Total Quality Management Implementation:

A Study to Critical Success Factors and Continuous Improvement to UAE organizations

تطبيق إدارة الجودة الشاملة:

دراسة لعوامل النجاح الحاسمة و التحسين المستمر لمنظمات دولة الإمارات العربية المتحدة

By

Essa AbdulAziz Ahmed Saif Al Ali

Student ID: 110036

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Faculty of Business

Dissertation Supervisor

Dr. Paul Gardiner

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Abstract

Total Quality Management is a new philosophy of management that was established in United Arab Emirates and Gulf region not a long time ago. Total Quality Management in UAE however, received little attention and researches from academics and practitioners regarding the critical success factors and continuous improvement. This dissertation aims to explore the main critical success factors necessary to implement TQM in UAE organizations and the continuous improvement elements. It also seeks to find the relationships between these critical success factors and the continuous improvement elements. Four critical success factors were found the most important in UAE organizations which are commitment of management, education and training, team work and organizational culture, and relationships. In addition, four continuous improvement elements were found significant for UAE organizations as a result of implementing TQM which are employee satisfaction, product quality, business process improvement, and customer satisfaction. A brief background of TQM was given including the gurus of quality management to explore the way TQM was improved. Furthermore, to improve and benchmark the continuous improvement elements, it is necessary to set clear Key Performance Indicators (KPI) and quality awards to further improve as the continuous improvement is a cyclic process.

A qualitative research that uses case study methodology was employed to three organizations in UAE and ten semi-structured interviews with documental reviews were used to fulfill the objectives of this research. The findings were reported into three basic components: analysis of critical success factors, analysis of effects of implementing these critical success factors, and continuous improvement. The findings show that whilst TQM suggests the best practices of management, people tend to deviate from these best practices and keep them on papers only. In most cases, quality procedures and methodologies exist in organizations; however, it is recommended to be a systematic audit system to the implementation of these procedures and methodologies.

Keywords: Total Quality Management, Continuous Improvement, Customer Satisfaction, leadership, UAE organizations

ملخص

إدارة الجودة الشاملة هي فلسفة جديدة في الإدارة التي تأسست في دولة الإمارات العربية المتحدة ومنطقة الخليج العربي ليست منذ فترة طويلة. إدارة الجودة الشاملة في دولة الإمارات العربية المتحدة تلقى اهتماما و بحوثا قليلة من الأكاديميين والممارسين حول عوامل النجاح الحاسمة والتحسين المستمر. هذه الأطروحة تهدف إلى استكشاف أهم عوامل النجاح الحاسمة اللازمة لتنفيذ إدارة الجودة الشاملة منظمات دولة الإمارات العربية المتحدة إضافة إلى عناصر التحسين المستمر. بالإضافة إلى ذلك، فإن هذه الأطروحة تسعى إلى إيجاد العلاقات بين عوامل النجاح الحاسمة و عناصر التحسين المستمر. من خلال هذه الأطروحة، تم العثور على أربعة من عوامل النجاح الحاسمة الأكثر أهمية في المنظمات في دولة الإمارات العربية المتحدة والتي هي: إلتزام الإدارة، و التعليم و التدريب، والعمل الجماعي و ثقافة المنظمة، و العلاقات. وبالإضافة إلى ذلك، فقد تم العثور على أربعة عناصر هامة في التحسين المستمر للمنظمات في دولة الإمارات العربية المتحدة نتيجة لتنفيذ إدارة الجودة الشاملة والتي هي: رضا الموظفين، وجودة المنتج، وتحسين العمليات التجارية، ورضا العملاء. في البداية، تم تقديم خلفية موجزة عن إدارة الجودة الشاملة بما في ذلك المعلمو الأوائل للكشف عن الطريقة اللي تطورت بها إدارة الجودة الشاملة في الماضي. وعلاوة على ذلك، من أجل تحسين وقياس عناصر التحسين المستمر، من الضروري تحديد مؤشرات الأداء الرئيسية بشكل واضح وجوائز الجودة لزيادة التطوير وبما أن عملية التحسين المستمر هي عملية دورية.

هذه الأطروحة اتبعت البحث النوعي و منهجية دراسة حالة الذين استخدما لدراسة ثلاثة منظمات من دولة الإمارات العربية المتحدة بالإضافة إلى عشرة مقابلات شخصية شبه منظمة و مراجعة أوراق و وثائق لتحقيق أهداف هذا البحث. تم ذكر نتائج هذا البحث في ثلاثة عناصر رئيسية هي: تحليل لعوامل النجاح الحاسمة، وتحليل آثار تنفيذ هذه العوامل الحاسمة، والتحسين المستمر. وتظهر النتائج أنه بينما إدارة الجودة الشاملة تقترح أفضل ممارسات الإدارة، فإن الناس يميلون إلى الخروج عن هذه الممارسات والاحتفاظ بها على الأوراق فقط. في معظم الحالات، تكون منهجيات و إجراءات إدارة الجودة الشاملة موجودة بالفعل، و لكن من المستحسن أن يكون هناك نظام مراجعة و تدقيق منهجية تنفيذ هذه الإجراءات و المنهجيات.

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Abbreviations

United Arab Emirates **(UAE)**

Total Quality Management **(TQM)**

International Organization for Standardization **(ISO)**

Plan, Do, Check, Act **(PDCA)**

American Society of Quality **(ASQ)**

United States of America **(USA)**

Job in General Scale **(JIG)**

Michigan Organization Assessment Questionnaire **(MOAQ)**

Key Performance Indicators **(KPI)**

European Foundation for Quality Management **(EFQM)**

Malcolm Baldrige National Quality Award **(MBNQA)**

Small and Medium Enterprises **(SME)**

Chief Executive Officer **(CEO)**

Health, Safety, and Environment **(HSE)**

Quality Assurance **(QA)**

Curriculum Vitae **(CV)**

Computer Aided Drawing **(CAD)**

Quality Control Plan **(QCP)**

Inspection and Test Plan **(ITP)**

Non Conformity Report **(NCR)**

Corrective Action Request **(CAR)**

Preventive Action Request **(PAR)**

Request For Inspection **(RFI)**

Information Technology **(IT)**

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Chapter 1

Introduction

1.1   Research Overview

Organizations in United Arab Emirates are facing problems in achieving acceptable customer satisfaction and continuous improvements. Recently, quality departments such as center of excellence have been added to many organizations in UAE whether it is a government, semi-government or private organization. This is because an effective quality management is a desirable field that should be integrated in such organizations. In terms of quality management, there are different types of it such as six sigma, lean, TQM, and ISO9000; however, the only quality management system that involves people in its process is TQM. In addition, TQM differs from the first concepts such as quality control and quality assurance in a way that TQM is a wider concept and embraces the whole organization rather than one part of a product. Total Quality Management was first appeared in 1940s in Japan industry and continues to develop. Japanese, after the Second World War, adopted quality in every product which has ultimately lead the nearly destroyed economy to the one of the best economies in the world. Total Quality Management is the latest field of quality management that was proven to be a successful management field in Japanese manufacturing organizations. Japan was helped by Deming who instructed that the quality should be integrated in any system and that the transformation is required in industry, education, and in government. Since that, quality gurus and quality researchers are trying to find the key elements that make TQM field successful. However, since the appearance, TQM concepts have not been fully accepted because it appears to be that managers look for short term results and benefits rather than long term developments and improvements. Total Quality Management then appeared in June 24, 1980 in a documentary named " If Japan Can… Why Can't We? ". The documentary mentioned before was a wake up for an American public and American business. Literature review suggests that manufacturing organizations have no difference than other types of organizations such as service organizations or construction organizations. Other than Deming, there are different TQM pioneers such as Crosby, Juran, and Ishikawa. These people have set some propositions which give the public an understanding to TQM practices, philosophy, and principles.

However, their propositions differ from each other although it can be found that there are some similarities.

Total Quality Management is a helpful tool for organizations especially nowadays where strong competitions take place between them and where they look for retaining superiority over other organizations. This idea brings the Darwinian idea into mind which is " Survival of the fittest ". The fitness that distinguishes successful organizations from failed ones is the quality and the customer satisfaction which is a common interest between organizations even though the nature of business may differ. Total Quality Management is not only focusing on quality aspects of products but also on participation of all members of the organizations towards achieving the continuous improvements through customer satisfaction by anticipating the needs and expectations. By involvement, employees become proud to work in the organization. It also encourages people to do right things routinely. Furthermore, if there will be any change to anything in the organization, TQM encourages the change to be managed and planned. In terms of TQM implementation, there are many studies that handle the correct implementation of TQM. Although TQM principles are the same, the implementation procedure differ between one study to another; debate seems to continue about TQM implementation. In fact, the reason that motivated the researcher to start this dissertation was that no studies have been done for TQM implementation in United Arab Emirates. Furthermore, the researcher wanted to investigate what the success factors of implementation of TQM that best suits United Arab Emirates as current studies appear to focus on other countries' industries such as American industry or Japanese industry.

1.2 Research Problem

As mentioned in the research overview section, there is a need to study Total Quality Management, critical success factors, barriers of implementation of TQM in United Arab Emirates organizations. TQM field is relatively new management style that appeared in 1980s in USA and as a result, UAE organizations have been influenced by the new management style; however, no evidence or information is given in magazines or papers regarding the affects or success factors in UAE. The culture in UAE still needs empirical evidence and real case successes to generalize the new style based on findings. There is a lack in literature review and there is no

empirical evidence between TQM and its critical success factors in UAE. These issues form the basis to study and write the dissertation. The study is composed of case study methodology to see real cases and draw conclusions based on findings in case organizations.

1.3   Scope

The scope of this study is limited to establishing the relationship between the key elements of implementation of Total Quality Management and the effect of continuous improvement as well as the whole cycle from implementation to the continuous improvement.

The context of this study is limited to UAE organizations.

1.4   Research Aims and Objectives

The aim of this research is to help finding the critical success factors of Total Quality Management in United Arab Emirates by investigating the relationship between Total Quality Management and Continuous Improvements in order to indentify the critical success factors that act as key elements which contribute to the continuous improvements within UAE organizations.

The objectives of this research are:

i.   To investigate the critical success factors of Total Quality Management in United Arab Emirates organizations.
ii. To study the effects of implementing Total Quality Management.
iii. To explore the approach organizations in United Arab Emirates are running in a context of Quality Management and Continuous Improvement.
iv. To assess critically the barriers to implement Total Quality Management.
v.   To compare the case studies of organizations in United Arab Emirates to Deming quality model (Deming fourteen points of quality).

Research aim and objectives will be discussed in details in the following chapters in combination with the discussion of study undertaken. After the literature review, discussion, and conclusion, aim and objectives will be further summarized.

1.5 Significance

This research is conducted to provide relevant information on critical success factors to implement total quality management and associated continuous improvements. The research will contribute and fill the gap of the growing body of knowledge and literature of total quality management especially in Gulf region in general and United Arab Emirates in specific. This study will benefit organizations who want to implement TQM by looking at critical success factors and other organizations' experiences on implementations. In addition, this research discusses the barriers to implement TQM in both literature and in the three case studies; therefore, other organizations will know the existing barriers to expect and mitigate the barriers. Regarding the implementation of TQM, practitioners would know the importance of defining the customer requirements and needs as well as the market requirements and therefore, they will plan the important consequences and will direct the decisions they make towards more customer-focused decisions. Moreover, certain pillars are important in order to gain the benefits of TQM such as vision, mission, clear objectives, and importance of commitment of management towards successful implementation by adopting quality in the strategic planning , provide and encourage quality tools and techniques, and understand the organization's resources.

1.6 Research Strategy

The adopted research strategy for this dissertation is detailed in Methodology chapter; however, it is briefly outlined sequentially here.

First, in order understand and grasp the theoretical perspective on Total Quality Management and the critical success factors, a literature review was conducted. The literature review eased the development of the case study which has interview guideline, questions, in addition to documental review.

Second, a case study was carried out based on what was found in literature review. Practitioners that have experience in the field of Quality Management were approached. Three case studies of organizations that are taken from three different sectors: manufacturing sector, construction sector, and oil sector. Semi structured interviews and documental reviews were used to facilitate the case study. After that, a

qualitative analysis methodology was used to analyze data and then interpretation, discussion, findings, conclusion, and recommendations were written.

1.7   Limitations of the Research

The design limitations of the research are listed below:

a) This research is based on case study approach which uses interviews and documental reviews for only three organizations. In terms of documental reviews, not all documents were available for the researcher due to the confidentiality of papers and documents as well as limited access to many documents such as internal circulars and minutes of meetings papers. Although the researcher used only three organizations for the case study, they are quite enough since this research is qualitative and explorative in nature where it is not necessary to represent large population.

b) A cross-sectional time horizon approach was used due to the limited time of the research. It represents a 'snapshot' of situations at given time. If time was not a constraint, a longitudinal approach would be selected to take the case study for larger time line.

c) Due to geographical and cultural reasons, this research was based on case studies of organizations in United Arab Emirates; therefore, the context of this research is limited and valid to United Arab Emirates.

d) This research uses interpretivism approach that uses qualitative tools and procedures. If, however, the time was not a major constraint, the research will use realism approach in addition to interpretivism approach to use qualitative, quantitative, and triangulation tools to enhance the reliability of the research.

e) Knowledge Management and Six-Sigma were presented in literature review; however, the concepts were out of scope as they are big and cannot be handled in this dissertation. The reasons are time limitation of this study, words limitation, and needs more organizations that implemented these methods. Six sigma needs very large organizations and mainly from manufacturing industry to do a case study. So, these concepts are omitted.

1.8   Structure of the Dissertation

The dissertation structure has been organized into the following chapters:

Chapter 1 – *Introduction*: This chapter gives an introduction to the dissertation. It consists of research overview, research problem, research aim and objectives, research questions, research hypothesis, the significance of the research, research strategy, design limitations, and finally, the structure of the dissertation.

Chapter 2– *Literature Review*: This chapter presents the literature review of Total Quality Management that focus on the critical success factors, continuous improvement, involvement of Key Performance Indicators and other topics such as Knowledge Management, and six-sigma concept.

Chapter 3 - *Research Design and Methodology:* This chapter gives research process onion by Saunders et al. (2003) that has research philosophy, research approach, research strategy, time horizon, and collection techniques. In addition, there is also a conceptual framework that was developed as a result of literature review. Finally, ethical considerations regarding this research are presented in this chapter.

Chapter 4 – *Findings and Discussion:* This chapter presents the analysis of results got from case studies as well as findings regarding concepts of Total Quality Management, critical success factors, and continuous improvements. In addition, it presents several things including: discussion of the results got from case studies, interpretation of results embedded with researcher's views, and limitation of the data collection.

Chapter 5 – *Conclusion and Recommendations*: This chapter presents the conclusion of the research and recommendations based on the research results. In addition, future research opportunities are presented in this chapter.

Literature Review

2.1   Introduction

The chapter gives a brief history and background of quality management that is related to any industry in general. Several items will be discussed including quality management, quality assurance, quality control, and total quality management. The chapter will also discuss the evolution of quality management philosophies by different famous quality gurus. The reason to mention some of quality gurus is to show how TQM philosophies are influenced by the thoughts of these gurus and their contributions are still prominent to TQM approaches.

After that, key points and discussion will be given on how to achieve Total Quality Management in organizations by giving values of TQM, tools and techniques. From literature review, and from the assistance of TQM structure, the interdependence of TQM elements will be discussed to achieve the vital goal which is the customer satisfaction and accordingly the continuous improvements. Finally, some barriers of implementing TQM in construction organizations will be summarized.

Finally, six-sigma concept will be briefly discussed and how it will advance and complement the Total Quality Management. Because the quality management area is dynamic in terms that improvement processes are emerging from time to time, the six-sigma, which is important improvement process is necessary to be discussed. However, the discussion will be brief due to the nature and context of the dissertation. Also, Total Quality Awards that are existing today will be mentioned due to the importance of these awards in providing and summarizing the baseline of organizations towards achieving the implementation of TQM. Furthermore, a brief discussion will be given on the relationship between TQM and Knowledge Management towards achieving the continuous improvement.

2.2   Background and History of Quality Management

Quality Management basically consists of inspection, quality control, quality assurance, and total quality management (Dale 1999). As deduced from McCabe (1998) and Dahlagaard et al. (1998), quality control and inspection are retrospective in such a way that their function is to identify and detect any problems or defects happened. However, McCabe added that quality assurance and total quality management seek improvements and future avoidance to problems and defects.

2.2.1   Quality Assurance

Quality assurance is looking on how to prevent problems and defects that are relating to quality by appropriate planning and methodologies. ISO added that quality assurance is aiming to produce confidence level through certain activities that the requirements will be fulfilled. McCabe (1998) concluded that quality assurance is proactive by looking to accomplish quality management system by a recognized system such as ISO 14001.

2.2.2   Quality Inspection and Control

Quality control, according to Arditi and Gunaydin (1997), is a detailed procedures and methodologies such as reviewing the work, planning, developing, scheduling and checking which ultimately set the quality assurance plans. In addition, it prevents any unacceptable changes to the product or service being offered (Hoyle 1998). Historically, quality control was the earliest and simplest form of quality which is based on detection of defects. The primary sources of quality control in the past were the drawings and specifications. Hoyle summarized quality control in his diagram based on plan, do, check, and conforms that was created by Deming. Figure 1 shows the summary of his principle.
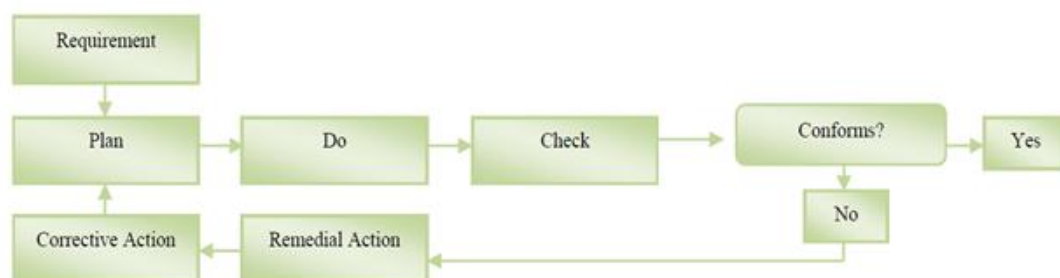
Figure 1: Summary of Quality Control based on PDCA (Hoyle 1998)

2.2.3   Total Quality Management

Morgan & Murgatroyd (1997) acknowledges that TQM involves the whole organization from managers down to employees that seeks to develop the services, products, and processes of organizations through quantitative methods which ultimately contribute to customer satisfaction, expectations, and needs. According to Dale (1999), TQM is a philosophy and management style which gives principles for managing organizations to attain and exceed expectations of customer through cooperation of every person in organization. It has two features: management principles and concepts in addition to management techniques and tools. Ho (1999) simplified the definition of Total Quality management by saying that Total refers to everyone who is involved whether customers or suppliers, Quality means that the requirements of customers are being met, and Management refers to the commitment of executive management.

Many people are confused between the difference between the Quality Management and Total Quality Management. As deduced from literature, Quality Management concern with the quality of products or services given by organization. To achieve this, Quality Management uses many tools and techniques such as quality assurance, quality control, Pareto charts, etc. In addition, Quality Management intends to meet specifications and standards of products and services (through quality control), planning the system on how to achieve and compare the results with specifications (through quality assurance), and finally, to improve the services and products through corrective and preventive actions taken afterwards. However, Total Quality Management is much wider than Quality Management in many things. It is a management style that has a strategy, with commitment of top management, to control, direct, organize, plan, the whole strategy of organizations towards achieving quality and continuous improvement. The strategy of organization has to cover the whole stakeholders such as employees, suppliers, customers, partners, and the competitive organizations in the market (to benchmark) by using and involving the available resources.

2.3   Quality Management Gurus – Pioneers and Followers

Quality management philosophy has its pioneers such as Joseph Juran and Edwards Deming and followers such as Kaoru Ishikawa and Philip Crosby. Sousa and

Voss (2002) claimed that these people are distinguished as the gurus of quality management. A brief discussion will be given regarding quality gurus in order to mention popular perspectives in total quality management and their contributions to it.

Edwards Deming was sent to Japanese managers to teach the methods of quality management including standards in manufacturing industry in 1950s (Knouse, 2009). Deming believes that 94 percent of quality issues are because of management (Burkhalter 1996). In 1986, Deming published a manifesto, "Out of Crisis" where he included 14 principles of quality management. These principles are stated below (Cohen n.d.):

1) No dependence on price tag in awarding business.
2) Continuous improvement to the system adopted.
3) Develop leadership.
4) Produce constancy of purpose to advance the service or product.
5) Take away barriers that steal the pride of workmanship from employees.
6) Encourage self improvement and continuous education.
7) On the job training.
8) Every person should work towards successful transformation.
9) Take away the fear.
10) Remove barriers between departments.
11) Eliminate quotas.
12) Minimize exhortations and slogans.
13) Implement new philosophy.
14) No reliance on inspection to accomplish the quality.

These quality principles however, face many obstacles. According to Deming, the obstacles include: lack of commitment from senior management, inconstancy, thinking about the short term rather than long term revenues, and management's dependence on the figures and accounting numbers where they ignore quality problems and focus of 'right numbers and profits' (Bank 2000).

Plan, Do, Check, Act cycle is a famous quality method discovered by Edwards Deming. He employed this method to encourage continuous and control improvement to quality processes and products as well. Refer to Figure 2 for the PDCA cycle.

- Establish the BCMS –
  Develop a Policy and
  Steering Committee
- Documentation and Records
- Embed BC in the Culture

- Corrective Actions
  and Preventative
  Actions (CAPA)
- Continuous
  Improvement

Plan

Act

Business
Continuity
Management
System
(BCMS)

Do

Check

- Perform a Business
  Impact Analysis and
  Risk Assessment
- Determine Strategies
- Develop and Implement
  a Response
- Exercise

- Internal Audit
- Management Review

Figure 2: Deming's Plan, Do, Check, Act Principle (Rupert 2010)

Joseph Juran is another quality guru who is famous for his quality trilogy that is composed of: quality planning, quality control, and quality improvement. These principles were developed in order to assist management for strategic quality planning. His book "Quality Control Handbook" is a quality reference standard that is largely used nowadays, according to Bank (2000). Juran concluded that there are ten steps for quality improvement process Landesberg (1999):

1) Reaching the goals come from proper organization.
2) Offer training to all people in organization.
3) Solving problems come through carrying out projects.
4) Report progress.
5) Keep score.
6) Communicate results.
7) Awareness for needs and opportunities for improvement.
8) Offer recognition.
9) Maintain momentum
10) Clear goals to improve.

Juran trilogy was the first method to assess the costs that come from poor quality. The trilogy simply states that constant waste is lead by no change. After changes, there will be additional costs; however, the margins will be higher and the additional costs will be recovered. Refer to Figure 3 for Juran trilogy (ASQC 1986).
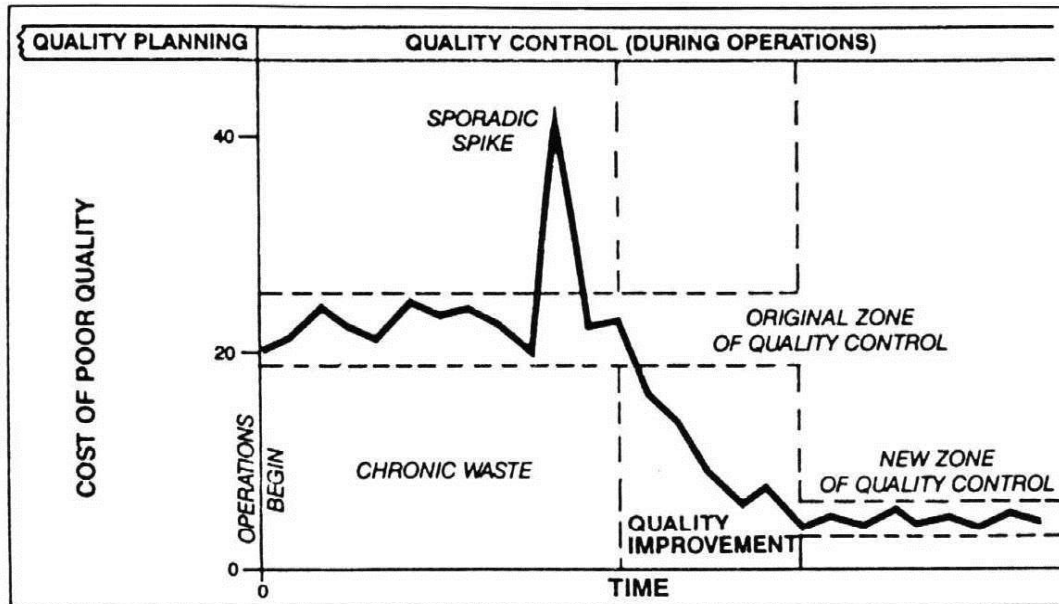
Figure 3: Juran Trilogy (ASQC 1986)

Quality planning, according to Juran (1986), is a process created to meet the objectives under conditions operated. In other words, it is the methods and activities that seek customers' needs and expectations and ultimately reduce the waste and develop the expected products (Gibbons 1994). Quality control is where evaluation of the actual works against the goals and take corrective actions accordingly. Chronic waste is where the planning process could not identify the waste and occurs thereafter in the execution stage. Juran suggests that chronic waste stays in control zone to prevent additional costs. Finally, the quality improvement process is where actions are taken to minimize the chronic waste. This is why the chronic waste level drops down and new zone of quality control is created. Juran added that to close the cycle, lessons learned must be noted from quality improvement and integrate them into the next cycle of quality planning.

Kaoru Ishikawa is one of the important followers of quality management. Ishikawa contributed to quality management by adding seven quality tools which

according to Ishikawa (1985), 95 percent of quality problems can be solved. The seven quality tools are (ASQ n.d.):

1) Check sheet.
2) Cause and effect diagram.
3) Histogram.
4) Pareto chart.
5) Scatter diagram.
6) Stratification.
7) Control charts.

Philip Crosby is also an important quality follower who is well known for his thoughts such as "zero defects" and "quality is free". Crosby outlined four quality absolutes in order to improve the quality process. The four absolutes are (Wangen 2012):

1) The definition of quality is the conformance to customers' requirements.
2) The price of non conformance is the measurement of quality.
3) Prevention is the system of quality.
4) Zero-defects the performance standard of quality.

2.4   Total Quality Management Background

Total quality management, according to Ross (1993), is an integrated management philosophy that is working towards continuous improvement, reducing reworks, attaining customer satisfaction, with the help of other practices and procedures. It also involves long range thinking, teamwork, enhance employee engagement and involvement, process redesign, constantly measure the results, and competitive benchmarking. According to Evans and Lindsay (1998), the aim of total quality management is to improve flexibility effectiveness, and competitiveness. American Society of Quality (cited in Li et al. 2000) added that TQM is a long term management approach that makes all employees participate towards improving the services, the products and the work culture. Implementation of TQM comes from the help of methodologies developed by quality gurus and leaders such as Deming, Juran, and Ishikawa (Bemowski 1992). Reports show that about 93 percent of USA largest 500 organizations apply TQM in some way (Li et al. 2000). It is concluded by Zink (2007) that total quality management philosophy should be integrated in any

excellence model in order to link the quality with corporate sustainability; however, since TQM is not only a product oriented but also a people oriented method; therefore, involvement of people in the corporate culture is a must in order to succeed. The total quality management supports the proactive measurement such as appraisal and prevention. It is noticed that there have to be a good employee relationships, leadership, employee training, and teamwork to achieve and maintain the objectives of TQM. In addition, reporting, monitoring and benchmarking are crucial parts of appraisal. These elements are the key elements in TQM process that have been captured and discussed in the coming paragraphs.

To simplify TQM, it is summarized as interdependence management process units namely core values, techniques and tools. The idea is that core values have to be supported by techniques such as policy deployment and supplier partnership, and tools such as control charts and tree diagrams. Core values will define the culture of the organization; accordingly, tools and techniques will be chosen as a result to be more efficiently and effectively (Bergman and Klefsjo 2003). Figure 4 shows core values of TQM as well as tools and techniques used.

TQM

Values	Techniques	Tools
Top Management Commitment	Quality Circles	Relation Diagram
Focus on Processes	Benchmarking	Ishikawa Diagram
Focus of Customers	Quality Function Deployment	ISO 9000
Let Everybody be Committed	Employee Development	Factorial Design
Base Decisions on Facts	Process Management	Process Maps
Improve Continuouslty	Self Assessment	Tree Diagram
	Supplier Partnership	Control Charts
	Design of Experiment	Criteria of MBNQA

Figure 4: Core Values of TQM, Tools, and Techniques (Hansson & Klefsjo 2003)

2.5   Key points in Total Quality Management and Critical Success Factors

Critical success factors, according to Lewis et al. (2006) are divided into soft and hard. Soft factors are related to behavioral aspects which deal with people aspects like leadership, teamwork, loyalty, training, education, human resource utilization, relationships with suppliers, and customer satisfaction. Rahman and Bullock (2005) added that soft factors include shared vision, empowerment of employees, cooperative supplier relations, workforce commitment, and customer focus. The most important thing is the employee involvement; TQM involves everyone in the organization. Powell (1995) stated that when an employee is involved in quality strategy of the organization, knowledge and information flow will be increased; hence, distribution of intelligence and resolving problems will be spread out to the bottom of organization. In addition, teamwork is looked as an important factor as teams are more effective and powerful to work activities than individual persons. Furthermore, teams in organizations contribute to trust and flexibility amongst members.

On the other hand, hard factors, according to Lewis et al. (2006) are system oriented which are quantified such as benchmarking, quality systems, quality assurance, flexibility, zero defects, innovation, and strategic planning. Rhaman and Bullock (2005) added some other factors that include just-in-time principles, technology utilization, and computer based technologies. Tools and techniques of quality management, according to Fotopoulos and Psomas (2009), are related to hard factors such as affinity diagram, scatter diagram, cause and effect diagram, run charts, and control charts.

Hoang et al (2006) developed a summary of six dimensions of Total Quality Management practices. Hoang, in his article, did a research and summarized the key points from existing past articles; therefore, he put each key success factor with whoever researched about it. The first dimension is the commitment of top management and leadership; the degree of support of top management to implement total quality environment. The second dimension is customer focus; to know customer current needs and future expectations and maintain long term relationships. The third dimension is strategic planning; how clear is vision, mission, quality policy and business plan. The fourth dimension is information and analysis; how is data and

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information matching the plan of quality improvement. The fifth dimension is process management; the process is to increase quality, value, and cost of quality. Finally, the sixth dimension is the human resource management; how management process is incorporated in the organization's strategy.

It is noticed through literature review that there are general pillars that form the total quality management. These elements differ from one quality philosopher to another; however, the basic components are captured here and have been structured according to what have been deduced from literature such as: Knouse 2009; Gupta et al. 2005; Juran 1986; Arditi and Gunaydin (1997); Agus et al. (2009); Babbar (1995); Al Shobaki et al. (2010); Hung et al. (2010); Ooi (2009); Talib et al. (2010); Al-Swidi (2011); Rherese and Joiner (2007); Mittal (2011); Talib et al. (2010), Lewis et al. (2006), and Hoang et al. (2006). Figure 5 shows a structured model of TQM as deduced from literature review. The diagram reflects the researcher's own understanding of TQM critical success factors and its sequence until continuous improvement happens; the diagram is created based on articles just mentioned before.

| Knowledge of Customer Expectations and Needs | - Leadership Involvement and Commitment
- Education and Training
- Organization and Teamwork Culture
- Relationships | - Employee Satisfaction
- Product Quality
- Business Process Improvement
- Customer Satisfaction Improvement | Continuous Improvement |

Figure 5: Structured Model of TQM as Deduced from Literature Review

In order to TQM to succeed, customer expectations and needs must be understood before any design and implementation of quality improvements (Gupta et al. 2005). Customer expectations and satisfaction however, is an attitude that can be

easily changed due to several circumstances; therefore, this will control the key elements of TQM such as leadership, training, relations, and organization's culture. It is also concluded that the customer expectations and needs form a loop with key elements and continuous improvement, meaning that whenever the needs differ, the continuous improvements methodologies will differ accordingly and as a result of these needs. Thus, careful thoughts must be given to understand the customer needs to implement the TQM (Gupta et al 2005).

2.5.1 Leadership Involvement and Commitment of Top Management

Quality leadership cannot be delegated and leaders are the ones who create the culture for quality (Smith 2006). Ahire et al. (1996) confirmed that total quality management will only succeed if executive management put it as a top priority. In fact, executive management is the first thing to desire when TQM is implemented (Dewhurst 1999). Actually, the commitment of executive management is like a compass which will direct towards creating systems, values, and goals in order for customer satisfaction. Jung and Wang (2006) added that executive management commitment and leadership is instrumental in making a culture where every employee is involved in continuous improvement. There are key elements in order for TQM implementation to succeed such as encouraging changes and creating long term vision by executive management (Reed et al. 2000). In addition, executive management commitment will lead to: ensuring quality training and education are available, effective communication is implemented, empowerment, creating team work culture, and making effective relationships with suppliers (Koehler & Pankowski cited in Al-Swidi 1996).

2.5.2 Education and Training

Education and training, as advised by quality gurus, help to learn new theories, concepts and ways to provide continuous improvements. Training could be a sort of learning problem solving, statistical methods, interaction with peers and methods of communications, and cost of quality. Interestingly, this can only occur if the top management is committed to quality. When major changes are introduced in organizations, other things will increase such as workloads; therefore, training and education is required. It is also known that whenever new technology or methodology such as TQM is introduced, wider ranges of activities and tasks will appear which will

be overcome by training and education. Training and education, according to Cartwright (1999), is composed into two elements. The first element is training people for necessary tasks in order to serve the company through certain methods, skills, and knowledge. The second element is giving education for people to develop adaptable and flexible capabilities through understanding, learning and growing. Training and education can be implemented in the organizations through several phases: the assessment phase where training needs are identified, planning phase where training is planned, implementation phase where training is delivered, and finally, evaluation phase where training is evaluated.

2.5.3   Teamwork and Organizational Culture

Teamwork is a vital key element that will offer the organization an environment that will lead the implementation of TQM and will offer a continuous improvement to quality strategies (Baxendale 1997). This is done by sharing knowledge, experiences, and information by involving all parties such as suppliers, customers, consultants, and contractors. Reed et al. (2000) added that there will be superior decision making and innovation environment if and only if there was harmony between teams as well as trust and chemistry. In addition, organizational culture offers identity to members of group through shared beliefs and values (Gupta et al. 2005). Maull et al. (2001) found out that organizational culture supports the strategic objectives of the company and are likely to be successful. Ishikawa (1985) implied that quality control practitioners have to contribute and promote the quality control ranging from senior management, departments in organizations, and all employees. Sureshchandar (2001) added an interesting point which is culture influences the service preeminence due to letting people share the common goals of the company as well as the vision which will ultimately align the functions of organizations towards shared aim and target.

2.5.4   Relationships

Relationships are important to achieve the TQM process improvements; relationships range from employee relationships to supplier relationships. Employee relationships if empowerment, accountability, and recognition is given, will lead to TQM improvements (Ahire et al 1996). In fact, these elements will create clear communication of the quality strategy of organization that will ultimately lead to

improvement. Recognition and reward of employees based on performance evaluated and quality contributions will direct the improvement process (Zu et al 2008). On the other hand, Mahbashi (2005) and Kaynak (2003) believed that the long term relationships with supplier (or contractor) will improve TQM process in a way that the quality of each stage will depend on the quality of previous stage. As an example, the quality of building a home by the contractor is directly related to the drawings and specifications that were generated by the consultant; this show that the quality of building by contractor depends on quality of drawings by consultant. In addition, quality gurus justified that by saying that when a project is tendered, selection criteria should not be based on price tag only, but also on quality where this can only happen by good relationships with contractor. Zu et al (2010) expanded this by stating that relations with the contractor can be happened by involving the contractor in the design stage, exchange queries and information regarding the project, and involvement in other activities such as value engineering workshops. This will create a partnership relationships based on trust and cooperation.

2.5.5   Employee Satisfaction (Job Satisfaction)

Employee satisfaction is an extremely important result from Total quality management and used as one of key performance measures (Naumann & Giel 1995). It is simply the degree of how much the employees like their jobs and careers and how much actually do employees feel about aspects of that job. There are several types of job satisfaction such as: satisfaction with job itself, colleagues, managers, and promotion. In reality, there are employees who are satisfied in their jobs where others are not satisfied provided that the same conditions and jobs are applied to both groups. It is measured through interviews with employees or with questionnaires. Actually, there are famous existing questionnaires that are effectively measure the satisfaction of employees such as The Job in General Scale (JIG) and The Michigan Organization Assessment Questionnaire (MOAQ). In general, there are key measurements for job satisfaction such as: equality, relationships, working environments, relationships with other teams and managers, and so on.   It positively alters the behavior of employees to the functioning of the organization by more cooperation and willingness to help the organization to be more successful. It was noticed also that employee satisfaction is one of the measures in TQM awards as will

be seen later. Ishikawa (1985) stated that organizations that have unhappy employees do not deserve to exist.

2.5.6   Product Quality

The quality of products is an important factor for organizations to be successful especially for manufacturing companies as it indicates whether the products are in conformance with specifications or not. Quality, according to Deming's (1986) philosophy, is meeting or exceeding customers' expectations and several terms are used to describe quality such as: reliability, maintainability, and serviceability. It is simply judged by customers; the customers are the only ones who judge the quality of service or product. When a quality image is obtained, it will give organizations a chance for a long term opportunity to be successful as well as an ability to compete in a market. As a result, quality of products has become a key business strategy and a key indicator for an organization's quality practices. It is noted through the literature that quality of products is one of the highest competitive priorities and performance as well as a subject of strategic importance and survival. Juran (1994) pinpointed this by stating that Japan, a leading country in quality management, reached the throne of economy and become economically superpower by putting the quality of products as a main strategy in Japanese organizations.

2.5.7   Business Process Improvement

Business process improvement is a control of reporting the quality data which allows measuring the performance of projects on different stages. The availability of data, according to Jung and Wang (2006), contribute to effective process management which is an integral part of total quality management. Kaynak (2003) added that process management is preventive approach which contributes to quality improvement by, for example, fool proof design process which offer stable production schedule and distribution of work which minimize the process variations by constructing quality into products. Mahbashi (2005) ensures that quality audits will be helpful in giving data and reports for future improvements. Several tools and techniques are cooperative in producing such reports such as: Ishikawa diagram, control charts, histograms, check sheets, and Pareto diagrams. The produced reports should be available to employees in the company to demonstrate weak areas and

whether the quality is achieved or not. The process will absolutely affect the level of customer satisfaction.

2.5.8 Customer Satisfaction Improvement

Quality, as defined by Deming (cited in Knouse 2009), is meeting or exceeding customer satisfaction with certain service or product. The whole idea of total quality management goes around customer satisfaction by identifying customer expectations and needs by standardizing methodologies and activities (Fewings 2005). In other words, TQM is to improve competitiveness through the best possible product quality and hence achieving the satisfaction of customer (Invernizzi & Molteni 1992). Quality, according to Garvin (1988) is defined by customer feedback not by manufacturing specifications. In other words, customers are the only ones who will judge the product if fulfills the expectations or not as well as customer satisfaction is verified by consumption of the product of its lifetime as well as its multiple attributes.

When the level of customer satisfaction is determined, clear areas of improvements will be obvious and hence continuous improvements will be carried out. Nowadays, there are many methods to determine the level of satisfaction such as balanced scorecard and key performance indicators. Once the measurements are obtained, and by comparison with previous projects and company's strategy, corrective actions could be taken in order for further improvement.

It was noticed that TQM awards assigned the maximum points for the customer satisfaction. Practitioners believe that customer satisfaction is the most significant factor to be consider strategically because customers to many organizations means business and when there are no customers there will be no business. In addition, it gives good measure to past, current and future performance. Customer satisfaction is basically how customers sense that their expectations and needs are being met by the organizations' services or products (Anderson et al. 1994). In other words, customer satisfaction is how much customers are delighted or disappointed as a result of comparing of what they expect and what is actually the outcome whether the service or product.

2.5.9   Continuous Improvement

The ultimate target of total quality management is to continuously improve the organization and its strategy through an on-going effort. It is basically, as mentioned before, a feedback from customer satisfaction level measured through different methods such as KPIs. Yosof and Aspinwall (1999) highlighted some points in order to achieve the continuous improvement. First, the involvement of executive management leadership and commitment is essential which eventually contribute to a team culture that has empowerment and involvement and support the continuous improvement. Second, availability of a quality system that has quality management standards and methodologies and quality reporting is also an important point. There are many quality methods that can be adopted such as six-sigma, benchmarking, KPI, and business process reengineering. Finally, a strategy that focuses on customer and continuous improvement through all the organization must be available. According to Ciampa (1992), there are internal improvements and external improvements and all lead one result which is higher profits. Figure 6 shows the difference between internal improvements and external improvements which all lead to higher profits.
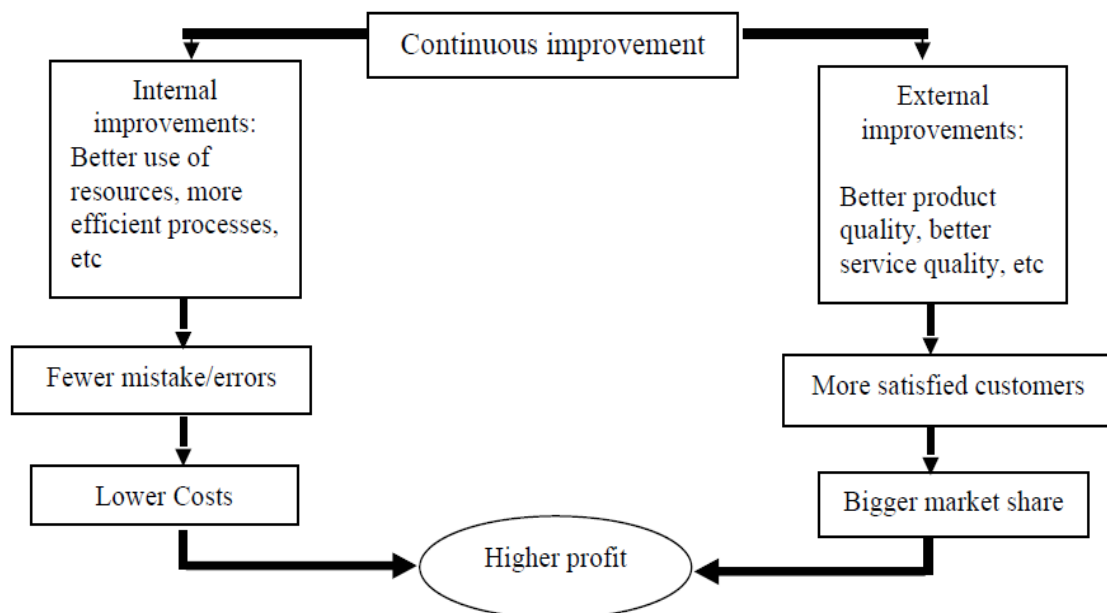
Figure 6: Continuous Improvement: Internal and External (Ciampa 1992)

Continuous improvement is not a one step; in fact, it is a cycle that has five stages as stated by Saylor (1992). First, mission and vision should be defined clearly by executive management and achieved by everyone in the organization. Second,

improvement opportunities are drawn as a result of the mission and vision and at this stage, the customers' expectations and needs should be well understood and defined with appropriate suppliers as well as issues found. Third, specific improvement opportunity should be selected based on the criticality and impacts on customers. These opportunities should be considered using tools and techniques of quality management such as process analysis or quality functioning deployment. Fourth, the results of using quality tools are used as a baseline to the mission and vision drawn at first. Finally, the fifth stage is where the cycle is repeated again where continuous improvement is not ending. Figure 7 shows continuous improvement cycle that has five stages found by Saylor.

Figure 7: Continuous Improvement Cycle (Saylor 1992)

2.6 Involvement of Key Performance Indicators (KPI) towards Continuous Improvement

Key performance indicators provide a system of performance measurement of quality improvements that are taken from customers and stakeholders. In addition, KPI, when performed and measured, will help the organization to provide a continuous improvement and make key strategic decisions by using benchmarking

against other organizations, departments, or the entire industry to set up areas where improvements are needed. Many researchers have summarized some of key indicators in each field. Kagioglou et al. (2001), for example, summarized the key indicators in construction field as: predictability of cost and time, client satisfaction of service and product, defects, profitability, safety, and productivity. In addition, Chan and Chan (2004) outlined a framework that gives the ability to measure the performance of projects and compare it to other successful projects in the organization. Figure 8 shows the Chan's KPI framework. Musa (2011), through his developed quantitative research, found out that certain key elements are strongly correlated with productivity of organizations; these elements are: top management commitment, customer focus, cooperation and teamwork, continual improvement, measurement system, rewards and training, and prevention focus.

Hakman and Wageman (1995) summarized the key elements of TQM as following: customer focus such as co-makership and customer satisfaction, involvement of operational nucleus such as training and quality circles, process orientation such as Just In Time process, and finally, continual improvement such as control mechanics.
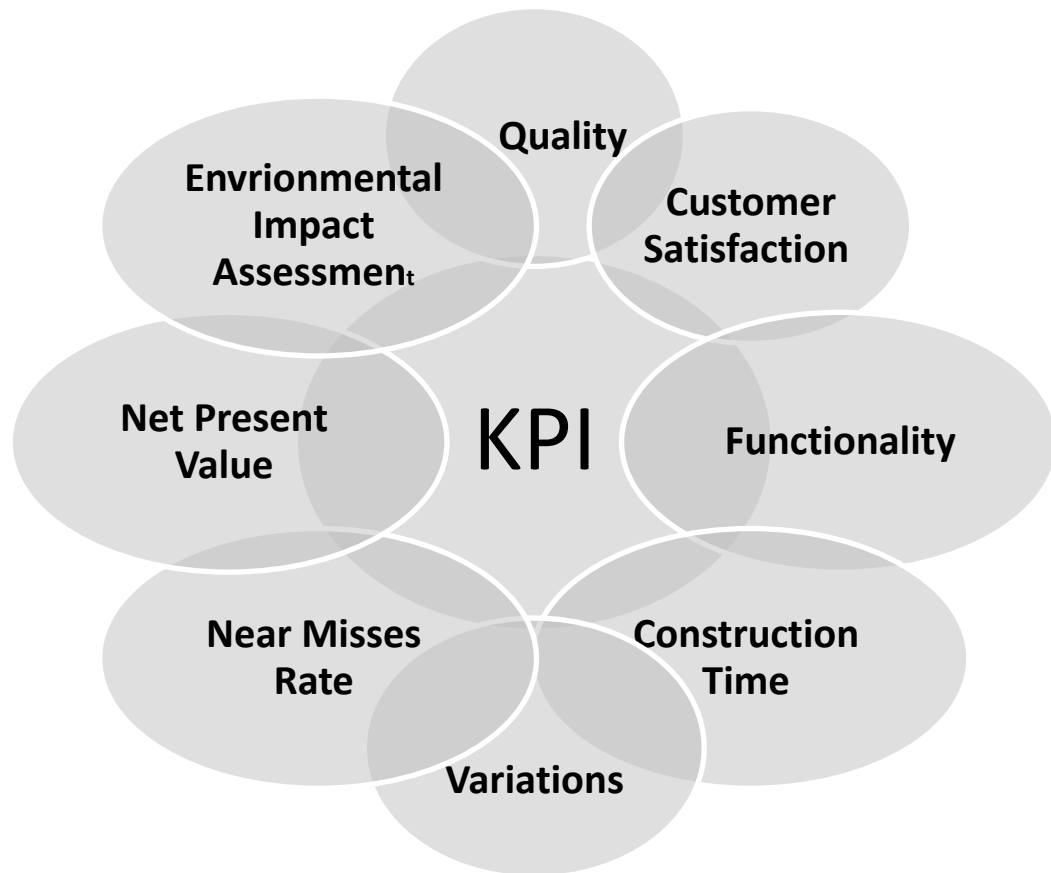
Figure 8: KPI Framework for Construction Projects (Chan & Chan 2004)

2.7 Total Quality Management Excellence Models and Awards

There are nowadays several quality awards such as The European Quality Award, Deming Prize, and Malcolm Baldrige National Quality Award. These awards differ from each other with own perceived model and has its own characteristics. The goals of these awards, as described by Ghobadian and Woo (1996), are: to increase the level of awareness of TQM, encourage organizations towards the continuous improvement, to offer established criteria and requirements for a self assessment, market awareness, understand the benefits of adopting TQM system, and finally, to promote sharing and dissemination of knowledge and information on benefits of TQM adoption and lessons learnt.

Deming Prize has several criteria and checklist to consider when an organization applies. It focuses mainly on executive management supports to the organization. The checklist for the organization's application is as following: Policies of organization, organization's approach towards quality, information and knowledge management both internally and externally, Standardization, human resources management, quality assurance, maintenance and apply lessons learnt by adopting

PDCA cycle, improvement by utilization of analysis results, effects whether tangible or intangible, and finally, the future plans for improvements. There is also a checklist to evaluate the top management of the organization. The checklist is as following: understanding of TQM, policies of quality, organization's management, human resources management, implementation of quality management measures, corporate social, and finally, the future visions. On the other hand, the European Quality Award is divided into two components: Enablers and Results. The Enablers are people management, leadership, policy & strategy, process and resources. However, the results are customer satisfaction, business results, people satisfaction, and impacts on society. Finally, the Malcolm Baldrige National Quality Award which was found by the United States Congress and give the benefits for organizations to satisfy customers and improve quality, capabilities and overall performance. The current model of this award is able to evaluate the quality practices of the organization, relationships with customers and suppliers, and benchmark the performance of organization with standards and competitors. The checklist for the award is as following: leadership, strategic planning, market and customer focus, information and analysis, human resources focus, process management, and, business results. As a result of these awards, universal framework has been provided towards aspects of TQM in organizations as well as tangible and intangible processes that manipulate the implementation of TQM and its results. It has been noticed that these awards share common ideas which are: the awards has TQM implementation enablers and overall results of implementation, the awards use criteria of human resources management, leadership, training and education, employee participation, process management, policy and strategy, and customer focus. In addition, these awards enable organizations to identify strengths and weaknesses in quality practices. As a result, it is acceptable to assume that the winners of these awards have implemented a full TQM package (Hackman and Wageman 1995).

Previous awards are based on TQM excellence models such as European Foundation for Quality Management (EFQM) and Malcolm Baldrige National Quality Award (MBNQA). EFQM was introduced in 1992 to assess organizations for European Quality Awards (Santos & Alverez 2007). EFQM is based on nine criteria as shown below. Five of criteria are 'Enablers' and four are 'Results. EFQM is intended to be a helping instrument to compare and benchmark competitive

organizations with each other. It is regularly revised and updated according to market needs. On the other hand, MBNQA excellence model was described before for the criteria and the purpose.
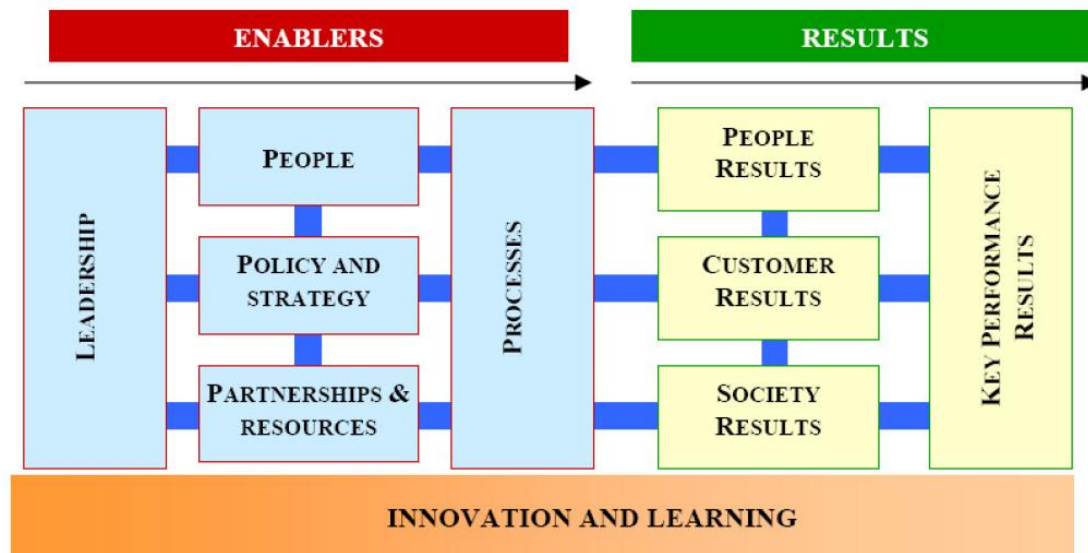
Figure 9: EFQM Excellence Model (Jacob et al 2004)

2.8   Barriers to Implement TQM in Organizations

There are many barriers and obstacles that make the implementation of total quality management system difficult, as deduced from literature review (Juran 1986; Mahbashi 2005; Haupt and Whiteman 2004; Shammas-Toma 1998; Pheng 1996). The first and most common obstacle is the lack of leadership amongst executive management. The implementation of TQM would probably affect the organizations in short term like revenues, costs associated with implementations, and cutback. Without commitment and support of higher management, TQM will be difficult to be implemented as higher management needs to understand the benefits of TQM. Also, the commitment of managers between departments should be consistent as the inconsistency between departments will create difficulties in implementation of TQM. Moreover, organizations need to include quality measurements when awarding contracts and need not depend on just a price and costs. Also, consideration of the initial cost of the project is a major barrier. TQM suggests that projects need to be seen by the life cycle costs and not just the initial cost. Contractors who are doing projects to clients do not favor from this idea as they do not get any benefit. Furthermore, TQM implementation would be difficult if there is no supporting

infrastructure that promotes cultural changes; in fact, many organizations fear to introduce changes. There are also a lack in recognition and rewards where many organizations are concerned about short term profits rather than sustainability of business in the long term. Moreover, Brah and Lim (2005) concluded through their research that there are difficulties stand in front of implementation of TQM. First, organizations may lack the focus on strategic focus that makes top management thinks that implementation of TQM will have immediate results. Second, the lack of top management support is an important difficulty. The final point is the lack of the organization culture that supports the implementation of TQM which in effect will change the strategy of the organization towards the overall performance.

Researchers have identified many barriers towards implementing TQM especially for Small and Medium Enterprises (SME's). They, unlike large enterprises, have incentive resources, lack management capabilities, knowledge, or business experience (Quazi and Padibjo 1998). Sebatianelli and Tamimi (2003) added that SME's are facing some difficulties in implementing TQM including insufficient planning or leadership for quality, poor human resource management and development, lack of customer focus, and unavailability of resources. Regarding the unavailability of resources, Ismail (2004) stated that the limitation of resources will resist the changes within SME's specifically for employees who will ultimately think that changes would threaten their positions. Finally, Tannock et al. (2002), through their research, summarized the main barriers that face SME's to four categories. First, the management awareness barriers which say that if there is no support of top management, implementation of TQM would be difficult. Second, the cultural barriers which states that if the culture of organization is not supportive and conducive, TQM implementation will not be successful. The third category is the training barriers which are important to implement TQM systematically. The fourth category is the financial barriers which are very important as the costs of implementing TQM and associated courses and training should be available.

2.9   The Integration of Six Sigma with Total Quality Management

Six-sigma is somewhat new concept of managing quality that was adopted first by manufacturing industry, specifically Motorola in early 1980s (Zu et al 2010; Kwak and Anbari 2006). Sigma basically is the variations regarding the process

average. Six sigma approach means to produce 3.4 defective parts per million opportunities; it involves using strategies of statistical tools and methodologies to gain information and knowledge needed to make faster products and services (Kerzner 2009). Kwak (2006) added that it focuses on three things: increasing the productivity, financial performance, and customer requirements and needs understanding.

To improve the performance of organization, Zu (2008) offered a six sigma model that could be integrated with total quality management that consists of function structure, improvement procedures, and using metrics. First of all, the function structure of six-sigma is utilized through training related to the approach depending on the experience level; for example, master black belt training is for highly experienced experts and green belt for beginners and between them there are black belt and yellow belt. These trainings are offered in many international bodies such as American Society of Quality where a body of knowledge is developed to cover all topics in quality such as leadership, quality problem solving techniques, and statistical methods. Zu concluded that when six-sigma approach is implemented, the business strategy of the organization will be met easily through planning and controlling tasks and activities. Second, the improvement procedures are implemented to manage improvement tasks and activities by Define, Measure, Analyze, Improve, and Control. By implementing this method statement framework, unproductive steps will be reduced by adopting new technology and new measurements tools (Kwak 2006). Third, using quantitative metrics helps for continuous improvement through setting certain goals. Linderman et al (2003) categorized quality practices infrastructure practices and core practices where infrastructure practices concern about supporting environment to the quality management whereas core practices concerns about using tools and methodologies to continuous improvement. Zu advised to integrate six-sigma method with total quality management in order to have a thorough methodology for continuous improvement. However, six-sigma approach will definitely need an extra leadership commitment as stated by Schroeder et al. (2008). Kwak (2006) confirmed that by using six-sigma approach, the whole organization will benefit as happened to Bechtel Cooperation who invested $ 30 million on implementing six-sigma; however, they reported profit of $200 million which was acknowledged by Kwak as a result of six-sigma.

Kwak and Anbari (2006) have utilized a framework for management of improvement activities. It reduces unproductive steps, motivates new measurements, and applies technology that leads to continuous improvements. The framework consists of Define, Measure, Analyze, Improve, and Control as following:

- Define: project boundaries, business flow process, and requirements of customers.
- Measure: data collection, issues and shortfalls, process to please customers' needs.
- Analyze: variations, opportunities for future improvements, and causes of defects.
- Improve: alternatives and processes for eliminations of variations.
- Control: improvements of structures and systems, strategies for improvements and the variations that satisfy customers' needs.
  Six- sigma is a wide theory and will be out of scope of this research. The reasons are stated in limitations sections.

2.10 The Influence of Organizational Characteristics to TQM Implementation

Organizational characteristics like: size of the firm, industry type, ownership, and culture such as situational interactions, beliefs, and attitudes are all influencing the implementation of TQM (Swamidass & Kotha 1998). Regarding the size of the organizations, researchers found that larger organizations have higher benefit from TQM than smaller ones (Choong 2004 and Garvin 1988). Haar and Spell (2008) through their research, and by taking company size as moderating variable when considering other variables as constant such as team works, group problem solving, and workplace autonomy, found that large companies who have larger variables mentioned before would benefit more from TQM theories; however, the study indicated that smaller organizations still had the advantage to benefit from TQM. Ahire & Golhar (1996) confirmed that by saying that small or large organizations, which produce high quality products, do not have operational differences when implemented TQM and are equally effective.

Ownership, in addition, influences the organizational behavior or culture (Hui et al. 2004). Noronha (2002) found through his research that dimensions of TQM practices were influenced by the cultural aspects in the organizations such as abasement, harmony with people, and interdependence. TQM practices differ also between overseas companies, as found by Feng et al. (2006), when they did a research between Singaporean and Australian companies.

The type of industry does not influence the TQM implementation greatly although TQM firstly was implemented in manufacturing organizations. TQM suits other types of organizations such as service industry. Soft factors of TQM such as employee involvement and empowerment are suitable in services industry more than manufacturing industry (Prajogo 2005). Literature review acknowledges that there is no significant difference between manufacturing industry and service industry as TQM applications suit all industries (Woon 2000; Prajogo 2005).

2.11 Knowledge Management as a Result of Total Quality Management

Knowledge management has gained popularity nowadays in organizations as a result of total quality management evolution. The reason behind this is that total quality management is implemented to achieve continuous improvement and to promote this, organizations have to encourage organizational learning in order to develop knowledge that can be utilized when needed (McAdam & Leonard 2001). Mukherjee et al (1998) added that change in knowledge structures and organizational achievements are connected to total quality management. Knowledge management, as described by McAdam and Leonard (2001), is both a strategy and tactics that utilized in managing human assets; it is a process of managing knowledge to see the existing needs and hence, develop new opportunities. Furthermore, Hsu and Shen (2005) defined Knowledge Management as a method that makes the organization capable of assembling and organizing the knowledge to improve the process of business strategy formulation and decision making. Molina et al. (2007) acknowledged that despite the significant relationship between TQM and Knowledge Management, there is still insufficient evidence in literature regarding the result of TQM on Knowledge Management behavior. Knowledge management, according to De Jarnett (1999), consists of knowledge creation, interpretation, dissemination, as well as use, retention

and finally refinement. Saline and Fadzilah (2008) concluded that knowledge management has three basic components namely: knowledge acquisition, knowledge conversion and knowledge application. Knowledge acquisition is where knowledge is internally constructed, generated, created, built, and developed. Knowledge conversion is where knowledge is organized and applied and where knowledge has been formalized and accessible. Finally, knowledge application is where knowledge is shared, disseminated, transferred, and distributed when it is organized and stored.

Zhao and Bryar (2001) confirmed that knowledge management has a connection with total quality management mainly in parts of continuous improvement and empowerment of workforce. Snyder and Cummings (1998) clarified this point by stating that if organizations desire for continuous improvement, then they are required to learn from past experience, efficiently use knowledge, set corrective actions and correct errors, and finally, apply the knowledge gained to the organization. Zetie (2002) highlighted the similarities of Knowledge Management and Total Quality Management as following: people oriented management, teamwork, result oriented, leadership commitment, and delighting customers. However, Zetie added that TQM differentiates from Knowledge management in distinctive focus in a way that TQM is an approach of improvement based on fact while Knowledge Management depends building culture that enhance knowledge creation and sharing.

Ooi (2009) has created a model of knowledge management behavior and found that the six dimensions of TQM all contribute to Knowledge Management in areas of knowledge acquisition, knowledge dissemination, and knowledge application. The relationship is such a way that the six dimensions are positively related to Knowledge Management. The figure below shows Ooi model of Knowledge Management.
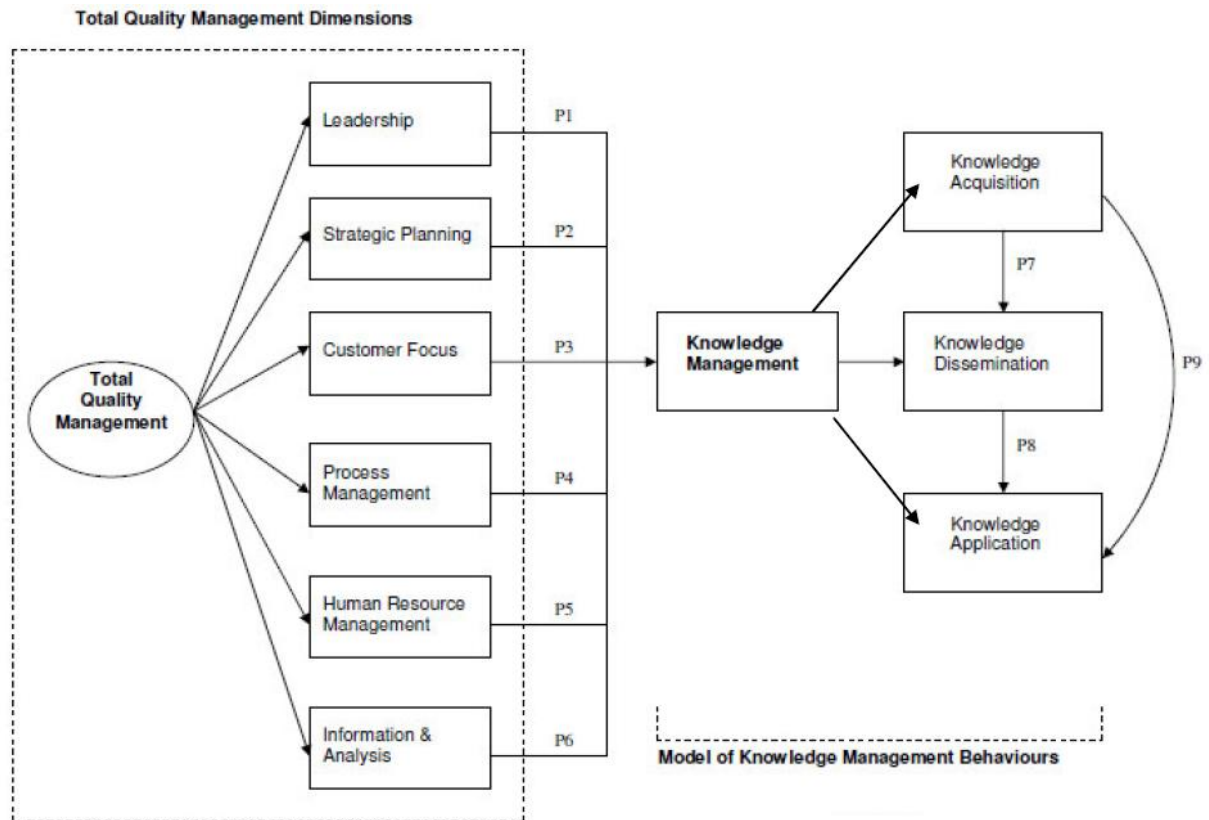
Figure 10: Ooi Model of Knowledge Management (Ooi 2009)

Ooi, in his model of knowledge management, put nine hypotheses; six hypotheses are related to total quality management; and three are related to knowledge management. In addition, the first six hypotheses in his model are positively related to knowledge management behaviors which include knowledge acquisition, knowledge dissemination, and knowledge application. Moreover, knowledge acquisition is positively related to knowledge dissemination, and knowledge dissemination is positively related to knowledge application. Ooi, in his study, intended to close the gap in literature between TQM and knowledge management and he came up with his model. The model should be used to study the effectiveness of TQM dimensions towards knowledge management. However, Ooi claimed that he will confirm the results got from questionnaire in a future article, but until now, there is no existing article to see the results. Knowledge Management and contribution to the continuous improvement of organization is a huge subject and hence, it will be out of scope of this research.

2.12   Summary

The literature review chapter discusses several things relating to Total Quality Management. First of all, it describes the history of Quality management and some background relating to it. It was seen that basically, Quality Management consists of four methodologies namely: quality control, quality inspection, quality assurance, and total quality management. The relationship between them is such a way that quality control and quality inspections are retrospective as they intended to identify and detect problems happened whereas quality assurance and total quality management search for future improvements and preventive actions.

Second of all, quality gurus were mentioned as part of evolution of total quality management; the gurus that were mentioned are Deming, Ishikawa, Crosby, and Juran. These people have many contributions to TQM and each one of them has famous model or tool. Quality principles, tools, methodologies, or models of these gurus, that some of them were mentioned in literature review, reflect the major part of the existing Total Quality Management theories and standards.

Third of all, a background of TQM was given in a context of: definition, philosophy, aim, and process. In addition, literature review breaks TQM into three integrated parts which are values, Tools and Techniques. To implement TQM, literature review suggests using such a break-down to simplify the implementation.

Fourth of all, the literature gives general pillars of TQM which are involvement and commitment of management, education and Training, organization and teamwork culture, and relationships with either suppliers or customers. The results of these pillars could range between employee satisfaction, product quality, business process improvement, and customer satisfaction improvement. The chapter explains thoroughly each point of these pillars and results.

Finally, miscellaneous topics related to TQM are mentioned. One of them is the KPIs of TQM implementation. Furthermore, TQM excellence models and famous awards are mentioned to benchmark the implementation of TQM against them. Barriers to implement TQM are also mentioned to take care and plan for the solutions. Six-sigma idea is also mentioned to relate the relationship with TQM. The

implementation is also affected by the characteristics of organizations. Finally, the relationship between knowledge management and TQM was mentioned as final part.

Research Design and Methodology

3.1   Introduction

This chapter presents the methodological perspective of the research. Several items will be discussed such as research strategy and methods, research methodology, research approaches, and data collection techniques for the current research. The aim and objectives of the research are presented in the first chapter.

3.2   Research Methodology

Research methodology is a how researcher adopts and utilizes research methods to finally solve a research problem whereas research methods are tools and techniques the researcher use to conduct the research (Kothari 2004). Research process onion found by Saunders et al. (2007) is widely used by researchers to show the research process. It consists of many layers where every layer demonstrates one research process. Figure 11 shows the research process onion where every layer is used to determine which research process is suitable for this specific research.
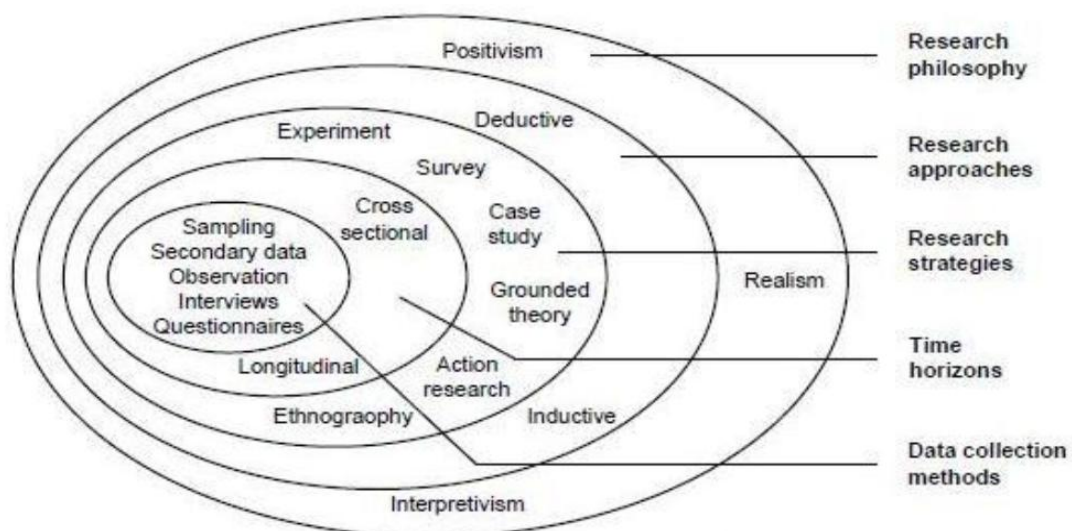
Figure 11: The Research Process Onion (Saunders et al. 2007)

3.2.1   Research Philosophy

Research philosophy is the first thing to be determined. According to Saunders et al. (2007), there are three schools of research philosophies which are: Interpretivism, Positivism, and Realism.

Interpretivism is about discovering situations' details to comprehend the reality as well as to see how much the subjective meanings are motivating peoples actions (Remenyi et al 1998). It uses naturalistic approaches and qualitative tools and techniques to comprehend others' experience and social role and compare it to our own set of meanings. Interpretative researchers see that interpretations of reality depend on the time and context of the research.

Positivism is where the researcher is independent of the subject of research and neither is affected nor affects it; the reality is objective and can be predicted and measured (Remenvi et al 1998). It relies on tools and techniques of quantitative analysis, facilitates replications, and deals with factual outcomes from law-like generalizations (Saunders et al. 2007). Measuring a melting temperature, in Positivism school, is independent of human influence and the researcher findings are reliable. Positivism method is common in science researches and less common in arts based researches. Positivism method is almost similar to quantitative research; however, they are not the same. Questionnaire, for example, is type of quantitative research when is done to get quantifiable data but the questionnaire depends on human participation and human influence; therefore, it is a quantitative research but not positivist. Since positivism is used in quantitative researches where quantifiable observations are used to get statistical analysis, this research will not use this method because qualitative method is used instead of quantitative method.

Finally, Realism is based on the belief that existing reality is independent of human beliefs and thoughts. Actually, there are social forces that influence people without them realizing that; therefore, Realism intends to study these forces and their implications on human behaviours and acts. It simply takes a position between positivism and interpretevism schools where realists believe that there are two basic aspects of experiencing the world namely the object itself and the sensation it expresses. This type of school will give comprehensive results regarding certain topics since it is a mixed between the other two schools. This method is inappropriate for this research as it consumes time and this research has a time boundary much less than the time needs to use this method.

This research uses Interpretivism philosophy where qualitative tools and techniques used to describe the critical success factors of TQM and the continuous

improvement. After looking at strengths and weaknesses of each philosophy, the decision was taken as the objectives of this research demands in-depth study to critical success factors and continuous improvements. If the time was not a major constraint, Realism in addition to Interpretivism could be used to study the social forces and use qualitative and triangulation tools and techniques as well.

3.2.2   Research Approach

When it comes to data collection methods, there are generally two research approaches namely: qualitative and quantitative. Qualitative approach is a source of explanations of processes that would be in identifiable local contexts as well as well-grounded wealthy descriptions that focuses in words rather than numbers (Amaratunga et al. 2002). However, quantitative approach is where the researcher takes measurements and control by assigning numbers to the measurements (Hussey and Hussey 1997). Qualitative approach was chosen due to objectives of this research where it demands a deep understanding of TQM critical success factors and continuous improvements.

There are generally two methods of reasoning (research approaches) namely inductive method and deductive method. Inductive approach works from specific to general; it involves specific observations to broader theories and generalizations. It goes to measurements and observations, detect regularities and patterns, and finally, having the generalizations of theories and conclusions. On the other hand, deductive approach works the other way around; it works from more general to more specific. The research begins with a certain theory of interest, then narrowing that to more specific hypothesis, narrowing that more by taking measurements and observations to address the hypotheses, and finally, the hypotheses are tested with results got to see the hypotheses are right or wrong to come up with the final conclusion. Inductive reasoning is a theory building process while deductive reasoning is a theory testing process.

Inductive approach is considered more suitable for this research as it is very powerful for making inferences, giving insights into results, and drawing conclusions.

3.2.3   Research Strategy

According to the research process onion, there are many research strategies that a researcher can adopt. The research strategies in research process onion include seven major research strategies: Survey, Grounded Theory, Case Study, Experiment, Action Research, and Ethnography. These research strategies are not seen as mutually exclusive; however, the strategy that is adopted in this research and seems appropriate is the case study. Case studies are generally associated with organizations in which an intensive examination of setting is emphasized (Bryman et al. 2007). Yin (2009) and Miller and Brewer (2003) reported that a case study is used largely in social research types such as economics, administration, planning, public policy, and management studies. A case study is bounded by activity and time where a researcher investigates in depth an event, a process, and activity, a program, or a combination of these individuals. The reasons behind choosing a case study strategy comes behind several reasons; Yin (2009) summarized the reasons to be: when looking at a contemporary event, when the case study does not look at behavioural events or controlling it, and the research objectives should be of explorative nature. To make a case study unique, a mix of data collection tools have to be used such as interviews, documentary analysis, or observations. To conduct a case study, Yin has summarized case study conduction into four: first is design case study by looking at required skills; second is conducting the case study by using collection techniques; third is analyzing the case study by looking at evidences got; and fourth is developing conclusions, implications, and recommendations based on evidence got.

3.2.4   Time Horizon

Cross-sectional method measures certain situation within narrow time span and it may be seen as contemporaneous. Longitudinal method however, involves making records and measurements for longer period of time (Saunders et al 2003). Cross-sectional method is selected because time is important factor; the registration period of the dissertation is limited.

3.2.5   Data Collection Techniques

There are many data collection techniques that is shown in Saunders et al. figure such as sampling, secondary data, observation, interviews, and questionnaires. Since this research is qualitative in nature and a case study strategy has been used as

stated earlier, interviews and documental reviews collection techniques were used for this research. According to Kvale (1996), interview is an interchange of ideas and views between two or more people regarding certain topic of mutual interest, emphasizes social situations of the data of research, and sees the centrality of interaction between human for knowledge production. There are reasons behind using interviews for collecting data, according to Gray (2004), such as: to get highly personalized data and having opportunities for probing. Interviews have several types namely: structured interviews, semi structured interviews, and unstructured interviews. Structured interviews or standardized interviews, according to Corbetta (2003), are asking the same questions without changing the words, sequence of questions, or even the tone of voice. This type of interviews are mainly used in quantitative researches and the questions are rigid and closed ended which are not explorative in nature; therefore, it was not used in this research as this research is explorative and qualitative in nature. Semi structured interviews, as described by Corbetta, is the order where wording of questions is not necessary and certain topics and themes are dealt with. The interviewer asks questions he believes suitable, ask questions in words he chooses, asks for clarifications, establish own style of conversation, and prompt to elucidate further. This type of interview is non standardized and commonly used in qualitative data when the researcher is not considering his research to test certain theory or hypothesis (David and Sutton 2004). Questions in this type are seen as key themes, topics, or issues where the order is not important and can be changed. This research will use semi structured interviews because of reasons just mentioned. In addition, this type of interview allows asking additional questions and probing to explore more and get opinions (Gray 2004). Finally, the unstructured interviews are casual, flexible and non directive method. In this type of interviews, there is no interview guide and the interviewees speak openly, frankly, and the information is given as much as possible. This research does not consider this type as it is not suitable for a master dissertation because the interview may take other directions than it is originally planned, uncontrolled, and the conversation topics are unplanned.

In addition to semi-structured interviews, documentary analysis will be used because, according to Stark and Torrance (2005), depending on one method of collecting data such as interviews will lead to empiricist analysis. In addition,

documentary analysis is used mainly to enhance the evidence got from interviews. There are many documents to analyze in these case studies; these documents would include quality manuals, quality policies, quality codes and standards, minutes of meetings, documents got from organizations' internet websites, and project quality plans.

Primary data will be collected through the information got from interviews because the information is obtained first, while secondary data will be attained through documental reviews.

Sound recorder will be used to record the interviews; however, note taking will be used in case of confidential information is given. The reason to use sound recorder is to have a full transcript of interviews conducted to analyze data in case some information mentioned is forgotten by the researcher.

3.3   Conceptual Framework

The Independent variables and dependent variables are derived through literature review in Chapter 2. A graphical representation of independent and dependent variables are presented below.
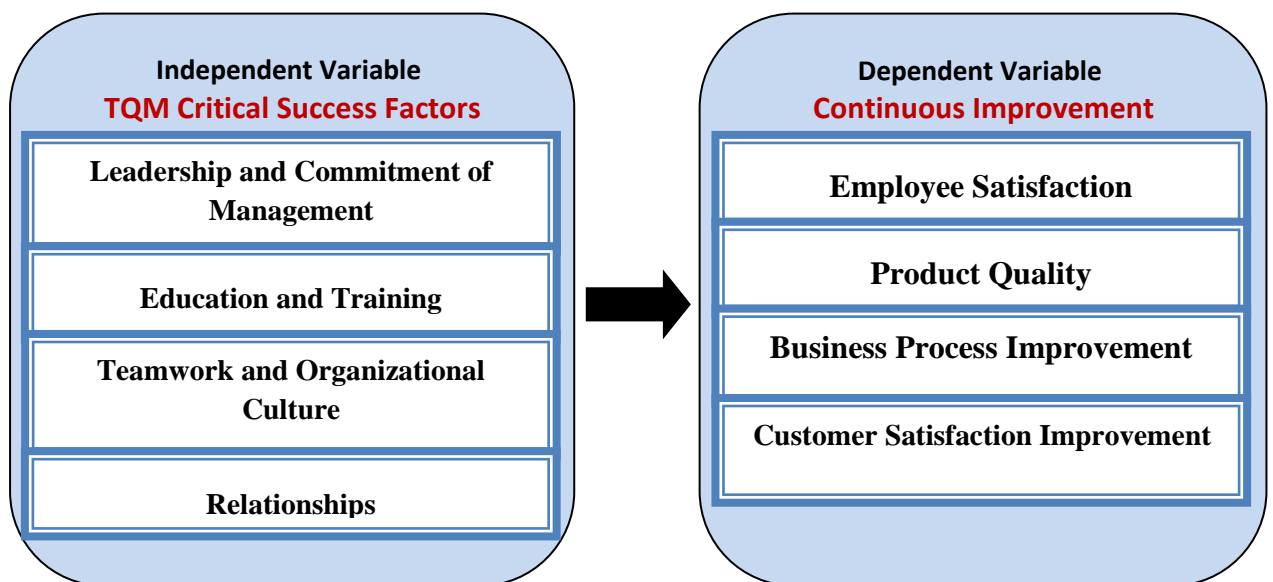
Figure 12: Graphical Representation of Conceptual Framework

The following table shows the independent variables and dependent variables and their sources in literature review. It is important to mention however, that the variables are not limited to the sources mentioned below. The researcher intended to

put the variable with sources that lead to build the conceptual framework mentioned above.

Table 1: Conceptual Framework Variables and their Main Sources

Variable	Source
Leadership and Commitment of Management	Smith 2006**,** Ahire et al. (1996), Dewhurst 1999**,** Jung and Wang (2006**,** Reed et al. 2000**,** Koehler & Pankowski cited in Al-Swidi 1996
Education and Training	Cartwright (1999**,** Deming's (1986
Teamwork and Organizational Culture	Baxendale 1997**,** Reed et al. (2000, Gupta et al. 2005, Ishikawa (1985, Sureshchandar (2001**,**
Relationships	Ahire et al 1996**,** Zu et al 2008 , Mahbashi (2005**,** Kaynak (2003, Zu et al (2010
Employee Satisfaction	Naumann & Giel 1995**,** Ishikawa (1985,
Product Quality	Deming's (1986, Juran (1994**,**
Business Process Improvement	Jung and Wang (2006**,** Kaynak (2003, Mahbashi (2005
Customer Satisfaction Improvement	Deming (cited in Knouse 2009 **,** Fewings 2005, Invernizzi & Molteni 1992, Garvin (1988, Anderson et al. 1994
Continuous Improvement	Yosof and Aspinwall (1999**,** Ciampa (1992**,** Saylor (1992

3.4   Pilot Study

A pilot study was performed in order to ensure that the questions in the interview guideline are clear and can be understood quickly. Two senior managers assisted in conducting pilot study and the result was changing some of the words of the questions that are not clear or could lead to misunderstanding with keeping the meaning same. The results had from pilot study were not put in the new interview guideline.

3.5   Research Sampling

It is known that empirical research depends on collecting data from a sample rather than from every possible case as it is impossible to do so. This sample will

represent the full set of population or cases as shown in the figure below. There is a technique which is convenience sampling that involves selecting easier cases that represent the full population. The sample is selected from UAE organizations that have experience in TQM or implemented it.
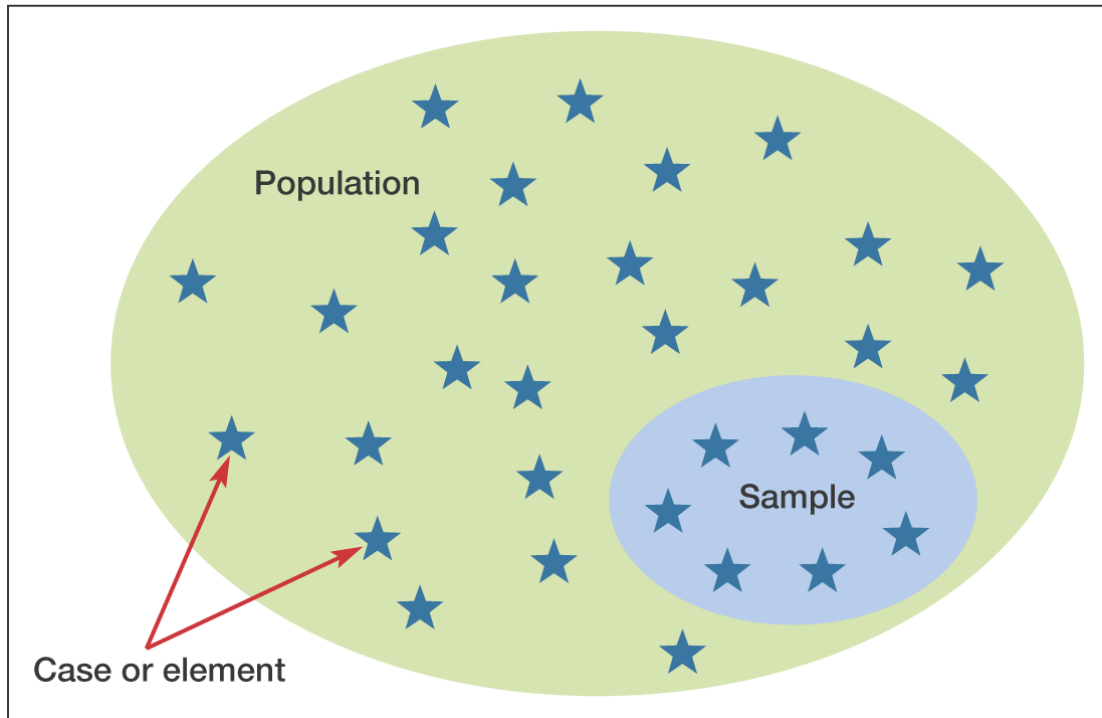
Figure 13: Population, Sample, and Individual Cases (Saunders et al. 2007)

3.6   Procedure

First of all, a selection of several organizations that have implemented TQM was done. One of the challenges that faces the researcher is to identify the target cases that will ultimately be suitable to meet the objectives of the research and that can be easily accessed for the reason of data collection. According to an analysis of UAE sectors (Marcopolis 2011; Economy Watch 2010) it was found that there are major sectors existing in UAE namely: Banking sector, Oil and Gas sector, Telecommunication and Information Technology sector, Real Estate and Construction Sector, and Manufacturing Sector. Three organizations will be chosen from above sectors which are: Real Estate and Construction sector, Manufacturing sector, and Oil and Gas sector. After getting the required information, an analysis, findings, and comparison will be done in the next section.

3.7   Population of Study

Oil and gas company: Case A

Case A organization is a semi-government oil and gas company in Abu Dhabi and in fact, it is the largest oil and gas company in UAE. It produces around one million and six hundred barrels of crude oil which is approximately 76% of United Arab Emirates oil production. The UAE government is a shareholder in this company with 60% and the other shareholders are American, British, and French oil and gas well known companies. The company operates onshore in addition to shallow coastal water within UAE. The company was established in 1971. This organization is put in the case study of this research because it is the biggest oil and gas company in UAE and worth studying it.

Construction company: Case B

Case B organization is a private construction company in Umm Al Quwain. The company's type is Limited Liability Company where it has three shareholders. It is one of the leading construction companies in UAE since its establishment in 1973. It specializes in construction of all civil buildings including residential buildings. It also works as main contractor or subcontractor for electrical, mechanical, plumbing, and interior designs. Since it is a well known construction company in UAE and the positive feedback from customers especially from government sector, it is significant to include this organization in the case study especially because it has a long experience in Quality Management.

Wood and Decorative Factory: Case C

Case C organization is a private wood manufacturing company in Umm Al Quwain. It is dedicated to be the first in region to manufacture wood products. It was established in 1981. It has a wide range of products such as doors, furniture, formworks, kitchens, decorations, and other forms of wooden products required by customers. It has worked for different clients in UAE and nearby such as Oman and Qatar. It is a well known company and the general feedback from public is excellent regarding the company especially in areas of competitive prices and producing products exactly satisfying customers' needs. Since this organization is a

manufacturing company, and Quality Management was implemented long time ago, it is worth to include this organization in the case study.

3.8 Ethical Considerations

There were many ethical considerations that were adhered to in this research.

a. The research was carried out only after the approval of the dissertation supervisor.

b. Personal information, quality, and nature of participants were kept confidential and no direct reference to any individual was done in any part of the research. In fact, any information extracted from the research was referred anonymously.

c. The researcher provided contact details like mobile phone number and personal email in case there is any concern wanted to be raised during the research or in future.

d. Informed consent was given to participants where the choice to participate was theirs and the nature of the research was discussed with them.

e. Findings and Results were reported in honest and complete fashion. There was no misleading others or misrepresenting what had done and also data was not fabricated to support any idea or conclusion.

3.9 Method of Analysis

Qualitative approach was chosen for this research through interviews and the data will be analyzed. Saunders et al. (2007) acknowledged that there is no any standardized procedure to analyze qualitative data because of the diverse nature. It is known that the main point for this research is to explore the critical factors of TQM and the continuous improvement. Qualitative analysis involves a clear process of categorization after summarization and then building meaningful structure (Saunders et al. 2007). When conducting interviews, information will be simultaneously noted and then the notes will be compared to each other to see any pattern and understand the meaning to build a common conclusion. Finally, to understand the subject well and to build a good conclusion, information got will be categorized in groups that follow the conceptual framework mentioned before.

3.10   Summary

The methodology chapter explains the methodology adopted in this research study. The research philosophy was chosen to be an interpretivism which, in other words, takes a qualitative tools and methodologies. A deductive approach employed in the study with a case study strategy that follows a cross-sectional approach. The data collection methods to be used in this research are interviews and documental analysis. Interview guideline was developed based on the conceptual framework that was developed from literature review. Ten interviews will be conducted that will be of type semi-structured. A procedure to carry out the research was written to explain the reasons behind choosing the three case studies (organizations). Finally, some ethical considerations were mentioned due to conducting a qualitative analysis followed by the method of analysis of this study.

Chapter 4

Findings and Discussion

4.1   Introduction

This chapter reports and analyzes the data and main findings collected through the interviews and documental analysis. As written in the previous chapter, the interviews were the main source of data and the documental reviews were the second source of data. These findings are presented to meet the aim of this research as well as the objectives that are written in chapter one. There were ten semi-structured interviews distributed between three organizations followed by documental reviews that are discussed later in this chapter. A list of interviewees is in the appendix and interviewees are referred by titles to preserve anonymity. Some quotations from interviews and documents are stated in this chapter to illustrate certain points where necessary to meet and prove the objectives of this research. Interviews were conducted in months August and September of year 2012 and during this period, the documental analysis was done. Interviews were face to face and ranging between forty five minutes to two hours approximately. The findings and discussions are presented in this chapter and Conceptual Framework that is in previous chapter was used to present clear and chronological information. The first section is an analysis of TQM critical success factors in these organizations to satisfy objective one. After that, the results of implementing TQM were investigated and written to satisfy objective 2. Then, a cross-case study was done in assistance to the previous sections to satisfy objective three which was " To explore the approach organizations in United Arab Emirates are running in a context of Quality Management and Continuous Improvement ". Next, barriers that were faced by these organizations are presented to satisfy objective four. And finally, a comparison between results got and one of the quality models created by one of gurus of quality which is Dr. Deming is presented in the last section to satisfy objective five. All information presented here is used in accordance with the Conceptual Framework chronology.

4.2   Analysis of TQM Critical Success Factors

4.2.1   Leadership and Commitment of Management

The first theme that was asked and discussed with the interviewees was the commitment of management and leadership towards quality management. Surprisingly, in all cases, interviewees agreed that top management has the major responsibility towards quality performance. Top management, according to organization B interviewee is " the driving force towards achieving the best quality and TQM implementation". In addition, organization A interviewees added that when executive management is committed for TQM, they will have performance objectives to see the level of quality implemented by departments in the organization and hence, the management will be able to benchmark against different departments and different competitive organizations. " This is why we have Key Performance Indicators that have put by top management and all employees are responsible towards achieving these indicators", according to an interviewee from organization A. Furthermore, not only top management's commitment is important for TQM implementation, but also top management's leadership is significant towards the success of TQM implementation. All interviewees have considered this point as vital factor especially organization C interviewees who indicated that top management provides personal leadership towards quality improvements. An example given by one of the interviewee was that leadership will offer to the organization a clear vision, mission, and objectives regarding the quality. When there will be a clear vision, mission, and clear objectives, a systematic evaluation and measurement will be offered to the organization towards quality and hence a continuous improvement will be made. An interviewee from organization C said that "We want this factory to be the first in UAE"; this shows a clear vision. By stating a clear vision, the work will be exciting and the benchmarking will be easy to carry. Again, leaders of organizations will compare the current and actual quality performance against the key performance indicators and benchmark to other organizations. Therefore, the commitment of executive management and leadership " will offer key areas of improvements that lead to success of TQM implementation", as reported by organization C interviewee. It has been summarized from interviewees that top management commitment towards quality improvement and leadership should cover several things. First, leaders of the organizations have to have strong leadership characteristics such as integrity, courage,

humour, and wisdom. Top management also have to develop long term vision and mission towards quality improvement. They need to know what the strategic priorities exactly are, and the business strategy they are working on. Moreover, leaders of the organization have to show and give recognition and motivation to every employee they lead. Work environment is also an important factor leaders have to consider; " If leaders want to implement TQM system in the organization then they have to consider the availability of resources and time for improvement", this is according to an interviewee from company C. Empowerment to employees cannot be given unless executive management is supporting the implementation of TQM; empowerment involves many activities such as employees involvement, sharing responsibilities and accountabilities, delegating responsibilities, or ownership and independence of employees towards their responsibilities. Empowerment is a very important method, as deduced from the case study, towards TQM; it is a motivating tool and gives a sense of responsibility to employees and hence giving the employees the chance to share the responsibility of quality achievement of the organization. Surprisingly, mainly all interviewees expanded the point of empowerment and gave some information about it. First, management have to direct employees toward achieving goals or key performance indicators. Many managers make common mistake regarding this point where managers only give general direction and make employees stuck with the details. Second, managers give and encourage employees to achieve their personal goals in addition to their normal duties. This gave employees an opportunity to gain new skills, behaviours, and professional certificates (professionalism).

It was deduced from interviews that, in summary, the commitment of management is divided into several factors namely: vision, empowerment, responsibility, financial rewards, leadership, and strategy. A statement by an interviewee from organization C that showed the management commitment was " managers and supervisors see their subordinates as responsible human beings as well as hardworking; therefore, it is managers' duty to give all employees full support and encouragement". The first factor for management commitment is the vision. Vision is normally created by executive management in which it tells where the organization is heading on, or " the future of the organization" according to organization A interviewee. When it is clear, then every employee will have clear objectives, and

when duty is performed, it will contribute to the overall vision of the organization and hence, leading to successful organization. Second, empowerment is a very important factor that shows the commitment of management towards quality and it was previously explained. Third, responsibility is where the mentality of management tends to involve all employees about their performance by collecting feedbacks and opinions. Fourth, financial rewards are where management rewards their employees by "financial" recognition as a result of outstanding performance. Fifth, is the leadership where leaders, as stated by organization C interviewee, direct employee not manage them. It is actually a behavior of leading people combined with science of management. Finally, strategy is where executive management has a strategic viewpoint that put continuous improvement, team work, and customer satisfaction at first objectives to be done. The strategy contributes to organization's mission and vision and according to an interviewee from organization B " leaders of the organization have put a clear strategy that is effective and will ultimately contribute to the organization's mission through supporting plans".

As a final remark, organization A, through its all processes, put Quality Manager directly under the Vice President of the organization not under Project Manger or Department Manager. This especially came when contractors or suppliers put Quality Manager under the Project Manager; and according to interviewees, this process will not empower the Quality Manager to do his or her tasks properly. In addition, any bidding contractor, through tendering evaluation, must present Quality Manager under CEO or at least equal to Project Manager.

4.2.2 Education and Training

Education and training is a major success factor towards implementing TQM in organizations. The second theme that was asked and discussed with the interviewees was the education and training. All interviewees indicated that their subordinates and themselves are all aware and educated on how their jobs adds and contribute to the company's mission and vision including quality mission and vision. In fact, training and education in organization B and C is planned and studied well; it is in line with the company's objectives and the job requirements of employees. In other words, training is offered to fulfil the company's strategies, within available resources, and suitable for the employee current skills. An interviewee from

organization B added "We study the training needs deeply focusing on short term and long term needs of the organization and accordingly we offer the training based on that". Organizations, according to all interviewees, include quality training courses to their list of courses they provide annually. Organization A interviewees gave examples of some of courses they provide such as: TQM fundamentals, six sigma green belt, and courses on quality audits. Organization A interviewees added that there is generally a dedicated budget for other courses some employees need in their core field and not listed in the annual plans such as communication skills, leadership skills, presentation skills, or ISO courses. While organization C interviewees acknowledged that" Management knows the importance of quality training when it comes to quality; in fact, trainings give the ability to employees to achieve the quality related works and targets easily". Furthermore, organization B interviewees acknowledged that the company tends to offer soft quality courses such as interpersonal relations, quality awareness, and negotiation skills.

Not only organizations offer training courses, but they have an evaluation system that will satisfy the training and education objectives, this is what all interviewees are assure of.

4.2.3 Team Work and Organizational Culture

Team work and organizational culture is a crucial factor towards the successful implementation of TQM. This factor was the third theme to be asked and discussed with the interviewees. An interviewee from organization C has said that team work is all about sharing responsibility of the work they are given between employees. All organizations confirm that the relationships between employees working in the same project or department are excellent not to mention that they are encouraging each other to work as teams. It was indicated by organization A and B that every employee when joining the company is provided with courses regarding team working and communication skills.

As a summary of what is got from interviews, a good teamwork is measured according to several factors namely: interdependency, trust, integration, communication, coordination, and overall satisfaction. Interdependency is where employees cooperate with each other to meet the department goals. Not only employees depend on each other, but also the department cooperates with each other

to satisfy the overall organization goals. Trust is another factor that must be present and usually is associated with interdependency; without trust there will be no interdependency. Integration is where employees feel a spirit of teamwork and cooperation within the department as well between departments. Communication is where there is a clear system or process of sending and receiving information (the flow of information). Coordination is a skill and managerial function where the activities of employees are interlinked and adjusted. It is simply the act of making different people work together to fulfill the goals and objectives of the organization. Finally, the overall satisfaction of employees is where employee is happy with the work environment and the tasks and duties an employee are given.

Employee participation is part of team work in organizations. TQM in general encourages employee participation in different activities for a certain goal. Organization A interviewees mentioned that different groups in the organization are meeting either on work time or on own time to increase and discuss points that are weak in their works and increasing quality. As an example, there are clubs for civil engineers, mechanical engineers,… etc that meet every month and discuss certain topics such as problems in codes and standards, quality issues related to their works, or coordination between different disciplines or departments. Top management provide the necessary resources for them such as supporting their ideas, implementing their points where needed, recognizing excellent ideas, or funding their activities such as funding them for a meeting place like hotel meeting room. These activities have given many benefits, tangible or intangible, such as increasing the communication and commitment of employees towards increasing the quality of work produced. Organization B interviewees added that for an employee participation, the organization has a system where employees, both experts or with normal experience, are encouraged to add their suggestions on any matter that affects their work. It is then carefully examined and implemented afterwards. They also added that whenever necessary and needed, management appoints a third party expert to discuss such suggestions. Organization C interviewees however, said that management implemented a periodic job rotation where employees move to different departments in which they learn new processes and skills. This has given a positive experience when such employees add excellent contributions when they return to their original

jobs because of their rotations and skills gained accordingly from other employees and activities.

When TQM is implemented, there are several things that affect the organizational culture. First, the work is encouraged to be done right at first. Second, supervisors and managers encourage employees to get their help whenever needed to improve the quality of work. Third, executive management encourage employees to be creative on their work in addition to being accountable for their work. Third, employees are taught to care about customers' expectations. TQM affects inter-and-intra cooperation procedures positively for suppliers and customers. Finally, and most importantly, communication channels will improve between departments and executive management.

As a summary to what was stated in interviews, organization culture factors that organizations, according to TQM implementation, are looking and measuring the success of implementation are: goal setting, training program, work settings, culture, team work, and promotion opportunity. Goal settings means that the organization tries to best serve the expectations and needs of customers. Organization B interviewees state that quality means total customer satisfaction while other interviewees in other organizations put quality as currency, accuracy, consistency, and integrity; by defining these then the customer satisfaction will be achieved. Training program is viewed favorably by all interviewees as it is one of the most important factors towards the success of the organization. Everybody acknowledged that training program has its own budget in the business strategy. A work setting is where every employee is given a clear duty and practices it in addition to his personal duties. Whenever possible, if the employee has finished his work duties, the employee can practice his personal duties such as reading and acquiring professional certificates. Culture of the organization, after implementing TQM, tends to be motivating in a way that the success of the produced work of employee means the success of the department which ultimately leads to the success of the organization. The mentality is changed in way that the employee accomplishes the normal objectives and duties in addition to his ambitions and personal works. Team work is a spirit where employees tend to talk with their colleagues on regular basis privately or professionally in addition to being satisfied that employees are helpful to their colleagues. Finally, the promotion opportunity, which was stated by only organization C, means that all employees have

opportunity to take assignments, duties, or responsibility provided that the employee is qualified for that. This has influenced the organizational culture by giving employee an opportunity to pursue personal ambitions and goals.

4.2.4 Relationships

Total Quality Management cares about the relationships between organization and customers as well as suppliers. This factor was discussed with the interviewees to get more sense about relationships in the organizations. Organization A interviewees explained the how the relationship between the company and suppliers go. The company depend on few dependable suppliers and subcontractors in which these suppliers are evaluated annually. These suppliers and subcontractors are selected based on capabilities and commitment to service and product quality and the value for money. The company conduct periodic examinations to those suppliers annually based on different criteria and on their fields of work such as construction companies, Information Technology companies, and catering companies. Each sector has different criteria to be evaluated. The interviewees gave examples for construction companies to be bid for projects and the criteria to be evaluated. These criteria are summarized on the table below.

Table 2: Criteria for Tender Evaluation of Construction Bidders

Evaluation Parameter	Sub Item	Basis for evaluation
Relevant Contracts Completed or Contracts in Progress	Clients to which companies	-worked before in the company -worked before in similar companies -worked before in UAE
	Relevant Project Scope	-experience in relevant or similar projects
	Projects Size	-experience in range projects offered by company
Key Personnel	Submitted CV's of all personnel	- Submitted CV's of all personnel
	Adequate number of key staff	-number of key staff is adequate for company's projects.
	Relevant experience of proposed key personnel	-Relevant experience of proposed personnel to similar projects.
	Availability of key staff within company organization	-all the staff are available within the bidder organization
Facilities and Equipments	Submitted list of equipments	-submitted complete list
	Adequacy of the submitted list	-adequacy of required equipments
	Availability of listed equipments	-all equipments are available and owned by the bidder

Mobilization and site establishment	Submitted acceptable mobilization plan	Well analyzed and prepared mobilization plan fulfilling all requirements
	Submitted acceptable site establishment layout	Proper arrangement and areas
Execution plans	Civil/architecture OR mechanical OR electrical OR instrument OR telecom	Well studied and detailed execution plan
HSE procedures	HSE plan AND HSE organization AND HSE records	Submitted acceptable HSE plan AND HSE organization AND HSE records
Organization	All required categories of personnel included	Include all required categories of personnel
	Proper line of communication	Proper understanding and presentation for the line of communication
	Proper level of responsibility	Proper understanding of levels of responsibility
Mobilization period	Personnel AND equipment mobilization plan	Acceptable and fit within project schedule
Planning and scheduling	Work breakdown structure	acceptable and well organized
	Activities level of details and major milestones	Activities and milestones are well detailed
	Network logic and activity duration	Solid network logic and activities durations
	S curve	Well analyzed and represents good logical progress
	Manpower histogram	Adequate manpower level and well analyzed manpower plan
	Detailed schedule	Well analyzed and presented detailed work schedule
Schedule of subcontractors	Subcontractors identified for all specialist items	Complete list identifying subcontractors for all specialties
	Subcontractors from approved list	All subcontractors are within the approved list
Tenderer's QA, HSE policies, Procedures and Manuals	QA standards and procedures AND Existing HSE policy AND Typical HSE plan in accordance with the company standards AND HSE questionnaire	Acceptable submittals

On the other hand, organization B interviewees, as organization B is frequently taking a role of main contractor to clients and has subcontractors in their contracts, acknowledged that contractors have to participate with the clients to improve quality related issues. These participations could be like value engineering workshops, functional analysis workshops, tender discussion seminars related to quality and construction issues, and suppliers and contractors quality improvement and training courses to improve the quality of services, products, employees or processes. Sometimes, contracts force contractors to participate in workshops to assist, propose, teach, or provide technical assistance to clients. Audits and

evaluations are frequently done to subcontractors of organization B. These audits and evaluations are to assess subcontractors' services and products, quality control capabilities, manufacturing practices such as manufacturing of concrete and reinforced concrete, and delivery practices and performance such as how the concrete is delivered on site. Such audits and evaluations are entered on a system for future use on performance and future relationships for sub contractors and suppliers. Subcontractors and suppliers who meet the requirements and specifications of the contract receive high ratings and hence, will retain the good relationships and invitations for future biddings. Communication is part of quality management, according to organization B interviewees. Some contracts specify the communication coordination procedures depending on needs. Communication channels are specified to keep the suppliers and subcontractors informed of any changes. Some channels could be like structural designer communicated to subcontractor's structural designer, or one focal point to all employees in subcontractor's organization. An example is given when communication is needed when shop drawings are changed; therefore, the scope of work is changed.

Organization C interviewees expanded the importance of customer relationships as one interviewee acknowledged that " without customers, we cannot survive as our business depends on our customers". According to what was stated in interviews from organization C, building relationships with customers depends, first, on identifying the customers. Second, is the identifying the exact needs and expectations of customers. The reason behind this is to see if the organization has an 'ability and capability' of meeting these expectations and needs. Moreover, relationships involve monitoring what was given to customers and what was expected from customers. One of the interviewees stated that " our strategy regarding customers' relationships are all based on mutual trust and we always implement a win-win strategy. "We do not sacrifice any of customers' expectations; we, if there is any misunderstanding regarding expectations, negotiate with customers in a way that all parties are satisfied", according to an interviewee from organization C. The relationship with customers develops over the time; several practices increase the relationships such as service evaluation cards, complaints handling, focus groups, and surveys. By using these practices, the organization will be able to measure the satisfaction and hence improve it. On the other hand, when customers are no satisfied

with the products produced, relationships tend to decline as quality is not accepted and creates so-called "quality mushroom". In other words, when customers face bad experience regarding products or services, these customers spread the bad experience to other people which some of them are customers to organizations or could be customer in future. This spread-out created by customers, will have negative effects on moving a lot of customers to other competitive organizations.

4.3 Analysis of Effects of TQM Implementation

4.3.1 Employee Satisfaction

Employee satisfaction is another important output of implementation of TQM. This was another theme to be discussed with the interviewees in the organization. As deduced from interviewees, organizations in all cases reward employees when a high quality work is produced. The sorts of rewards could be like bonus, praise, vouchers, or social offers such as hotel discounts or ticket discounts. Organization A interviewees added that to get high employee satisfaction, the organization put a whole department calling it employee assistance department. The purpose of this department is to promote a work-life that offers to employees and their dependents an access to confidential counselling program at no charge. The counselling employees receive could be of sort of job-related stress and anxiety, personal issues, grief and depression, death and traumatic incidents, and other related issues. This was supported with another interviewee from organization A when he said " employees in the organization generally experience a sort of stress especially when it comes to meet the workload responsibilities". Organization B set bi-annual survey to test the employee satisfaction; they put a target to get more than 90% of employees to be satisfied. When an employee is satisfied, " there will be several positive consequences related to quality such as the work produced by other co-workers will be in the expected range, work will be produced in a timely fashion, and internal process of the organization will contribute to high quality output", according to an interviewee from organization B. Organization C interviewees added that "Managers regularly visit the employees and ask them for their opinions on their performance". Generally, organizations tend to substitute intangible rewards such as praise or recognition with economic incentives such as bonus or wage raise. This was indirectly stated by all interviewees; however, organization B interviewees explicitly stated that when management applied this method, employee satisfaction surveys showed a great

improvement. They added, "the bonus system we have is related to several things including customer satisfaction, productivity, quality, and profits. These values that we put are related to the target annual organization's objectives". In addition, organization C interviewees stated that management currently reviews several things that are related to quality such as job security, nature of employees jobs like job loads, career development like clear criteria for getting higher grades with equal opportunities, and the salaries and other benefits such as car purchase loan.

It was deduced from interviewees that job satisfaction is always about job involvement; that means if employees are involved, they will perform better and will be more involved with customers and finally the productivity will increase. One interviewee stated that " TQM utilizes employees' goals, make the works more qualitative, which ultimately serve the organization's mission and strategy, and customer satisfaction will be increased". In addition, relationships inside the community of the organization will be developed because employees are more satisfied and happier to socialize. This will also affect the relationships between employees and customers where employees will tend to be " more smileys and more sociable with customers". Relationships between employees will be developed normally when they meet outside the working hours as one company has several clubs where employees meet and discuss several issues. Top management has a role in this where top management support, implement, recognize, or fund any topic that was discussed by employees. These clubs, as mentioned by several interviewees increase cooperation, trust, communication, and coordination. Many interviewees indicated that the company has several training courses related to these points such as "dealing with customers", " achieving happiness in the workplace", "communication skills", and " team working". The figure below gives the relationship between employee satisfaction and critical success factors that was suggested in conceptual framework.

Leadership and Commitment of Management
by creating employee assistance department, offering bonus system, reviewing satisfaction surveys and suggest for solutions, review related issues such as job security, and finally support, implement or recognize employees ideas.

Education and Training
by courses offered related to the employee satisffaction

Employee Satisfaction

Team Work and Organizational Culture
by developing clubs to increase cooperation trust, coordination, and between employees, communication.

Relationships
by developing good relationships between employees in organization or between employees and customers

Figure 14: Relationship between Employee Satisfaction and Critical Success Factors

4.3.2 Product Quality

Product quality is another theme that has come as an output of TQM implementation and was discussed with the interviewees. According to all interviewees, the quality of a product means that the product or service has to satisfy the customer needs and expectations as well as to delight the customers. In addition, the quality is not only a product for short term use, but it should focus in both short and long term use where maintenance can be in minimum. Organization A interviewees assured that before any project or service is done, there is so-called "Functional Review" where engineers and staff meet to discuss the product whether it is satisfactory for the end user. Functional Review is composed of people from different departments as well as from end users and suppliers where they do "Functional" analysis. An example given was a project for a residential building for staff; it needs people from civil, mechanical, electrical, environmental, contracts, planning, etc background to discuss if the project and its documents are complete and will satisfy the end user which in this case is the staff from company. It is also mentioned that this process allows test whether the project and its all components are reliable for use; for example, all the electrical and mechanical equipments like electrical loads and mechanical pumps for air conditioning are safe and suitable for the current project. Functional review, according to one interviewee, needs a good relationship between departments in the organization as it gathers specialists from

other departments such as planning department, safety department, finance department, etc to conduct functional review. It also involves teamwork activities; therefore, employees have to have excellent skills at team working that allows everybody to contribute to the best of the project. Organization B interviewees mentioned a value engineering and functional analysis in which it is a process to discuss if the project is at lowest costs with keeping the "functions" or the purpose of the project constant without decreasing the quality and the performance of the project. It was also mentioned that the projects they run have to have minimum service; therefore, value engineering focuses in substituting lower quality equipments with higher quality equipments to minimize the service and maintenance of the project in its running life cycle. Value Engineering needs substantial training; therefore, employees are offered courses to value engineering and value analysis with a chance to attend value engineering workshops for other projects to practice and gain knowledge. Again, value engineering needs good team work culture to be able to get the best of value and best quality in lower costs. Organization C interviewees however, mentioned that their staff including designers and salespersons go around market and analyze the client's needs and sensation of products and come up with best alternatives of products that delight customers. In addition, they adopted a Computer Aided Drawing (CAD) software programs to draw and show details of products to analyze, retrieve for future use, find alternatives, and most importantly, to discuss with customers the small details for assuring the best satisfying products. All in all, it is mentioned by interviewees from different organizations that the quality of products can be tested or known by either benchmarking the product with competitive companies' products or by looking at different criteria namely the reliability of product, performance of product, external failure costs like the claims and warranty, internal failure costs when manufacturing the product, conformity rates, and finally the durability of product against planned life cycle. In addition, approximately all interviewees agreed that quality of products is committed and put in the strategy of the organization by higher management. The strategy could include ensuring quality education and quality training are available to employees, empowerment, creating team work culture, effective communication between employees and departments, and making good relationships with contractors and suppliers. Key Performance Indicators have some parts regarding quality, and employees work to achieve these indicators. Higher management will be able to systematically benchmark to other

departments, other competitive organizations, and quality awards when they have clear KPI criteria for employees. The figure below gives the relationship between product quality and critical success factors that was suggested in conceptual framework.
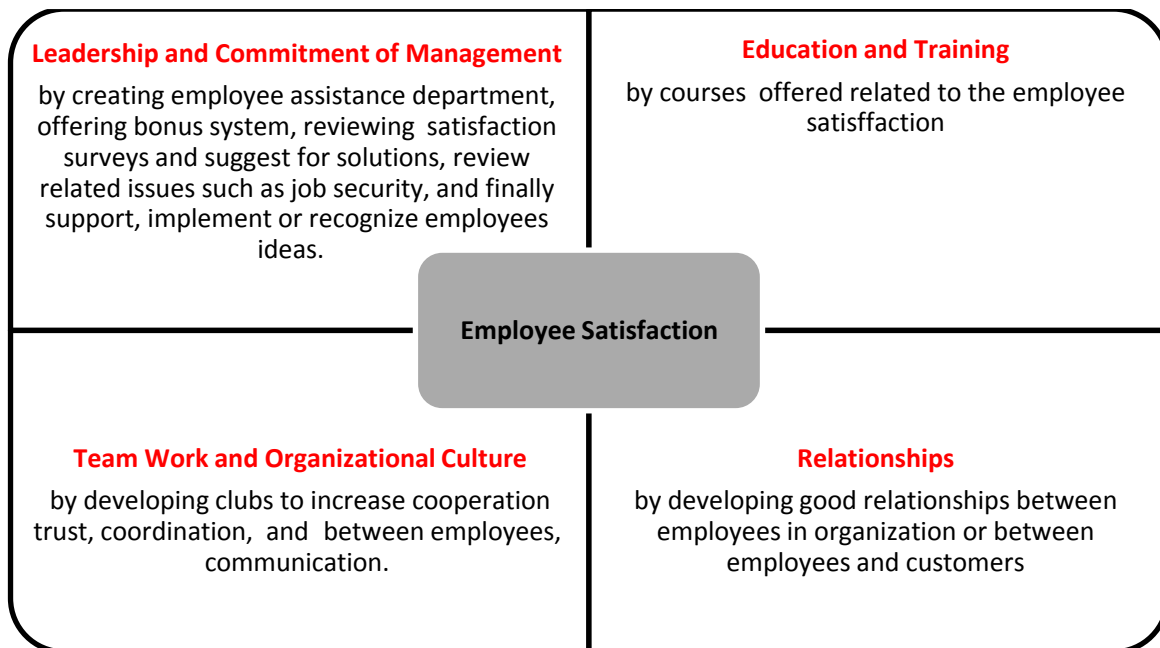

Leadership and Commitment of Management
by putting strategy that handle quality such as ensuring training, effective communication, etc

Education and Training
by courses offered related to the product quality such as value engineering

Product Quality

Team Work and Organizational Culture
Functional Analysis and Functional Review
Value Engineering and Value Analysis
Clear KPI

Relationships
making good relationships with suppliers
Functional Review
Value Engineering

Figure 15: Relationship between Product Quality and Critical Success Factors

4.3.3 Business Process Improvement

Business process will be improved as a result of implementation of TQM. The theme was important and hence was discussed with interviewees of the organizations. When implementing TQM, it generally will improve all the process of business in that organization whether human resources, information resources, material resources, or technological resources. As it was indicated by all interviewees that all processes are developed when top management is committed towards the strategy of improvement. Top management people are the concerned parties that write, analyze, and implement the organization's vision, mission, and objectives. Process improvement, according to interviewee from organization C is a " repetitive cycle and is developing over years; therefore, objectives of the organization have to be aligned with improvement of processes". These business processes (that was mentioned before), according to several interviewees from different organizations, positively contribute to team working and organizational culture .Organization B sees that the business process will be improved only and only if the processes are measured and audited in a regular

basis. Organization A and organization B justified that point by stating that organizations implemented ISO standard that is related to quality management to audit and therefore, measure the processes. Many employees are offered training courses related to quality such as " internal auditing" or " archiving system". In summary, human resources process will be improved in several ways such as a welfare program will be initiated and measured, incentive system will be created, training and education needs will be analyzed, and finally, a methodology will be initiated to collect and hence analyze the information. In addition, information resources process will be developed regarding initiating information system that would cover the needs and duties of the organization in addition to a system that will specify exactly the needs for the information system. Furthermore, TQM also touches the financial resources process in a way that it will initiate a methodology to prepare the annual budget and annual expenditure of the organization, create future plans to increase the revenues and decrease the expenditure, methodology to meet the annual budget, and make corrective actions if the costs increase more than the plans. Organization C interviewees, since the organization is a manufacturing company, acknowledged that in terms of material resources improvement, a storage system was initiated for the materials they order, a system cover the required material for their projects, and finally, a system that calculate the best use of materials. This was supported in organization B when they admitted that a system was brought up to control all materials they order especially that the system calculates the best use of steel cut offs and the needs of other construction projects. However, organizations C and B confirmed that employees who are working on these computer software programs are well trained to analyze the data reports and not just depending on the computer calculations as this is critical for calculating costs. In terms of technological resources, organizations commonly specify the needs of departments for new technologies and have corrective actions regarding the requirements of technical control improvement.

Business process, according to organization A interviewees, includes promoting good procedures, policies, and methodologies. This process, is seen as it runs the customers' requirements and affairs. The organization, for example, has provided the best known codes and standards for the "Engineering and Major Projects Department". These codes are updated whenever possible; example of codes and

standards are "Shell Engineering codes", " American Standards of Testing Material", and " British Code". Process management is divided into three main categories: customer relationship management, structure and coordination, and quality process management. Customer relationship management is specializing on initiating a system to collect and analyze data and needs from customers, and also a system to collect the complaints and suggestions. Structure and coordination management is specializing on setting, updating, and improving standards to ensure coordination and delegation authority, coordination between different parties, employees between other departments, or between employees and contractors. In terms of quality process management, TQM will create several things such as focusing on time, conformance to control, documentation system, engineering codes and standards, engineering design, and safety, customers needs and requirements, and finally conformance to the mission and vision of the projects. It was raised also that TQM affects positively on communication management. Organization B states that the communication process increased between different departments, bottom-up, top-down and the feedback system was also improved whether formal feedback or informal feedback related to quality. The communication system gives employees a clear communication channels so that no misunderstanding happens between employees or disputes. Organization B added that this positively affects the relationships between employees in departments. The figure below gives the relationship between business process improvement and critical success factors that was suggested in conceptual framework.

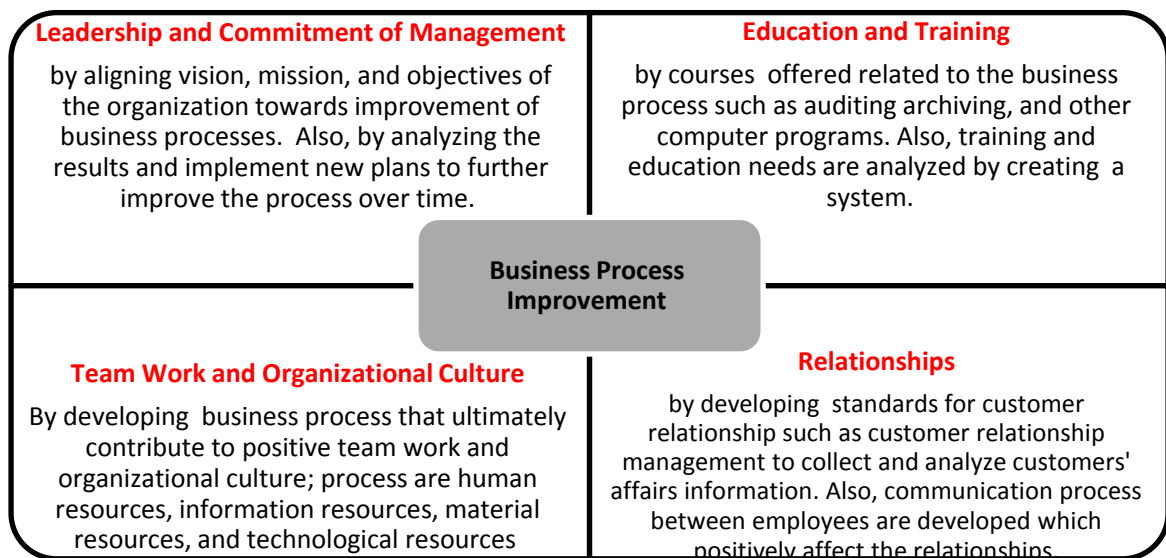| Leadership and Commitment of Management	Education and Training
by aligning vision, mission, and objectives of the organization towards improvement of business processes. Also, by analyzing the results and implement new plans to further improve the process over time.	by courses offered related to the business process such as auditing archiving, and other computer programs. Also, training and education needs are analyzed by creating a system.
Business Process Improvement	
Team Work and Organizational Culture	**Relationships**
By developing business process that ultimately contribute to positive team work and organizational culture; process are human resources, information resources, material resources, and technological resources	by developing standards for customer relationship such as customer relationship management to collect and analyze customers' affairs information. Also, communication process between employees are developed which positively affect the relationships

Figure 16: Relationship between Business Process Improvement and Critical Success Factors

4.3.4   Customer Satisfaction Improvement

Customer satisfaction is the most important output of TQM implementation and the theme was discussed with the interviewees. Predictably, interviewees acknowledged that management commitment to quality is the most important factor that leads to customer satisfaction. All organizations implied that commitment of management could be of several actions such as putting related customer satisfaction issues in organization's goals and plans, allocating sufficient resources that contribute to better customer satisfaction, communicate and measure the customer satisfaction related issues with employees, or allocate a bonus system that is related to customer satisfaction attainment. In addition, interviewees mentioned that organizations give opportunities to employees to take courses that are related to customer satisfaction such as understanding customer needs, greeting customers, using positive language, dealing with angry customers, body language and tone of voice. Many interviewees stress the importance of relationships for customer satisfaction. Relationships can be done by building relationships in all dimensions such as business colleagues, partners, suppliers, friends, family, professional acquaintances, and community. Organization A confirmed that the customer satisfaction is the most important factor which keeps the company in business. The mission of "Engineering and Major Projects Department" in organization A touches this point by stating " Our mission is to provide innovative solutions in engineering and project management, consistently surpassing customer expectation". Organization B interviewees admitted that in construction industry, it is difficult to determine the customer satisfaction level, however, there are several factors to reach good customer satisfaction such as good response time regarding customer requests, capability to cooperate between all parties, continuous measurement of the customer satisfaction by meetings, surveys, emails, and finally, conformance to what has been agreed prior the work. One of interviewees added that "to reach customer satisfaction in construction industry, we usually instruct project managers and all subordinates to know the requirements of contract and what the client wants; we don't take a project without a clear definition of what is required. In other words, everything should be clear to avoid unnecessary errors". Since organization C is a manufacturing company, their products are offered through a market investigation. The market investigation helps the company know what customers like, dislike, and how the expectations of customers can be met. In

addition, it helps identifies the weaknesses of the products by looking to competitive companies. "We benchmark our products to what are offered outside, we also see what customers like, their suggestions, and future anticipation for improvements". Generally, all organizations acknowledged that there is such a customer satisfaction survey that is distributed through different methods such as emails, internet, by hand, by telephone, or in methods such as questionnaire. The purpose is to determine the level of service or the quality of product organizations give. The results of these surveys are to improve the quality of product that can delight the customer, improve the process of operations and productions, or improve the service itself. Furthermore, organizations not only offer products, but they provide the insurance or warranty of that product. For example, organization B after handling any project, the warranty period of the project is one year. If anything happens during this year, a free maintenance, repair, replacement, or compensation is offered for customers. Another example is from organization A where software programs from information technology department are maintained and updated regularly if there is any crash in the system. It is important to mention that several interviewees acknowledged that organizational culture is closely related to customer satisfaction. When TQM was implemented, communication system, for example, has become clear whether top-down or bottom-up and the flow of information between departments has been developed. Communication system, in addition to coordination, contributes to positive customer satisfaction because the process of communication between customers and employees become quicker. Also, when customers communicate, comment, or complain, the information will flow easily and the customer will be happy accordingly. The figure below gives the relationship between customer satisfaction improvement and critical success factors that was suggested in conceptual framework.
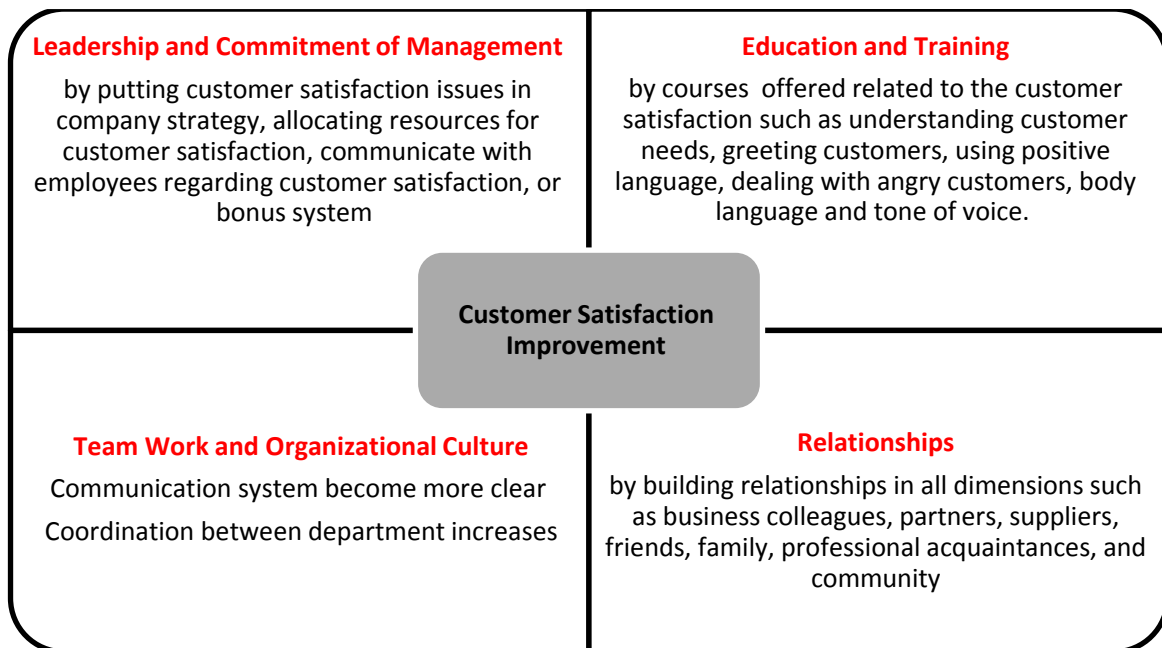
Leadership and Commitment of Management	Education and Training
by putting customer satisfaction issues in company strategy, allocating resources for customer satisfaction, communicate with employees regarding customer satisfaction, or bonus system	by courses offered related to the customer satisfaction such as understanding customer needs, greeting customers, using positive language, dealing with angry customers, body language and tone of voice.

Customer Satisfaction Improvement

Team Work and Organizational Culture	Relationships
Communication system become more clear Coordination between department increases	by building relationships in all dimensions such as business colleagues, partners, suppliers, friends, family, professional acquaintances, and community

Figure 17: Relationship between Customer Satisfaction Improvement and Critical Success Factors

4.4   Continuous Improvement

4.4.1   Steps towards Continuous Improvement

Continuous improvement is the final output of TQM and the performance of the organizations will be measured against it. One interviewee from organization C states that "No continuous improvement will be done unless there is a commitment from higher management"; therefore, when executive management is committed to quality and quality production, there will a continuous improvement over time". Interviewees gave different elements to continuously improve the processes and work. But before continuous improvement happens, a benchmark and comparison of what was the actual work against the organization's business goals, objectives, and the competitive organizations in the market. By benchmarking and comparison, an organization would find points of weaknesses that will lead to improvements later. Continuous improvement; in fact, is a never-ending cycle that happens every time where points of improvement exists. First, the teams in the organization and team work would be measured and improved to attain smoothly working environment. Second, the operating system would be regularly evaluated and measured and hence improving the operations. Third, an evaluation, measurement, and benchmarking of the key performance indicators and the work targets of employees (how the achievements were) would be taken in account. There will be also other

improvements such as time and cycle performance regarding different works and process such as feedback response, work production time, or achieving responsibilities within time frame.

4.4.2   Barriers to Continuous Improvement

Interviewees, when talking about continuous improvement, they pinpointed that not all weakness points will be improved immediately. Actually, every organization has a limited resources such as human resources or financial resources. In addition, TQM continuous improvement is limited by many factors such as the level of education and training of employees, the attitude of employees towards resistance, or the organization structure.

Continuous improvement is not an easy task for organizations to implement. Organizations have different types of ownership such as joint-venture company, limited liability company, private-owned company, or government-owned company. Therefore, TQM continuous improvement cycle will differ according to different types of organizations. In addition, not all organizations are same, but they also differ in business activities, management in quality maturity, and business goals and objectives. According to interviews conducted, there are different types of improvements such as impossible improvements, conditional improvements, irrelevant improvements, and feasible improvements.

Impossible improvements happen usually within government or semi-government organizations where the improvement is difficult to implement. Examples given of this type are acquiring partnership with suppliers, changing contract conditions where contracts are standardized, operational innovations, or changing organization's structure. The reason is simply because the management style of these organizations is preserved to by autonomous. In addition, the resources could be limited where the organization can not improve that certain point. A conditional improvement on the other hand, is where there are certain points of improvements where they can implement on conditions that the barriers or limitations can be solved. This type of improvement happens in all types of organizations where improvement could be acquiring a variation order in existing contract, rotation of employees between different departments, or promoting an employee to a higher position. Irrelevant improvements is the third type of improvements where the improvement

cannot be effective for some reason such as the improvement point contradicts with organization's objectives and goals, the resources are during time of raising the improvement point, or the improvement point is useless to the organizations activities. Finally, the feasible improvements can be implemented; however, it needs a critical study where improvements can be prioritized, studied well against business objectives and goals, and against the organization's resources. These kinds of improvements came as a result when a discussion of type of organizations was conducted. As the research is based on case study of three different kinds of organizations, and as the organizations are semi-governmental, limited liability company, and private (solely owned), the different kinds of improvements were worth mentioning.

4.4.3 Approaches to Continuous Improvement

It was important to discuss the level of implementation of TQM activities in these organizations; therefore, a cross-case study was done for that purpose and to see how organizations are looking for continuous improvement. All organizations were using quality control tools in order to differentiate their works from competitive firms. In general, the quality activities that were mentioned in the interviews were internal quality audit, problem solving techniques, value engineering, production planning, production control, statistical process control, benchmarking, supplier improvement activities, quality function deployment and implementing ISO standards. According to interviewees, all previous mentioned tools and techniques contribute to the continuous improvement whether in short term or long term.

A cross-case study showed that different organizations apply different TQM approaches depend on their needs. First of all, organization A interviewees mentioned several TQM activities namely staff interviews and meetings, business development planning and meetings (group meetings), customer cooperation and dialogues, employee meetings, and competence groups. Staff interviews and meetings are implemented by executive management and according to interviewees, it was easy to implement this activity where everyone is involved to express own opinions. Business development planning and meetings were implemented by executive management due to the growth of the organization. Executive management decide the areas of development; however, every employee is involved in the planning process. Meetings are conducted to receive suggestions where consensus is reached whenever is

possible. Customer cooperation and dialogues came out as in idea from quality department as part of ISO 9000. Employees who are directly dealing with customers are involved where everyone takes courses and hence the experience of dialogues is increased. Employee meetings came out from one department in the organization where the head of department was planning to meet with employees and project managers to discuss the performance of projects. It was very helpful for this department to increase the cooperation and coordination between different parties of the project. After that, and after seeing the positive results, other departments set out compulsory weekly meetings for mentioned purposes. Finally, the competence groups were initiated as result of customer satisfaction benchmarking where it increases the business performance over time.

Second of all, organization B interviewees mentioned other activities namely surveys for both customers and staff, follow up of carried out training courses, bonus system, and the measurement of correct delivery and precision of work. Surveys for both customer and staff came as a need over time where it was necessary to involve everyone and every stakeholder of that organization. Suggestions, feedback, cons and pros, and many more are got through these surveys and hence the business improves. There is a dedicated system for collecting responses as well as administrative employees to analyze the results. Follow up of carried out training courses was initiated by human resources department specifically the training coordinators where a need to assess the training courses given by vendors. As a result, the courses contents were improved and a methodology of assessment of instructors, courses contents, vendors, and the course itself was put to review the suitability to the company's needs. Bonus system was developed by one of the senior project managers due to increase of projects. The system motivated the employees to increase the outcome and decrease the costs so that everyone gets the bonus. This method increased the performance of running projects by delivering the projects on time, within scope, and with quality desired outcome. Measurement of correct delivery and precision of work is a normal practice for construction companies. Due to experience of the organization, this system was implemented long time ago which benefited the company by increasing profits and avoid the liquidated damages and late delivery fines.

Finally, organization C interviewees mentioned TQM activities namely customer and staff surveys, the use of ISO standards, meetings with staff on daily,

monthly, quarterly, and annually, and finally, business day. Customer and staff surveys were explained previously and have the same positive impacts on the organization. The use of ISO standards came out as a result of organization's strategy to get certified by ISO. Consequently, administrative works has been developed especially the archiving system. Meetings with staff on regular basis were initiated by heads of departments. This has been resulted positively in a way that the organization has been more structured. Furthermore, the communication system has been developed both top-down and bottom-up as a result of this system. Finally, the business day is a social system found by general manager of the company where every employee is involved and everyone has the right to know the business of the company such as: annual revenue, health, safety and environment matters, annual strategy, objectives, mission, and vision, and employees concerns raised. It is a very positive approach where it gives the employees a feeling of community.

To have a clearer picture of what was stated above, the below table link each of continuous improvement approach to what is needed from critical success factors and the effects of implementations that were mentioned in the Conceptual Framework. After creating this table, it was shown to some of interviewees to add notes and discusses if some points in Conceptual Framework were missed and the final Table is shown here.

Table 3: Organizations Approaches to Continuous Improvement and the Link to Critical Success Factors

Approach	Independent Variable (Critical Success Factors)	Dependent Variable (Continuous Improvement)
Staff interviews and meetings	Leadership and Commitment of Management Teamwork and Organizational Culture	Employee Satisfaction
Business development planning and meetings (group meetings)	Leadership and Commitment of Management Teamwork and Organizational Culture	Business Process Improvement
Customer cooperation and dialogues	Teamwork and Organizational Culture Relationships	Customer Satisfaction Improvement Product Quality
Employee meetings	Teamwork and Organizational Culture	Product Quality Business Process Improvement

Competence groups	Leadership and Commitment of Management Teamwork and Organizational Culture	Product Quality Business Process Improvement
Surveys for both customers and staff	Relationships Teamwork and Organizational Culture	Product Quality Customer Satisfaction Improvement
Follow up of carried out training courses	Education and Training	Employee Satisfaction Product Quality Business Process Improvement
Bonus system	Leadership and Commitment of Management Teamwork and Organizational Culture	Employee Satisfaction Business Process Improvement
Measurement of correct delivery and precision of work	Education and Training Teamwork and Organizational Culture	Product Quality Customer Satisfaction Improvement
Customer and staff surveys	Relationships Teamwork and Organizational Culture	Product Quality Customer Satisfaction Improvement
The use of ISO standards	Leadership and Commitment of Management Education and Training Teamwork and Organizational Culture Relationships	Product Quality Business Process Improvement
Meetings with staff on daily, monthly, quarterly, annually	Leadership and Commitment of Management Teamwork and Organizational Culture	Employee Satisfaction Business Process Improvement Customer Satisfaction Improvement
Business day,	Leadership and Commitment of Management Teamwork and Organizational Culture	Employee Satisfaction Product Quality Business Process Improvement

The case study also involved some documental reviews that were based on some documents made available to researcher. First of all, a 'quality manual' for organization B was reviewed as it is the most important thing regarding quality in this organization. The quality policy statement is "Sustain and improve the high quality of Building Contracting serviced provided by the Company to ensure that all contractual requirements between the Company and its Clients are consistently achieved". The second statement indicates that company provides documented assurance to clients to demonstrate that the specified requirements for the works will be, are being, and have been achieved. Their quality system is developed based on international quality codes and standards such as British System, ISO 9002, and ISO 9001. The quality system is designed to provide an assurance to clients, which can be supported through documented records, that all contracts will be completed in accordance with the agreed time, cost, and specification. The quality manual advises that conformance with the requirements of the detailed procedures outlined is mandatory for all staff. The quality manual then put major headlines regarding quality system in the organization; these headlines are: Management Responsibility, Quality System, Contract Review, Document Control, Purchasing, Inspection and Testing, Control of Non-Conforming works, Corrective and Preventive Action, Internal Quality Audits, Training, Statistical Techniques. It has been seen that the quality manual reflects what is in conceptual framework regarding the continuous improvement. Continuous improvement consists of employee satisfaction, product quality, business process improvement, and customer satisfaction improvement. The relationship between quality manual and continuous improvement is as following:

- Employee satisfaction: training for quality that gives employees clear methods of doing works which ultimately make them satisfied and happy with their works.

- Product Quality: inspection and testing plans that assures conforming to quality, control of non-conformance works procedures, corrective and preventive actions that assures all works to be according to standards, and using of statistical techniques whenever required to produce high quality products.

- Business Process Improvement: document control to assure documentation system is according to standards and all documents are

available for later use and audits, purchasing procedures to be according to standards, internal quality audits to benchmark against the required objectives

- Customer Satisfaction Improvement: through the quality policy that says that all contractual requirements between company and client are to be achieved, and contract review policy is to make sure all requirements are met.

The Project Quality Plan of organization C was reviewed to see its contents. This document is submitted to main contractor or supplier whenever organization C subcontracts (takes a role of subcontractor). The document has many points but the researcher would try to summarize it. First of all, the quality policy statement is mentioned and signed by the General Manager to reflect the commitment of the organization towards quality. The statement is a bit long but it reflects the organization's commitment towards Quality, Safety, Environment, and People. Second of all, the scope of project is mentioned to reflect the good understanding of work that the subcontractor will take from the main contractor. It explains the whole work that will be done according to what the contractor gives to make sure no conflicts happen later. Third, there is a section for Quality Management System that has general requirements regarding the codes and standards of project, documentation requirements for quality policy, quality manual, and quality procedures, control of documents regarding approval and issues, revisions, distributions, and language of communication, and organization and responsibilities that define every employee in organization and its responsibilities. Finally, Quality summaries (or Quality Procedures) have the main content which includes control of documents and records, training and further training, purchasing, project planning, execution, etc. The project quality plan contributes to continuous improvement through:

- Employee satisfaction: defining every employee responsibility which develops the relationships between employees and decrease disputes and by training and further training if employee needs to perform certain tasks.
- Product Quality: using well-known codes and standards that satisfy the customers,

- Business Process Improvement: documentation requirements for quality policy that has to be referenced and archived,

- Customer Satisfaction Improvement: explaining the work in scope written by the company that rephrase the scope of work needed by client in order to conflicts happens later.

There is a document called Quality Control Plan (QCP) that was reviewed for organization B. This document is intended for quality control in order for quality people to control the work in site. The PCP was for concrete works and according to an interviewee " every major activity in the project has its QCP". The purpose of this document was to provide comprehensive procedures for performing the civil concrete works. The document is quite big but in summary, it has: Scope of work, References to main standards, Procedure of work carried out, Pre-Pouring Requirements, Placing of concrete, Finishing Curing, and Coating for Protection, and Appendix where all forms are there. This document, which is done for every major activity, defines the required work and gives details such as methods of conducting activity, time, and procedures. This will assure the product has to be in high quality because the client has to review this document and states any comments if not satisfied with anything. Also, the relationship between the contractor and the client will be very clear as the work to be performed is known and the requirements too.

An Audit is frequently done by the client's quality department on regular basis to assess the contractor works. There are many audit areas that the quality department audit in organization A such as: control of documents, approval registers, calibration and inspection status, and construction activity. If the audit team needs to issue corrective actions, they write it in the final section which is corrective actions requests section. Audits are necessary for benchmarking to quality systems and for future lessons learned if any work done was not expected.

Organization A offered the researcher examples of inspection and test plan (ITP) that the organization uses for their contractors. The inspection and test plan has all major deliverables in a table and its required submittals for review; these submittals could be method statements, request for inspection, request for proposal, or surveillance of work from client. The information in these papers should comply with scope of work, contract documents, and procedures and standards. Inspection and test

plan define deliverables in scope of work for which the client has to be happy with every deliverable. When all deliverables are known and the client is happy with these deliverables, there will be no place for disputes and disagreements which ultimately will leave the customer satisfied.

Non Conformity Report (NCR) is a document issued by the client (organization A) to the contractor that gives details of any non conformance points or any deviation from standards or procedures that was identified in quality process reviews such as quality audit. The objective of NCR is to give concise and clear definition of the problem raised in order to take proper corrective action. Contractor has to send NCR close out to write all justifications and explanations of NCR raised by client. NCR assures two things: the contractor has to do every work according to standards required, and if deviation from required standards happens, the contractor has to do the work again to achieve required quality.

Corrective Action Request (CAR) is a document sent if any NCR issued. The corrective details are given by the client (organization A); however, this is in client's experiences and thoughts but not necessary compulsory. Corrective action after that is written from contractor that the contractor see right or should be implemented. If approved by the client, then the follow-up details are given with dates and schedule to follow. Preventive Action Request (PAR), on the other hand, has the same features of CAR but CAR is sent whenever there was a problem whereas PAR is sent whenever an expected problem thought to be happened in special circumstances. Contractor proposes preventive actions to be taken in order to prevent and avoid the mentioned problems. These documents ensure that the client should be informed if deviation of required standards happens, and to make sure client will be satisfied.

A document reviewed for organization C that every year is updated to reflect the benefits of implementing Quality Management systems such as ISO. This document is for General Manager's reveiew to see and feel the goodness of quality implementation,   support, and implement the future proposals regarding continuous improvements. In addition, an ISO certificate was read to see the activities mentioned in the certificate. The document is relatviely long, but the researcher will try to summarize the main findings. First of all, after an implementation of Quality Mangement, a system of documentation of procedures, standards, and policies was

completed. Employees in different departments, before the Quality management was implemented, did not know why, how, or what to perform because documented work instructions were not available. This also has benefited employees in a way that all works to be done should be consistent in addition to giving other departments' employees knowledge on tasks to be achieved. Second of all, a system or software was created on needs of company including putting all checklists and documents to be saved including employees courses and training plans. In addition, a communication channels were created between other departments to share knowledge, leassons learned, and best practices. Furthermore, if an employee is searching for certain policy, standard, or related documents, the software can serve as a search tool to save time.

Two projects dossiers were revised for organization A to see how the organization is actually managing the projects. It was noticed that there are important papers missing from the dossiers such as RFI (Request For Inspection), method statements, material approvals, daily and weekly progress reports, and guarantee papers). It was also noticed that the there is no clear submittals list in the scope of work and the contract papers that gives clear list for the contractor to submit. A question was raised on the interviews regarding this issue and the interviewees gave several reasons. First, some engineers left the company and some are moved from one site to another; therefore, the new engineers did not know the submittals that had to be submitted due to no proper handover from one person to another. In addition, construction engineers (who know the project well) and who are running the project on site did not audit the papers to see the what was the missing papers even though there were many audits from quality departments. It seems here, in the researcher's opinion, that there are some points missing. First, the team work is missing here because there is no proper handle from one engineer to another, and even the engineer has left the company, it appears that the relationships are not good enough to get the needed information from the past engineer. Second, the culture of organization seems to be not handling or managing the projects well as there are critical papers missing and no commitment to find the reasons behind this issue.

A project case study was done for one of organization's B projects that has not finished yet and has some problems. With the help of interviews and some documents that were available, the researcher deduced some important issues regarding quality

management. First, the Project was handed over to client in 08 April 2012 (Handover Certificate was available). After that date, specifically at 03 July 2012, an inspection has been done to the project by a client team that contains HSE engineers, environment engineers, construction engineers, IT engineers, and electrical engineers. The team discovered and put some issues that were not finished although they are in scope of work. This has created some conflicts especially after signing the hand over certificate. In addition, snag list and two non conformity reports are not closed yet although the contract has finished and the project is on warranty period. With the help of interviews, it seems that concerned parties are not completely involved in the project either during construction or at the time of signing completion certificate. It seems also that there is a lack of coordination between departments and between parties in the project as the scope of work and the contract does not give a clear coordination procedures. Coordination procedures and communication system was not clear between parties and the communication process was taking time. Therefore, a conflict happened between the contractor and the client.

4.4.4 Approaches towards Quality Awards

During interviews, it was mentioned that organizations nowadays are competing towards achieving highest scores in assessments of some quality awards that are available in United Arab Emirates such as Dubai Quality Award, Sheikh Khalifa Excellence Award, and Emirates Government Excellence Award. Interestingly, all previous awards are based on EFQM Award (European Foundation for Quality Management Award). One of the three case organizations won the golden award of Sheikh Khalifa Excellence Award, and part of interviews was on that. All previous mentioned awards are based on nine criteria namely: leadership, policy and strategy, people, partnership and resources, processes, customer results, people results, society results, and performance results. The interviewees help the researcher to find the relationship between these criteria and the conceptual framework of this research as the next diagram explains. There are two diagrams; one is for the relationship between Sheikh Khalifa award criteria and the critical success factors, and the other is between Sheikh Khalifa award criteria and the continuous improvement elements.
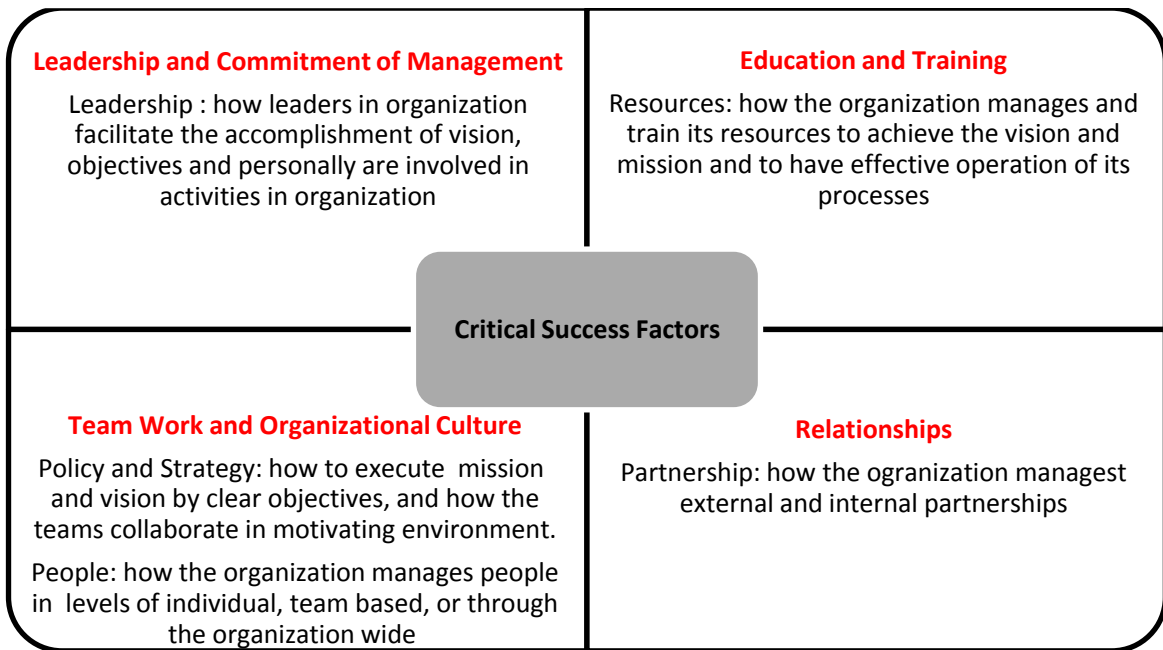
Figure 18: Relationship between Sheikh Khalifa Award Criteria and Critical Success Factors
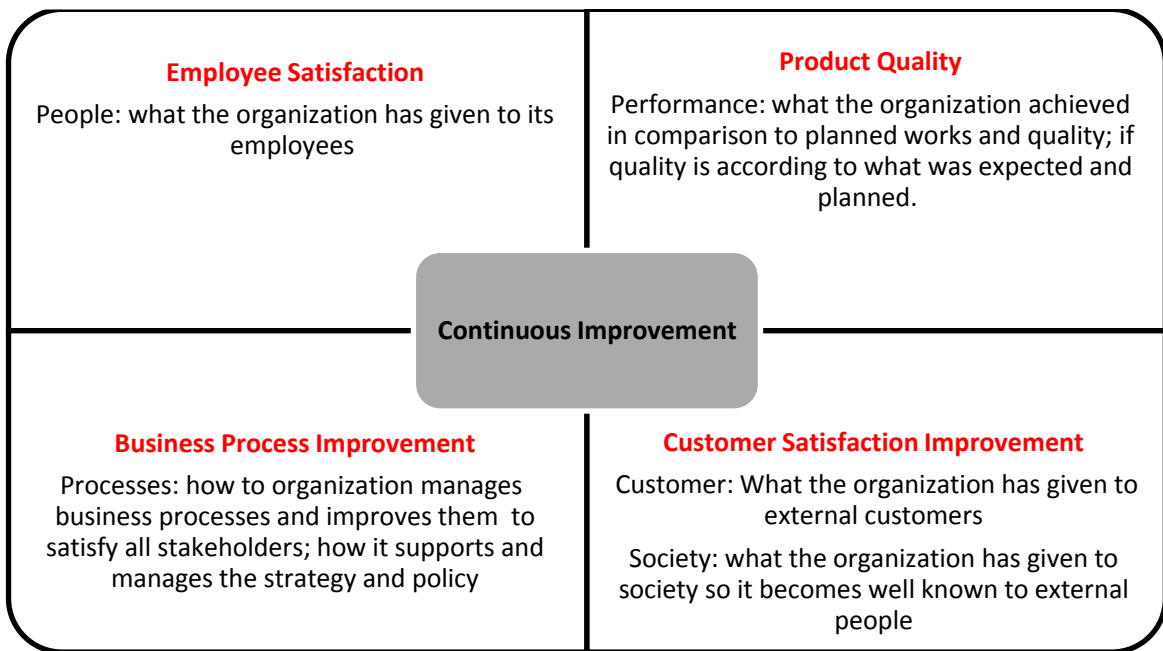

Figure 18: Relationship between Sheikh Khalifa Award Criteria and Continuous Improvement Elements

It has been noticed through interviews that organizations compete to win quality awards and top management are preoccupied. One interviewee acknowledged that the General Manager once said to employees " I don't care what you do or how

you work, but our organization has to win". When top management concern about the quality awards, they will deviate from the important works they have and concentrate on how to achieve the awards. The behavior of employee controlled by quality awards is out of scope of this research but it proposed for future research .

4.5   Barriers to Implement TQM

The dissertation discusses the critical success factors towards implementing TQM; therefore, there are certain barriers towards a complete and success implementation. TQM barriers were discussed with interviewees to determine what the barriers were during the time of implementation. Organization A interviewees mentioned several barriers the organization faced during implementation of TQM. The first and most important barrier is the inconsistent of staff performance. It was noticed that staff performance during work was inconsistent although there are measureable indicators to measure the objectives and work achieved of staff. However, the conclusion drawn here by management is that staff when are overwhelmed with work, the performance would be decreased; therefore, the quality of work achieved would be less. It was also noticed that many employees were not trained to handle work pressure; therefore, one of the main reasons of this barrier is training and education to handle work pressure. Furthermore, the organization has a barrier that is so-called lack of decentralization. The organization has a centralized style of management where management retains the authority of decision making. In decentralization style of management, the authority is distributed and delegated throughout the organization from top to bottom. This barrier caused customer dissatisfaction because, for example, customers had to wait long time until employees get approval of any business process from supervisor and the supervisor gets approval from higher manager and so on. A barrier was faced also by organization lately which is lack of ambitions and innovations towards quality from employees. This problem has many negative consequences such as lack of quality innovations, stuck in problems with customers related to quality, or quality problems such as rework or scraps. It was deduced from interview that this barrier came as a result of organization culture that was, at that time, not motivating employees to give their best.

In addition, Organization B interviewees revealed some barriers the company faced that they had to overcome during time. The first barrier was the increasing number of staff turnover. Because the construction industry has more workloads and

weather conditions in UAE, the company loses money when training courses are offered to staff and ultimately they resign to find more comfortable job. The interviewee indicated also that staff turnover increases when management is not caring about employees' affairs that are concerned with motivation such as bonus, recognition, or gifts. Staff turnover also negatively affects other process of business such as loosing documentation and archives records, customer dissatisfaction because the person who dealt with customer and had business relationship had left the company, and keep the position or vacant unavailable until suitable person can occupy. Moreover, increasing work overload is a major barrier faced by the organization as it makes staff unable to meet quality and other objectives of project. When an employee has high work load, the employee would miss many quality objectives and recommendations as there is no time to read the contract to see the expectations and needs. An example is given when the contract specifies the possibilities of bathroom of a house; the employee would not look and search for best possibilities because he or she does not have time for such things. Instead, the employee will choose whatever is on hand to close the objective. It is deduced here that team work was not suitable enough and accountability between teams were not clear. Furthermore, there are two barriers, according to interviewees, that still affect the organization negatively which are resistance to change and not excellent experience in quality management. Resistance to change is mainly coming from some departments' managers due to feeling that new works will appear as a result of implementation and continuous improvement. Moreover, the organization still needs more experience for implementing continuous improvement. "The problem is not from implementing Quality Management, but the problem is how to rectify and get with the new changes and the appearing modifications", according to one of the interviewees.

Finally, organization C interviewees pointed out TQM barriers of their organization to overcome. The first barrier was to find skilled labours and craftsmen who can perform professional decorative according to customers' requirements. This has affected the customer satisfaction leading to customer not satisfied for the works being done because of several reasons such as the work done was not according to their expectations and the quality of works done was poor. The company pays for reworks and repairs and therefore, it cost the company a lot of money. It seems here

that the organization depends on skilled labours that are difficult to find. Part of solution interviewees mentioned was that they involved new labours into a team of skilled labours to learn and practice. When skilled labours teach and give requirements of products and how the products are done and made to new labours, the new labours, over short time, will be skilled labours eventually. In addition, lack of English language ability of many staff made some difficulties for the company in several things such as miscommunication between staff, difficult communication between management and non-speaking English staff, and difficult and miscommunication between these staff and customers. The reason behind this barrier was that most skilled employees and labours are from non English countries in addition to not learning English in their countries. Furthermore, the organization faced a barrier that the customer has different perceptions about quality of works produced. As the organization is a manufacturing company that produces decorative products, customers expect to have many things in the product produced therefore, when the product is in the final stage, the customers see that the quality is not as good as expected. It is deduced here that the relationship between the company's representative and customer is poor because whenever the relationship is managed by the representative, the customer would ultimately understand the quality of the product. This was overcome by having workshops with customers to explain the products that will be produced to see the final product not to mention that models can be used to give the customer a picture of final product. Workshops are one example of making relationships with customers and keeping the customer close to the quality of products produced. One barrier was mentioned by two interviewees that still affecting the company negatively which is focusing into short term results. One of the objectives of the organization is to achieve a profit of certain number; this objective always appears in the business plan. Managers including project managers, when focusing into this objective, abandon quality sometimes as they are overwhelmed with achieving the objective.

Coming back to conceptual framework mentioned in last chapter, the below diagram illustrates and categorized the barriers just mentioned based on conceptual framework. It is important to say that this section only deals with the barriers to implement TQM. Solutions to the barriers that are mentioned in this section are out of scope of this research and are proposed in the next chapter for further research.
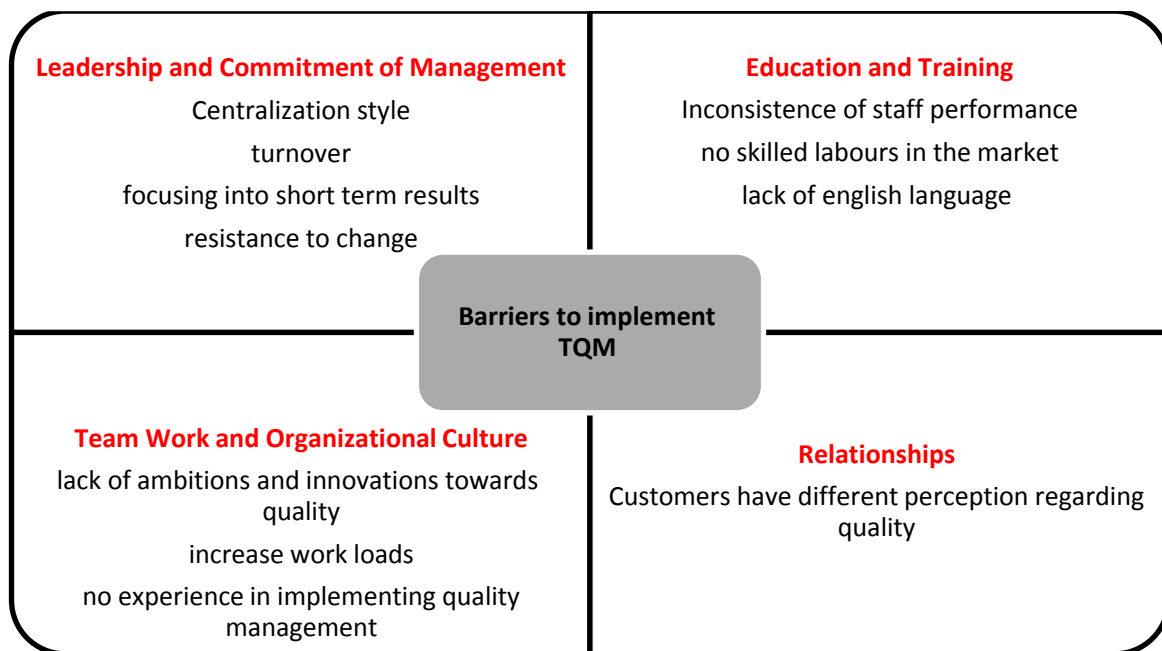
Figure 19: Categorization of Barriers according to Conceptual Framework

4.6 Comparison between Literature Review (Deming Model) and Case Study Findings

From above findings, it was clear that many concepts appeared in literature review were implemented already in these organizations. One of famous gurus models which is Deming 14 points of quality was raised to compare what is implemented to what is not. As a general note, it was obvious that the Deming's fourteen points were almost implemented. The Deming's fourteen points are presented here with a comparison of what was found. A comparison can be extended to other quality models such as Crosby's model, Juran Trilogy, Plan-Do-Check-Act model created by Deming, or Juran ten points of quality; however, this is left for future research.

1) No dependence on price tag in awarding business.

It was seen that organizations did not depend on price when awarding contracts. As seen before, organizations do regular evaluations to monitor the performance of contractors and suppliers; therefore, the cost or price of contract is the last thing to be seen. One interviewee states that " in our organization, we do technical review for the bidders; some of bidders fail and some succeed; those who succeed go to commercial evaluation".

2) Continuous improvement to the system adopted.

The system adopted in these organizations are frequently checked and updated. It was mentioned that no improvements will be done unless regular audits and measurements are done. It was also written about the audit reports in organization A that is done to contractors. Training and education courses are given whenever new ideas or tools to be used; therefore, there is no stop point in continuous improvement.

3) Develop leadership.

Leadership is mentioned by all interviewees and is the most critical success factor, as said, to successful TQM. Leadership was encouraged in all organizations as written in the first section. Many interviewees acknowledged that their companies offer them massive courses regarding leadership to help everybody to be leader in their fields. When leadership is promoted, the productivity will be improved because leaders tend to get the best work from employees.

4) Produce constancy of purpose to advance the service or product.

It was seen through case studies that management are working hard on long term results by providing vision, mission, objectives, and strategy. Dedication to improvement is the most important aspect in this part; therefore, management is providing every effort such as education and training, and making an innovative and creative environment that allow the company to be in business not for short term but for long term. They involve all employees in many activities to make everybody aware of the business and where it is going because even though the managements know the long term vision and objectives, employees also should know what they are doing and how the work contribute to both short term results and long term results.

5) Take away barriers that steal the pride of workmanship from employees.

As stated earlier, and as written in section 4.4.3, management has given all the rights to employees to share their experiences, comments, and difficulties so that all employees are involved in business and in continuous improvement. In addition, management is looking for performance of employees as they are giving tools, systems, standards, materials to perform their works.

6) Encourage self improvement and continuous education.

It was seen that all organizations have in their plans and strategies the development of people. Organizations, through their human resources departments, study and analyze the needs of courses to be offered to their employees. All organizations believe that an organization will only survive if its people are improving, but not just good people to work.

7) On the job training.

On the job training is very important and was seen when one of organizations put unskilled labours with skilled labours and teams to learn from them. On the job training is effective for employees to learn what is job they are doing and why is done in that way. Team work is the tool to conduct on the job training; this is why all organizations looked at team work as very important and one of critical success factors of implementation of TQM.

8) Every person should work towards successful transformation.

It was seen through interviews that organizations tend to involve all employees in the business. As written in section 4.4.3, many approaches that come from management of organizations that reflects their commitment to involve every employee in their business. These approaches give employees the sense that everybody is involved to continuous improvement.

9) Take away the fear.

Fear was taken away and empowerment was substituted. Job security was taken in account and, as discussed, an "employee assistance department" was created to take all the bad thinking that affects the employee. We also have seen that organizations tend to build trust, cooperation, and coordination between teams in departments to eliminate fear and to build more secure environment for work.

10) Remove barriers between departments.

Organizations are trying to build a team-work environment in which all teams cooperate, communicate, and coordinate to ultimately produce excellent work. As we have seen, many adopted systems, standards, or manuals try to clarify the relationships between employees to avoid any confusion or misunderstanding such as project quality plan or quality manual. Relationships between departments and between employees are one of critical success factors and other departments are seen to be internal customers; therefore, their satisfaction is required.

11) Eliminate quotas.

Documents that were reviewed such as project quality plan and quality manual is intended to provide a system for continuous improvement. The system is intended to make everybody focus on quality not for quantity; it is how well employees do the work not how many employees do. Quality standards are all about giving employees hints on how to do the work and remove barriers that prevent doing that work.

12) Minimize exhortations and slogans.

No exhortations and slogans were mentioned in the case studies; in fact, it was deduced that this point is eliminated where companies try to substitute slogans with effective leadership. As was stated by one of managers, the work is left to employees and the methods are up to them, but he wants the results.

13) Implement new philosophy.

The new philosophy that was implemented is a continuous improvement environment where some areas are continuously improved such as employees' satisfaction, product quality, business process improvement, and customer satisfaction improvement. In fact, these were main items in conceptual framework, and as we saw in the case studies, all organizations are trying to achieve this philosophy.

14) No reliance on inspection to accomplish the quality.

It was seen through documental review that organizations tend to eliminate inspection and substitute it with standards, manuals, and processes. Inspection does not improve quality neither it is effective because planning to inspect is planning to failure. Quality comes from improvement of processes but not from inspection. Improvement of processes is discussed widely as it is one element in the conceptual framework.

4.7 Summary

The findings and discussion chapter gives an analysis and main findings to the research conducted through semi structured interviews and documental analysis. First of all, an analysis of Total Quality Management critical success factors was conducted. There are four critical success factors of TQM namely: leadership and commitment of management, education and training, team work and organizational culture, and finally, relationships with internal customers, or external customers

including suppliers. Second of all, an analysis of effects of Total Quality Management implementation was done which are employee satisfaction, product quality, business process improvement, and finally, customer satisfaction improvement. Then a section of continuous improvement which is the main outcome of implementation of TQM was put that includes steps towards continuous improvement, barriers of continuous improvement, approaches to continuous improvement, documental reviews to some papers that were available, and finally, approaches towards quality awards. Next, barriers for TQM implementation were mentioned according to what was stated on interviews. The final section compares the model of Deming's fourteen points to the case organizations.

5.1 Introduction

Having described the findings of ten semi-structured interviews and documental reviews, this chapter presents the conclusion and recommendations drawn up from previous chapters. In addition, there is a ' Recommendations for Future Research' section to describe what can be added in the future. The last section will express the contributions of this research to both practitioners and academics.

5.2 Conclusion

A comprehensive approach was adopted to address the aim and objectives of this research which were stated in chapter one. First, a literature review was undertaken to a detailed level to understand the concepts of the critical success factors of TQM and continuous improvement. The literature review was used to set a clear conceptual framework of four critical success factors of implementing TQM in UAE organizations and four continuous improvement elements. The conceptual framework after that was used to conduct a case study strategy that uses interviews and documental analysis tools to collect data from three different organizations.

The literature review conducted first and the findings of case study altogether show that there is such a critical success factors needed to implement TQM and if such critical success factors were implemented, there will an improvement to the organizations based on continuous improvement elements. This research has five objectives to be satisfied, an attempt was made in this research to satisfy the objectives and the following discussion show up the conclusions drawn about the objectives of this research.

Objective 1: to investigate the critical success factors of Total Quality Management in United Arab Emirates organizations

Based on literature review and what was found in the case study, the critical success factors can be categorized into four different categories which are: commitment of management and leadership, education and training, organization culture and teamwork, and finally the relationships whether suppliers relationships or

customer relationships. It was seen that the commitment of management was the driving forces towards successful implementation by benchmarking, setting KPIs, and clear strategy. The benefits of quality can be gained only if the quality management is involved in the organization's strategy, mission, vision, and objectives that can be measured and benchmarked. Leadership is a characteristic that is important for managers to improve the strategic quality management. Finally, the empowerment (responsibility and accountability) of employees is got only if managers are committed to quality. Education and training is given in line with the needs and objectives of company that will enhance the skills of employees towards quality management. Teamwork, which promotes quality continuously in addition to the culture, is also important to meet the goals of organization and could enhance the satisfaction of employees. Finally, the relationships are also vital factor as the customer relationships will keep the organization in line with business.

Objective 2: to study the effects of implementing Total Quality Management.

It was concluded through implementing the Total Quality Management that there are several benefits from implementing it. First, employee satisfaction will be increased as rewards system will be developed and as mentioned, a several positive consequences will appear such as creating a department for the employees' counselling. Moreover, the product quality and service quality would be improved as a result of TQM. Because of understanding the customer needs and expectations, the organization will produce products and services that ultimately delight the customers. Furthermore, it was seen that the whole process of business would have been improved. Human resources, information resources, material resources, or technological resources are all variables that would be improved consequently. In addition, customer satisfaction, which is the most important variable that quality management is created for, will be improved. We have seen how companies try and do for acquiring high customer satisfaction. Finally, continuous improvement, which is the main objective of Total Quality Management, would be achieved. It was concluded that the first step towards continuous improvement is the benchmarking. After that, several concepts have to be applied to achieve continuous improvement as mentioned in previous chapter.

Objective 3: To explore the approach organizations in United Arab Emirates are running in a context of Quality Management and Continuous Improvement.

It was summarized, through documental analysis and from some of interviews, how organizations implemented Quality Management. Many activities were mentioned by interviewees to show how organizations implemented Quality Management. In addition, several documents were reviewed and presented in previous chapter such as quality manual, project quality plan, quality control plan, and audit report. It was clear that organizations implemented every possible concept to achieve as much as possible of Quality.

Objective 4: to assess critically the barriers to implement Total Quality Management.

It was discussed in previous chapter many barriers that were faced by organizations. Through presenting these barriers by each organization, some ideas were revealed on how these organizations overcome the difficulties. It is deduced thereafter, that the implementation of TQM is not an easy task but it needs a clear strategy over time and learning from others' mistakes.

Objective 5: To compare the case studies of organizations in United Arab Emirates to Deming quality model (Deming fourteen points of quality).

Through the case studies, interviews, and documental analysis, it was seen clearly and written in previous chapter that the most concepts written in literature review were implemented already in these organizations. In the last section of previous chapter, the comparison was done between what was found and what the gurus thought about in literature. As a conclusion, almost all the theories were applied except some points where these depicts barriers or do not meet the needs of these organizations.

5.3 Recommendations

This research was conducted due to a motivation of investigating the critical success factors of Total Quality Management and continuous improvement elements and the relationship between them. The research aim was to do a research that is based on United Arab Emirates organizations to ultimately find how continuous improvement can be achieved.

This research gives empirical evidence that if critical success factors of Total Quality Management are implemented correctly, there will positive influence on continuous improvement of the organizations. It is therefore, deduced that the main recommendation coming up from this research is that organizations should benchmark and review the level of implementation of Total Quality Management in order to enhance the level of achievements and continuous improvement. Based on what was done in case study that has three organizations with ten semi structured interviews and documental reviews, the following recommendations can be raised:

1- It was seen through organization's A projects dossiers that relationships between employees are not good enough, and the culture of the organization and team work are not helpful to handle project from one person to another. It is recommended therefore, that there should be a systematic handover from one person to another one leaving the project. It is important to make a list of submittals in the contract, deliverables, and important papers that everybody are aware of. When the person who is managing the project is leaving the place, it is of organization's culture responsibility to teach that person how to handle the project and what to handle. Furthermore, an audit should be done by professional people in addition to the person leaving the project to see what is submitted, what should be submitted, and what the missing papers are. Relationships are important here to help the new person contact the old person in case there is any enquiry; therefore, is recommended that people should be taught the importance of relationships with people who leave the company or move to another department.

2- Some recommendations have to be raised for project's case study of organization B. First of all, coordination procedures and communication system have to be clear and put in contract to make the procedures compulsory for all parts. It is necessary to include such procedures as every project has a unique system of coordination procedures that differ from other projects. The communication system has to include all concerned engineers and parties either from client or from the contractor in order to include everybody that has relationship with the scope of work. Furthermore, a lessons learnt system has to include such problems to benefit in future from such problems and avoid them. Finally, a revision to contract and scope of work is extremely important

before submitting the project as it ensures everything related to scope of work is performed as required.

3- As stated in case study of organization A, it is important to teach construction stuff (who are working on site and generally persons who are working in projects) internal auditing. There are already external and internal auditing courses according to ISO standards; however, there should be a professional designated courses to stuff according to their fields. Construction engineers; for example, may learn comparing scope of work documents with archives and what were submitted with what is supposed to be submitted. Periodic auditing to archives of project may save the client and contractor from delay in future. In addition, complete references of the project will be on hand any time on future without any missing papers.

4- It is recommended that organizations formulate a quality system that best suits their needs and standards in addition to adopting one of international quality systems such as ISO 9000. The question is not whether to have an international quality system or not to have, but what can be the best way to originate such a system that can handle the organization's business. This can be done by a comprehensive analysis to the organization's problems and defects. By recognizing such problems, solutions can be developed to prevent such problems and solve the problems in case anyone happened. Therefore, the development of quality system is completely based on solutions that prevent reoccurrence of organization's problems. In case of adopting international quality codes such as ISO 9000, elements of preventing problems can be emerged with such adopted code to make a comprehensive quality standard to organization. By adopting this method, organization will show the commitment of the main objective towards quality which as improving quality.

5.4 Recommendations for Further Research

As mentioned earlier, because of time limitation and words limitation of this dissertation, not all of dimensions of this study were investigated. Below are some points that are highlighted in order to improve the research that are not addressed in this study and needs more explorations in order to generalize this study.

1- As discussed in Limitations sections in Chapter 1, this research uses a case study approach that involves interviews and documental analysis. Future research could involve more case studies (more organizations) with more interviewees and more documents and archives. This will benefit findings and digging into more details and hence generalizing information got through comprehensive case studies. In addition, future researches could involve categorizing organizations depend on sector such as construction sector, manufacturing sector, etc and do case studies accordingly so that a comparison is done to find the general pillars of critical success factors to implement Total Quality Management.

2- This research was based on a cross-sectional time horizon approach that represents a 'snapshot' of situations at given time. Further research could involve a longitudinal time horizon that represent an extended time so that many things can be seen clear such as trends, changes, problems arising, solving these problems, performance indications, etc

3- This research was based on case studies of organizations in United Arab Emirates; therefore, the context of this research is limited and valid to United Arab Emirates. Future research could involve other geographical locations outside United Arab Emirates to see if results got can be compared to UAE organizations. It will be also easier to notice whether results are replicated between locations or between industries. Moreover, national culture, as presented in literature review, could be investigated to see the effects on the Total Quality Management.

4- An interpretivism approach was used for this study due to time limitations. Interpretivism approach uses only qualitative tools and procedures. For future research, it is recommended to use interpretivism approach with realism approach that allow qualitative, quantitative, and triangulation tools to be used to enhance the reliability of information got. Interpretivism approach with realism approach could, for example, allow use a case study in addition to statistical methods such as Pearson's Correlation, Reliability Testing, and/or Spearman's rho correlation.

5- As written in Limitations section, Knowledge Management and Six-Sigma concepts were omitted due to time and words limitations. Future research could involve some organizations that adopted six-sigma methods to see the

relationship between six-sigma and Total Quality Management. Furthermore, knowledge management will need more documental reviews to see the integration of knowledge management with TQM. Such documental reviews should not be confidential and therefore, case studies should involve organizations who are free to give such documents for reviews.

6- It is recommended for future research that quality models have to be compared to each other to see the advantages and disadvantages. In addition, since quality models have quality awards that are based on, it is also recommended to see the criteria for each award and recommend the criteria that best suit the United Arab Emirates organizations. It is critical and very important that many organizations are becoming obsessed with these quality awards; therefore, future research could include how the quality awards control the behaviour of management and employees in such organizations. This could involve a case study to some organizations to see the gaps and deviations from the real work to obsession of quality awards and what the gaps are.

5.5   Contribution of this Research

The research study has considerable practical and academic implications in the area of Total Quality Management. The research was undertaken with the major objective of exploring the critical success factors towards implementing Total Quality Management in the context of United Arab Emirates organizations. In terms of literature, this study is the first to highlight the critical success factors in UAE as there is no study mentioned in previous researches. Moreover, this study used a qualitative approach which is rarely used in previous literature as the majority of studies used only quantitative approaches. Specific contributions from academic perspective as well as from industry perspective are detailed below:

5.5.1   Academic Perspective

This is the first study to investigate and explore Total Quality management practices in United Arab Emirates organizations. Consequently, it could be a start way to building theory and add to body of knowledge the practices and critical success factors that are considered to be crucial in UAE society.

Secondly, this study has provided empirical evidence on how Total Quality Management has developed companies in several variables and competitiveness such as service quality, training courses, and process improvements.

This study has shed light on excellence models worldwide as well as local one which is usually abandoned in literature especially when it comes to UAE context.

Finally, the study gave attention on some barriers that many of them are not mentioned in literature.

5.5.2   Practitioners' Perspective

First of all, this study has outlined and summarized the main critical success factors for successful implementation of TQM. Therefore, organizations in future have these factors on hand to study and improve in order to apply them in their organizations.

Second, this study gave some barriers of three organizations that implemented TQM; so, organizations can benefit from them to avoid any future barrier and learn from mistakes.

Finally, the study gave, in many parts of it, the importance of quality planning which is how organization put the quality in its strategic plans that include mission, vision, and objectives. By putting quality in all strategic plans, organizations can start implementing TQM and gain the benefits of it.

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Interview Guideline

Leadership and Commitment of Top Management

- The level of responsibility to quality management and performance.
- Offer personal leadership to improve quality and quality management.
- Management evaluates quality performance.
- Management involves in the quality of improvement process and continuously reviews the evolving issues.
- Quality performance, mission, vision, and objectives are clear.
- Management and empowerment to employees.
- Components of commitment of management.

Education and Training

- Reasons of Education and Training.
- The Structure of offereing Training.
- Example of Training courses.
- Evaluation system.

Teamwork and Organizational Culture

- Benefits of Teamwork
- Measurement of Teamwork
- Employee Participation as part of teamwork
- Relationship between TQM and organization culture.
- Support the concept of TQM in the organization.
- Measurement of organization culture

Relationships: Customer and Supplier

- Benefits of relationships with suppliers
- Measurement and evaluation of relationships with suppliers
- Benefits of relationships with customers
- Measurement and evaluation of relationships with customers

Employee Satisfaction

- Methods to obtain employee satisfaction
- Employee satisfaction surveys.

Product Quality

- Definition of Product Quality
- Activities to increase the quality of products.
- Testing the quality of products.

Business Process Improvement

- The processes that would be improved.
- Activities that have been improved.

Customer Satisfaction

- Importance of customer satisfaction
- Factors to obtain customer satisfaction
- Customer satisfaction surveys
- After-sale services

Continuous improvement

- Areas of improvements
- Methodologies to continuously improve the business
- Types, reasons, and barriers of continuous improvement.

Interviewees Positions

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
Organization A				
Position	Quality Control Engineer	Senior Quality Assurance Engineer	Quality Control Supervisor	
Organization B				Senior Quality Officer
Position	Project Manager	Assistant General Manager	Quality Manager	
Organization C				
Position	General Manager in Charge	Senior HR Coordinator	Chief Customer Services Officer	