thresholds and the regression path is negative (-.316). This means that when group culture goes up by 1 standard deviation, employee barriers go down by 0.316 standard deviations, showing a negative relationship in accordance with the hypothesis. Therefore hypothesis H2 was strongly supported.

- H3. Hypothesis H3 proposed that group culture decreases customer barriers. Figure 5.4 and table 5.21 show that the independent predictor variable of group culture to customer barriers was found to be negatively and significantly related to the dependent variable ($\beta = -0.362$, $P < 0.01$, $t = 6.569$). All statistics are within acceptance thresholds and the regression path is negative (-0.362). This means that when group culture goes up by 1 standard deviation, customer barriers go down by 0.362 standard deviations, showing a negative relationship as hypothesized. Therefore hypothesis H3 was strongly supported.
- H4. Hypothesis H4 proposed that group culture decreases information barriers. Figure 5.4 and table 5.21 show that the independent predictor variable of group culture to information barriers was negatively and significantly related to the dependent variable ($\beta = -0.489$, $P < 0.01$, $t = 8.406$), with all statistics within acceptance threshold and the regression path is negative (-0.489). This means that when group culture goes up by 1 standard deviation, information management barriers goes down by 0.489 standard deviations, showing a negative relationship as hypothesized. Therefore hypothesis H4 was also strongly supported.

- **Developmental culture and TQM implementation barriers**

- H5. Hypothesis H5 proposed that the presence of developmental culture decreases employee barriers. Figure 5.4 and table 5.21 show that the independent predictor variable of developmental culture to employee barriers was negatively but less significantly related to the dependent variable ($\beta = -0.073$, $P = 0.187$, $t = 1.318$). All statistics are within acceptance thresholds except the p-value which is > 0.05 . However, the regression path is negative (-0.073). This means that when developmental culture goes up by 1 standard deviation, employee barriers go down by 0.073 standard deviations, showing a negative relationship as was hypothesized. However, because estimates have significance below the critical t-value for a type I error of 0.05, therefore, although the estimate is found to be in the hypothesized direction, it cannot be supported due to non-significant p-value (> 0.05).
- H6. Hypothesis H6 proposed that developmental culture will decrease customer barriers. According to Figure 5.4 and table 5.21, the independent predictor variable of developmental culture to the customer barrier construct was found to be negatively related to the dependent variable ($\beta = -0.030$, $P = 0.557$, $t = .558$). All statistics are within acceptance thresholds except the p-value which is > 0.05 . However, the regression path

is negative (-.030) indicating that when developmental culture goes up by 1 standard deviation, customer barriers go down by 0.030 standard deviations, showing a negative relationship as was hypothesized. Again, because estimates have significance below the critical t-value for a type I error of 0.05, therefore, although the estimate is in hypothesized direction, it cannot be supported due to non-significant p-value (>0.05).

- **Rational culture and TQM implementation barriers**

H7. Hypothesis H7 proposed that the presence of rational culture decreases top management barriers. According to Figure 5.4 and table 5.21, the independent predictor variable of developmental culture to top management barriers was found to be negatively related to the dependent variable ($\beta = -.159$, $P < 0.01$, $t = 3.053$) and all statistics were within acceptance thresholds with a regression path that is negative (-.159). This means that when developmental culture goes up by 1 standard deviation, customer barriers go down by 0.159 standard deviations, showing a negative relationship as was hypothesized. Therefore hypotheses H7 was strongly supported.

H8. Hypothesis H8 proposed that rational culture decreases employee barriers. According to Figure 5.4 and table 5.21, the independent predictor variable of developmental culture to the employee barrier construct was found to be positively related to the dependent variable ($\beta = +.048$, $P = 0.368$, $t = 0.901$). All statistics were not within acceptance thresholds and the regression path was found to be positive (+0.048). In other words, when rational culture goes up by 1 standard deviation, employee barriers also go up by 0.048 standard deviations, showing a positive relationship contrary to the proposed theory. Therefore hypotheses H8 was not supported.

H9. Hypothesis H9 proposed that rational culture decreases customer barriers. According to Figure 5.4 and table 5.21, the independent predictor variable of developmental culture to customer barriers was found to be positively related to the dependent variable ($\beta = +.110$, $P < 0.05$, $t = 2.079$). This means that when rational culture goes up by 1 standard deviation, customer barriers also go up by 0.110 standard deviations, showing a positive relationship contrary to the hypothesis. Therefore hypotheses H9 was not supported.

- **Hierarchical culture and TQM implementation barriers**

H10. Hypothesis H10 proposed that hierarchical culture decreases planning barriers. According to Figure 5.4 and table 5.21, the independent predictor variable of developmental culture to planning barriers was negatively related to the dependent variable ($\beta = -.086$, $P < .001$, $t = 7.895$). This means that when hierarchical culture goes up by 1 standard deviation, planning barriers go down by 0.086 standard deviations. All statistics are within acceptable range and there is a negative regression path (-.086), thus a negative relationship was found as hypothesized with statistical significance, and hypothesis H10 was supported.

H11. Hypothesis H11 proposed that hierarchical culture decreases process management barriers. According to Figure 5.4 and table 5.21, the independent predictor variable of developmental culture to planning barriers was found to be negatively related to the dependent variable ($\beta = -.215$, $P < .001$, $t = 3.301$). All statistics were within acceptance threshold and the regression path is negative (-.215). When hierarchical culture goes up by 1 standard deviation, process barriers go down by 0.215 standard deviations, showing a negative relationship as was hypothesized. Therefore hypothesis H11 was strongly supported.

5.4 Chapter summary

In this chapter, the survey data was analyzed using statistical tools, and the findings were presented. The next chapter provides a discussion of these results. In order to answer the research questions, statistical procedures were performed to ascertain descriptive statistics of the demographic characteristics and the existing organisational culture and TQM implementations barriers. The results provide evidence on the magnitude of the culture types and the magnitude of the barriers to the TQM implementations that exist in the organisations in the survey sample.

The proposed measurement model was assessed on the basis of overall model fit, validity and reliability. The measurement model was validated through confirmatory factor analysis (CFA) and several statistical tests including convergent validity (CV), discriminant validity, (DV), reliability and average variance extracted (AVE). As a result, theoretically and operationally valid and reliable scales were developed and subsequently testing of the measurement model was performed with these scales. Overall, the finalised scales were found

to possess satisfactory validity and reliability and were consequently employed in the hypotheses testing.

The structural model was assessed for overall model fit using SEM, which was also used to investigate the relationships between the independent variables of organisational culture constructs and independent variables of TQM implementation barrier constructs. For testing the structural theory the direction and significance of the structural parameter estimates for the majority of the hypotheses were as predicted, and correlation parameter estimates were greater than zero for a positive relationship and less than zero for negative relationship.

The findings showed that the direction and size of the correlation parameter estimations in the model were generally consistent with the extant TQM implementation theory. However, the findings regarding the path coefficients were not entirely conclusive in relation to the proposed hypotheses. For example, the direction of correlation parameter estimations between group culture and top management barriers; rational culture and customer barrier; and rational culture and employee barriers were not as predicted. Nevertheless, despite these unexpected outcomes the findings overall support the majority of the hypotheses. The standardised solution showed sound estimates with the predicted direction of correlations and parameter estimation. Further discussion on interpretation of these results is provided in the next chapter.

Chapter Six: Discussion

6.1 Introduction

The Quality management literature has thrived with diverse TQM definitions, explanations of the content of TQM, TQM implementation models, quality award models, standards, empirical studies and theories. Nevertheless, this literature is in broad agreement on the theory that with proper implementation of TQM an organisation can achieve cost effective and optimum utilization of resources to achieve performance excellence. Since its development, TQM has proved its capability to affect positively on performance outcomes, such as financial performance and profitability as well as with human outcomes, such as employee satisfaction, employee relations, and customer satisfaction (Zeitz et al., 1997; Black and Porter, 1996; Flynn and Saladin, 2006; Dayton, 2001; Stephens et al, 2005; Wilson and Collier, 2000; Paul et al, 2005), however, in practice, these TQM benefits are not easy to achieve (Oakland, 2003). Despite its theoretical premise and the enthusiastic response to TQM, the literature reports many cases of TQM implementation failure (Smith et al., 1994; Wilkinson et al., 1998; Harari, 1993a; Fuchsberg, 1992; Brown, 1993; Jacob, 1993; Shin et al., 1998; Ackoff, 1993; Becker, 1993; Bemowski, 1993; Jacob, 1993; Kunst and Lemmink, 2000; Walsh et al., 2002; Taylor and Wright, 2003; and Sila, 2007). Researchers have generally attributed these failures to implementation, not to TQM theory and method (Huq, 2005). Therefore, following a careful review of the literature, this study is based upon the prevalent argument that TQM implementation barriers are one of the prime causes of failure of TQM (Ngai and Cheng, 1997; Salegna and Fazel, 2000; Sebastianelli and Tamimi, 2003; Huq, 2005; Zeng et. al., 2008; Amaral and Sousa, 2009; Bhat and Raj, 2009; Taylor and Wright, 2003), and that these barriers can be addressed by developing characteristics of organisational culture that support TQM implementation and moderating characteristics of organisational culture that impede TQM implementation (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009).

Therefore, this study has empirically examined evidence on the impact of characteristics of organisational cultural on TQM implementation barriers. The main purpose of this study was to examine the relationship between organisational culture and TQM implementation barriers to gain a better understanding of the factors affecting TQM

implementation. It is expected that replication of this study in other organisations with different culture and context may further help in developing an improved model of TQM implementation. In this context, the study has first identified the type of organisational culture and secondly identified significant TQM implementation barriers existing in the target population of Bahraini organisations, and has investigated what type of organisational culture is associated with what type of barrier. This study attracted 325 responses from key organisational informants constituting a response sample that provided a substantive representation of the total population of service and manufacturing organisations of Bahrain as shown in table 5.1 in chapter 5. The summary of the demographics of respondents in table 5.2 (chapter 5) supports the fact that all three criteria of relevance, qualification and experience of respondents were met and that the data was obtained from highly dependable professionals. Similarly, the demographic of the participant organisations in table 5.2 (chapter 5) show a balanced representation of organisations (by size, company type and company operation type) Therefore, the following preconditions of coverage and sampling suggested by Dillman et al., (2009 p-43) were satisfactorily met:

- include a survey population of all organisations to which results will be generalized; and
- draw a sample that represents the survey population

Another important consideration was the validity of the survey instrument used in this study. According to Singh (1995), when a scale is adapted and applied to specific culture and region, it is necessary to assess the relevance of the context of the scale to achieve the validity of inferences. Therefore, the instrument was revised further through pilot structured interviews with quality practitioners and academics from the same context and background as the target sample population to ensure that the questionnaire was relevant, comprehensive, understandable and valid. The survey instrument was modified based on their input. The survey was administered online and answers to culture and barriers related questions were mandatory. As a result, there was no missing data found. Some missing data was observed in open ended general demographic questions and was easily filled by contacting the respondents. Values of scales were fixed and thus no chance of outliers was there in data. Finally, the reliability and validity of the adapted scales was assessed through construct validity and goodness of fit which is an essential condition for further theory testing and development (Bagozzi et al., 1991). Both the measurement model and the structural model were assessed using CFA/SEM (sections 5.3.1 and 5.3.2). All the steps mentioned above demonstrate the validity of the survey instrument, construct validity, and salience of the data

collected. Therefore, the few unexpected results that were observed can be considered to be realistic and based on fact.

This chapter discusses the findings presented in chapter 5 and systematically reviews how this research has addressed the research questions formulated in chapter 1. First, the state of existing organisational culture in the survey population is discussed in section 6.2 by looking at the characteristics of each type of organisational culture in the context of TQM implementation. Then, the state of significant TQM implementation barriers in the survey population is examined in section 6.3. Finally, the impact of organisational culture on TQM implementation barriers is discussed in section 6.4 by examining the observed relationships between the two.

6.2 Organisational culture

Development of quality and business excellence can't be achieved merely by rudimentary improvement strategies but by fostering capability to do the right things through a persistent and lasting set of norms and values (Oakland, 2003). Such built in norms, values, beliefs, behaviours and climate are referred by many scholars as an organisational culture (Denison and Spreitzer, 1991; McDermott and Stock, 1999; Cameron and Quinn, 1999; Prajogo and McDermott, 2005; Al-khalifa and Aspinwall, 2001). Therefore, understanding the cultural profile of an organisation and mapping this profile to the steps needed to accomplish a change is an important part of the TQM journey (Cameron and Quinn, 1999). In this context, the organisational culture profile observed in the survey population is discussed from two perspectives:

- Data was collected on four types of culture - group, developmental, rational and hierarchical. Therefore, in the first step, the overall cultural profile is discussed based on each type of culture.
- The score for each type of culture emerges from six underlying dimensions (organisational character, leadership character, management style, binding force, emphasis of organisation and success criteria) that contribute to the overall score. Therefore, in the second step, further investigation based on the mean score of each dimension for each type of organisation culture and the implications of this score on the overall results is discussed.

6.2.1 Organisational culture profile by type of culture

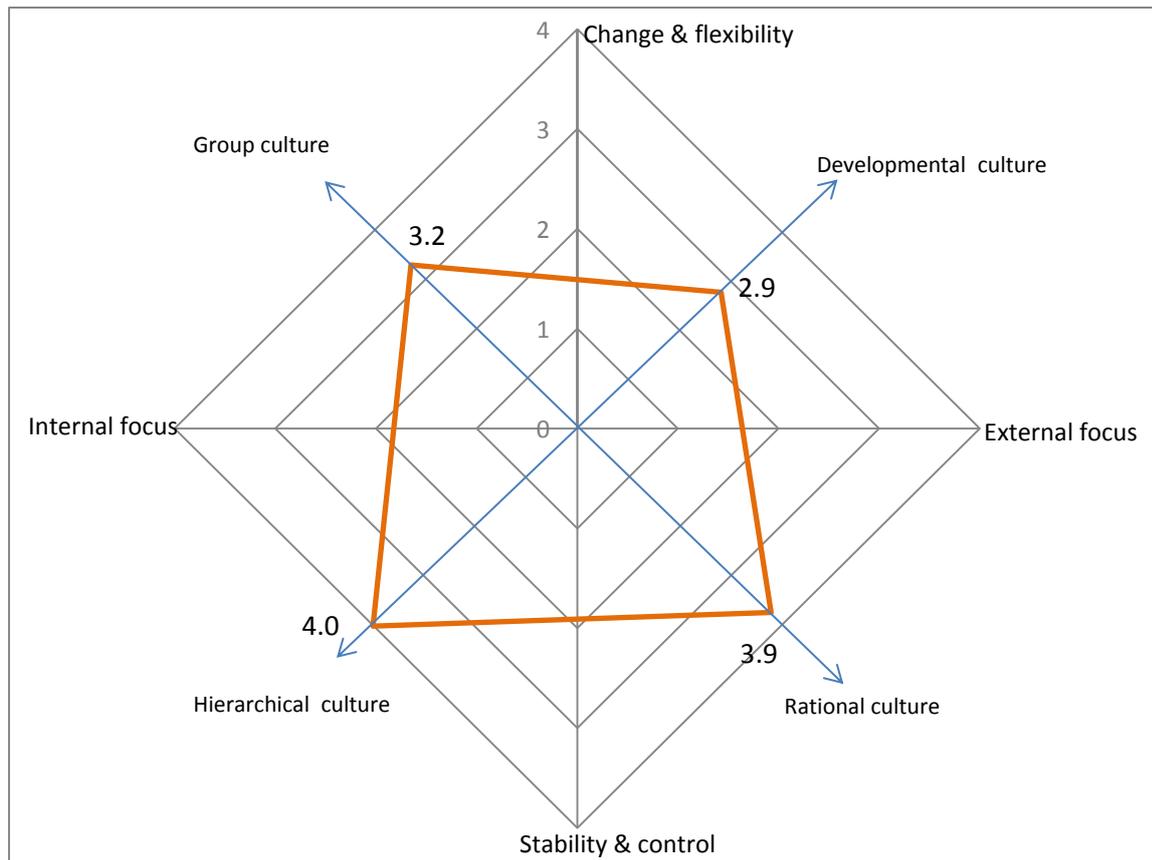
Table 5.4 in chapter 5 illustrates the overall mean and std. deviation of each organisational culture types. The findings in table 5.4 show that the organisations in the survey population are predominantly inclined towards a mix of hierarchical and rational culture types. The general tendency is therefore towards control, centralization, stability, and predictable performance outcomes (hierarchical culture); and task focus, goal achievement, efficiency, productivity and profitability (rational culture).

The graphical presentation of results in figure 6.1 below, displays an organisational culture profile. Both of the prevailing cultures with the highest scores (hierarchical 4.0 and rational 3.9) are oriented towards centralization which reflects stability and control, while both of the weaker cultures (group culture with a medium score 3.2 and developmental also with a medium (but the lowest score 2.9) are oriented towards decentralization which reflects flexibility and spontaneity. This indicates that the focus of the organisations in the survey population is a lot more on stability, order, and control, rather than flexibility, discretion, and dynamism.

As illustrated in figure 6.1, the organisational focus of one of the prevailing cultures (hierarchical) is internal and oriented towards maintenance and improvement of the existing organisation, while that of other (rational) is externally focused on adaptation and interaction with the external environment. This indicates that the organisations in survey population have an internal focus on integration and unity along with an external focus on differentiation, and rivalry. The organisations have harmonious internal characteristics together with a focus on interacting or competing with others outside their boundaries. The score for both hierarchical and rational cultures in the survey population is quite high, reflecting the dominant role of both types of culture in the sample organisation. Due to the dominant role of control oriented culture types, organisations in this survey population show a propensity for a stable, predictable, and mechanistic character while TQM is more perceived to need a changing, adaptable, and organic character to fully flourish (Naor, 2008). Supporting this argument, Dellana and Hausser (1999) assert that those cultures which are characterized by flexibility rather than control are most likely to be able to implement TQM comprehensively. In particular, these authors proposed that group culture, characterized by “teamwork, participation, and a mentoring leadership” on the one hand, and “developmental” culture characterized by “creativity, risk taking, and a creative leadership” on the other, provide the most favourable conditions for TQM. Ironically, both of these culture types are weaker in the

survey population. Therefore it is reasonable to argue that the less significant role of the more favourable culture types and the more dominant role of the less favourable culture types in the survey population is a potential obstacle in any TQM intervention. This result was anticipated because of the controlled and centralized organisational structures in the region.

Figure 6.1 Mean score of each culture type



The majority of the organisations in the survey population have a ‘medium’ score (on 5-point likert scale) in group culture which is a sign of a potentially considerable lack of employee participation in decision making; open discussion and communication; empowerment of employees to act; value of human relations, teamwork and cohesion; and developing human resources through training. Under such conditions, employees may find it difficult to justify their commitment and contribute whole-heartedly to the production of quality products and services, or to the improvement of the business operations (Gallear and Gobadian, 2004). Perhaps the most central prerequisite of successful TQM programme is good communication between top management and employees, mentioned explicitly by most of the authors, while a second important dimension is employee involvement or

empowerment (Zeitz et al., 1997). According to the findings, both of these critical characteristics are somewhat deficient in the survey population. Similarly the low score on developmental culture also suggests that the organisations in the survey population lack flexibility and decentralization that in turn is likely to curb expansion, growth and development due to lack of innovation and creative problem solving processes (Cameron and Quinn, 1999; Prajogo and McDermott, 2005). In today's changing marketplace, lack of flexibility in organisational culture limits an organisation's ability to innovate. Therefore, the low score on developmental culture indicates that organisations in the survey population may presently lack the potential to grow and compete globally. According to Zeitz et al., (1997), innovation refers to the climate that supports new ideas concerning work methods as well as products. They report that most authors imply that any climate orientation toward innovation is consistent with, and conceptually overlaps continuous improvement, a feature of TQM. On the other hand, the overall high score in rational culture suggests that a focus of the organisations in the survey population is on task accomplishment, goal achievement, efficiency, productivity and profitability. Likewise, the overall high score in hierarchical culture reveals a controlled and centralized structure to ensure stability, continuity, order and predictable performance outcomes. As both dominant cultures (rational and hierarchical) are control-oriented, the similarity in score of both cultures in the survey population is consistent with existing theory.

These overall results are very similar when compared to the results of other studies made in Eastern cultures, particularly Middle Eastern cultures. In the context of Middle Eastern cultures, the results of this research support past research that reported similar results in terms of scores on the same four types of organisational culture. While investigating the culture of Qatar organisations (Qatar is an Arab country in the Middle East, a Gulf state very close to Bahrain both culturally and geographically) Alkhalifa and Aspinwall (2001) found that hierarchical culture score (3.4) and rational culture (3.4) were the prevailing types of cultures and group culture (3.1) and developmental culture (2.9) were the weaker cultures. It is reasonable to conclude that these results are quite similar to this study because of commonly held attitudes, values, and beliefs that guide the behaviour of the organisation members of both countries (Martin, 1985).

When comparison is made with the studies in western cultures the results are different. As an example of the cultural profile of western organisations, the study of Zu et al., (2009) is used. The study was conducted in US organisations and Zu et al. (2009) found

that group, developmental and hierarchical culture types had equal score of 3.5, while rational culture had a higher score of 3.8. Compared to the present study, group and developmental culture in the study of Zu et al. (2009) had higher scores, while rational and hierarchical culture had a slightly lower score. The findings of Zu et al., (2009) indicate a much stronger hold of TQM culture in the US organisation sample compared to the Bahrain and Qatari samples. The results of another study conducted in Australian organisations by Prajogo and McDermott (2005) are also fairly different to those of this study. The score on group culture was 3.7, developmental 3.6, rational 3.8 and hierarchical 3.5. As such, the high score on group and developmental culture and lower score on hierarchical culture compared to this study also reflects a more dominant ‘TQM culture’ in Australian organisations. However, one common pattern in all four studies that is observed is that the rational culture score is high (the highest in three out of four studies) indicating a trend of prioritizing control and external focus. Thus, organisations in these three regions and cultures (USA, Australia and the Middle East) have relatively more focus on task accomplishment, goal achievement, efficiency, productivity and profitability rather than employee empowerment, employee participation and human resource development. Figure 6.2 summarizes the results of each culture type in the four different studies.

Figure 6.2 Results of each culture in four different studies

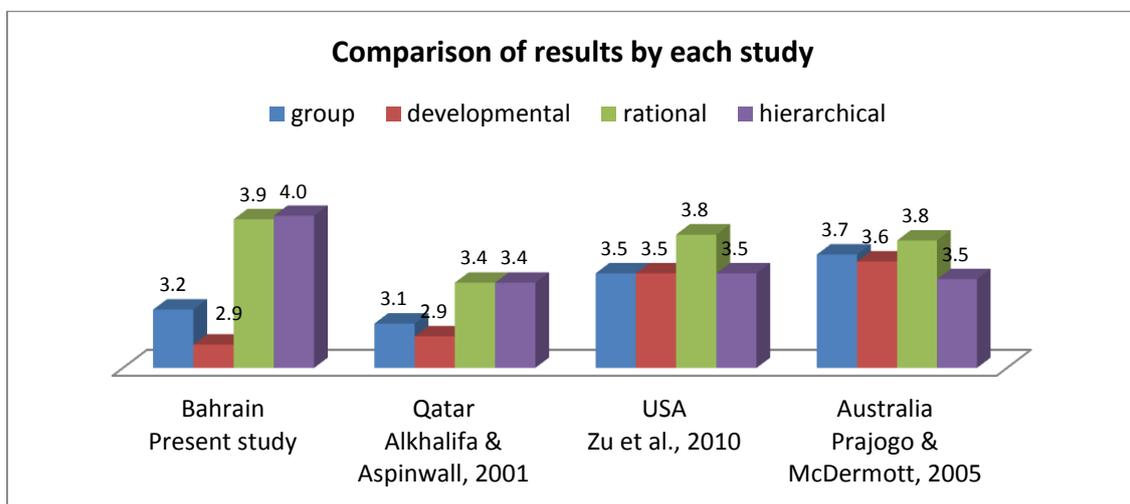


Figure 6.2 provides a slightly more detailed picture and also reveals some other interesting facts. The score of group culture in Bahraini organisations (3.2) is a little higher than Qatar organisations (3.1) but much lower than US (3.5) and Australian organisations (3.7). Qatar organisations (3.1) have been found to be the lowest and Australian organisations

(3.7) the highest in score on group culture. The organisations in the present survey population are lowest in developmental culture score (2.9) but have the highest score on rational (3.9) and hierarchical (4.0) cultures, again reflecting a strong hold of culture that is generally considered to be less favourable to TQM implementation.

Denison and Spreitzer (1991) argue that none of the cultural types are wholly good or bad in essence, because any type of culture can be useful based on the organisational goals. They further state that the four cultures in their typology should be viewed as ideal types, meaning that organisations are characterized by some combination of these four culture types – although some types could be more dominant than the others. Thus, a particular organisation need not be classified exclusively as having one type of culture, but can be considered as containing elements from the four culture types, where one type may be more dominant (Quinn and Spreitzer, 1991, Cameron and Freeman, 1991, Yeung et al., 1991). As McDermott and Stock (1999) noted “as such, a high rating on one dimension (e.g. internal orientation) does not exclude a high rating at the opposite end (e.g. external orientation)”. Quinn (1988) explained this more clearly, arguing that “we want our organisations to be adaptable and flexible, but we also want them to be stable and controlled. We want growth, resource acquisition, and external support, but we also want positive information management and formal communication. We want an emphasis on the value of human resource but we also want an emphasis on planning and goal setting.” The implication here is that given TQM’s characteristics, a mix of organisational culture types that is most favourable to these characteristics is required in order to support TQM and its implementation. A balance is required that meets the competing demands of change and stability - one that will provide enough flexibility to accommodate innovation and growth but won’t jeopardize stability, control, and order (Cameron and Quinn, 1999). Likewise, potentially conflicting requirements produced by internal and external organisational environment need to be balanced as well. Consequently, by employing a trade-off between stability and flexibility and a trade-off between internal and external focus, organisation can determine either to have only one of two entities, or determine the degree to which organisations can have both (Denison et al., 2006).

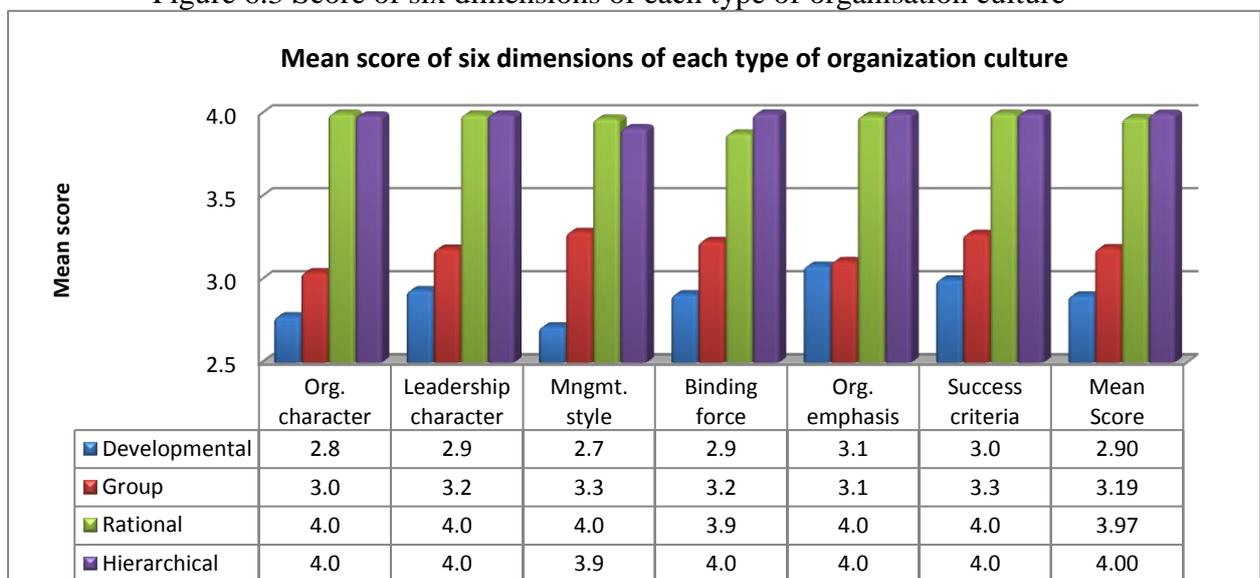
Summarizing the discussion, thus organisations are unlikely to reflect only one culture type but to be effective the adoption of some elements of each of the four cultural ideal types is necessary (Zammuto and Krakower, 1991; Cameron and Quinn, 1998). Different cultures may fit different organisations and their environments, and the desirability of a strong

specific type of culture depends on how well it supports the organisation's strategic goals and objectives (Schein, 1985). However, any dominant culture type will have an extensive impact on the character, behaviour and performance of an organisation and ultimately this dominant culture type will determine the success of improvement programme such as TQM. Therefore, it is reasonable to conclude that those organisations in the survey population planning to implement a TQM programme or that already have a TQM programme in place, need to focus more on developing characteristics of a culture that are more TQM-friendly , in other words, one with a greater group and developmental focus.

6.2.2 Organisational culture profile by dimensions of culture

The score for each type of culture emerges from six underlying dimensions (figure 6.3) and the score of all six dimensions is the aggregated to get the mean score of each culture type. Therefore, the overall score for each culture type is made up of a score on six dimensions of organisational culture type, and hence an extra layer of analysis is possible, which would show if any one or more of these dimensions contributes significantly more to the overall score for each culture type than the other dimensions. However, as illustrated in figure 6.3, no significant variations were observed. In other words, each underlying dimension contributed broadly equally to the overall score for each culture type. More importantly, it also helps to determine that the measures are accurate representations of the properties of the formal construct definition indicating that internal consistency exists and the measures consistently represent the same latent constructs of organisation culture type. Figure 6.3 shows mean the score of six dimensions for each of the each type of organisation culture.

Figure 6.3 Score of six dimensions of each type of organisation culture



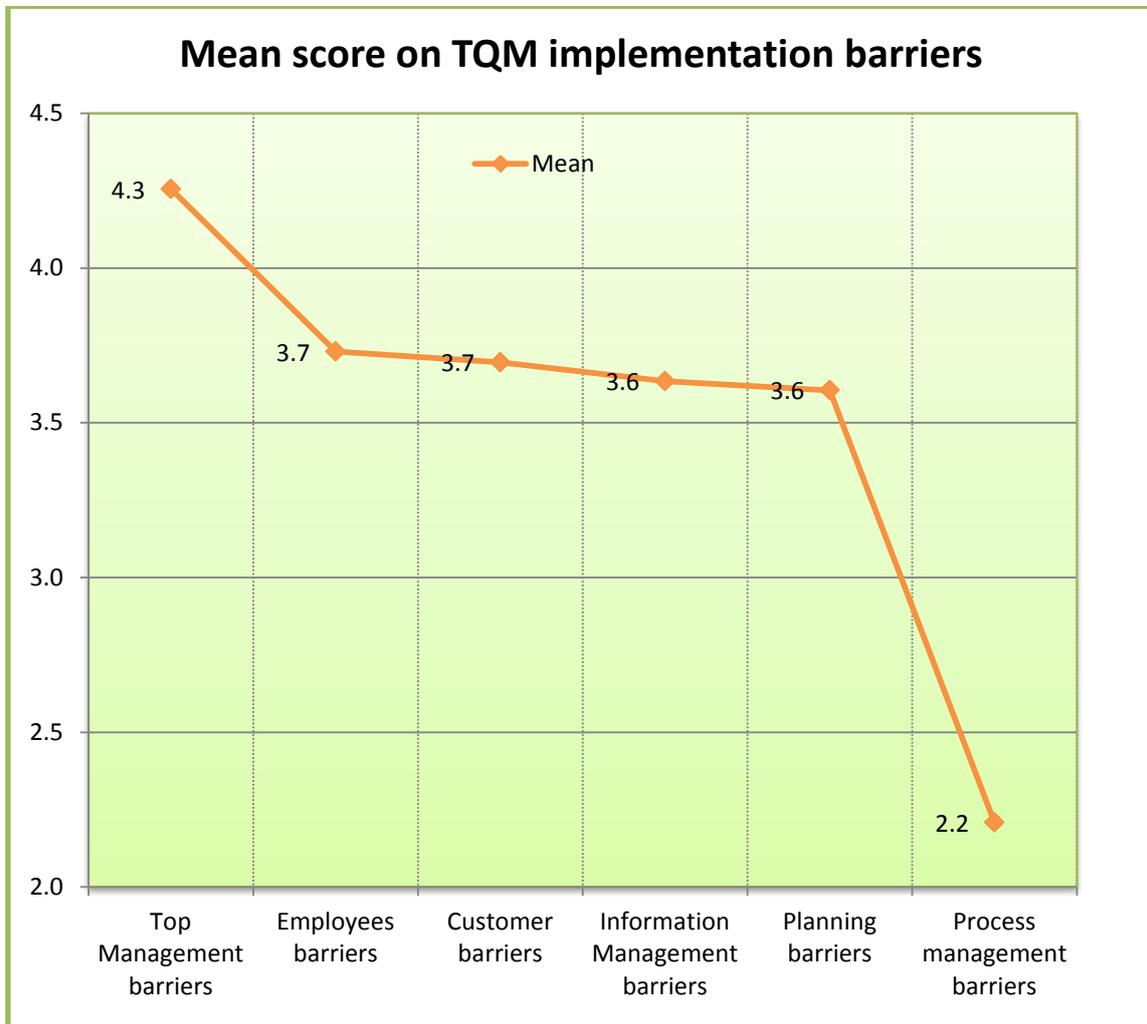
6.3 TQM implementation barriers

This section discusses the TQM implementation barrier constructs and their individual indicator results, with reference to previous studies on TQM implementation barriers. Although the objective of this study of identifying significant TQM implementation barriers is similar to other previous studies, a key difference lies in the demography of the respective samples. This difference is used to make a comparison between organisations with different demographic characteristics, that is, between organisations of developed countries such as Europe and USA and organisations of developing countries such as Bahrain. Similarities and contradictions with previous studies are discussed along with the relevance of the results for future researchers and implications of results for TQM practitioners.

6.3.1 Profile of TQM implementation barrier constructs

In this section the results for the TQM implementation barrier constructs and their constituent indicators are discussed. Table 5.7 in chapter 5 illustrates the mean, standard deviation and total number of respondents for each TQM implementation barrier construct. Based on the results given in table 5.7, TQM implementation barriers related to top management have the highest score (4.3). Second highest is the score on employee barrier and customer barriers (3.7). The score on information management barriers and planning barriers was slightly lower (3.6). However, process management barriers have the lowest score (2.2). A unique outcome from these results that seems to be new in TQM implementation research is that barrier constructs having more human involvement (i.e. leaders, employees and customers) have higher barrier score than those with less human involvement (i.e. information, process and planning). Therefore, the results of this study also substantiate the importance of the human dimension in quality management, highlighting the need for a strong drive for the education and training of managers and employees in quality management. Figure 6.4 below is constructed from table 5.7 in chapter 5 which illustrates the overall score of TQM implementation barrier constructs.

Figure 6.4 Mean score on TQM implementation barriers



The Overall mean score of the constructs is 3.5, well above the middle value 3 on the liker scale of 1 to 5, an indication of high overall score of barriers in the survey population and that organisations in Bahrain are beset with all kinds of TQM implementation barriers.

In chapter 5, the score of each indicator of the six TQM barrier constructs was presented in six tables (table 5.9 through table 5.14). Overall, the preceding brief analysis of the individual barrier indicators (section 5.2.4) showed that each contributes virtually equally to their respective barrier constructs. No single individual barrier indicator was significantly more prevalent than the others making up the construct.

6.3.2 TQM implementation barrier constructs/constituent indicators

This section will discuss the results based on constructs of TQM implementation barriers and their constituent indicators.

6.3.2.1 Top management barriers

In the top management barrier construct, the barrier indicator of “lack of top management commitment and support to quality” has a very high score (4.3), revealing the fact that any quality management system applied in Bahraini industries has minimal support from top management. Researchers agree that the leadership and commitment of top management is the driver of TQM (Powell, 1995; Black and Porter, 1996; Ahire et al., 1996; Flynn et al., 1994; Samson and Terziovski, 1999). The importance of addressing this barrier for TQM implementation is emphasized by many researchers such as Gobadian and Gallar (1996); Flynn et al., (1994), Hellsten, (2000); Ahire,(1998); and Motwani, (2001). These results should be a matter of concern for leaders of industries in survey population.

Commitment and support to quality by top management is a vital factor that is proved to be important in TQM effectiveness (Soltani et al., 2006). Lack of commitment and support to quality by top management is found a significant TQM implementation barrier in previous studies such as Sebastianelli and Tamimi (2003), Salegna and Fazel (2000), Ngai and Cheng (1997), Kifyah and Zain (2002), and Whalen and Rahim (1994). The significant high score of this barrier in the present study is consistent with, and validates the results of previous studies. Furthermore, some more recent studies have also identified the lack of top management support to quality as significant barrier in TQM implementation process. These studies include: Amaral and Sousa (2009); Bhat and Raj (2009); Angell and Corbett (2009); Huq (2005); Rad (2004); McFadden et al. (2006); and Jun et al. (2004).

Similarly, the barrier indicator of lack of allocating resources for training is highly prevalent in this study. This finding is supported by all studies mentioned above except Salegna and Fazel (2000) who emphasized more on failures that involve the TQM implementation process rather than lack of resources. The study by Salegna and Fazel (2000) and Bhat and Raj (2009) also specifically mentioned the adverse role of excessive layers of management in TQM implementation process. This study verifies the results of previous studies that the barrier of lack of resources for training is a significant TQM implementation barrier. This barrier has the highest score in the present study. It appears that in the Bahrain

sample, there exist obstacles to quality improvement i.e. with management, rather than the works.

In the light of the evidence provided above, it is reasonable to argue that top management is the primary TQM factor. The high level of existing barriers in implementing this TQM factor in organisations in the survey population is a challenge for leaders of these industries. It is difficult for managers of these companies to implement TQM practices without top management devoting the necessary resources to the effort. Without commitment from above, commitment that translates into tangible resources such as time and money, most employees would find it impossible to carry out a TQM directive (Angell and Corbett 2009). Top management needs to initiate management practices that lead to minimizing the barriers in TQM implementation. The results of this study evidently show that barriers are emerging from the existing management culture which is unfavourable to TQM implementation. Leaders of the companies in survey population are encouraged to set existing management culture as the starting point for building a quality improvement process based on TQM from that baseline.

6.3.2.2 Employee barriers

According to the results in table 5.10 (section 5.2), all barrier indicators of employees barrier construct have a relatively high score, and the mean score of all employee barrier indicators was 3.7. Therefore, all indicators of the employee barrier construct are equally high in companies of the survey population. These factors are thought to contribute significantly toward the ineffectiveness of TQM implementation in the organisations sampled in this study. Gauging from these findings, there is little doubt as to why the Bahraini worker's quality performance lags a significant way behind other countries (Ernst & Young 2009).

Organisations that wish to pursue TQM and be successful in its implementation need to develop their employees accordingly by minimizing employee barriers. Employees need to be trained in group discussion and communication techniques, the basic tools of quality and process improvement, and problem identification/problem-solving skills. Employees need to be empowered to implement quality improvement efforts, and, when successful, they need to receive appropriate recognition for their achievements. Without such opportunities and a supportive environment, employees might feel frustrated, thereby contributing to more frequent turnover (Ngai and Cheng, 1997). Studies by Tamimi and Sebastianelli (1998) and

Salegna and Fazel (2000) also place human resource issues as the single most significant contributor in assuring effective TQM implementation. It is reasonable to argue therefore, that a focus on mobilizing (empowering and involving) employees is a second critical requirement in Bahrain organisations, once the top management barriers have been sufficiently addressed.

6.3.2.3 Customer barriers

According to results in table 5.11, customer satisfaction still has not been addressed properly in the organisation's policy in the companies of survey population. In the customer barrier construct, all four barrier indicators had similar scores (and mean score was 3.7). The Results show that the companies in the survey population haven't yet realized the importance of customer focus in doing business. These companies are not measuring customer satisfaction, not assessing the needs and expectations of customers enough, not taking customer feedback enough and have insufficient contact with key customers.

Quality has travelled well beyond the dictum of meeting standards and conformance to specifications. Meeting and or exceeding customer's requirements and preferences has become the norm. The new quality slogan of "delight the customer" has led to the belief that customer satisfaction is the most important requirement for long term success and sustainability of any organisation. Thus the basic rationale of TQM is valuing the customer by understanding the basic customer needs and by maximizing customer satisfaction. A focus on customer needs and expectations is identified as the core factor of TQM by many TQM scholars (Dean and Bowen, 1994; Juran, 1995; Black and Porter, 1996; Ahire et al., 1996; Evans and Lindsay, 1999; Samson and Terziovski, 1999; Soltani et al., 2003; Yang, 2003; Flynn and Saladin, 2006; Yasin and Alavi, 2007). Total quality management is a philosophy which aims to provide organisations with a template for success through customer satisfaction. TQM has been described as the development of an organisational culture, which is defined by, and supports, the constant attainment of customer satisfaction through an integrated system of tools, techniques and training (Bounds et al., 1994).

It is clearly that Bahraini organisations need to implement TQM practices that satisfy customers. This is likely to be dependent however, on their progress in first addressing the top management and employee barriers that exist.

6.3.2.4 Planning barriers

According to table 5.12, in the planning barrier construct all barrier indicators have a relatively high score. The mean score is 3.6 and the difference between the maximum and minimum score is 0.10, showing consensus among the respondents on the severity of each barrier indicator. This study has thus observed that planning has not been taken seriously by leaders of companies in the survey population which should be a cause for apprehension for these leaders of these industries.

Planning is a necessary stepping stone to accomplish must tasks. Strategic planning provides the guidelines for the execution of TQM initiatives. Lack of planning a TQM initiative is an important barrier of TQM success. Furthermore, organisations need to plan their TQM initiatives according to changes in the environment and also emerging technologies for example. Planning provides clarity of organisation objectives and a formulated plan on board creates awareness among all stakeholders about quality initiatives of the organisation and provides clarity of organisation policy about TQM programme. Writers strongly emphasize the importance of strategic planning process based on total quality (Deming, 1986; Ahire et al., 1996; Zairi, 1999; Sinclair and Zairi, 2001; Dayton, 2001; Oakland, 2003). Whalen and Rahim (1994) cited poor planning as number one barrier in the implementation of TQM improvement activities. A 21 step TQM implementation approach by Goetsch and Davis (1995) used in many research studies had three phases (preparation, planning, and execution) and notably, 15/21 of these steps are related to planning. Therefore, given planning's centrality to providing the direction and guidance upon which the organisations efforts to address the employee and customer barriers effectively is likely to rest, it appears that one of managements priorities in Bahrain organisations must be on critically evaluating and revising accordingly, the organisations strategic plans to include an explicit focus on customer and quality goals.

6.3.2.5 Process management barriers

According to table 5.13 in chapter 5, results of individual barrier indicator of process management barrier construct in the industries of survey population have a low mean score of 2.2 and furthermore the difference between the highest and lowest score of the indicators is minimal (.08) reflecting consensus among population that process management barriers in survey population are not prevalent. Therefore, all indicators of process management barrier

construct are equally and significantly low and can be a source of satisfaction for leaders of companies.

A fundamental principle of TQM is that mistakes may be made by people, but most of them are caused, or at least permitted, by faulty systems and processes. This means that the root cause of such mistakes can be identified, eliminated, and prevented by changing the process. Process management can have many bottlenecks such as delays, reviews, mistakes, duplication, movement, processing inefficiencies, and resource inefficiencies. Lack of standard procedures, long turn-around times and communication breakdowns can also contribute to poor process management. Customer satisfaction is the ultimate goal of a TQM initiative which is achieved by product/service quality that depends largely on the quality of the processes. When organisations pay attention to their processes they are able to take proper quality control in the key steps of the operations procedures to prevent defects (Yang, 2003). The absence of process management barriers, and by implementation the presence of well developed process, is something that can be built on where addressing the other barriers, and also something that needs to be carefully preserved and not inadvertently undone.

6.3.2.6 Information management barriers

According to results in table 5.14, the individual barrier indicator results of the information management barrier construct present high score on this construct have very similar scores, with an overall mean score of 3.6. Organisations that wish to pursue TQM and be successful in its implementation need to develop their communication techniques in order to improve on the basic tools of quality and process improvement, and problem identification/problem-solving skills. Employees need to be aware of quality improvement efforts. Without such opportunities and a supportive environment, TQM may not flourish (Ngai and Cheng, 1997). To gain competitive advantage, organisations should have the capacity to collect new information and transfer it into action faster than a competitor (Singh, 2010). Information is an essential resource for setting and meeting management objectives, and the role it plays within the organisation is of vital importance as it helps to build knowledge and measure the overall performance of the organisation. For a company to achieve successes in the quality management it needs a robust information system for reporting the changes in key performance parameters, and in the shortest possible time. Therefore, information system (IS) contributes greatly in the success of the quality programme.

Decisions that are made based on accurate data are likely to produce better results than decisions that are based on a hunch or intuition (Lai, 2003). For example, with data based decisions, the needs and the desires of the customer are well known and as a result they can be incorporated into the product or service design. This can greatly enhance customer satisfaction in the product and or service and can improve the quality and efficiency of the company itself.

6.4 Impact of organisational culture on TQM implementation barriers

In order to address research question 3 (measuring the impact of organisational culture on TQM implementation barriers), hypotheses were developed on the basis of relationships between independent constructs of organisational culture and dependent constructs of TQM implementation barriers. Largely, the findings in this study show that group culture which is believed to be an ideal culture for TQM implementation (Cameron and Quinn, 1999) does help to decrease employee barriers, information barriers and customer related barriers as was predicted but doesn't help decrease top management barriers. Rational culture does decrease top management barriers as predicted, but it doesn't help decrease employee and customer barriers, contrary to the hypothesized predictions. The results confirm the prediction that hierarchical culture decreases planning and process management barriers significantly. However, developmental culture also decreases employees and customer barriers as predicted but not significantly. An examination of these mixed results is provided in the following sections.

6.4.1 Impact of group culture on TQM implementation barriers

The data analysis shows that group culture decreases employee, customer and information management barriers as hypothesised but doesn't decrease top management barriers as predicted. Therefore H1 is not supported while H2, H3, and H4 are supported.

H#	Hypothesis statement	Result
H1	Group culture decreases top management barriers	Not supported
H2	Group culture decreases employee barriers	Supported
H3	Group culture decreases customer barriers	Supported
H4	Group culture decreases information barriers	Supported

Table 6.1 Result of hypothesis test related to group culture

The literature review in chapter 2 suggested that group culture is the key factor in decreasing TQM implementation barriers (e.g., Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; and Zu et al., 2009). Dellana and Hauser (1997) argued that less resistance (barriers) in TQM implementation may exist in flexibility-oriented organisations having a dominant group culture. Group culture focuses on flexibility and internal maintenance by emphasizing strong human relations, unity, and participation of members (Zu et al., 2009). According to Denison and Spreitzer (1991), human development is the main emphasis of organisations with group culture. In the TQM literature these characteristics of group culture are found to be important for implementing TQM by decreasing overall TQM implementation barriers. In this study, the construct of group culture was found to be a validated predictor variable to examine its relationship with TQM implementation barrier constructs. The result of each hypothesis related to group culture is discussed in the following sections.

6.4.1.1 Relationship of group culture and top management barrier construct (H1)

H1 Group culture decreases top management barriers - *Not supported*

In hypothesis H1, it was proposed that group culture decreases top management barriers but while examining this relationship, contrary results were revealed. The result of the SEM in chapter 5 (section 5.3.2.3) indicated a positive loading of the independent variable of group culture construct on the dependent variable of top management barrier construct ($\beta = +.323$, $p < 0.01$, $t = 5.918$) which was contrary to the predicted direction. Therefore, hypothesis H1 is not supported because the regression path is positive (+.323). However, the prior literature suggests that group culture, having an internal and flexible orientation would be associated with decreasing top management barriers.

The primary task of managers is to keep the workforce unified - thinking, moving, and operating in one direction. The organisations with group culture are very personal places and people are united like an extended family (Denison and Spreitzer, 1991), therefore group culture is an ideal culture from the top management perspective. The study by Prajogo and McDermott (2005) also concluded that group and developmental culture have a strong correlation with the TQM principles of top management, customer focus, and people management. Similarly, the TQM-culture model of Zu et al. (2009) shows that the group

culture was significantly related to the top management TQM factor. Specifically, the top management support in terms of investing in training to help employees increase their knowledge, skills and ability is considered to be facilitated by group culture. The significance of this relationship is also supported by Naor et al. (2008). Dellana and Hauser (1999) used TQM principles of the Baldrige criteria that include top management support as an elementary factor. These authors concluded that less resistance to TQM implementation should be encountered in organisations with group culture and developmental culture. The resistance to TQM implementation generally occurs when top management doesn't build consensus through exchanging its vision with employees and fails to establish the communications to create awareness of organisational goals for quality improvement and disseminate TQM implementation progress to employees (Beer, 2003; Lee and Choi, 2006; Kaynak, 2003). Accordingly, group culture, through its characteristics of open communication, would be expected to help decrease the barrier of "lack of communicating quality awareness within the organisation".

The above mentioned studies present empirical evidence that prevalence of group culture reduces top management barriers. However, many other studies that although not having a specific focus on culture and TQM relationship, have nevertheless suggested a logical relationship between group culture and top management barriers. For example, one of the characteristics of group culture is that the leadership in this type of culture is supportive and values employees' ideas. As such, these characteristics would be expected to decrease the top management barrier of lack of commitment and support to quality. As leadership in group culture is participative and it encourages empowerment and teamwork, therefore, leaders would be expected to actively support the quality programme and direct the needed investment in training to help employees increase their knowledge, skills and ability (Beer, 2003). Therefore group culture would also be expected to help remove the common top management barrier of inadequate resources for employee training. Similarly, when employees are not involved in improvement projects, they feel detached from organisation goals and ultimately, this negatively affects the employees' attitude, which, in turn, impacts performance. In such cases, top management can help create a feeling of attachment of employees to the goals of the organisation by teamwork, consensus and participation which the characteristics of group culture (Cameron and Quinn, 1999).

According to Dension and Spreitzer (1991), in group culture, leaders are thought of as mentors, coaches, and, perhaps, even as parent figures. Therefore, the main role of top

management in TQM implementation is creating a shared vision and unifying mindset of all the members within the organisation in order to break down barriers between departments (Prajogo and McDermott, 2005). The group culture values participation and openness and thus would be expected to decrease communication barriers between top management and employees, and through its participative structure reduce the undesirable effects of excessive layers of management.

Theoretically, the studies mentioned above show a positive and strong relationship between group culture and top management practices and hence inferentially, a negative relationship between group culture and top management barriers, suggesting that group culture will decrease top management barriers. However, a statistically significant relationship in the predicted direction between group culture and top management barriers was not found in the present study of Bahraini organisations. The reasons for this unexpected finding are not immediately clear. However, one possible explanation may be that the relatively high prevalence of hierarchical and rational culture (oriented towards centralisation and control as illustrated in figure 6.1), might have limited the extent to which the presence of group culture encourages top managers to engage, empower and communicate with employees. This may even be to the extent that the top managers in the Bahraini firms become uncomfortable when they observe too much of a flexible and dynamic internal orientation (i.e. group culture) emerging, and may actually hold back on expending empowerment and openness and thus inadvertently create rather than remove barriers to effective TQM implementation.

6.4.1.2 Relationship of group culture and employee barrier construct (H2)

H2 Group culture decreases employee barriers - *Supported*

The result of SEM in chapter 5 (section 5.3.2.3) show that the independent predictor variable of group culture was negatively and significantly related to the dependent variable of employee barriers ($\beta = -.316$, $P < 0.01$, $t = 5.716$) and regression path is negative ($-.316$). A negative loading of group culture on the employee barrier construct is in line with the predicted direction, therefore hypothesis H2 is supported.

The influence of the group culture on the TQM factor of employee focus has been investigated by several researchers (e.g., Zu et al., 2009; Naor et al., 2008; Prajogo and

McDermott, 2005; and Dellana and Hauser, 1999). Largely, these studies highlighted the significant impact that group culture can have on the employee factor. The results of these studies thus inferentially support the argument that promoting group culture will help to effectively decrease employee barriers. The study by Zu et al. (2009) established a significant relationship between group culture and the TQM factor of employee focus. Zu et al. (2009) stated that the TQM factor of employee focus is found to be supported by the group and rational cultures whose core values are consistent with the application of organisational development techniques such as investment in employee training and education, employee involvement and participation, and the performance-based policy of rewards and recognition. Similar result were reported by Prajogo and McDermott (2005), stating that there is a significant relationship between group culture and employee focus. According to Naor (2008), an organisational culture which supports a cordial and cohesive environment results in higher level of trust which can ensure enthusiasm and willingness of the employees to work together to meet the organisation's goals. Naor (2008) further asserts that in a culture in which there is value for the employees' work, objective feedback, a cordial-cohesive environment and high flexibility, employees have the tendency to stay with the organisation. These attributes can also lead to lower employee absenteeism/turnover, lower levels of stress, and higher product and service quality for the customers they serve. All these characteristics of participation, trust, and a concern for human development are the core values of group culture (Denison and Spreitzer, 1991; Cameron and Quinn, 1999; Denison and Neale, 2000), and therefore by developing a group culture, organisations promote the TQM principle of employee focus thus decreasing employee related barriers of TQM implementation.

The studies mentioned above provide empirical support for the relationship between group culture and reducing employee barriers. In addition, many other studies that although not having a specific focus on culture and TQM, have nevertheless also suggested a logical relationship between group culture and reducing employee barriers. For example, Denison et al. (2006) states when employees are empowered they have the authority, initiative, and ability to manage their own work that creates a sense of ownership and responsibility toward the organisation. Logically therefore, employee empowerment can be achieved through prevalence of group culture, that would be expected to eventually decrease the TQM barrier of 'employees are not empowered to implement quality improvement'. In the supportive environment of group culture, employees are not only encouraged to participate in continuous improvement teams and are rewarded for their contribution to better quality, but also receive

the training and education to be successful in their jobs. In this context, the development of human resources by empowering and engaging the employees helps organisations to be effective and competitive (Buckingham and Coffman, 1999). Supporting this argument, Denison and Spreitzer (1991) argue that group culture emphasizes employee education and training because education and training can change values such as employees' beliefs, behaviour, and attitudes; and enhance employees' abilities in carrying out their duties. In order to meet varying business needs and stay competitive, organisations with group culture persistently invest to develop the skills of the employees. This training is focused to increase knowledge, skills and ability of employees and help them in their career development. These characteristics of group culture would be expected to help decrease the TQM implementation barriers of "employees not trained in quality improvement skills" and are supported by the findings of this study.

Likewise, Quinn (1988) asserts that employees are the pool of experience, knowledge and information and they want to share this knowledge and experience to feel that they are making significant contributions in their workplaces. As the orientation of group culture is open and participative in nature, therefore employees do have a feeling that they have at least some contribution into decisions that will affect their work and hence feel attached to the goals of the organisation. A key emphasis of group culture is on flexibility and internal integration which in turn can create attachment, a sense of commitment, faith, and involvement of each employee in the general and strategic issues of the organisation (Denison and Spreitzer, 1991). The characteristic of group culture of a friendly place to work can create an environment without fear and compulsion. Because employees are intrinsically motivated to do a good job when working in such environment (Detert et al., 2000; Hackman and Wageman, 1995), therefore the need for properly motivated employees for quality improvement is realized by group culture.

Taylor and Wright (2003) infer that TQM programmes fail because of TQM implementation barriers such as lack of involvement of employees in the TQM programme. Deming (1986) also emphasized the importance of participation of employees in quality programme. According to Juran (1995), TQM is the system of activities directed at achieving empowered employees and delighted customers. Therefore, creating culture where employees are valued and empowered leads to successful quality management implementation (Westbrook and Utley, 1995). The group culture's emphasis on employees' involvement and empowerment are consistent with and should facilitate the process of establishing the

organisational environment supporting employee involvement and empowerment for the effective implementation of quality initiatives (Cameron and Quinn, 1999; Detert et al., 2000; and Naor et al., 2008). Accordingly, group culture can help to motivate employees to work at their full capacity by decreasing the employee barriers of lack of workforce participation, lack of communication and lack of employee involvement in improvement projects.

Accordingly, in organisations having dominant group culture top management is likely to persuade its employees to bring innovative ideas for organisational development and participate in the decision making process. Employees feel that they are appreciated and treated with respect. This strategy brings about a sense of belonging and employees feel they are doing something for themselves (Cameron and Quinn, 1999). Organisations with group culture stress the need for training of employees, employee involvement in decision-making, rewarding employees for quality performance and communicating with them consistently in order to create awareness of organisational goals for quality improvement (Kaynak, 2003; Lee and Choi, 2006; Pande et al., 2002). Therefore the group culture would help decrease employee barriers of lack of recognition for achievements in quality improvement, lack of appropriate performance evaluation and reward system, and consequently, the lack of employee satisfaction across the organisation.

TQM is a philosophy of change, and hence resistance to change by employees and even management is not unexpected. Inadequate communications of the intended changes in the organisation may result in resistance expressed through resentment about managements approach, doubts and uncertainty, and fear that employees may lose their jobs (Huq, 2004). The characteristics of group culture of establishing the communications to create awareness of organisational goals for quality improvement (Flynn et al., 1994) would therefore be expected to help decrease employee resistance to change barrier.

Effective implementation of TQM in an organisation demands building teamwork, providing employees with appropriate training, involving them in decision-making and rewarding them for quality performance (Dale, 2007). The literature supports the propositions that group culture helps to address each of these elements. Based on this finding of the study, it can be stated that group culture can play an important role in effective TQM since it has been shown to have a direct and significant influence on decreasing employee barriers.

6.4.1.3 Relationship of group culture and customer barrier construct (H3)

H3 Group culture decreases customer barriers - *Supported*

Hypothesis H3 proposed that group culture decreases customer barriers. According to the result of structural parameter estimates of the SEM model in chapter 5 (section 5.3.2.3) the independent predictor variable of the group culture construct was negatively and significantly related to the dependent variable of customer barrier construct ($\beta = -.362$, $P < 0.01$, $t = 6.569$) and regression path was negative (-.362). A negative loading of group culture on the customer barrier construct is in line with the predicted direction, and therefore hypothesis H3 is supported.

This finding is similar to the previous studies on the relationship of group culture and the TQM factor of customer focus (Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008). In a study of 194 Australian organisations, Prajogo and McDermott (2005) found that group culture and customer focus had a relatively stronger correlation than the other TQM practices examined in the same way. The study by Zu et al. (2009) couldn't establish any relationship between group culture and customer focus, however Naor et al. (2008) found a significant relationship between both variables. The study by Dellana and Hauser (1999) also found a significant relationship between the two variables. The results of these empirical studies support and validate the results of this study.

The aforementioned studies demonstrate that there is empirical support that prevalence of group culture reduces customer barriers. In addition to these empirical studies, the wider extant literature provides plenty of anecdotal and evidence on the significance of this relationship. Although, these studies do not have a specific focus on culture and TQM relationship, they have suggested a logical relationship between group culture and reducing customer barriers. For example, Jacobson and Aaker (1987) propose that market share will be larger for the companies investing in quality improvement and hence providing quality products to customers. Logically it is expected that TQM will attract more satisfied customers (Kaynak, 2003). Because the satisfaction of customers is the key to organisation success, therefore the entire organisation should focus on customers' needs and expectations (Dean and Bowen, 1994). To do so, organisations need to possess a high level of group culture in order to be able to be flexible and to adapt to changing customer demands over time (Naor et al., 2008).

Similarly, an effective customer feedback system and frequent contact with key customers can provide value for customers by taking information from the external environment into internal systems and analyzing it for informed decision making on customer oriented policies (Denison, 2006). The assessment of customer needs, expectations and satisfaction will enable an organisation to understand and react to their customers and anticipate their future needs. In this context external feedback from customers is the 'acid test' for determining whether organisations are doing the right things (Zairi, 2000). Group culture fosters these activities through its characteristics of open communication and better contact with customers, creating an effective system to measure customer satisfaction and ascertain customer needs and expectations. Such an environment promoted by group culture can boost innovative and creative ideas for the ultimate benefit of customers.

As was argued by Deming (1986) (in chapter 3), the core objective of TQM is to delight the customers. Therefore, identifying and determining what customers want is a central concern in TQM (Hackman and Wageman, 1995). Many authors have considered the lack of attention to customer requirements and feedback system as one of the very common barriers facing organisations realising adoption of quality management system techniques (Sebastianelli and Tamimi, 2003; Salegna and Fazel; and Jun et al., 2004). These customer barriers can be effectively addressed by the presence of group culture because the management style in the group culture is characterized by teamwork, consensus, participation, open communication and empowering employees to deal with customers (Yeung et al., 1991; Denison and Spreitzer, 1991; Prajogo and McDermott, 2005; Zu et al., 2009). These characteristics of group culture facilitate identifying customer concerns through open communication in order to seek feedback and measure customer satisfaction (Quinn and Kimberly, 1984; Quinn, 1988; Denison, 1990; Cameron and Freeman, 1991). As the group culture stresses commitment, cooperation and open communication, therefore it can result in building strong relationships with customers (Denison and Spreitzer, 1991). Consequently it can help to decrease TQM implementation barriers such as lack of an effective system to measure customer satisfaction, lack of feedback system from customers, lack of assessment of customers' needs and expectations and lack of close contact with key customers.

Furthermore, an emphasis on group culture has been suggested as enhancing the involvement of customers in organisational activities (Naor et al., 2008). TQM is based on the premise that customers (the internal and external) are the focus of all activities of an organisation, and all improvements in quality must be directed toward customer satisfaction

(Ahire et al., 1995). According to Juran (1995), quality on one hand, could mean features of products that should meet customer needs and thereby provide customer satisfaction. Measuring customer preferences before and after product/service delivery; creating partnerships with customers; and enhancing competitiveness by involving customers in planning and design are all supported by group culture. Similarly, a participative management style empowers employees to take any necessary action to ensure customer satisfaction (Rad, 2004). In quality management, it is essential to maintain close links with customers and suppliers (Dean and Bowen, 1994; Hackman and Wageman, 1995).

The strength of relationship between group culture and reducing customer barriers found in this study strongly reflects the degree to which Bahraini organisations could be driven to satisfy their customers by taking steps to develop and enhance the prevalence of group culture. The results for hypothesis H3 confirm the fact that the influence of group culture on reducing customer barriers is significant. Based on the findings, it can be stated that promoting and developing group culture traits can play an important role on the success of TQM since it has a direct and significant influence on decreasing customer barriers.

6.4.1.4 Relationship of group culture and information barrier construct (H4)

H4 Group culture decreases information management barriers –*Supported*

This study found a significant negative relationship between the group culture construct and information management barrier construct as was predicted. The results of the SEM (section 5.3.2.3) show that the independent predictor variable of group culture construct was negatively and significantly related to the dependent variable of information management barrier construct ($\beta = -.489$, $P < 0.01$, $t = 8.406$), with a negative regression path. Therefore hypothesis H4 was supported.

This finding is in line with the results of previous studies that have addressed the relationship of group culture and the TQM factor of information management. The study by Prajogo and McDermott (2005) confirmed a positive relationship between group culture and information management. Zu et al. (2009), in his study of US companies, also found that group culture was a strong predictor of the TQM factor of information management. Dellana and Hauser (1999) found that there was a strong relationship between group culture and the

Baldrige criteria relating to information management. Similar results were reported by Naor et al. (2008).

Various other studies incorporating TQM factors and organisation culture have highlighted the significance of this relationship, even though these studies were not designed to measure the relationship. For example, Powell (1995) concluded that TQM practices had to be implemented within a suitable environment (i.e. culture) that emphasized inter-organisational communication so that individuals can liaise with other departments freely and share and disseminate quality and performance information. Other researchers too have emphasized that an appropriate organisational culture based on group values is necessary for obtaining, storing and analyzing information (Buch and Rivers, 2002; Lagrosen, 2003; Lewis, 1996). Likewise, a focus on customers' needs and expectations is a fundamental principle of TQM and there should be a mechanism of information exchange to obtain the necessary information for identifying customer requirements and feedback on the quality of products/services (Flynn et al., 1995; Hackman and Wageman, 1995). When information management barriers are addressed properly, it can help to create an effective system to measure customer satisfaction through an effective information management system. Group culture helps to foster these requirements through its characteristic of open communication.

According to Roger et al. (2008), effective TQM implementation can be achieved by identifying quality problems and solving them comprehensively through the exchange of ideas. Through its focus on participation and communication, group culture supports the discussion of ideas. Furthermore, employees can be motivated to speed their efforts in identifying and solving problems, and to take more responsibility for improvement projects (Naor, 2008). This process in turn, can generate useful data on quality and performance that can be used for further improvement. Gunasekaran (1999) found that a major enabler of TQM implementation was communication between managers/supervisors and staff, and that poor communication between departments was a real barrier to implementing TQM. Oakland (1997), Nagi and Cheng (1997), Salegna and Fazel (2000) and Al-Zamany et al (2002) all state that ineffective internal and external communication networks and lack of information exchange in an organisation are significant barriers in the way of improving business.

The intent of information exchange in a group culture is to foster an environment where individuals feel comfortable in discussing TQM related problems, so that information and knowledge is shared freely (Stock et al., 2006). Group culture can therefore help to decrease the barriers of poor inter-organisational communication and a lack of disseminating

quality and performance information. As observed by Kaynak (2003), Lee and Choi (2006) and Schroeder et al. (2008), group culture can further enhance cooperation between departments through teamwork to exchange ideas; enhance joint efforts of management and employees in process management activities; quality problem identification and solving; effective measurement of process and product performance; and project coordination. Without a systematic method for discovering and identifying TQM related problems, TQM implementation is generally doomed to failure (Naor et al., 2008). This systematic method may include reporting TQM problems, open discussion about TQM problems and statistical analysis of TQM implementation data. Group culture supports the development of these characteristics through participation, involvement, empowerment and communication (Cameron and Freeman, 1991). Therefore, group culture is highly likely to help to decrease the information management barrier of lack of information on quality and performance.

Open communication fostered by the group culture is also expected to facilitate liaison between people from different departments (Klein et al., 1998) and the timely sharing of quality data throughout the ranks of the organisation. This can help decrease the information management barrier of lack of disseminating quality and performance information. Openness in group culture is consistent with the principle of management by fact in quality management achieved through systematic quality data collection, reporting, analysis and measurement in a problem-solving cycle (Hackman and Wageman, 1995). Accordingly, this will help to remove information management barrier of lack of measuring quality.

The result relating to hypothesis 4 confirms the fact that the influence of group culture on information management barriers is significant. It can be stated that group culture plays an important role in the success of TQM since it has a direct and significant influence on decreasing information management barriers.

6.4.2 Impact of developmental culture on TQM implementation barrier constructs

The data analysis showed that developmental culture decreases employee and customer barriers but not significantly. Nevertheless the regression path was observed to be in the predicted direction. However due to the lack of statistical significance both hypotheses (H5 and H6) cannot be said to be fully supported.

H.No.	Hypothesis statement	Result
H5	Developmental culture decreases employee barriers	Not Supported
H6	Developmental culture decreases customer barriers	Not Supported

Table 6.2 Result of hypotheses test related to developmental culture

The results of each hypothesis related to developmental culture are discussed in following sub sections.

6.4.2.1 Impact of developmental culture on employee barrier construct (H5)

H5 Developmental culture decreases employee barriers- *Not supported*

According to hypothesis H5, developed based on theory as discussed in chapter 2, developmental culture should help to decrease employee barriers. The result of the SEM model (section 5.3.2.3) shows that the independent predictor variable of developmental culture was negatively but not significantly related to the dependent variable of employee barriers ($\beta = -.073$, $\rho = 0.187$, $t = 1.318$). However, the ρ -value which was >0.05 means that the estimate has the significance below the critical t-value for a Type 1 error of 0.05. Therefore, due to lack of statistical significance it is reasonable to propose that hypothesis H5 is not fully supported.

This finding is similar to previous studies in terms of the direction of the path estimates but the level of significance was higher in previous studies (Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009). The SEM results are in line with the predicted direction and support the argument in the literature that for effectively decreasing employee barriers, the presence of a developmental culture is supportive. Like group culture, developmental culture also emphasizes flexibility, but in this case with more focus on the external environment (Cameron and Quinn, 1999). According to Denison and Spreitzer (1991), the orientation of organisations with a developmental culture is towards growth, resource acquisition, innovation, and continual adaptation to the external environment; and such organisations are characterized as creative workplaces where people are free to experiment and take risks. With visionary leadership and creative employees, organisations with a developmental culture can realize rapid growth by producing unique and original products/services targeting new markets (Denison and Spreitzer, 1991; Cameron and Quinn, 1999; Denison and Neale, 2000). The main emphasis of developmental culture is on

decentralization, freedom of action, growth, innovation and creative problem solving processes (Cameron and Quinn, 1999).

The studies mentioned above provide support for the relationship between developmental culture and reducing employee barriers as do other studies in the wider TQM literature. For example, Zammuto and Krakower (1991) assert that most workers are inherently motivated to do a good job when working in an environment free of compulsion and fear which is provided by the developmental culture by virtue of its characteristic of freedom of action. This environment can create affection, a sense of obligation, trust, and contribution of each employee in organisational issues. The freedom of action allows employees to bring innovative ideas for organisational development and participate in decision making processes (Cameron and Quinn, 1999). Therefore the developmental culture would be expected to help remove TQM implementation barriers such as lack of employee participation, empowerment, involvement and communication. It would also help to address barriers of inappropriate performance evaluation and reward systems; insufficient teamwork facilitators and team building techniques; and finally employees' resistance to change.

Likewise, the entrepreneurial character of the developmental culture encourages employees to try new things that promote innovation, acquiring new resources, prospecting for opportunities, identifying unique or new products/services and becoming a product leader and innovator (Cameron and Quinn, 1999). In such innovative organisations, there is a drive with incentives for constant, continuous improvement and doing things better (Detert et al., 2000). As these processes and products belong to an employee domain, developmental culture therefore is genuinely associated with decreasing employee barriers.

Similarly, in order to be a product leader, organisations need more involvement and teamwork, which require more responsibility and a greater level of employee skill and knowledge than can be achieved through, formal and systematic training and education (Oakland, 1997). Developmental culture gives high importance to employee training. Al-Zamani et al. (2002) insist that quality training and education programme are the main obstacles any organisation faces in the way of getting improvement and it is the developmental culture oriented organisations that invest more in training programme.

Any training programme needs resources and the developmental culture tends to focus on providing appropriate and necessary resources (Denison and Spreitzer, 1991). The focus on innovation and adaptation also increases the allocation of organisational resources

for employee training so as to improve their knowledge and skills to meet the changing requirements of customers (Yeung et al., 1991). Empowered, involved and well trained employees, who in turn are more satisfied and less resistant to change (Cameron and Quinn, 1999), help decrease employee barriers in an organisation. Since the developmental culture is oriented to looking for new resources and external support for growth (Denison and Spreitzer, 1991), it promotes a focus on adoption of new tools, technology and other improvement approaches. Therefore, developmental culture will also help remove barriers such as lack of skills, participation, involvement and empowerment of employees.

Theoretically, the studies mentioned above show a positive and strong relationship between developmental culture and employee focus and hence inferentially, a negative relationship between developmental culture and employee barriers, suggesting that developmental culture will decrease employee barriers. A statistically significant relationship in the predicted direction between developmental culture and employee barriers was not found in the present study therefore this hypothesis cannot be fully supported in the survey of Bahraini organisations. However, the regression path is negative which means that when developmental culture goes up, employee barriers go down, showing a negative relationship in accordance with the hypothesis. The reasons for this unexpected lack of significance are not immediately clear. However, one possible explanation may be that developmental culture has external focus and employees are internal to an organisation, therefore a relatively low incidence of developmental culture in the survey population might have affected the results. Secondly, the developmental culture is oriented to change and flexibility and strongly supports employee empowerment in order to promote innovation and creativity. But, the high prevalence of hierarchical and rational culture in Bahraini organisations (figure 6.1) might have influenced them to resist empowering employees due to the centralization and control orientation. Additionally, empowerment is a management concept of relatively recent origins, and it may be that this concept hasn't yet gained full appreciation by the leaders of Bahraini organisations. TQM is still at an initial stage in many of the Bahraini organisations and it may take some time to establish itself and change the perception of leaders. Another characteristic of developmental culture is trying new products/services by taking risks, which may not be encouraged by Bahraini managers due to the prevalence of the more mechanistic type of culture (hierarchical and rational).

6.4.2.2 *Impact of developmental culture on customer barrier construct (H6)*

H6 Developmental culture decreases customer barriers – *Not supported*

The customer barrier construct in this study was represented by four constituent variables, all closely related to customer satisfaction: customer needs and expectations; effective customer feedback system; and frequent contact with key customers. According to the theory in chapter 2, the characteristics of developmental culture were hypothesized to help decrease the customer barriers. The results of the structural parameter estimates (SEM) (section 5.3.2.3) show that the independent predictor variable of developmental culture was negatively but not significantly related to the dependent variable of customer barriers ($\beta = -.030$, $p = 0.557$, $t = .558$). All the statistics were within acceptance threshold except the p -value which was >0.05 which means that the estimate has significance below the critical t -value for a Type 1 error of 0.05. Therefore, due to lack of statistical significance the hypothesis H6 cannot technically be fully supported.

The finding, despite the lack of significance, that developmental culture has a negative relationship with customer barriers is in line with the predicted hypothesis and is similar to the finding of previous studies, notably Dellana and Hauser (1999); Prajogo and McDermott (2005); Naor et al. (2008) and Zu et al. (2010). In their Australian study Prajogo and McDermott (2005) found that there was an influential relationship between developmental culture and the TQM factor of customer focus. Developmental culture has an external focus, and customers are outside the boundary of the organisation. Such a relationship was also substantiated by Zu et al. (2009) in the US study. The study by Naor et al. (2008) also supports the validity of this relationship.

The empirical studies mentioned above maintain the argument that the relationship between developmental culture and customer barriers reduces the effects of customer barriers on TQM implementation. Denison and Spreitzer (1991) argued that through its external orientation, developmental culture supports organisations in acquiring real time customer feedback and improving their ability to connect with key customers. This activity helps to anticipate customers' needs and implement creative solutions to customer needs or problems

(Cameron and Quinn, 1999). Customers are always looking for products/services of good quality and large market share has been shown to go to those organisations who win the loyalty and satisfaction of their customers (Dale, 2007). Increased contact with key customers in turn provides better information about the market or greater brand loyalty, which in turn can lead to a rise in sales and margins (Tena, 2003). A focus on customers' needs and expectations is one of the fundamental principles of TQM and TQM seeks to ensure information exchange to get customer feedback on the quality of products/services (Dellana and Hauser, 1999). Developmental culture emphasizes adapting to changing customer demands over time and thus it would be expected to help to remove the TQM barrier of lack of feedback system from customers/stakeholders.

In a developmental culture, an external focus on customer desires is highly evident (Choi and Behling, 1997). Organisations with a developmental orientation tend to secure long-term quality programme success because they treat future customers as important as their current customers (Dellana and Hauser, 1999). Organisations with a developmental culture direct internal efforts toward their customers through an increasingly external focus (Chang and Wiebe 1996). This orientation creates a drive for companies to invest in quality improvement to achieve market advantage (Zu et al., 2009). Efforts in quality improvement are expected to bring in more satisfied customers with greater loyalty and increased sales (Kaynak, 2003). This is a major characteristic of developmental culture, which is heavily focused on customer satisfaction and development of new markets, and thus reducing TQM implementation barriers such as lack of effective systems to measure customer satisfaction and assess customers' needs and expectations and lack of, effective customer feedback system and close contact with key customers.

In order to meet customer and market needs, organisations need to possess a high level of developmental culture in order to be flexible and to adapt to changing customer demands over time (Naor et al., 2008). Such kind of external adaptation and development of flexibility and diversity can stimulate employees' interests in pursuing and understanding customer needs and markets (Denison and Spreitzer, 1991). Such organisations tend to build a strong relationship with customers because customer focus is well developed throughout the organisation, supported by effective customer satisfaction tracking (Al-khalifa and Aspinwall, 2000). The developmental culture type, which emphasizes a more external focus characterized by change and risk-taking, would therefore be expected to decrease customer barriers such as lack of effective system to measure customer satisfaction, assessment of

customers' needs and expectations, effective customer feedback system and close contact with key customers, consequently improving the customer focus of the organisation. Finally, it is important to note that the employee barriers and customer barriers are very closely related. Organisations interact with their customers through employees. Therefore logically, a motivated employee will help to ensure a satisfied customer. When employee barriers are addressed properly, customer satisfaction could also be enhanced.

Theoretically, the studies mentioned above show a positive and strong relationship between developmental culture and customer focus and hence inferentially, a negative relationship between developmental culture and customer barriers, suggesting that developmental culture will decrease customer barriers. However, a statistically significant relationship in the predicted direction between developmental culture and customer barriers was not found in present study, therefore this hypothesis was not supported in the survey of Bahraini organisations. A detailed examination of this unexpected finding is left for future research, but again some possible explanations can be explored. One possible explanation may be that the relatively low score of developmental culture in survey population (the lowest act of the four culture types) (figure 6.1) might have affected the significance of the relationship. The relatively low score on developmental culture shows lack of flexibility and change in favour of stability and a control orientation of managers of Bahraini organisations. Additionally, the majority of Bahraini industries are supporting functional products that satisfy basic needs. There are very few industries in Bahrain that develop highly innovative products such as cutting edge technology. Hence there is no fierce competition in industries for 'revolutionizing' products. Therefore, emphasis on developmental culture that promotes innovation and creativity is low. Similarly, due to this probable lack of focus on high end competitiveness, the need to be responsive to customer needs may be low. These realities appear to have affected the results of hypothesis 6. However, it is important to remember that the regression path is negative, which means that when developmental culture goes up, customer barriers go down; showing negative relationship in accordance with the prediction, implying that investing in nurturing a developmental culture is a highly worthwhile investment in pursuit of helping to remove TQM customer barriers.

6.4.3 Impact of rational culture on TQM implementation barriers

The data analysis shows that rational culture decreases top management barriers but has no effect on employee barriers and customer barriers. Therefore hypothesis H7 is

supported but hypotheses H8 and H9 are not supported. The model shows that the rational culture is negatively related to the top management barrier construct as predicted and positively related to the employee and customer barrier constructs, contrary to the original prediction. The results for each hypothesis related to rational culture are discussed in turn below.

H.No.	Hypothesis statement	Result
H7	Rational culture decreases top management barriers	Supported
H8	Rational culture decreases employee barriers	Not supported
H9	Rational culture decreases customer barriers	Not supported

Table 6.3 result of hypothesis test related to rational culture

6.4.3.1 Impact of rational culture on top management barrier construct (H7)

H7 – Rational culture will decrease top management barriers - *Supported*

According to hypothesis H7, the characteristics of rational culture are expected to help decrease top management barriers. The results of the structural parameter estimates show that the independent predictor variable of rational culture was negatively and significantly related to the dependent variable of top management barriers ($\beta = -.159$, $p < 0.01$, $t = 3.053$), and regression path is negative ($-.159$). Therefore, hypothesis H7 is supported.

This finding is supported by previous empirical studies that have examined the relation between characteristics of rational culture and the TQM factor of top management commitment (Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009). The rational culture is goal-oriented and associated with more of a hard-hitting and challenging leadership approach. Leaders are expected to build up comprehensible objectives and forceful strategies to realize procedures and processes that can lead to a high level of productivity and profitability (Cameron and Quinn, 1999). Leaders are required to provide guidance and control to realize the corporate vision and goals that demand a high level of commitment. The rational culture therefore would be expected to help remove the barrier of lack of commitment by top management to achieve quality goals by taking responsibility for quality (Denison and Spreitzer, 1991).

The empirical studies mentioned above provide evidence that the relationship between rational culture and reducing top management barriers is significant. Furthermore, many other studies that, although not having a specific focus on culture and TQM, have also

suggested logical relationships between rational culture and top management barriers. For example, according to Denison and Spreitzer (1991), organisations with a rational culture are very result oriented places - a major concern is with getting the job done through competitive and achievement oriented people. There is an emphasis on achievement and goal accomplishment by hitting stretch targets and winning in the marketplace, therefore, the management style is characterized by high demands and achievement. Researchers agree that the leadership and commitment of top management is a key driver of TQM (Powell, 1995; Black and Porter, 1996; Ahire et al., 1996; Flynn et al., 1994; Samson and Terziovski, 1999). The goals and objectives of quality improvement can only be set and achieved when managers recognize the importance of quality improvement for the success of their organisation and this understanding would develop through quality awareness (Huq, 2005; Rad, 2004; McFadden et al., 2006; Jun et al., 2004). The focus of rational culture to achieve competitiveness through quality improvement can help decrease the lack of quality awareness barrier within the organisation.

The top management barrier of lack of allocation of adequate resources for employees' training by managers is evaluated as a critical factor hindering TQM implementation in several previous studies (Minjoon, 2004; Kotey and Slade, 2005; Thomas and Armstrong, 2004; Tannock et al., 2002; Soltani et al, 2008; Walsh et al., 2002). Since the major concern of leadership in rational culture is getting the job done through competitive and achievement oriented people, leadership in a rational culture focuses on quality improvement by allocating adequate resources for employees' training (Denison and Spreitzer, 1991).

As stated before, many layers of management in any organisation can create communication gaps and are a potential cause of delayed decision processes and decision making which can result in missing opportunities. The importance of addressing this barrier for TQM implementation is emphasized by many researchers such as Ghobadian and Gallear (1996); Flynn et al. (1994), Hellsten (2000); Ahire(1998); and Motwani (2001). The result-oriented nature of rational culture demands an instantaneous and swift management style breaking through the barrier of many layers of management (Soltani et al., 2006). Top management demonstrates its commitment to the achievement of the quality goals by taking responsibility for quality and being evaluated based on quality performance (Anderson et al., 1994; Flynn et al., 1994; Kaynak, 2003). As leaders in the goal-oriented rational culture are demanding in achieving competitiveness, they tend to develop clear objectives and aggressive

strategies to drive practices and behaviours leading to productivity and profitability (Cameron and Quinn, 1999; Denison and Spreitzer, 1991).

The result for hypothesis 7 confirms that the influence of rational culture on top management barriers is significant and in the predicted direction. Based on the findings, it is clear that rational culture can play an important role in the success of TQM since it has a direct and significant influence on decreasing top management barriers. The findings therefore indicate that through the mechanisms discussed above, Bahraini organisations should be able to enhance their existing TQM implementation strategies or approach by safeguarding, for the short term of least, their rational culture orientation.

6.4.3.2 Impact of rational culture on employee barrier construct (H8)

H8 – Rational culture will decrease employee barriers - not supported

The SEM results indicated a positive loading of rational culture on the employee barrier construct ($\beta = +.048$, $\rho = 0.368$, $t = 0.901$). This was contrary to the predicted direction. Therefore, hypothesis H8 is not supported because the regression path is positive (+.048), and moreover the estimate of standardized regression weight is also not significant. This means that based on the Bahraini sample context, a high score on rational culture in an organisation won't help to decrease employee barriers.

The prior literature suggested that rational culture, having an external orientation would be associated with decreasing employee barriers. However, the finding in this study is contrary to those in previous studies (Naor et al., 2008; Prajogo and McDermott, 2005) on culture and quality management. These studies showed a positive and strong relationship between rational culture and the TQM employee factor and therefore suggested an inferentially negative relationship of rational culture with employee barriers. One fundamental principle of TQM is an employee focus (Black and Porter, 1996; Sousa and Voss, 2002; Kaynak, 2003; Nair, 2006; Flynn and Saladin, 2006). The results of previous studies support the argument in the literature that in order to effectively decrease employee barriers organisations require an environment with specific cultural characteristics that include those associated with the rational culture type. Organisations with a prevalent rational culture are result oriented places, people are very competitive and achievement oriented. These characteristics of organisational culture are related to employee barriers.

Rational culture regards incentives as an integral tool to motivate the workforce to pursue better performance and achieve organisational goals (Naor, 2008). Such incentives and rewards delivered by management are used to increase employee participation in continuous improvement and to enhance employees' ownership in their jobs and quality improvement activities (Naor, 2008). Therefore, rational culture would be expected to help remove TQM implementation barrier of lack of strong motivation of employees through performance based reward policies. Employees need to be empowered to implement quality improvement efforts, and, when successful, they need to receive appropriate recognition for their achievements. Without such opportunities and a supportive environment, employees might feel frustrated, thereby contributing to more frequent turnover (Ngai and Cheng, 1997). The lack of recognition for achievements in quality improvement is reported as a significant barrier in the literature (Ngai and Cheng, 1997; and Amaral and Sousa 2009). A critical lack of recognition of employees for achievements in quality improvement affects morale and motivation. Therefore, rational culture would help remove TQM implementation barrier of employees and teams are not recognized for achievements in quality improvement.

TQM uses compensation policies including incentives for group performance, quality-based incentives and compensation based on breadth of skills (Flynn et al., 1995; Henderson and Evans, 2000). Compensation of executives for the achievement of TQM goals and rewards is given based on the outcomes of their improvement projects that they are accountable for (Henderson and Evans, 2000). Such incentives and rewards delivered by management are used to increase employee participation in continuous improvement and to enhance employees' ownership in their jobs and quality improvement activities (Ahire et al., 1996; Naor et al., 2008). These performance-contingent compensation policies are compatible with the strategies characterizing the rational culture, which regard incentives as an integral tool used to motivate employees to pursue better performance and achieve organisational goals (Naor et al., 2008).

The implementation of any quality programme means more involvement and empowerment, which require more responsibility and a greater level of skill and knowledge by the employees. The control-oriented characteristic of rational culture doesn't promote such level of empowerment and involvement of employees, but instead provides training for employees through formal and systematic training and mechanisms of education. Depending on the needs of a particular organisation, training and education should cover the entire workforce as part of an ongoing process and more attention should be given to management

techniques and quality management issues. By focusing on training, rational culture was expected to help decrease the TQM implementation barriers of lack of employees training in quality improvement skills and lack of employee training in group discussion and communication techniques.

If employees are not satisfied with their job, there will be frequent cases of turnover. The lack of satisfaction can occur due to multiple factors such as inappropriate performance evaluation and reward system (Sebastianelli and Tamimi, 2003; Salegna and Fazel, 2000); lack of empowerment and participation (Ngai and Cheng, 1997; Amaral and Sousa 2009; and Angell and Corbett 2009); low motivation (Salegna and Fazel, 2000); poor work environment; and or lack of incentives (McFadden et al., 2006). According to Amar and Zain (2002), TQM programme are often viewed with scepticism, and are destined to fail if they do not get the full support of the entire work force. Organisations that score highly on items such as “employees are resistant to change” and “employee's satisfaction across the organisation is low” most likely have leaders who have failed at communicating their commitment to quality in concrete ways. In rational culture, the leaders are demanding, and emphasize productivity, performance and goal achievement as one of the primary motivating factors (Cameron and Quinn, 1999). These characteristics of rational culture would be expected to help decrease employee barriers such as “employee's satisfaction across the organisation is low” and “employees are resistant to change”.

In change management, the attitude of employees towards quality is seen to be one of potentially the greatest barriers in many organisations. It has been reported that it is very difficult to change the mindset of the employees with regards to quality (Oakland, 2003). Employees believe that quality is a needless task and added cost, and hence could not accept it as an integral part of the job. Rational culture has the potential to ensure the change management by virtue of its results-oriented characteristic. Therefore, rational culture would be expected to help remove TQM implementation barrier of employees tend to be resistant to changes.

Theoretically, the studies mentioned above show a positive and strong relationship between rational culture and employee focus and hence inferentially, a negative relationship between rational culture and employee barriers, suggesting that rational culture will decrease employee barriers. This hypothesis was not supported in the survey of Bahraini organisations. Despite a careful re-examination of the literature the reasons for this unexpected finding are not immediately clear and future research is needed to explore possible explanations.

6.4.3.3 Impact of rational culture on customer barriers (H9)

H9 – Rational culture will decrease customer barriers - *Not supported*

According to hypothesis H9, the characteristics of rational culture were expected to help decrease customer barriers. However a positive loading of rational culture on the customer barriers construct ($\beta = +.110$, $\rho < 0.05$, $t = 2.079$) was contrary to the predicted direction, and therefore hypothesis H9 is not supported.

The findings of this study are therefore not in line with findings of previous studies (Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Zu et al., 2010) which suggest that there is a strong relationship between rational culture and decreasing customer barriers. The prior literature suggests that rational culture, having external and control orientations would be associated with reducing customer barriers.

The empirical studies mentioned above provide evidence that the relationship between rational culture and customer barriers is significant. Many studies in the wider TQM literature, in addition to those already mentioned above have suggested a logical relationship between rational culture and customer barriers (Cameron and Quinn, 1999, Mohrman et al., 1995, Bowersox et al., 2007). Rational culture's external orientation emphasizes customer focus. In the context of TQM, Cameron and Quinn (1999) suggest that the rational culture orientation would enable external partnerships and measuring customer preferences, and thus rational culture orientation would be likely to decrease customer barriers. The results of this study don't support this proposition and therefore a future research in this area is deemed necessary.

Cameron and Quinn (1999) suggest that the creation of partnerships with customers (and suppliers) in a TQM environment is highly compatible with the rational culture. Organisations emphasizing the rational culture pursue productivity, profit and impact supported by the measurement of customer preferences (Denison and Spreitzer, 1991). The focus of rational culture on customers supports the organisations to work closely with their customers to understand their needs and expectations so as to better position their products and services in the market (Flynn et al., 1994). More direct contact of organisational members, including line workers, to customers can motivate continuous improvement efforts (Mohrman et al., 1995). Similarly, when rational culture is present, organisations seek opportunities to collaborate with key customers through for example, strategic partnerships

(Bowersox et al., 2007). Achieving the improvements necessary to gain competitive advantage requires effectively integrating with customers (Kaynak and Hartley, 2008; Naor et al., 2008). Hence, top management needs to establish close contact with key customers to achieve desired quality objective.

The focus of rational culture on the external market/resources would be expected to help develop close relationships with customers that would help remove the TQM implementation barriers of lack of joint planning with customers, lack of strong motivation of customers and lack of customer focus. Building close contacts with customers is aimed to provide managers and employees a better understanding of customer needs and expectations in order to assess current quality level, control quality conformance, and set goals for future improvement (Flynn et al., 1994; Hackman and Wageman, 1995).

Theoretically, the studies mentioned above show a positive and strong relationship between rational culture and customer focus and hence inferentially, a negative relationship between rational culture and employee barriers would be expected, suggesting that rational culture will decrease employee barriers. A statistically significant relationship in the predicted direction between rational culture and employee barriers was not found in the present study therefore this hypothesis was not supported in the survey of Bahraini organisations. The reasons for this unexpected finding are not immediately clear but there may be some possible explanation for this result. The rational culture is distinguished by its major characteristics of the goal achievement and profitability. The profitability is largely an outcome of customer satisfaction which is achieved through an effective system to measure customer satisfaction, assessment of customer needs and expectations through customer feedback and keeping contact with key customers. The relatively high score on customer barriers with the Bahraini sample indicates that such a system is not effectively present in Bahraini organisation which may be neutralizing the focus of rational culture on customers. Another possible explanation may be that Bahraini organisations actually place too much emphasis on bottom line profit (because of dominant rational culture) and therefore follow the strategies that meet the short term goals at the expense of establishing long term goals of customer relationship. In doing so, Bahraini organisations lose focus on customers. Future research is needed to explore possible explanations.

6.4.4 Impact of hierarchical culture on TQM implementation barriers

The data analysis shows that hierarchical culture decreases planning barriers and process management barriers. Therefore both hypotheses are supported.

H.No.	Hypothesis statement	Result
H10	Hierarchical culture decreases planning barriers	Supported
H11	Hierarchical culture decreases process barriers	Supported

Table 6.4 results of hypothesis test related to hierarchical culture

6.4.4.1 Impact of hierarchical culture on planning barriers (H10)

H10 – Hierarchical culture will decrease planning barriers - *Supported*

The results of structural parameter estimates of the SEM model (section 5.3.2.3, figure 5.7 and table 5.18) show that the independent predictor variable of hierarchical culture is found to be negatively related to the dependent variable of planning barriers ($\beta = -.086$, $p < .001$, $t = 7.895$) and the regression path is negative ($-.086$). Therefore, hypothesis H10 is supported. This finding is consistent with findings of previous studies (Dellana and Hauser, 1999; Prajogo and McDermott, 2005), although it is worth noting that the study by Zu et al. (2009) didn't find such a relationship. Cameron and Quinn (1999) stated that the main characteristics of hierarchical culture are control, centralization, routinisation, formalization, structure, stability, continuity, order and predictable performance outcomes. Therefore, organisations with a hierarchical culture are run more by rules and regulations with a focus on control and stability that would be achieved through stable processes, predictable workloads and scheduled production (for example, supported by statistical process control) and thus high efficiency (Naor, 2008). The hierarchical culture points to more fixed organisational structures with formal rules, close control, clear lines of decision-making authority and a mechanism for accountability, therefore departments in hierarchical culture tend to be working in harmony using formalized problem-solving approaches, clear step-by-step instructions, prescribed tools and laid down procedures (Cameron and Freeman, 1991; Cameron and Quinn, 1999; Denison and Spreitzer, 1991). Hence, hierarchical culture is very conducive for institutionalizing new approaches; and introducing new tools and techniques for performance excellence.

Due to centralized control in the hierarchical culture, there is a level of stability that ensures security of employment and steadiness in relationships with customers that, in turn

ensures smooth scheduling in accordance with customer driven plans (Denison and Spreitzer, 1991). The outcome of these characteristics is efficient production and dependable delivery to customers. The hierarchical culture tends to use strategies of standardized rules and procedures. Correspondingly, TQM planning practices also require the use of the formalized approach to plan and conduct a project with clear steps, instruction and tools prescribed at each step of the procedure. Schroeder et al. (2008) suggested that from the perspective of the organisational routines theory, problem solving can follow predictable planned steps. Therefore, planning activities can truly flourish in a hierarchical culture.

The belief underlying the hierarchical culture is that individuals and departments will abide by organisational plans and policies when formally stated and enforced through rules and regulations (Quinn and Kimberly, 1984). Organisations emphasizing the hierarchical culture are characterized by a formalized and structured place to work where procedures govern what people do (Cameron and Quinn, 1999). In such organisations, employees will feel comfortable about complying with the formal steps of the planning procedure and they will be more willing to follow the rigorous steps and use the prescribed tools to plan well (Denison and Spreitzer, 1991). Thus, the concern for predictability, uniformity and formality of rules and procedures inherent in the hierarchical culture is expected to facilitate organisations to put systemic planning procedures into effect. Therefore, the hierarchical culture can help to decrease planning barriers such as strategic plans not being customer driven, organisation's strategic plans not including quality goals and lack of specific ways of institutionalizing new approaches / tools / techniques.

The results of this empirical study confirm the fact that the influence of hierarchical culture on decreasing planning barriers is significant. Based on the findings, it can be stated that hierarchical culture can play an important role on the success of TQM since it has a direct and significant influence on decreasing planning barriers. Bahraini organisations should therefore be mindful not to inadvertently compromise the value of hierarchical culture in removing TQM barriers by, for example de-emphasising it in their effort to develop a greater component of group or developmental culture.

6.4.4.2 Impact of hierarchical culture on process management barriers (H11)

H11 – Hierarchical culture will decrease process management barriers - *Supported*

According to hypothesis H11 the characteristics of hierarchical culture are expected to help decrease process management barriers. The results of the SEM (section 5.3.2.3, figure

5.7 and table 5.18) show that the independent predictor variable of hierarchical culture is negatively related to the dependent variable of process management barriers ($\beta = -.215$, $\rho < .001$, $t = 3.301$), and the regression path is negative ($-.215$), supporting hypotheses 11. This study found that hierarchical culture had the highest score in its survey population and was significantly related with process management barriers. It is worth noting that the culture and barrier profile results of the Bahrain survey population show hierarchical culture as the highest scoring culture type and process management barriers as the lowest scoring barriers, inferring that a dominant hierarchical culture has already helped to decrease process management barriers in the survey population.

The finding for hypotheses 11 is consistent with the findings of previous studies such as (Dellana and Hauser, 1999; Prajogo and McDermott, 2005). It is generally accepted that organisations can improve quality of product/service through good process management that would result in less scrap and rework, less production cost and even less price for consumer (Walsh et al. 2002). The bottom-line results of this practice would be improved quality performance and higher efficiency and productivity, and in turn better financial and market performance, higher customer satisfaction, and competitive advantage (Kaynak, 2003). Hierarchical culture values these bottom-line results and thus would help decrease many TQM implementation barriers associated with inefficient process management.

Organisations with hierarchical culture are run by rules and regulations with a focus on control and stability, achieved through stability of processes (Dension and Spreitzer 1991). Predictable workloads and, scheduled production can increase efficiency (Naor, 2008). Stability, continuity and order help to ensure predictable performance outcomes. The hierarchical culture has fixed organisational structure, therefore departments and people work in a unified manner following formal rules, close control, clear lines of decision-making authority and a mechanism for accountability (Dension and Spreitzer 1991). There are clear step-by step instructions, prescribed tools and laid down procedures. Quality management systems in such organisations tend to be all inclusive and quality initiatives include all organisational functions/departments. Therefore, hierarchical culture would capitalize on process control and help remove the TQM implementation barrier of lack of a comprehensive quality programme and also treating quality as a separate initiative (not everyone's responsibility).

The hierarchical culture is characterized by uniformity, internal efficiency, and a close adherence to rules and regulations (McDermott and Stock, 1999). To achieve a high quality

level, it is important to have an organisational environment valuing the hierarchical culture in order to support the use of tools in process control and improvement (Cameron and Quinn, 1999). Process management in TQM focuses on improving internal process stability (or reducing process variability) through, for example preventive maintenance, production schedules, and statistical process control (Flynn et al., 1994, 1995; Kaynak, 2003). As the hierarchical culture pursues efficiency, stability and error detection and measurement, these process management techniques are more likely to be implemented and maintained in the organisation (Dension and Spreitzer 1991). Therefore, the hierarchical culture will decrease process barriers such as lack of a comprehensive quality programme.

The results of this empirical study confirm the fact that hierarchical cultures influence on reducing process barriers is significant. Based on the findings, it can be concluded that hierarchical culture plays an important role on the success of TQM since it has a direct and significant influence on decreasing process barriers. Similarly to what was argued in the previous sections it is important that Bahraini organisations do not lose sight of the importance of maintaining the presence of hierarchical culture as they go about planning and developing their TQM implementation approach.

6.5 Summary of discussion

The study findings points toward the fact that most of the organisations in Bahrain are not typified by a single cultural type, but have a tendency to be influenced mainly by a mix of hierarchical and rational characteristics. It indicates that the focus of the organisations in the survey population is on stability (hierarchical culture) and performance/profitability (rational culture). This tendency is not desirable, because theoretically the cultural profile that supports TQM implementation should have a dominant group culture that focuses on human development and a dominant developmental culture that focuses on customer satisfaction.

In order to measure the impact of organisational culture on TQM implementation barriers), hypotheses were developed on the basis of relationships between independent constructs of organisational culture and dependent constructs of TQM implementation barriers. Largely, the findings in this study show that group culture which is believed to be an ideal culture for TQM implementation helps to decrease employees barriers, information barriers and customer related barriers as predicted but doesn't help decrease top management barriers.. Rational culture decreases top management barriers as predicted but it doesn't help decrease employee and customer barriers, contrary to the hypothesized prediction. The results

confirm the predictive power of hierarchical culture in decreasing planning and process management barriers significantly. Developmental culture also decreases employees and customer barriers as predicted but not significantly.

The empirical results of this study reveal that different culture types influence different constructs of TQM implementation barriers. The model shows that the group culture is significantly related to 3 of the 6 TQM implementation barrier constructs. This finding confirms the importance of group culture for quality management as suggested in prior studies (Naor et al., 2008; Prajogo and McDermott, 2005). The results show that the developmental culture is not significantly related to the TQM implementation barriers related to customers and employees. The rational culture was found to have a significant effect on 1 of the 3 hypothesised TQM barrier constructs. The rational culture is the second most prevalent culture in this study and this culture is quite dominant. However, only 1 out of 3 hypotheses is supported. A focus on task achievement is observed as common theme of management style in this study. The empirical results reflect that this culture will help to decrease top management barriers but have opposite effect on employee and customer barriers. Although understanding the customer and developing close relationships with them are key strategies for gaining competitive advantage and ingrained in the rational culture the study found no significant relationship with reducing customer barriers.

The hierarchical culture has significant links to reducing process management and planning barrier in this study but no such links were found in previous studies. This is therefore a very important contribution of this study. For example, Cameron and Freeman (1991) found that the hierarchical culture was not related to any measures of organisational effectiveness in US higher education institutions. Also, Yeung et al. (1991) and Quinn and Spreitzer (1991) found that those organisations that overemphasized the hierarchical culture were the worst performers and their employees reported a low quality of work life. However, the results of this study showed that hierarchical culture has the highest score in survey population and is significantly related with process management barriers and planning barriers.

In the context of the survey population, a lack of skilled employees and training has been previously identified as a key challenge to the economy of Bahrain (D&B, 2008). A better trained and motivated workforce is considered an urgent need for the sustainable development of the economy of Bahrain. The result of this study infer that this objective can be achieved by addressing employees barriers through granting empowerment to employee to

apply quality improvement efforts; employee involvement in improvement projects; providing training in quality improvement skills, and training in group discussion and communication techniques; recognizing employees for achievements in quality improvement; and following an appropriate performance evaluation and reward system. Such TQM practices are consistent with the dimensions of group culture. Promoting the characteristics of group culture in the target population may thus significantly reduce employee barriers in the implementation of the above TQM practices.

In this study five out of eleven hypotheses are either not or not fully supported. It should be remembered that if a hypothesis is not supported, it should not be considered as absolute scientific proof that prediction is wrong (Jaynes, 2003). Rejecting a hypothesis is also very useful, informative and worth knowing because often, data that initially may seem to be inconsistent with a theory may in fact lead to new important predictions (Royall, 1997). In this study, the real world data did not fully agree with some of the hypothesized predictions indicating that the implications of theory were not totally supported by the facts in this study's context. Nevertheless, overall the majority of predicted relationships were supported. Whatever the reason for rejecting a hypothesis, it triggers a need for further inquiry and testing. Whether a hypothesis is supported or rejected, the best course of action in academic research is to test it again and again with different settings.

Chapter Seven: Conclusion

7.1 Introduction

In this chapter, the author briefly summarises the findings of the research. Issues that emerge from the main findings of the study are presented. The research implications are discussed from theoretical and practical perspectives. First, the theoretical contributions of the thesis, in terms of the gap in the TQM implementation knowledge domain that has been addressed are discussed. Second, the practical/managerial implications of the study's findings are described. This is followed by a discussion of the methodological and theoretical limitations of the research. Finally, some possible directions for future research are recommended.

7.2 Main outcomes of study

This research was partly inspired by the objective of the government of Bahrain to shift from an economy built on oil wealth, to a productive, globally competitive economy through its economic Vision 2030 programme. In order to transform Bahrain's economic offering to a multi-industry global contender, the country needs to produce high quality products/services. In its Vision 2030 programme, Bahrain has identified the need for extensive quality and cultural improvement that can be supported by the appropriate use of tools such as TQM (<http://www.bahrainedb.com/economic-vision.aspx>). Furthermore, although much research has been undertaken in the area of TQM, relatively little research has explicitly and systematically examined the influence of organisational culture on key aspects of the TQM implementation process. In particular, despite widespread acknowledgement of the importance of culture in TQM, and widespread acknowledgement of the existence of barriers to the implementation of TQM, the literature to date indicates that there is no systematic study that has specifically investigated the relationship between organisational culture and TQM implementation barriers. This thesis, therefore, has the central theme of examining characteristics of organisational culture that would help overcome TQM implementation barriers and consequently help in developing an improved understanding of factors affecting TQM implementation. This in turn would help in informing the development of improved models of TQM implementation that can be used by practitioners with a view to helping them to implement successful and sustainable TQM management approaches. The study has empirically examined evidence on the influence of organisational culture on TQM implementation barriers to better understand how different culture types are likely to affect TQM implementation.

Accordingly, based on a thorough review of TQM literature, a framework was developed that describes proposed relationships between organisational culture and TQM implementation barriers. This framework incorporated four independent variables of organisational culture (group culture, developmental culture, rational culture, and hierarchical culture) and six dependent variables of TQM implementation barrier constructs (top management barriers, employee barriers, customer barriers, planning barriers, information management barriers, and process management barriers). Following the findings of Prajogo and McDermott (2005), this study positions organisational culture as an antecedent of TQM implementation in an organisation, and thus assumes that TQM implementation barriers are largely the consequences of the type of existing culture. The implication of this stance on directions for future research is discussed in section 7.4.

The study applied a quantitative method with a positivist approach in which an online survey questionnaire was used to obtain quantitative data to test the stated hypotheses. The data for this study was obtained from service and manufacturing industries in Bahrain. The sample consisted of 325 usable responses. The SEM (Structural Equation Modelling) technique was used to test the hypothesised relationships using analysis of moment structure (AMOS) software. SPSSTM 15.0 was used to analyse demographic statistics. The main conclusion of this study is summarized in section 7.4 by answering each research question raised in chapter one of this thesis. But before bringing up the conclusion, it would be appropriate to mention a few limitations of this study to ensure that the value and importance of the drawn conclusion is not compromised because of these limitations.

7.3 Limitations of the study

This research has a few methodological limitations:

1. One is the possibility of self-reporting bias. Ahire and Golhar (1996) point out that “when one collects data from managers about their own organisations, and specifically about managerial issues with which they are closely associated, there is a potential for self-reporting bias.” To help counteract any such bias, it has been suggested that multiple responses from each organisation can be obtained. In this study, because the target respondents were quality practitioners, top managers and leaders of organisations who are very few in each organisation, the identification of multiple respondents at such a level in each organisation was difficult to guarantee in the Bahrain sample. However, using the perceptions of single respondent from each organisation is a justified approach, as this

approach is highly common in high impact research (e.g. Zu et al., 2009 and Prajogo and McDermott, 2005).

2. Self-reported data has also been associated with social desirability bias. In some situations, the respondent may be tempted to give a socially desirable response to a survey question rather than expressing what is really happening in the organisation. Alreck and Settle (1995) state that “when personal preferences, opinions, or behavior deviate from what’s socially prescribed, respondents are very prone to report what’s socially acceptable, rather than the true answers.” Some of cultural and barrier questions had this potential weakness and it may be argued that they were therefore prone to such bias. Also, when self-reported data is taken on one occasion only, concerns over common method bias influencing the recorded responses may arise (Hair et al, 2009). Nevertheless, the author took steps to mitigate against this happening, notably by clarifying this possibility in the survey instructions to reduce this bias. Furthermore, each question was a constituent of the larger construct that was to be aggregated in the analysis, and thus a specific response on a specific question was not used to draw any inferences. Therefore, the potential problem of “social desirability” was further moderated. It should also be noted that cross-section studies appear to remain one of the most prevalent and respected methodological approaches in TQM and more widely in operations management research.
3. The author tried to maintain a reasonable length of survey questionnaire but due to the complex nature of the questions on TQM implementations barrier and cultural profile questions based on CVF framework, the length of the survey questionnaire was larger than desirable. However, the online administration of survey had the option to save the answers and continue and complete the survey at a later time. This would compensate the potentially strenuous affect of a long questionnaire on the respondents.
4. Although the results of this study are useful points of departure for other organisations globally, the results can’t be fully generalized to other countries around the globe because culture is unpredictable and varies from place to place. Schwartz (1994) and Hofstede (1991) strongly argue that it is crucial to measure the cultural values of the particular sample being studied and not to rely on reported values for other samples, even if they are for the same cultural area or grouping. Similarly, the result of TQM implementation barriers found in the survey population can’t be generalized to other places/regions. In this context, the results are more suggestive for countries beyond Bahrain than conclusive, but will act as valuable groundwork for later research in the TQM

implementation domain. Therefore, an empirical investigation is required to identify the type of culture and barriers existing in other industries where future study would take place. However, the validated and empirically tested framework, along with the survey instrument may be used anywhere, conveniently.

5. A further limitation is the cross-sectional design of the study, collecting data at a single point in time. Future researchers are encouraged to consider longitudinal designs which can establish the effect of culture on implementation barriers over time.

Despite the limitations discussed above, the study achieved its objectives, and its overall aim of empirically examining evidence on the impact of cultural characteristics on TQM implementation barriers to better understand their influence towards the effective and comprehensive implementation of TQM.

7.4 Conclusion

The conclusions drawn from this study are firstly presented in relation to each of the research questions raised in chapter one of this study:

Research Question 1. What are the types of existing organisational culture in the industries of Bahrain?

From the culture perspective, the findings of this study indicate the existence of the mechanistic-type culture within Bahraini organisations, represented by the hierarchical and rational culture. The mean score of both hierarchical and rational cultures in the survey population indicates their prevalence which, in turn, reflects a strong hold of culture that, according to the literature (Dellana and Hausser, 1999; Cameron and Quinn, 1998) is not in line with what may be considered to be an 'ideal' TQM culture. TQM, according to the literature, primarily needs a changing, adaptable, and organic character to flourish but companies in the survey population showed an orientation more towards a stable, predictable, and mechanistic character. Previous research suggests that those cultures which are characterized by flexibility (group and developmental) rather than control (hierarchical and rational) are most likely to support the implementation of TQM effectively. This cultural profile in the survey population appears partly unfavourable for TQM interventions because of the dominant existence of rational and hierarchical culture types.

However, some characteristics of hierarchical culture such as routinisation, formalization and step-by-step task procedures and processes are supported in the literature to

obtain the requisite degree of stability, continuity and order. The literature also indicates that such characteristics of hierarchical culture are also needed in TQM implementation. For example, in order to maintain stability and order, Deming (1986) and many other TQM scholars emphasized to establish clear standards for employees work and methods to achieve those standards. Supporting the need of routinisation and formalization, Feigenbaum (1991) stressed that employees should clearly know their duties and responsibilities. Similarly, there is convincing evidence in literature that many successful organisations in developed and developing countries have more focus on the characteristics of rational culture such as task accomplishment, goal achievement, efficiency, productivity and profitability, rather than characteristics of group culture such as employee empowerment, employee participation and human resource development (Zu et al. (2009) in the USA; Prajogo and McDermott (2005) in Australia; and Alkhalifa and Aspinwall (2000) in the Middle East). Since evidence in the literature suggests that many organisations in developed countries such as the USA and Australia that have a dominant rational culture also have successful TQM programme, therefore it is reasonable to imply that rational culture also supports TQM.

While acknowledging the prevalence of hierarchical and rational culture types, the findings of this study substantiate the idea of the concurrent coexistence of organic and mechanistic types of culture in Bahraini organisations. Such contradictory combination of cultures is consistent with the findings of previous studies on the composition of organisational culture (Buenger et al., 1996; Kalliath et al., 1999; Zammuto and Krakower, 1991). In the context of combinations of cultures as found in this study, the previous research on organisational culture suggests that organisations are unlikely to reflect only one culture type and that to be effective, the adoption of some elements of each of the four ideal culture types (group, developmental, rational and hierarchical) is necessary. Therefore, a favourable mix of characteristics of organisational culture is desired, that not only meets the competing demands of change and stability but also provides enough flexibility to accommodate innovation and growth (Prajogo and McDermott, 2005). Nevertheless, the dominant culture will have an extensive impact on the character, behaviour and performance of an organisation and ultimately this dominant culture is likely to be a major determinant of the success of improvement programme such as TQM (Prajogo and McDermott (2005).

Research Question 2. What are the significant TQM implementation barriers in the industries of Bahrain?

Lack of understanding and not addressing TQM implementation barriers is considered a prime cause of failures of TQM (Ngai and Cheng, 1997; Sebastianelli and Tamimi, 2003; Jun et al., 2004; and Bhat and Raj, 2009). One of the inherent characteristics of TQM is that it takes considerable time to mature and bring results. If TQM implementation barriers are not identified before implementation then considerable resources can be wasted during the implementation process. This study found that TQM implementation barriers are prevalent in companies in Bahrain. It is important for organisations in Bahrain to understand the presence of these barriers both before and during TQM implementation, such that where possible, steps can be taken to address them. The study found that the TQM implementation barrier related constructs of top management, employees, customers, information management and planning had a relatively high score in Bahraini companies, while process management barriers had a much lower score. It is interesting to note that the three high scoring barrier constructs were those more associated with human involvement (i.e. leaders, employees and customers), while those arguably more concerned with the organisational infrastructure and practices had lower scores (i.e. information, and planning had slightly lower scores and process management barriers had the lowest score). The results of this study therefore also substantiate the importance of the human dimension in quality management, and it is reasonable to conclude that they therefore highlight the need for a strong drive for the education and training of managers and employees in quality management.

Research Question 3. What is the relationship between organisational culture and TQM implementation barriers, based on the culture profile and barriers that exist?

The study also reveals a disparity in the effects of culture types on the TQM implementation barriers. The study found that group culture helps decrease employees barriers, information barriers and customer related barriers significantly but it doesn't help decrease top management barriers. On the other hand, rational culture helps decrease top management barriers as predicted but it doesn't help decrease employee and customer barriers, contrary to the hypothesized prediction. The results confirm that hierarchical culture helps to decrease planning and process management barriers significantly. Developmental culture also helps to decrease employee and customer barriers as predicted, but not significantly.

The findings substantiate the importance of progressively building a cultural environment that will decrease barriers to TQM implementation in order to support the comprehensive implementation of various TQM practices and hence increase the possibility of success with quality management initiatives. The different practices are driven by and reflect multiple dimensions of organisational culture (Prajogo and McDermott, 2005). As recognized in the literature (e.g., Cameron and Freeman, 1991; Quinn and Spreitzer, 1991; Smart and St. John, 1996; Wilkins and Ouchi, 1983; Yeung et al., 1991), the unique advantage of different culture types indicates that an emphasis on one single culture type is not the best approach for overall organisational effectiveness. The results of this study suggest that in order to seek maximum benefits from implementing multiple TQM practices, it is important to develop not only flexibility and people-oriented culture values (i.e., the group and developmental culture) but also control and external oriented values (i.e., the rational and hierarchical culture).

This study is based on the argument that it is the organisational culture that will impact TQM Implementation barriers. The findings of this study also suggest that organisation culture has a significant impact on TQM implementation barriers. For example, group culture significantly relates to the three constructs of TQM implementation barriers i.e. barrier constructs of employees, customers and information management. This is followed by hierarchical culture that relates to two barrier constructs i.e. process management and planning barrier constructs. Rational culture constructs relates to one but the most important barrier construct of top management barriers. However, developmental culture doesn't relate to any hypothesized barrier construct significantly.

The findings suggest that the group, hierarchical and rational culture correlate at fairly similar degrees with TQM implementation barrier variables but developmental culture correlates less strongly. These finding verify the findings of few previous studies that have attempted to examine the culture-TQM relationship, such as those by Chang and Wiebe (1996), Zeitz et al. (1997) and Dellana and Hauser (1999) who always place organizational culture as the antecedent of TQM practices. Therefore, based on the empirical findings of this research, the causal direction between Culture and TQM can be concluded by stating that it is the organizational culture that will determine the results of TQM implementation rather than the TQM implementation bringing about cultural change. This statement is supported by many previous researchers (Maull et al., 2001; McNabb and Sepic, 1995; Westbrook and Utley, 1995).

7.5 Contributions of the study

In this section, the research implications are discussed, from both the theoretical and practical perspectives (section 7.3.1 and 7.3.2). Firstly though, three overarching contributions are presented:

First and foremost this study adds to the existing knowledge on TQM and its implementation as it is the first study, both in a western and non-western context that has explicitly and empirically examined the influence of organisational culture on TQM implementation barriers. Thus, the findings of this research provide for a deeper and richer understanding of the factors affecting the implementation of TQM.

Secondly, given that the theoretical model was based on literature developed mainly in western contexts (such as the U.S., Europe and Japan), the test of the theoretical model in the context of Bahraini firms has also provided a good opportunity for the researcher to evaluate the applicability of culture/TQM barrier theory in a different, non-western national context.

Thirdly, this study has also developed and initially validated a scale to measure TQM barriers based on the synthesis of prior work that can be used by practitioners and researchers in their effort to advance the theory and practice of the TQM approach.

7.5.1 Specific theoretical and methodological implications

1. Although it was not the intention of this research to develop a model (or revised model) of TQM implementation, this study has contributed a new dimension to our understanding of factors affecting the implementation of TQM. It thus provides future researchers with a wider and deeper understanding of these factors that can inform the development of more effective and empirically grounded models for TQM implementation that explicitly take account of organisational culture and TQM implementation barriers.
2. The findings indicate that organisational culture can have a positive effect on TQM implementation by helping to decrease the prevalence of the very commonly observed types of TQM barriers. Three of the four culture types (group, rational and hierarchical culture), in the Bahrain context, have been shown to have the capacity to have such an effect. This finding substantiates the importance of an explicit consideration of organisational culture in TQM implementation research. Furthermore, each of the six barrier constructs has been shown to be associated with a culture orientation that helps to

remove it. As such, it is reasonable to argue that it is important that future research work relating to specific elements of TQM such as leadership, employee focus, customer focus, information management, strategic planning and process management, takes into account and is informed by the corresponding organisational culture connection.

3. Despite the global perception of the TQM concept, its worldwide reach and its use by many quality and excellence awards, there was found to be hardly any research attempts to study TQM implementation issues in the context of developing countries. In addition to that, there was a lack of theoretical frameworks that would deal with the TQM failure issues in developing countries. The work in this thesis has made a new contribution to the field of TQM implementation with a focus on supporting TQM's effective implementation in developing countries. This study recognized the need to address TQM implementation in developing countries through examining the relationship between organisational culture and TQM implementation barriers in Bahrain. Such an attempt is believed to provide a better knowledge and a wider vision for implementing TQM successfully in developing countries, for 'local' organisations as well as for multinational organisations that operate in this part of the world.
4. The findings provide evidence of the need for managing the multidimensional elements of TQM implementation barriers through corresponding characteristics of organisational culture. The methodology used in this study is believed to enable practitioners to assess the readiness of the organisation's culture to embrace a formal TQM approach. It provides baseline measures of the extent of TQM implementation barriers that can be used to track obstructions in TQM implementations. The survey instrument measures the distinct dimensions of both culture and TQM implementation barriers. This allows the practitioners to target those features that require attention, thus enabling them to more effectively deploy the resources available to them.
5. The research identified types of organisational culture that exist in Bahraini industries and explored the characteristics of each type of culture in the context of TQM implementation using an established and validated CVF framework for organisational culture. Revalidation and testing the usefulness of the CVF framework in the context of Bahraini industries is also a contribution.
6. This study also identified TQM implementation barriers that exist in Bahraini industries and it is the first study to do so, thus providing future researchers investigating TQM in a GCC context with an empirical platform. It is expected that this research will provide a

much needed impetus for further research on TQM implementation and barriers in the GCC context.

7. The design and the conduct of study that included the development of a survey questionnaire for identifying significant TQM implementation barriers is a valuable foundation for later research. During the literature review, it was found that there was a lack of a good diagnostic questionnaire in the literature on TQM implementation barriers that could be easily administered. Therefore a systematic methodology was adopted in this study for deriving the commonly cited significant TQM implementation barriers from the literature and validating them through structured interviews.
8. Largely, previous surveys in the GCC region have been paper based or email based. The survey questionnaire in this study was administered online via a web-based survey. The use of online survey for fielding the survey questionnaire has proved very successful, hence validating the utility of web-based surveys for future researchers. This may encourage future researchers on using online survey based approaches which are fast, easy, economical, and reliable.
9. Finally the Structured Equation Modelling (SEM) in Amos 16 was used to measure structural relationships between constructs of organisational culture and TQM implementation barriers. Amos can present a model in an intuitive graphical interface to show hypothesized relationships among variables and SEM in Amos empirically examines a theoretical model by combining both measurement model and structural model in one analysis. Because it takes information about measurement into account while testing the structural model, therefore, the design of the structural model emerging from the measurement model results in a more precise measurement of dependence relationships between constructs.

7.5.2 Specific practical/managerial implications

1. The findings of the study substantiate the argument in the literature that organisations seeking to improve their fortunes through a TQM approach need to work with culture (Schein, 1985; Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Prajogo and McDermott, 2005; Naor et al., 2008; Zu et al., 2009). Extending this, the finding that culture can help to address the removal of TQM implementation barriers leads to the conclusion that assessing the culture profile of the organisation is an

extremely worthwhile, if not crucial step, that organisations should take as early in their TQM journey as possible.

2. For Bahraini managers tasked with the introduction or rejuvenation of TQM specifically (and possibly managers in other GCC countries), this study augments and extends the existing understanding of TQM implementation factors that has predominantly been derived in the western context, thus providing a directly relevant foundation on which to build their own understanding of how to approach TQM.
3. It can be concluded from the findings that in the Bahraini context, group culture is the most dominant of the four culture types in terms of helping to remove barriers to TQM implementation. Furthermore, the findings also indicate that group culture has this effect even when it is not the most prevalent type of culture in the organisation, in other words, when other culture types are actually more dominant. In this sense, the results of this study strongly support the findings of previous studies (Chang and Wiebe, 1996; Zeitz et al., 1997; Dellana and Hauser, 1999; Alkhalifa and Aspinwall, 2000; Prajogo and McDermott, 2005; and Zu et al. 2010) that argue for group culture as a mainstay of facilitating effective TQM implementation.
4. In the Bahrain context, the next most dominant culture type for helping to remove TQM barriers is hierarchical culture, which was shown to have the capacity to help decrease two types of TQM barrier constructs. This finding is perhaps even more salient, particularly when considered in conjunction with the finding that developmental culture was not shown to help remove TQM barriers, since it demonstrates that the tendency in the literature to focus primarily on group and developmental culture attributes as facilitators of TQM implementation may be misplaced and needs to be re-evaluated. This study counters that argument, suggesting that the more mechanistic culture types, particularly hierarchical, have a role to play. Consequently, Bahraini managers should embrace the existence of hierarchical culture when developing their quality management and TQM ethos, and not necessarily seek to reduce or sideline it, as might be the case in western based TQM interventions.
5. The findings suggest that any efforts that can be made to increase the presence of group culture and hierarchical culture prior to commencing the formal implementation of TQM would be highly beneficial. Alternatively, the findings indicate that such efforts would be highly beneficial as part of the ongoing implementation, or as part of a rejuvenation of TQM efforts should a loss of momentum occur during TQM implementation as has been

reported in the literature as a common occurrence as implementation progresses and matures (Oakland, 2004).

6. The findings indicated that the removal of top management barriers in the Bahraini organisations is underpinned by rational culture. The leaders in rational culture believe in competitive market leadership and profitability. In order to win in the marketplace and outpace competition, they need quality of products/services. Therefore, they hire competitive and achievement oriented people, provide them with continual training, and achieve their goals through hard driving and aggressive strategy. Hence, the leaders are highly committed; provide resources for training; communicate quality awareness directly with employees by cutting management layers; and set goals and objectives for quality improvement. Therefore, rational culture adequately addresses most of the top management barriers and should be promoted to decrease top management barrier in TQM implementation. Therefore this finding would be very helpful for the leaders in Bahraini organisations, which need to familiarize themselves with the characteristics of rational culture and its impact on TQM implementation.
7. The removal of employee barriers, customer barriers and information barriers in the Bahraini organisations is underpinned by group culture. Organisations with group culture believe in the development of human resources, teamwork, employee commitment, and concern for people. Hence group culture decreases employee barriers. Similarly, the characteristics of loyalty and mutual trust in group culture decrease customer barriers and the characteristics of communication, openness, and participation in group culture decrease information barriers. Such information would be very supportive for the leaders in Bahraini organisations, specifically when they identify characteristics of organisational culture and make themselves acquainted with these characteristics of culture.
8. The removal of planning barriers and process management barriers in the Bahraini organisations is underpinned by hierarchical culture. In hierarchical organisations, control and efficient operations are ensured by proper planning, coordinating and organizing. Efficiency is achieved through planning and smooth scheduling resulting in low-cost production. Therefore, planning barriers are decreased in organisations with hierarchical culture. Hierarchical organisations are controlled and structured places with formal procedures, rules and policies that give predictable outcomes, permanence and stability. Hence, process management barriers are decreased. This kind of information would be very convenient in practice for the leaders of Bahraini organisations when evaluating and improving their planning approaches.

9. The results, overall, indicate that the removal of TQM barriers is dependent on both the more people oriented culture type (represented here by group culture) and the more mechanistic culture type (represented here by hierarchical and rational culture).
10. Given the specific culture mix that has shown to exist in Bahraini organisations, and the specific ways in which the different types of culture support decreasing the existing TQM barriers, a number of recommendations for Bahraini organisations on implementing TQM as per the vision 2030 programme has endorsed, can be put forward:
 - a. Firstly, identifying and understanding the organisational culture is necessary before TQM implementation as there is a clear indication of a positive relationship in the literature stating that an appropriate culture is vital to the success of TQM.
 - b. Secondly, the literature indicates that many organisations do an excellent job of committing to total quality by implementing the TQM practices but neglect to address potential implementation barriers of TQM. Therefore, it is important for all organisations to understand and avoid these barriers as far as is possible both before and during TQM implementation.
 - c. Thirdly, organisations can enhance the likelihood of a effective implementation of TQM by understanding the impact of organisational culture on TQM implementation barriers. In order to accomplish this task, organisations need to know which type of culture can help to remove which barriers. Therefore, there is a need to identify variables of organisational culture and TQM implementation barriers and to establish the relationships between these two variables through empirical evidence, so that they can be built into implementers' models for TQM implementation. Hence, during the process of TQM implementation, Bahraini organisations should investigate the impact of underlying cultural characteristics on TQM implementation barriers.
11. The contribution that this research has made is extremely timely for two reasons. Firstly, in the context of this study, companies in Bahrain who may have limited experience of establishing TQM have realized the need, supported by Bahrain government policy implementation, to more holistically address quality management through the TQM approach. Secondly, in the wider context, it is apparent that despite the reported failures, TQM is still a popular management approach that organisations are turning to, often through their adoption of one of the national or international business excellence approaches, to help develop their organisational performance (Dale et al., 2007; Oakland, 2003). The research thus provides Bahraini organisations with an empirically based assessment of organisational culture in Bahrain, an empirically based examination of the

relative strength of the common impediments and pitfalls to the effective implementation of TQM existing generally in Bahraini industry and commerce, and an empirically based examination of how culture may or may not influence these likely barriers to TQM implementation that Bahraini companies are likely to face.

12. Although it was not the intention of this research to develop a `model` for TQM implementation in Bahraini organisations, the research instrument used in this study readily lends itself for use by manufacturing or service organisations of all sizes as either a pre-TQM audit tool, or as the basis for periodic/continuous self-assessment, that can be used by the management of the organisation to inform the nature, timing and priorities amongst its TQM implementation activities.
13. Whilst individual Bahraini organisations are advised (as above) to carefully examine the findings of this research in the context of their specific organisation, it is the Bahraini government that represents Bahraini industry and commerce as a whole, and as far as is possible is encouraged to (some would argue it must) provide relevant context specific advice and guidance to the country's companies. While not underestimating the value that the Bahraini government can take from the existing, mainly Western-developed knowledge base on implementing TQM, this study immediately provides them, as policy makers and in their efforts to advise and support companies as part of their vision 2030 programme, with (a) an empirically derived understanding of the general pattern of organisational culture existing in Bahrain, (b) an empirically derived understanding of the breadth and relative intensity of the barriers to TQM existing in Bahrain, and (c) an empirically derived understanding of the linkages between the former and the latter in Bahrain, that can therefore directly and with a very high degree of relevance inform the advice and support they provide.
14. The conceptual framework and survey instrument tested and validated in this study, will help organisations of Bahrain to identify the appropriate emphasis on TQM implementation based on their organisational culture and subsequently identify TQM implementation barriers. The Research will benefit organisations who have not been able to implement TQM effectively, or who are in the process of planning the introduction of the TQM approach. More specifically, the development of a deeper understanding of TQM implementation would meet the long term objectives of Bahrain centre of excellence and the Vision 2030 programme of government of Bahrain. Furthermore, it is reasonable to propose that the conceptual framework and survey instrument can be used in any

organisational environment in any country or region. Therefore, it is envisaged that this study will help enhance the success rate of TQM implementation on a large scale.

15. As identified in this study, the co-existence of all four types of culture within the survey population has reaffirmed the proposition by Denison and Spreitzer (1991) who have specifically affirmed the need to incorporate and balance all four cultural types. The instrument devised in this study would facilitate managing this cultural inconsistency which seems to be one of the major issues of TQM and the main challenge for organisations that implement it (Prajogo and McDermott, 2005). The major implication of this finding is that organisations need to accommodate divergent goals by developing a system and/or structure that allows enough flexibility for adapting different (even contrasting) management styles, hence, swinging comfortably between control and flexibility and between internal and external orientation (Tushman and O'Reilly, 1996).
16. By and large, the coexistence of the control and flexible models implies that these antagonistic elements are there within an organisation and need to be managed tactfully (Prajogo and McDermott, 2005). However, there are many trade-offs in the deployed strategies in cultural context - like discarding some characteristics of existing type of culture, preserving some characteristics of existing culture and adopting some attributes of another type of culture. It is believed that by using the survey instrument and conceptual framework, organisations can know very clearly what is required to change and what is not. It will provide practitioners more informed understanding to manage the cultural paradox in the context of implementing TQM.
17. Previous studies on TQM implementation reveal two related aspects. Firstly, that TQM is often not implemented properly and secondly that when properly implemented TQM undeniably improves performance. To this end, this study has provided an empirically grounded framework that can be used alongside other pertinent advice as a tool for helping practitioners to implement TQM effectively.

7.6 Directions for future research

In this section, future research directions are suggested.

1. This study has examined for the first time a `new` relationship in the TQM implementation domain, and has done so in a Bahrain context. It is important that other researchers now examine the relationship between organisational culture and TQM not only in other GCC or non-Western contexts, but perhaps most importantly in western

contexts, where the vast majority of TQM theory development and examination of TQM practice to date has taken place.

2. It is expected that this study will help to foster a formal discussion especially between researchers taking opposing stances on whether culture is an antecedent of TQM or vice versa. That is to say, whether TQM implementation determines organisational culture or organisational culture promotes/inhibits TQM implementation. This research attempted to explore these and other relationships between TQM and culture. Our results support the view that organisational culture promotes/inhibits TQM implementation, yet it still opens further debate in this area, particularly the recursive and reciprocal effect of both variables need to be explored further. One of the assumptions may be that adoption of a TQM perspective could have positive effect on organisational culture and reciprocally such transformation of organisational culture would sustain further implementation of TQM - generating a recursive effect.
3. In this study, the data on organisational culture profile was collected only at the organisational level, but in the case of large organisations each department/division or function may have subgroups of culture which are more homogenous within the department/division but are heterogeneous with respect to overall organisational culture because of the varied nature of their function. For example, an IT department in a large aluminium factory may have developmental culture as more prevalent, but the production division may have rational or hierarchical culture more dominant. Similar speculations can apply to TQM implementation barriers that may vary due to the specific tasks of each department/division. Future research may investigate this fact at root level.
4. Another research domain may be regarding the most appropriate combination of cultures that will promote/inhibit TQM implementation barriers. The question whether this combination will differ with respect to industry sector, strategic goals of the organisations and business environment, remains open. Organisations operating in a stable industry might be expected to emphasize more on control elements of organisational culture such as the characteristics of hierarchical or rational culture, while organisations operating in a dynamic environment might be more expected to put more emphasis on group and developmental culture. Further examination of this phenomena is required to inquire whether adding such variables as control variables into the existing conceptual framework will affect the results or not.
5. According to the theory in the literature, group culture would minimize top management barriers. The results of this empirical study demonstrate that the influence of group

culture on top management barriers is uncertain, which is contradictory to the theory-based prediction, and also contradictory to the results of some previous empirical studies, prompting a call for further investigation. This same implication can apply to the other four hypotheses that were not fully supported. In this study, real world data did not agree with hypothesized predictions about these five relationships, indicating that the implications of theory is not supported by the facts. Whatever the reason for rejecting a hypothesis triggers a need of further inquiry and testing. Accordingly, the following five hypothesis need to be tested using the same methodology, but with research samples from different study populations.

- H1 Group culture decreases top management barriers
- H5 Developmental culture decreases employee barriers
- H6 Developmental culture decreases customer barriers
- H8 Rational culture decreases employee barriers
- H9 Rational culture decreases customer barriers.

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Appendix 1 Survey Questionnaire

Impact of organisational culture on Total Quality Management

implementation/barriers

This survey is a part of a study that seeks to empirically examine the impact of underlying cultural factors on TQM implementation barriers in order to better understand their influence towards the successful implementation of TQM. The study will identify the type of organisational culture and the significant TQM implementation barriers existing in Bahraini industries. This will enable an analysis of which barriers are most associated with each type of organisational culture. The results of the study will offer original insight into some of the less understood practical aspects of TQM implementation in Bahraini industries.

The survey comprises four parts:

Part I Profile of your organisation

Part II Organisational culture that exists in your organisation

Part III TQM implementation barriers that exist in your organisation

Total Quality Management is a management approach that often requires fundamental changes in the way organisations work. What specific changes may be required need to be examined through reliable data acquired within a robust research design. As this research is the first of its kind in Bahrain and many future research studies will base their work on the results of this research, we request a very careful, accurate and unbiased response from managers, quality practitioners and the leaders of the industries. By completing the survey carefully, you can assist in improving our understanding of TQM implementation.

Your replies to this questionnaire are kept in strict confidence. The name of participating companies are not released or divulged to third parties. Data will be analysed and reported on a group basis.

Thank you in advance for your time and effort. I am extremely grateful for your participation in this study. If you have any questions, please email me.

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TQM Survey – Part I Personal and Organisational profile

Listed below are questions about yourself and the profile of your organisation. Please provide as much detail as possible.

1. **Job title:** _____

2. **Highest level of education:**

HSSC Diploma Bachelor Masters PhD

Other, please specify:

3. **Professional qualification:** _____

4. **Quality Management experience**

Less than 1 year 1 to 3 years 4 to 7 years 8 to 15 years More than 15 years

Choose one that applies

5. **Work experience**

Less than 1 year 1 to 3 years 4 to 7 years 8 to 15 years More than 15 years

Choose one that applies

6. **Number of employees in your organisation:** _____

7. **Type of company**

(Please indicate which one or more of the following apply)

- Primarily manufacturing
- Professional service (i.e. customized service for individual customers, e.g. consultancy)
- Mass service (i.e. standardized services for mass consumption, e.g. retail banking)
- Other, please specify:

8. **Type of operation/establishment**

(Please tick the ONE that best describes your establishment)

- A single independent local establishment
- A branch of a local establishment
- Part of a multi-national establishment
- Other, please specify:

9. If a manufacturer, which of the following describes your production process - (Please tick any that apply)

Make-to-order Make-to-inventory

Other, please specify:

10. If a manufacturer, which of the following describes your products - (Please tick any that apply)

End user products Parts/components

Other, please specify:

11. Type of Quality Management in your organisation and their duration

(Please select the duration for each of the following as they apply in your organisation)

	Not yet	Less than 1 year	1 to 4 years	4 to 7 years	More than 7 years
TQM	<input type="radio"/>				
Six Sigma	<input type="radio"/>				
ISO 9000	<input type="radio"/>				
QFD	<input type="radio"/>				
Kaizen	<input type="radio"/>				
Lean manufacturing	<input type="radio"/>				
BPR	<input type="radio"/>				
Other	<input type="radio"/>				

Others - please specify here

TQM Survey – Part II
IDENTIFYING ORGANISATIONAL CULTURE PROFILE

Founders of Total Quality Management (TQM) and many other researchers have described TQM as a universal philosophy that can fit anywhere. However, they argue that the business environment and organisational culture have a great influence on successful TQM implementation. This research is an attempt to explore the nature of this influence in Bahraini organisations. Organisational culture is examined through six dimensions (questions 12 - 17 below). For each four statements (A, B, C & D) relate to the type of ORGANISATION that yours is most like.

Please select the appropriate response (from Strongly disagree, Disagree, Neutral, Agree, Strongly agree) for each statement (A, B, C & D) depending on how similar the statement is to your ORGANISATION. None of the statements are any better than the others; they are just different.

12. The organisation is a very

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
A: Personal place - it is like an extended family. People seem to share a lot of themselves	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B: Dynamic and entrepreneurial place - people are willing to stick their necks out (try new things) and take risks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C: Result oriented - a major concern is with getting the job done. People are very competitive and achievement oriented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D: Controlled and structured place - formal procedures generally govern what people do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. The leadership in the organisation is considered to exemplify

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
A: Mentoring, facilitating or nurturing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B: Entrepreneurship, innovating, or risk taking	<input type="radio"/>				
C: A no-nonsense, aggressive, results-oriented focus	<input type="radio"/>				
D: Coordinating, organizing, or smooth-running efficiency	<input type="radio"/>				

14. The management style in the organisation is characterized by

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
A: Teamwork, consensus, and participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B: Individual risk-taking, innovation, freedom, and uniqueness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C: Hard-driving competitiveness, high demands, and achievement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D: Security of employment, conformity, predictability, and stability in relationships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. The glue (binding force) that holds the organisation together is

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
A: Loyalty and mutual trust - commitment to this organisation runs high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B: Commitment to innovation and development - there is an emphasis on being on the cutting edge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C: Emphasis on achievement and goal accomplishment - aggressiveness and winning are common themes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D: Formal rules and policies - maintaining a smooth-running organisation is important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. The organisation emphasizes

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
A: Human development - high trust, openness, and participation persist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B: Acquiring new resources and creating new challenges - trying new things and prospecting for opportunities are valued	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C: Competitive actions and achievements – hitting stretch targets and winning in the marketplace are dominant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D: Permanence and stability - efficiency, control and smooth operations are important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. The organisation defines success on the basis of

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
A: The development of human resources, teamwork, employee commitment, and concern for people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B: Having the most unique or newest products. It is a product leader and innovator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C: Winning in the marketplace and outpacing the competition - competitive market leadership is the key	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D: Efficiency - dependable delivery, smooth scheduling and low-cost production are critical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Source: Organisational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn (1999)

TQM Survey – part III
TQM IMPLEMENTATION /BARRIERS

The main focus of the Total Quality Management (TQM) concept is to create the conditions for continuous improvement of products, services and processes. TQM has the potential to integrate many improvement philosophies proposed over the last few decades. However, TQM can prove difficult to achieve if it is not implemented well. One of the possible flaws in the TQM implementation approach is that implementers of TQM don't consider the possible impact of underlying implementation barriers during the implementation effort. This study seeks to explore this impact.

Please read the following statements carefully and indicate how true each is about your organisation (Strongly disagree, Disagree, Neutral, Agree, Strongly agree)

18. Top management barriers

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
18.1 - Senior managers in our organisation show visible commitment and support to quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.2 - Senior managers allocate inadequate resources for employee training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.3 - The leaders in our organisation frequently set goals and objectives for quality improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.4 - In our organisation there is frequent turnover of managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.5 - There are many layers of management in the organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.6 - Management style slows down learning culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.7 - Middle managers provide an effective link between top manager and operators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.8 - Quality awareness and improvement is championed by middle managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. Employee barriers

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
19.1 - Our employees are rarely empowered to apply quality improvement efforts in their area	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.2 - Employee involvement in improvement projects is a common practice in our organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.3 - Our employees are trained in quality improvement skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.4 - Training employees in group discussion and communication techniques is given low priority in our organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.5 - Employees and teams are often recognized for achievements in quality improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.6 - Employee satisfaction across the organisation is low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.7 - In our organisation employees tend to be resistant to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.8 - There is a lack of internal TQM expertise in our organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.9 - We have an appropriate performance evaluation and reward system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Customer barriers

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
20.1 - The organisation has an effective system to measure customer satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20.2 - Customers' needs and expectations are rarely assessed in our organisation	<input type="radio"/>				
20.3 - The organisation lacks an effective customer feedback system	<input type="radio"/>				
20.4 - In our organisation, contact with key customers could be much closer	<input type="radio"/>				

21. Planning barriers

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
21.1 - The strategic plans of our organisation are customer driven	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.2 - The organisation's strategic plans don't include quality goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.3 - We have specific ways of institutionalizing new approaches/ tools/ techniques in our organisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.4 - There are not enough joint planning activities with our suppliers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Process management barriers

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
22.1 -The quality initiatives in our organisation do not include all organisational functions/ departments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22.2 - Quality is treated as a separate initiative in our organisation (i.e. it is delegated to selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

individuals only)

22.3 - Communication with our external network of stakeholders tends to be ineffective

22.4 - Adequate resources to effectively employ TQM are not available in our organisation

22.5 - Cross functional teams are not used in our organisation

22.6 - Organisation tends to have many uncoordinated (ad hoc) quality initiatives

23. Information management barriers

Strongly disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly agree 5

23.1 - There tends to be poor inter-organisational communication in our organisation

23.2 - There is no need for individuals to liaise with people outside of their own departments

23.3 - Quality and performance information is disseminated widely in the organisation

23.4 - Our organisation effectively and frequently measures its quality performance

23.5 - The best practices / or products of other companies are benchmarked by our organisation

23.6 - Our organisation would like to implement quality initiatives but there is not enough time to do this

Appendix 2 SPSS Data file

Table 2A: SPSS data file - descriptions of the attributes of each variable in the data file

S#	Variable name	Full variable description according to questionnaire	Short variable description for analysis after normalizing the statements
1	ID	Subject ID	Subject ID
2	PFjt	Job title	Profile job title
3	PFeduHS	HSSC	Profile education level HSSC
4	PFeduDiploma	Diploma	Profile education level Diploma
5	PFeduBach	Bachelor	Profile education level Bachelor
6	PFeduMasters	Masters	Profile education level Masters
7	PFeduPhD	PhD	Profile education level PhD
8	PFeduOthers	Other education	Profile education level Other education
9	PFpqualif	Professional Qualification	Profile Professional Qualification
10	PFqmexp	Quality Management experience	Profile Quality Management experience
11	PFworkexp	Work experience	Profile Work experience
12	PFnemp	Number of employees	Profile Number of employees
13	PFcotp1	Primarily manufacturing company	Profile company type Primarily manufacturing
14	PFcotp2	Professional service provider company	Profile company type Professional service provider
15	PFcotp3	Mass service provider company	Profile company type Mass service provider
16	PFcotp4	Other types	Profile Other company types
17	PFoptp1	A single independent local establishment	Profile operation type Single independent local establishment
18	PFoptp2	A branch of a local establishment	Profile operation type Branch of a local establishment
19	PFoptp3	Part of a multi-national establishment	Profile operation type Part of a multi-national establishment
20	PFoptp4	Other operation types	Profile Other operation types
21	PFprproc1	Make-to-order	Profile production process Make-to-order
22	PFprproc2	Make-to-inventory	Profile production process Make-to-inventory

23	PFprproc3	Other process types	Profile Other production process types
24	PFprtp1	End user products	Profile product type End user products
25	PFprtp2	Parts/components	Profile product type Parts/components
26	PFprtp3	Other product types	Profile Other product types
27	PFqmdur1	TQM duration	Profile QM type TQM duration
28	PFqmdur2	Six sigma duration	Profile QM type Six sigma duration
29	PFqmdur3	ISO 9000 duration	Profile QM type ISO 9000 duration
30	PFqmdur4	QFD duration	Profile QM type QFD duration
31	PFqmdur5	Kaizen duration	Profile QM type Kaizen duration
32	PFqmdur6	Lean manufacturing duration	Profile QM type Lean manufacturing duration
33	PFqmdur7	BPR duration	Profile QM type BPR duration
34	PFqmdur8	Others duration	Others duration
35	PFqmOthr	Other QM type	Profile Other QM types
36	OCd1A	The organisation is a very personal place - it is like an extended family. People seem to share a lot of themselves	Organisation character in group culture
37	OCd1B	The organisation is a very dynamic and entrepreneurial place - people are willing to stick their necks out (try new things) and take risks	Organisation character in developmental culture
38	OCd1C	The organisation is a very result oriented place - a major concern is with getting the job done. People are very competitive and achievement oriented	Organisation character in rational culture
39	OCd1D	The organisation is very controlled and structured place - formal procedures generally govern what people do	Organisation character in hierarchical culture
40	OCd2A	The leadership in the organisation exemplifies mentoring, facilitating or	Leadership character in group culture

		nurturing	
41	OCd2B	The leadership in the organisation exemplifies entrepreneurship, innovating, or risk taking	Leadership character in developmental culture
42	OCd2C	The leadership in the organisation exemplifies a no-nonsense, aggressive, results-oriented focus	Leadership character in rational culture
43	OCd2D	The leadership in the organisation exemplifies coordinating, organizing, or smooth-running efficiency	Leadership character in hierarchical culture
44	OCd3A	The management style in the organisation is characterized by teamwork, consensus, and participation	Management style in group culture
45	OCd3B	The management style in the organisation is characterized by individual risk-taking, innovation, freedom, and uniqueness	Management style in developmental culture
46	OCd3C	The management style in the organisation is characterized by hard-driving competitiveness, high demands, and achievement	Management style in rational culture
47	OCd3D	The management style in the organisation is characterized by security of employment, conformity, predictability, and stability in relationships	Management style in hierarchical culture
48	OCd4A	The binding force that holds the organisation together is loyalty and mutual trust - commitment to this organisation runs high	Binding force in group culture
49	OCd4B	The binding force that holds the organisation together is commitment to innovation and development - there is an emphasis on being on the cutting edge	Binding force in developmental culture
50	OCd4C	The binding force that holds the organisation together is	Binding force in rational culture

		emphasis on achievement and goal accomplishment - aggressiveness and winning are common themes	
51	OCd4D	The binding force that holds the organisation together is formal rules and policies - maintaining a smooth-running organisation is important	Binding force in hierarchical culture
52	OCd5A	The organisation emphasizes on human development - high trust, openness, and participation persist	Organisation emphasis in group culture
53	OCd5B	The organisation emphasizes on acquiring new resources and creating new challenges - trying new things and prospecting for opportunities are valued	Organisation emphasis in developmental culture
54	OCd5C	The organisation emphasizes on competitive actions and achievements - hitting stretch targets and winning in the marketplace are dominant	Organisation emphasis in rational culture
55	OCd5D	The organisation emphasizes on permanence and stability - efficiency, control and smooth operations are important	Organisation emphasis in hierarchical culture
56	OCd6A	The organisation defines success on the basis of development of human resources, teamwork, employee commitment, and concern for people	Success criteria in group culture
57	OCd6B	The organisation defines success on the basis of having the most unique or newest products. It is a product leader and innovator	Success criteria in developmental culture
58	OCd6C	The organisation defines success on the basis of winning in the marketplace and outpacing the competition - competitive market leadership is the key	Success criteria in rational culture
59	OCd6D	The organisation defines success on the basis of efficiency -	Success criteria in hierarchical culture

		dependable delivery, smooth scheduling and low-cost production are critical	
60	BRtm1	Senior managers in our organisation show visible commitment and support to quality	Top management barrier - lack of commitment and support to quality
61	BRtm2	Senior managers allocate inadequate resources for employee training	Top management barrier - inadequate resources for employee training
62	BRtm3	The leaders in our organisation frequently set goals and objectives for quality improvement	Top management barrier - lack of goals and objectives for quality improvement
63	BRtm4	In our organisation there is frequent turnover of managers	Top management barrier - frequent turnover of managers
64	BRtm5	There are many layers of management in the organisation	Top management barrier - many layers of management
65	BRtm6	Management style slows down learning culture	Top management barrier - management style slows down learning culture
66	BRtm7	Middle managers provide an effective link between top manager and operators	Top management barrier - ineffective link of middle management
67	BRtm8	Quality awareness and improvement is championed by middle managers	Top management barrier - lack of creating quality awareness and improvement by middle managers
68	BRemp1	Our employees are rarely empowered to apply quality improvement efforts in their area	Employee barrier - lack of empowerment to apply quality improvement efforts
69	BRemp2	Employee involvement in improvement projects is a common practice in our organisation	Employee barrier - lack of involvement in improvement projects
70	BRemp3	Our employees are trained in quality improvement skills	Employee barrier - lack of training in quality improvement skills
71	BRemp4	Training employees in group discussion and communication techniques is given low priority	Employee barrier - lack of employee training in group discussion and communication

		in our organisation	techniques
72	BRemp5	Employees and teams are often recognized for achievements in quality improvement	Employee barrier - lack of recognition for achievements in quality improvement
73	BRemp6	Employee satisfaction across the organisation is low	Employee barrier - lack of satisfaction
74	BRemp7	In our organisation employees tend to be resistant to change	Employee barrier - resistance to change
75	BRemp8	There is a lack of internal TQM expertise in our organisation	Employee barrier - lack of internal TQM expertise
76	BRemp9	We have an appropriate performance evaluation and reward system	Employee barrier - Inappropriate performance evaluation and reward system
77	BRcus1	The organisation has an effective system to measure customer satisfaction	Customer barrier - lack of effective system to measure customer satisfaction
78	BRcus2	Customers' needs and expectations are rarely assessed in our organisation	Customer barrier - needs and expectations not assessed
79	BRcus3	The organisation lacks an effective customer feedback system	Customer barrier - lack of effective customer feedback system
80	BRcus4	In our organisation, contact with key customers could be much closer	Customer barrier - lack of contact with key customers
81	BRpln1	The strategic plans of our organisation are customer driven	Planning barrier - strategic plans are not customer driven
82	BRpln2	The organisation's strategic plans don't include quality goals	Planning barrier - strategic plans don't include quality goals
83	BRpln3	We have specific ways of institutionalizing new approaches/ tools/ techniques in our organisation	Planning barrier - lack of institutionalizing new approaches/tools/techniques
84	BRpln4	There are not enough joint planning activities with our suppliers	Planning barrier - not enough joint planning activities with suppliers
85	BRproc1	The quality initiatives in our organisation do not include all organisational functions/ departments	Process barrier - quality initiatives do not include all organisational functions/departments

86	BRproc2	Quality is treated as a separate initiative in our organisation (i.e. it is delegated to selected individuals only)	Process barrier - quality initiative is delegated to selected individuals only
87	BRproc3	Communication with our external network of stakeholders tends to be ineffective	Process barrier - ineffective communication with stakeholders
88	BRproc4	Adequate resources to effectively employ TQM are not available in our organisation	Process barrier - inadequate resources to effectively employ TQM
89	BRproc5	Cross functional teams are not used in our organisation	Process barrier - cross functional teams are not used
90	BRproc6	Organisation tends to have many uncoordinated (ad hoc) quality initiatives	Process barrier - many uncoordinated quality initiatives
91	BRim1	There tends to be poor inter-organisational communication in our organisation	Information barrier - poor inter-organisational communication
92	BRim2	There is no need for individuals to liaise with people outside of their own departments	Information barrier - individuals do not liaise with other departments
93	BRim3	Quality and performance information is disseminated widely in the organisation	Information barrier - lack of disseminating quality and performance information
94	BRim4	Our organisation effectively and frequently measures its quality performance	Information barrier - quality performance is not measured
95	BRim5	The best practices / or products of other companies are benchmarked by our organisation	Information barrier - the best practices/products of others are not benchmarked
96	BRim6	Our organisation would like to implement quality initiatives but there is not enough time to do this	Information barrier - lack of enough time to implement quality initiatives
97	PRipm1	Our staff turnover rate is increasing	Internal performance - low staff turnover rate
98	PRipm2	Rate of defects/errors in our products/services is increasing	Internal performance - Rate of defects/errors in our products/services is increasing

99	PRipm3	Our employees promptly respond to customers orders, complaints and enquiries	Internal performance - prompt response to customers
100	PRipm4	Productivity rate is increasing	Internal performance - productivity rate is increasing
101	PRepm1	The number of repeat customers for our products/services is continually increasing	External performance - repeat customers continually increasing
102	PRepm2	The number of customer complaints about our products/services is increasing	External performance - customer complaints decreasing
103	PRepm3	Our gross profit rate is continually increasing	External performance - gross profit rate is continually increasing
104	PRepm4	Our market share is growing	External performance - market share is growing
105	PRepm5	Our competitive position is improving	External performance - competitive position is improving
106	PRepm6	The number of successful new products/services is increasing	External performance - number of new products/services is increasing

Table 2B: Constructs of culture types and their dimensions

Variable	Description	New composite variable
OCd1A	Organisation character in group culture	Group (group culture)
OCd2A	Leadership character in group culture	
OCd3A	Management style in group culture	
OCd4A	Binding force in group culture	
OCd5A	Organisation emphasis in group culture	
OCd6A	Success criteria in group culture	
OCd1B	Organisation character in developmental culture	Develop (developmental culture)
OCd2B	Leadership character in developmental culture	
OCd3B	Management style in developmental culture	
OCd4B	Binding force in developmental culture	
OCd5B	Organisation emphasis in developmental culture	
OCd6B	Success criteria in developmental culture	
OCd1C	Organisation character in rational culture	Rational (rational culture)
OCd2C	Leadership character in rational culture	
OCd3C	Management style in rational culture	
OCd4C	Binding force in rational culture	
OCd5C	Organisation emphasis in rational culture	
OCd6C	Success criteria in rational culture	
OCd1D	Organisation character in hierarchical culture	Hierarch (hierarchical culture)
OCd2D	Leadership character in hierarchical culture	
OCd3D	Management style in hierarchical culture	
OCd4D	Binding force in hierarchical culture	
OCd5D	Organisation emphasis in hierarchical culture	
OCd6D	Success criteria in hierarchical culture	
Variable	Description	New composite variable
OCd1A	Organisation character in group culture	Group

OCd2A	Leadership character in group culture	(group culture)
OCd3A	Management style in group culture	
OCd4A	Binding force in group culture	
OCd5A	Organisation emphasis in group culture	
OCd6A	Success criteria in group culture	
OCd1B	Organisation character in developmental culture	
OCd2B	Leadership character in developmental culture	
OCd3B	Management style in developmental culture	
OCd4B	Binding force in developmental culture	
OCd5B	Organisation emphasis in developmental culture	
OCd6B	Success criteria in developmental culture	
OCd1C	Organisation character in rational culture	Rational (rational culture)
OCd2C	Leadership character in rational culture	
OCd3C	Management style in rational culture	
OCd4C	Binding force in rational culture	
OCd5C	Organisation emphasis in rational culture	
OCd6C	Success criteria in rational culture	
OCd1D	Organisation character in hierarchical culture	Hierarch (hierarchical culture)
OCd2D	Leadership character in hierarchical culture	
OCd3D	Management style in hierarchical culture	
OCd4D	Binding force in hierarchical culture	
OCd5D	Organisation emphasis in hierarchical culture	
OCd6D	Success criteria in hierarchical culture	

Table 2B Constructs of TQM implementation barriers and their respective indicators

Variable	Description	New composite variable
BRtm1	lack of commitment and support to quality	BRtm (top management barrier)
BRtm2	inadequate resources for employee training	
BRtm3	lack of goals and objectives for quality	

	improvement	
BRtm4	frequent turnover of managers	
BRtm5	many layers of management	
BRtm6	management style slows down learning culture	
BRtm7	ineffective link of middle management	
BRtm8	lack of creating quality awareness and improvement by middle managers	
BRemp1	lack of empowerment to apply quality improvement efforts	BRemp (employees barrier)
BRemp2	lack of involvement in improvement projects	
BRemp3	lack of training in quality improvement skills	
BRemp4	lack of employee training in group discussion and communication techniques	
BRemp5	lack of recognition for achievements in quality improvement	
BRemp6	lack of satisfaction	
BRemp7	resistance to change	
BRemp8	lack of internal TQM expertise	
BRemp9	Inappropriate performance evaluation and reward system	
BRcus1	lack of effective system to measure customer satisfaction	BRcus (customer barrier)
BRcus2	needs and expectations not assessed	
BRcus3	lack of effective customer feedback system	
BRcus4	lack of contact with key customers	
BRpln1	strategic plans are not customer driven	BRpln (Planning barriers)
BRpln2	strategic plans don't include quality goals	
BRpln3	lack of institutionalizing new approaches/tools/techniques	
BRpln4	not enough joint planning activities with suppliers	
BRproc1	quality initiatives do not include all organisational functions/departments	BRproc (process barriers)
BRproc2	quality initiative is delegated to selected	

	individuals only	
BRproc3	ineffective communication with stakeholders	
BRproc4	inadequate resources to effectively employ TQM	
BRproc5	cross functional teams are not used	
BRproc6	many uncoordinated quality initiatives	
BRim1	poor inter-organisational communication	Brim (information management barriers)
BRim2	individuals do not liaise with other departments	
BRim3	lack of disseminating quality and performance information	
BRim4	quality performance is not measured	
BRim5	the best practices/products of others are not benchmarked	
BRim6	lack of enough time to implement quality initiatives	

Appendix 3 Normality Test

Table 3A: Tests of Normality – organisation culture variables

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Leadership character in group culture	.233	325	.000	.883	325	.000
Management style in group culture	.243	325	.000	.873	325	.000
Binding force in group culture	.239	325	.000	.869	325	.000
Organisation emphasis in group culture	.231	325	.000	.883	325	.000
Success criteria in group culture	.211	325	.000	.880	325	.000
Organisation character in developmental culture	.214	325	.000	.888	325	.000
Leadership character in developmental culture	.225	325	.000	.889	325	.000
Management style in developmental culture	.220	325	.000	.901	325	.000
Binding force in developmental culture	.191	325	.000	.905	325	.000
Organisation emphasis in developmental culture	.257	325	.000	.874	325	.000
Success criteria in developmental culture	.192	325	.000	.905	325	.000
Organisation character in rational culture	.318	325	.000	.795	325	.000
Leadership character in rational culture	.318	325	.000	.797	325	.000
Management style in rational culture	.320	325	.000	.801	325	.000
Binding force in rational culture	.295	325	.000	.837	325	.000
Organisation emphasis in rational culture	.319	325	.000	.798	325	.000
Success criteria in rational culture	.334	325	.000	.777	325	.000
Organisation character in hierarchical culture	.253	325	.000	.838	325	.000
Leadership character in hierarchical culture	.287	325	.000	.819	325	.000
Management style in hierarchical culture	.298	325	.000	.832	325	.000
Binding force in hierarchical culture	.286	325	.000	.816	325	.000
Organisation emphasis in hierarchical culture	.304	325	.000	.799	325	.000
Success criteria in hierarchical culture	.274	325	.000	.828	325	.000

a Lilliefors Significance Correction

Table 3B - Tests of Normality – TQM implementation barrier variables

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
BRtm1	.271	325	.000	.785	325	.000
BRtm2	.331	325	.000	.743	325	.000
BRtm3	.264	325	.000	.785	325	.000
BRtm4	.238	325	.000	.822	325	.000
BRtm5	.261	325	.000	.795	325	.000
BRtm6	.260	325	.000	.799	325	.000
BRtm7	.260	325	.000	.785	325	.000
BRtm8	.263	325	.000	.795	325	.000
BRemp1	.281	325	.000	.857	325	.000
BRemp2	.259	325	.000	.866	325	.000
BRemp3	.278	325	.000	.850	325	.000
BRemp4	.277	325	.000	.858	325	.000
BRemp5	.279	325	.000	.851	325	.000
BRemp6	.287	325	.000	.853	325	.000
BRemp7	.279	325	.000	.858	325	.000
BRemp8	.272	325	.000	.861	325	.000
BRemp9	.287	325	.000	.853	325	.000
BRcus1	.257	325	.000	.870	325	.000
BRcus2	.276	325	.000	.862	325	.000
BRcus3	.271	325	.000	.863	325	.000
BRcus4	.270	325	.000	.864	325	.000
BRpln1	.294	325	.000	.824	325	.000
BRpln2	.252	325	.000	.841	325	.000
BRpln3	.260	325	.000	.837	325	.000
BRpln4	.261	325	.000	.845	325	.000
BRproc1	.275	325	.000	.818	325	.000
BRproc2	.244	325	.000	.841	325	.000
BRproc3	.237	325	.000	.845	325	.000
BRproc4	.254	325	.000	.835	325	.000
BRproc5	.258	325	.000	.822	325	.000
BRproc6	.252	325	.000	.836	325	.000
BRim1	.298	325	.000	.841	325	.000
BRim2	.317	325	.000	.831	325	.000
BRim3	.259	325	.000	.837	325	.000
BRim4	.233	325	.000	.867	325	.000
BRim5	.307	325	.000	.838	325	.000
BRim6	.326	325	.000	.822	325	.000

a Lilliefors Significance Correction

Table 3C – Checking normality of data distribution by Kurtosis and Skewness

Variables	N Statistic	Range Statistic	Mean Statistic	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
OCd1A	325	4	3.04	-.051	.135	-1.120	.270
OCd2A	325	4	3.18	-.078	.135	-1.141	.270
OCd3A	325	4	3.29	-.193	.135	-1.245	.270
OCd4A	325	4	3.23	-.072	.135	-1.274	.270
OCd5A	325	4	3.11	-.083	.135	-1.250	.270
OCd6A	325	4	3.27	-.148	.135	-1.283	.270
OCd1B	325	4	2.78	.032	.135	-1.137	.270
OCd2B	325	4	2.94	-.083	.135	-1.168	.270
OCd3B	325	4	2.72	.227	.135	-.937	.270
OCd4B	325	4	2.91	.028	.135	-1.071	.270
OCd5B	325	4	3.08	-.161	.135	-1.187	.270
OCd6B	325	4	3.00	.038	.135	-1.095	.270
OCd1C	325	4	4.00	-1.155	.135	1.782	.270
OCd2C	325	4	3.99	-1.143	.135	1.682	.270
OCd3C	325	4	3.97	-1.111	.135	1.626	.270
OCd4C	325	4	3.88	-.875	.135	.949	.270
OCd5C	325	4	3.98	-1.132	.135	1.601	.270
OCd6C	325	4	4.01	-1.194	.135	2.192	.270
OCd1D	325	4	3.99	-.833	.135	.185	.270
OCd2D	325	4	3.99	-.995	.135	1.546	.270
OCd3D	325	4	3.91	-.898	.135	.623	.270
OCd4D	325	4	4.02	-1.032	.135	.980	.270
OCd5D	325	4	4.04	-1.084	.135	2.025	.270
OCd6D	325	3	4.03	-.650	.135	.073	.270
BRtm1	325	3	4.29	-.516	.135	-.616	.270
BRtm2	325	2	4.39	-.738	.135	-.753	.270
BRtm3	325	3	4.27	-.435	.135	-.511	.270
BRtm4	325	3	4.09	-.287	.135	-.709	.270
BRtm5	325	3	4.24	-.451	.135	-.831	.270
BRtm6	325	3	4.24	-.558	.135	-.492	.270
BRtm7	325	3	4.28	-.465	.135	-.544	.270
BRtm8	325	3	4.24	-.455	.135	-.851	.270
BRemp1	325	3	3.76	-.410	.135	-.369	.270
BRemp2	325	3	3.74	-.277	.135	-.504	.270
BRemp3	325	3	3.63	-.187	.135	-.275	.270
BRemp4	325	3	3.77	-.419	.135	-.413	.270

BRemp5	325	3	3.62	-.209	.135	-.281	.270
BRemp6	325	3	3.77	-.426	.135	-.291	.270
BRemp7	325	3	3.76	-.377	.135	-.350	.270
BRemp8	325	3	3.74	-.323	.135	-.391	.270
BRemp9	325	3	3.77	-.440	.135	-.320	.270
BRcus1	325	3	3.68	-.289	.135	-.634	.270
BRcus2	325	3	3.70	-.362	.135	-.501	.270
BRcus3	325	3	3.70	-.372	.135	-.580	.270
BRcus4	325	3	3.70	-.367	.135	-.602	.270
BRpln1	325	3	3.66	-.094	.135	-.174	.270
BRpln2	325	3	3.60	.103	.135	-.368	.270
BRpln3	325	3	3.55	.020	.135	-.268	.270
BRpln4	325	3	3.62	-.016	.135	-.328	.270
BRproc1	325	4	2.17	.389	.135	-1.208	.270
BRproc2	325	4	2.21	.457	.135	-1.043	.270
BRproc3	325	4	2.18	.370	.135	-1.063	.270
BRproc4	325	4	2.25	.326	.135	-1.183	.270
BRproc5	325	4	2.22	.233	.135	-1.378	.270
BRproc6	325	4	2.23	.331	.135	-1.177	.270
BRim1	325	3	3.66	-.314	.135	-.152	.270
BRim2	325	3	3.68	-.445	.135	-.017	.270
BRim3	325	3	3.58	.044	.135	-.293	.270
BRim4	325	3	3.54	.022	.135	-.514	.270
BRim5	325	3	3.66	-.400	.135	-.133	.270
BRim6	325	3	3.69	-.488	.135	.082	.270
Valid N (listwise)	325						

Figure 3A - Checking outliers in organisational culture using box plots

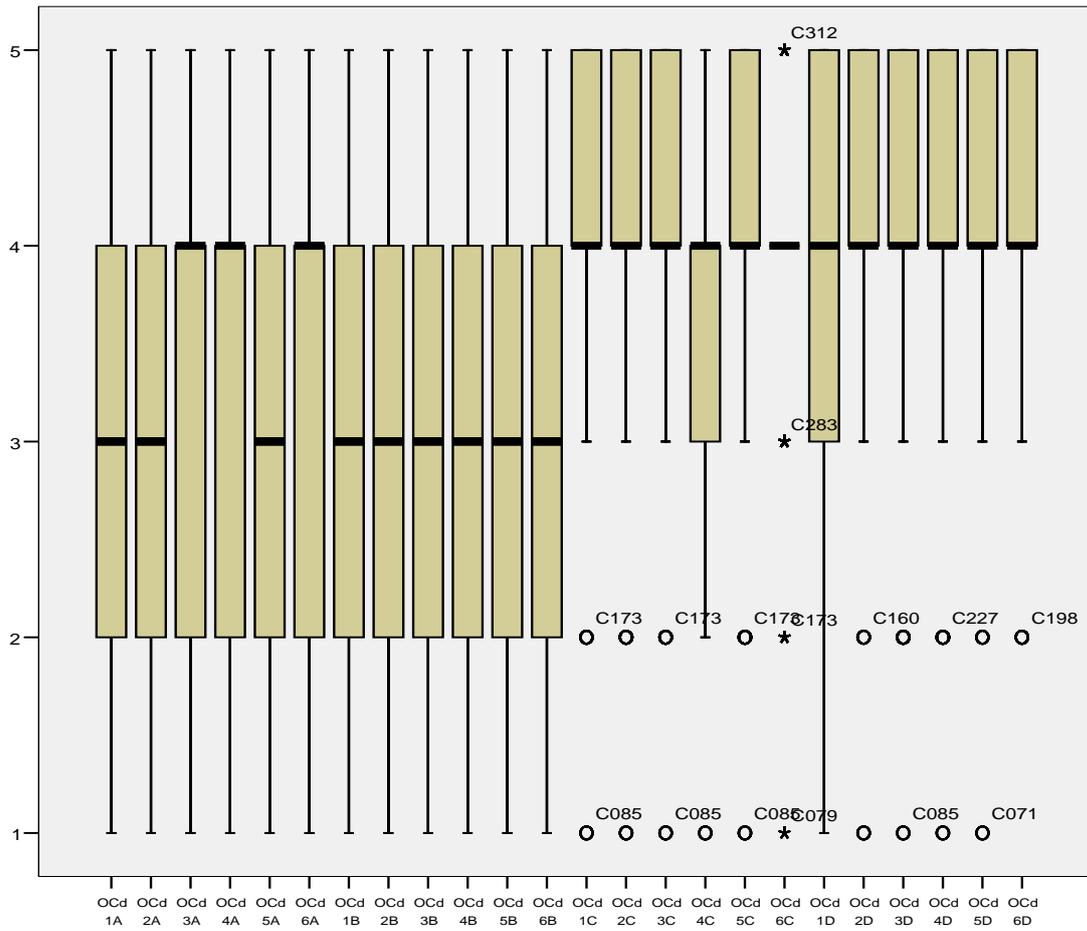
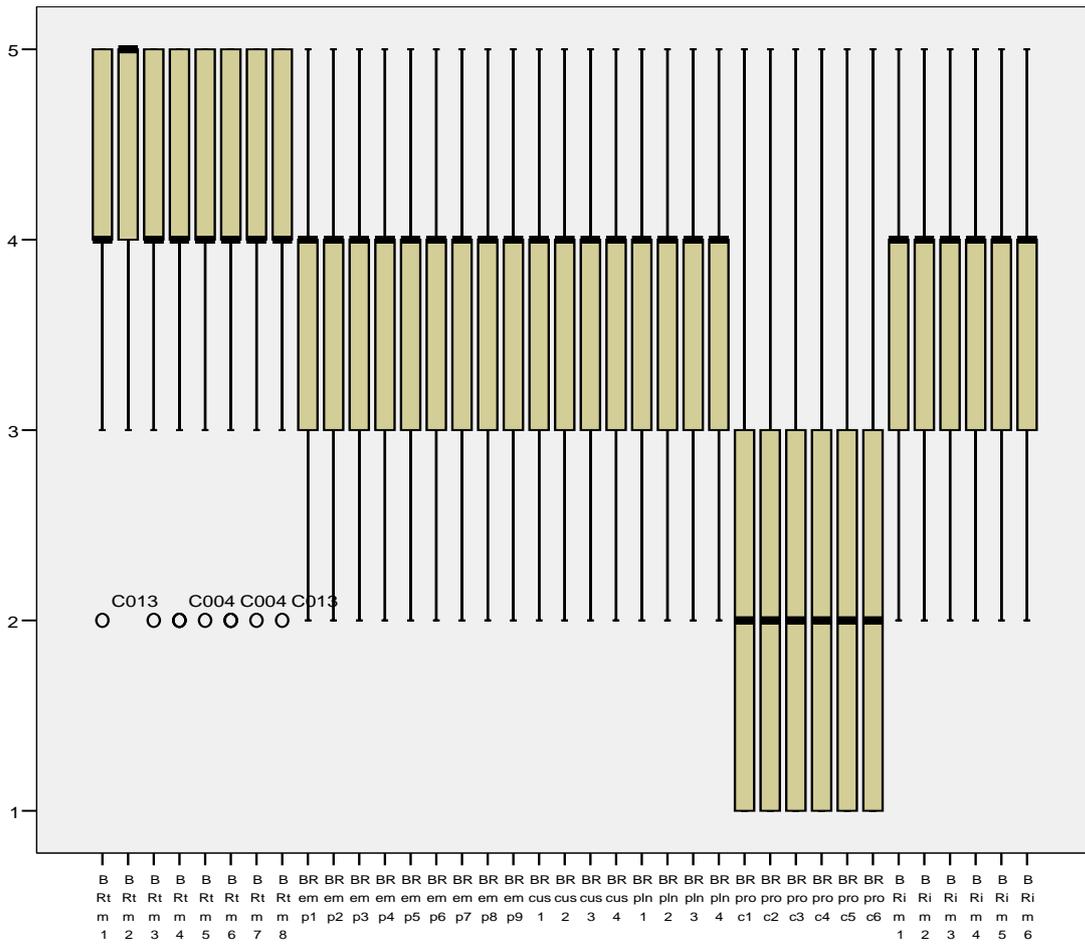


Figure 3B - Checking outliers in TQM barriers using box plots



Appendix 4 AMOS Output CFA

Table 4A: AMOS output for CFA model - GOF statistics

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	151	2353.552	1280	.000	1.839
Saturated model	1431	.000	0		
Independence model	53	21222.594	1378	.000	15.401

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.039	.799	.775	.715
Saturated model	.000	1.000		
Independence model	.331	.161	.128	.155

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.889	.881	.946	.942	.946
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.929	.826	.879
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	1073.552	941.233	1213.659
Saturated model	.000	.000	.000
Independence model	19844.594	19376.411	20319.199

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	7.264	3.313	2.905	3.746
Saturated model	.000	.000	.000	.000

Model	FMIN	F0	LO 90	HI 90
Independence model	65.502	61.249	59.804	62.714

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.051	.048	.054	.324
Independence model	.211	.208	.213	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	2655.552	2715.952	3226.909	3377.909
Saturated model	2862.000	3434.400	8276.654	9707.654
Independence model	21328.594	21349.794	21529.137	21582.137

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	8.196	7.788	8.629	8.383
Saturated model	8.833	8.833	8.833	10.600
Independence model	65.829	64.384	67.294	65.894

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	188	193
Independence model	23	23

Table 4B: AMOS output for CFA model - Regression Weights

			Estimate	S.E.	C.R.	P	Label
BRemp	<---	Group1	-.223	.039	-5.716	***	
BRim	<---	Group1	-.240	.028	-8.406	***	
BRtm	<---	Group1	.203	.034	5.918	***	
BRcus	<---	Group1	-.262	.040	-6.569	***	
BRemp	<---	Rational1	.054	.060	.901	.368	
BRtm	<---	Rational1	-.159	.053	-3.007	.003	
BRcus	<---	Rational1	.126	.061	2.079	.038	
BRproc	<---	Hierarchical1	-.553	.168	-3.301	***	
BRemp	<---	Developmental1	-.060	.046	-1.318	.187	
BRcus	<---	Developmental1	-.026	.046	-.558	.577	
BRpln	<---	Hierarchical1	-.150	0.19	-7.895	***	
BRemp1	<---	BRemp	1.000				
BRemp4	<---	BRemp	.908	.032	28.405	***	
BRemp6	<---	BRemp	.997	.017	59.999	***	
BRemp7	<---	BRemp	.900	.029	31.219	***	
BRemp8	<---	BRemp	.912	.027	33.987	***	
BRemp9	<---	BRemp	.987	.021	47.463	***	
BRcus4	<---	BRcus	1.000				
BRcus3	<---	BRcus	1.057	.026	40.006	***	
BRcus2	<---	BRcus	.896	.036	24.989	***	
BRcus1	<---	BRcus	.983	.032	30.922	***	
BRpln2	<---	BRpln	1.000				
BRpln3	<---	BRpln	.751	.042	18.057	***	
BRpln4	<---	BRpln	.958	.034	28.214	***	
BRproc6	<---	BRproc	1.000				
BRproc5	<---	BRproc	.941	.037	25.121	***	
BRproc4	<---	BRproc	1.033	.035	29.102	***	
BRproc3	<---	BRproc	.940	.034	27.484	***	
BRproc2	<---	BRproc	1.025	.036	28.225	***	
BRproc1	<---	BRproc	1.047	.033	31.734	***	
BRim1	<---	BRim	1.000				
BRim2	<---	BRim	1.314	.069	19.168	***	
BRim5	<---	BRim	1.081	.072	15.026	***	
BRim6	<---	BRim	1.262	.067	18.801	***	
BRtm8	<---	BRtm	1.000				
BRtm7	<---	BRtm	.626	.039	15.907	***	
BRtm6	<---	BRtm	.856	.032	26.854	***	
BRtm5	<---	BRtm	.996	.013	74.716	***	
BRtm4	<---	BRtm	.583	.047	12.387	***	
BRtm3	<---	BRtm	.722	.033	21.781	***	
OCd6A	<---	Group1	1.000				
OCd5A	<---	Group1	.972	.043	22.792	***	
OCd4A	<---	Group1	.926	.040	23.103	***	

			Estimate	S.E.	C.R.	P	Label
OCd3A	<---	Group1	.959	.042	22.622	***	
OCd2A	<---	Group1	.867	.039	21.999	***	
OCd1A	<---	Group1	.769	.047	16.524	***	
OCd6B	<---	Developmental1	1.000				
OCd5B	<---	Developmental1	1.050	.060	17.627	***	
OCd4B	<---	Developmental1	1.077	.060	17.876	***	
OCd3B	<---	Developmental1	.836	.061	13.650	***	
OCd2B	<---	Developmental1	1.048	.061	17.309	***	
OCd1B	<---	Developmental1	.947	.059	16.176	***	
OCd6C	<---	Rational1	1.000				
OCd5C	<---	Rational1	1.170	.040	29.625	***	
OCd4C	<---	Rational1	1.154	.041	27.915	***	
OCd3C	<---	Rational1	1.159	.039	29.704	***	
OCd2C	<---	Rational1	1.131	.041	27.394	***	
OCd1C	<---	Rational1	1.108	.042	26.512	***	
OCd6D	<---	Hierarchical1	1.000				
OCd5D	<---	Hierarchical1	1.597	.189	8.441	***	
OCd4D	<---	Hierarchical1	1.443	.187	7.717	***	
OCd3D	<---	Hierarchical1	1.188	.173	6.868	***	
OCd2D	<---	Hierarchical1	1.449	.181	8.005	***	
OCd1D	<---	Hierarchical1	1.370	.187	7.318	***	

Table 4C: AMOS output for CFA model - Standardized Regression Weights

	Estimate
BRemp1 <--- BRemp	.973
BRemp4 <--- BRemp	.868
BRemp6 <--- BRemp	.987
BRemp7 <--- BRemp	.891
BRemp8 <--- BRemp	.909
BRemp9 <--- BRemp	.963
BRcus4 <--- BRcus	.928
BRcus3 <--- BRcus	.989
BRcus2 <--- BRcus	.861
BRcus1 <--- BRcus	.923
BRpln2 <--- BRpln	.961
BRpln3 <--- BRpln	.752

	Estimate
BRpln4 <--- BRpln	.934
BRproc6 <--- BRproc	.911
BRproc5 <--- BRproc	.881
BRproc4 <--- BRproc	.928
BRproc3 <--- BRproc	.910
BRproc2 <--- BRproc	.918
BRproc1 <--- BRproc	.952
BRim1 <--- BRim	.747
BRim2 <--- BRim	.978
BRim5 <--- BRim	.791
BRim6 <--- BRim	.957
BRtm8 <--- BRtm	.987
BRtm7 <--- BRtm	.666
BRtm6 <--- BRtm	.839
BRtm5 <--- BRtm	.989
BRtm4 <--- BRtm	.569
BRtm3 <--- BRtm	.777
OCd6A <--- Group1	.887
OCd5A <--- Group1	.881
OCd4A <--- Group1	.891
OCd3A <--- Group1	.877
OCd2A <--- Group1	.861
OCd1A <--- Group1	.738
OCd6B <--- Developmental1	.788
OCd5B <--- Developmental1	.879
OCd4B <--- Developmental1	.861
OCd3B <--- Developmental1	.705
OCd2B <--- Developmental1	.848
OCd1B <--- Developmental1	.809
OCd6C <--- Rational1	.881
OCd5C <--- Rational1	.966

	Estimate
OCd4C <--- Rational1	.946
OCd3C <--- Rational1	.967
OCd2C <--- Rational1	.939
OCd1C <--- Rational1	.928
OCd6D <--- Hierarchical1	.513
OCd5D <--- Hierarchical1	.782
OCd4D <--- Hierarchical1	.633
OCd3D <--- Hierarchical1	.534
OCd2D <--- Hierarchical1	.714
OCd1D <--- Hierarchical1	.598

Table 4D: AMOS output for CFA model - Squared Multiple Correlations

	Estimate
OCd1D	.357
OCd2D	.509
OCd3D	.285
OCd4D	.400
OCd5D	.612
OCd6D	.263
OCd1C	.861
OCd2C	.882
OCd3C	.934
OCd4C	.896
OCd5C	.933
OCd6C	.775
OCd1B	.655
OCd2B	.718
OCd3B	.496
OCd4B	.742

	Estimate
OCd5B	.772
OCd6B	.620
OCd1A	.544
OCd2A	.742
OCd3A	.769
OCd4A	.794
OCd5A	.775
OCd6A	.787
BRtm3	.604
BRtm4	.324
BRtm5	.978
BRtm6	.704
BRtm7	.444
BRtm8	.974
BRim6	.915
BRim5	.625
BRim2	.957
BRim1	.558
BRproc1	.907
BRproc2	.844
BRproc3	.828
BRproc4	.861
BRproc5	.776
BRproc6	.830
BRpln4	.873
BRpln3	.565
BRpln2	.924
BRcus1	.853
BRcus2	.741
BRcus3	.979
BRcus4	.861

	Estimate
BRemp9	.927
BRemp8	.826
BRemp7	.794
BRemp6	.974
BRemp4	.754
BRemp1	.946

Appendix 5 AMOS Output SEM

Table 5A: AMOS output for SEM model - GOF statistics

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	117	3275.411	1314	.000	2.493
Saturated model	1431	.000	0		
Independence model	53	21222.594	1378	.000	15.401

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.220	.750	.728	.689
Saturated model	.000	1.000		
Independence model	.331	.161	.128	.155

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.846	.838	.901	.896	.901
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.954	.806	.859
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	1961.411	1796.827	2133.602
Saturated model	.000	.000	.000
Independence model	19844.594	19376.411	20319.199

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	10.109	6.054	5.546	6.585
Saturated model	.000	.000	.000	.000

Model	FMIN	F0	LO 90	HI 90
Independence model	65.502	61.249	59.804	62.714

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.068	.065	.071	.000
Independence model	.211	.208	.213	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	3509.411	3556.211	3952.118	4069.118
Saturated model	2862.000	3434.400	8276.654	9707.654
Independence model	21328.594	21349.794	21529.137	21582.137

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	10.832	10.324	11.363	10.976
Saturated model	8.833	8.833	8.833	10.600
Independence model	65.829	64.384	67.294	65.894

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	139	143
Independence model	23	23

Table 5B: AMOS output for SEM model - Regression Weights

	Estimate	S.E.	C.R.	P	Label
BRemp <--- Group1	-.223	.039	-5.716	***	
BRim <--- Group1	-.240	.028	-8.406	***	
BRtm <--- Group1	.203	.034	5.918	***	
BRcus <--- Group1	-.262	.040	-6.569	***	
BRemp <--- Rational1	.054	.060	.901	.368	
BRtm <--- Rational1	-.159	.053	-3.007	.003	
BRcus <--- Rational1	.126	.061	2.079	.038	
BRproc <--- Hierarchical1	-.553	.168	-3.301	***	
BRemp <--- Developmental1	-.060	.046	-1.318	.187	
BRcus <--- Developmental1	-.026	.046	-.558	.577	
BRpln <--- Hierarchical1	-.150	0.19	-7.895	***	
BRemp1 <--- BRemp	1.000				
BRemp4 <--- BRemp	.908	.032	28.405	***	
BRemp6 <--- BRemp	.997	.017	59.999	***	
BRemp7 <--- BRemp	.900	.029	31.219	***	
BRemp8 <--- BRemp	.912	.027	33.987	***	
BRemp9 <--- BRemp	.987	.021	47.463	***	
BRcus4 <--- BRcus	1.000				
BRcus3 <--- BRcus	1.057	.026	40.006	***	
BRcus2 <--- BRcus	.896	.036	24.989	***	
BRcus1 <--- BRcus	.983	.032	30.922	***	
BRpln2 <--- BRpln	1.000				
BRpln3 <--- BRpln	.751	.042	18.057	***	
BRpln4 <--- BRpln	.958	.034	28.214	***	
BRproc6 <--- BRproc	1.000				
BRproc5 <--- BRproc	.941	.037	25.121	***	
BRproc4 <--- BRproc	1.033	.035	29.102	***	
BRproc3 <--- BRproc	.940	.034	27.484	***	
BRproc2 <--- BRproc	1.025	.036	28.225	***	
BRproc1 <--- BRproc	1.047	.033	31.734	***	

	Estimate	S.E.	C.R.	P	Label
BRim1 <--- BRim	1.000				
BRim2 <--- BRim	1.314	.069	19.168	***	
BRim5 <--- BRim	1.081	.072	15.026	***	
BRim6 <--- BRim	1.262	.067	18.801	***	
BRtm8 <--- BRtm	1.000				
BRtm7 <--- BRtm	.626	.039	15.907	***	
BRtm6 <--- BRtm	.856	.032	26.854	***	
BRtm5 <--- BRtm	.996	.013	74.716	***	
BRtm4 <--- BRtm	.583	.047	12.387	***	
BRtm3 <--- BRtm	.722	.033	21.781	***	
OCd6A <--- Group1	1.000				
OCd5A <--- Group1	.972	.043	22.792	***	
OCd4A <--- Group1	.926	.040	23.103	***	
OCd3A <--- Group1	.959	.042	22.622	***	
OCd2A <--- Group1	.867	.039	21.999	***	
OCd1A <--- Group1	.769	.047	16.524	***	
OCd6B <--- Developmental1	1.000				
OCd5B <--- Developmental1	1.050	.060	17.627	***	
OCd4B <--- Developmental1	1.077	.060	17.876	***	
OCd3B <--- Developmental1	.836	.061	13.650	***	
OCd2B <--- Developmental1	1.048	.061	17.309	***	
OCd1B <--- Developmental1	.947	.059	16.176	***	
OCd6C <--- Rational1	1.000				
OCd5C <--- Rational1	1.170	.040	29.625	***	
OCd4C <--- Rational1	1.154	.041	27.915	***	
OCd3C <--- Rational1	1.159	.039	29.704	***	
OCd2C <--- Rational1	1.131	.041	27.394	***	
OCd1C <--- Rational1	1.108	.042	26.512	***	
OCd6D <--- Hierarchical1	1.000				
OCd5D <--- Hierarchical1	1.597	.189	8.441	***	
OCd4D <--- Hierarchical1	1.443	.187	7.717	***	

	Estimate	S.E.	C.R.	P	Label
OCd3D <--- Hierarchical1	1.188	.173	6.868	***	
OCd2D <--- Hierarchical1	1.449	.181	8.005	***	
OCd1D <--- Hierarchical1	1.370	.187	7.318	***	

Table 5C: AMOS output for SEM model - Standardized Regression Weights

	Estimate
BRemp <--- Group1	-.316
BRim <--- Group1	-.489
BRtm <--- Group1	.323
BRcus <--- Group1	-.362
BRemp <--- Rational1	.048
BRtm <--- Rational1	-.159
BRcus <--- Rational1	.110
BRproc <--- Hierarchical1	-.215
BRemp <--- Developmental1	-.073
BRcus <--- Developmental1	-.030
BRpln <--- Hierarchical1	-.086
BRemp1 <--- BRemp	.972
BRemp4 <--- BRemp	.865
BRemp6 <--- BRemp	.987
BRemp7 <--- BRemp	.888
BRemp8 <--- BRemp	.907
BRemp9 <--- BRemp	.962
BRcus4 <--- BRcus	.929
BRcus3 <--- BRcus	.988
BRcus2 <--- BRcus	.861
BRcus1 <--- BRcus	.924
BRpln2 <--- BRpln	.973
BRpln3 <--- BRpln	.747
BRpln4 <--- BRpln	.924
BRproc6 <--- BRproc	.911
BRproc5 <--- BRproc	.881
BRproc4 <--- BRproc	.928
BRproc3 <--- BRproc	.910
BRproc2 <--- BRproc	.918
BRproc1 <--- BRproc	.953

	Estimate
BRim1 <--- BRim	.747
BRim2 <--- BRim	.978
BRim5 <--- BRim	.790
BRim6 <--- BRim	.957
BRtm8 <--- BRtm	.987
BRtm7 <--- BRtm	.669
BRtm6 <--- BRtm	.841
BRtm5 <--- BRtm	.989
BRtm4 <--- BRtm	.572
BRtm3 <--- BRtm	.779
OCd6A <--- Group1	.881
OCd5A <--- Group1	.882
OCd4A <--- Group1	.887
OCd3A <--- Group1	.879
OCd2A <--- Group1	.867
OCd1A <--- Group1	.741
OCd6B <--- Developmental1	.792
OCd5B <--- Developmental1	.863
OCd4B <--- Developmental1	.872
OCd3B <--- Developmental1	.708
OCd2B <--- Developmental1	.851
OCd1B <--- Developmental1	.809
OCd6C <--- Rational1	.881
OCd5C <--- Rational1	.966
OCd4C <--- Rational1	.946
OCd3C <--- Rational1	.967
OCd2C <--- Rational1	.939
OCd1C <--- Rational1	.927
OCd6D <--- Hierarchical1	.506
OCd5D <--- Hierarchical1	.802
OCd4D <--- Hierarchical1	.646

	Estimate
OCd3D <--- Hierarchical1	.527
OCd2D <--- Hierarchical1	.696
OCd1D <--- Hierarchical1	.586

Appendix 6 Standardized Regression Weight CFA and SEM

Table 6A: Comparison of standardized Regression Weights between CFA and SEM models

Variable	CFA	SEM
BRemp1	.972	0.973
BRemp4	.865	0.868
BRemp6	.987	0.987
BRemp7	.888	0.891
BRemp8	.907	0.909
BRemp9	.962	0.963
BRcus4	.929	0.928
BRcus3	.988	0.989
BRcus2	.861	0.861
BRcus1	.924	0.923
BRpln2	.973	0.961
BRpln3	.747	0.752
BRpln4	.924	0.934
BRproc6	.911	0.911
BRproc5	.881	0.881
BRproc4	.928	0.928
BRproc3	.910	0.91
BRproc2	.918	0.918
BRproc1	.953	0.952
BRim1	.747	0.747
BRim2	.978	0.978
BRim5	.790	0.791
BRim6	.957	0.957
BRtm8	.987	0.987
BRtm7	.669	0.666
BRtm6	.841	0.839
BRtm5	.989	0.989
BRtm4	.572	0.569
BRtm3	.779	0.777
OCd6A	.881	0.887
OCd5A	.882	0.881

OCd4A	.887	0.891
OCd3A	.879	0.877
OCd2A	.867	0.861
OCd1A	.741	0.738
OCd6B	.792	0.788
OCd5B	.863	0.879
OCd4B	.872	0.861
OCd3B	.708	0.705
OCd2B	.851	0.848
OCd1B	.809	0.809
OCd6C	.881	0.881
OCd5C	.966	0.966
OCd4C	.946	0.946
OCd3C	.967	0.967
OCd2C	.939	0.939
OCd1C	.927	0.928
OCd6D	.506	0.513
OCd5D	.802	0.782
OCd4D	.646	0.633
OCd3D	.527	0.534
OCd2D	.696	0.714
OCd1D	.586	0.598