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Status and Challenges of Total Quality Management Application in Selected Palestinian Chemical Industries

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Dedication

To the laurel crown that I wear…. My father's soul –God's mercy be upon him.

To the candle that burns in order to illuminate my life…. My affectionate mother.

To the angelic companion who supports me in this life…. My dear husband.

To that who got bored of being away from and whom I was always busy from…. My beloved son.

To the flowers that spread their perfume in my life…. My brothers and sisters.

To all those who generously helped and supported me during my study…. My father-in-law –God's mercy be upon him.

To those who always gave generously, granted and never took… My respectable teachers.

To all those, I dedicate this effort as a fulfillment and recognition for their patience and support throughout my study..

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At last, I would like to thank everyone who encouraged and advised and helped me to get my work done..

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الإقرار

أنا الموقع أدناه مقدم الرسالة التي تحت عنوان:

Status and Challenges of Total Quality Management Application in Selected Palestinian Chemical Industries

اقر بأن ما اشتملت عليه الرسالة إنما هي من إنتاجي الشخصي باستثناء ما تمت الإشارة إليه حيثما ورد، وان الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل أية درجة علمية أو بحث علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

Declaration

This work, provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's name : **اسم الطالب**

Signature : **التوقيع :**

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Abbreviations

1. **PCS**: Palestinian Chemical Sectors
2. **TQM**: Total Quality Management
3. **ISO**: International Standards Organization
4. **GATT**: General Agreement on Tariffs and Trade
5. **PDCA**: Plan, Do, Check, Act, Cycle
6. **PFI**: Palestinian Federation of Industries
7. **GDP**: Gross Domestic Product
8. **NK**: Not Known
9. **GMP**: Good Manufacturing Practices
10. **HACCP**: Hazard Analysis and Critical Control Points
11. **PS**: Palestinian Specifications
12. **PEDL**: Palestinian Essential Drug List
13. **SPSS**: Statistical Software Package for Social Sciences program
14. **ANOVA**: Analysis of Variance test
15. **LSD**: Fisher's Least Significant Difference test
16. **SWOT**: Strength Weaknesses Opportunities Threats
17. **TQMP**: Total Quality Management Practices
18. **SCMP**: Supply Chain Management Practices
19. **FSP**: Firm's Supply Performance
20. **AHP**: Analytic Hierarchy Process
21. **NPD**: New Product Development
22. **VA**: Value Analysis
23. **QFD**: Quality Function Deployment
24. **CE**: Concurrent Engineering
25. **OEM**: Original Equipment Manufacturing
26. **ODM**: Original Design Manufacturing
27. **OBM**: Original Brand Manufacturing
28. **MBNQA**: Malcolm Baldrige National Quality Award
29. **TQC**: Total Quality Culture

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Abstract

This study first aims at assessing the status of Palestinian chemical industries(PCS), and at measuring the level of the application of total quality management philosophy in Palestinian chemical sectors, especially in the pharmaceuticals, food and detergents sectors from the perspective of top managements. Second, the study seeks also to identify the obstacles and challenges facing the application of total quality management philosophy in the PCS.

The population of the study consisted of a selected number of Palestinian chemical plants engaged in production of chemicals. The study sample consisted of 40 industrial company selected purposefully from pharmaceuticals, food, and chemical detergents sectors. To study the problem of variables, a structurally designed questionnaire was used to collect data from the sample companies.

After data collection and analysis, it was found that there was a great interest by industrial plants in applying the variables of TQM philosophy of different degrees and at different levels. The highest application level was the continuous improvement. The next application level was using

statistical methods and feedback. The participation of workers and their development represented the lowest level of application.

In the light of the study findings, several recommendations were suggested. One recommendation is the importance of applying the philosophy of total quality management by companies that did not adopt this philosophy previously. Another recommendation is the need for continuous work to achieve suppliers' participation in order to reach a comprehensive application of combined TQM dimensions. A third suggestion is giving more attention and interest to the use of statistical techniques and quality control tools because they help in identifying and analyzing quality problems.

Chapter 1

General Framework for the Study

1.1. Introduction

The great challenges facing business organizations and the subsequent rapid changes in this century have made these organizations adopt a clear vision to cope with these challenges, thus enabling them to see the future and force them to shift from adoption of traditional administrative methods to adoption of modern strategies methods. This has enabled them to keep up with the ongoing developments and the growing global competition level **(Basardah, 2006).**

The dynamics in the business environment imposed on organizations apply specific strategies to ensure that they can survive and grow. So business organizations have realized the need to focus on the total quality strategy because this strategy is an effective tool in facing changes which occur in the global market **(Basardah, 2006).** Nowadays, several industrial organizations and service managers try to look at the best ways and means to improve the administrative quality of their products. Many are wondering what successful leaders should do to improve their organizations to lead them to excellence among global organizations. Such questions reflect the aspirations of the vast majority of contemporary business organizations and highlight the importance of finding the most appropriate means to achieve this level (**Evans & Dean, 2003**).

The Palestinian economy deteriorated during the second intifada, especially due the negative role played by Israel in creating an unstable economy. This can be seen in the damages caused to all economic sectors and reflected on various aspects of economic and social life. Against this background, it was necessary to carry out a renewing and revitalizing process of the Palestinian economy, and raise the issue of TQM concept especially in the area of administrative work (**Palestinian Federation of Industries, 2009**). TQM is a management philosophy meant to establish an intellectual framework and a common culture which lead to a management that is more responsive to the requirements of change and rapid development in the field of business through the provision of products or services that satisfy customers. Therefore, it is important to understand the administrative leadership of the strategic perspective of TQM in order to take advantage of the strengths and features provided by this strategy for their organizations in seeking for excellence (**Dale, 2003)**.

1.2 Research objectives

The main goal of this research is to study and assess the quality status of Palestinian chemical industry, in terms of continuous improvement, use of statistical control and feedback, commitment and support of senior management, customer-driven quality, organizational culture, suppliers' participation, employees' participation and development.

In addition to the above main goal, the following objectives have been identified:

1. Assess the current situation of quality for three different PCS.
2. Identify the main benefits and advantages of the TQM.
3. Explore the challenges facing the use of TQM in PCS, and propose some solutions.
4. Justify the rationale behind adopting TQM in the PCS.

1.3. Research questions

1. What is the TQM application status of PCS?
2. What are the challenges and difficulties facing TQM application in PCS?

1.4. Research variables

For the total quality management system, two variables were adopted in this study:

1. Independent variables (variables of company data profile):

type of industry, ownership of the company, the scope of the current market, the nature of the ownership of the company, specifications which the company operates according to, the number of branches of the

company, the company's capital, the number of the company's products, and the number of workers in the company.

2. The dependent variables (variables of the philosophy of Total Quality Management): commitment and support of senior management, customer – driven quality, employees' participation and development, continuous improvement, suppliers' participation, organizational culture, use of statistical control and feedback, and the most important obstacles and challenges facing the application of the principles of quality in the company.

1.5. Research Methodology

The methodology followed in this research basically depended on using a structured questionnaire as shown in Appendix 1 for top management of companies listed in Appendix 2, and conducting structured interviews, as shown in Appendix 3, with PCS supervisors listed in Appendix 4.

The researcher examined the stability tool by using the internal consistency test. The reliability coefficient (Cronbach alpha) was calculated, and the tool was validated by referees.

Main aims of the structured interviews and questionnaires :

1. To investigate how the identified critical quality factors are implemented in order to understand the current quality issues.

2. To assess the participants' viewpoints about quality and ISO certifications by asking them about their opinions and attitudes towards the prospects of applying total quality management in PCS.

1.6. Previous studies

In recent years, studies have focused on the quality of product or service provided by various organizations and institutions. There has also been burgeoning research on the relationship between total quality management and different issues. For example, the impact of TQM on supply chain management (SCM) and firms supply performance (FSP) was examined in the automotive industry in Thailand. To achieve the objectives of this study, the researchers developed measurement instruments for SCM, TQM and FSP based on an extensive literature review and verified by experts, pilot test and various statistical techniques. The hypothesized model was tested through a path analysis.

The study found that the set of SCM, TQM and FSP measures were reliable and valid for Thailand's automotive industry. TQM not only had a significant direct positive impact on SCM and on FSP but also a significant indirect positive impact on FSP through SCM**. (Vanichchinchai & Igel, 2011)**.

Other studies dealt with the effects of the application of TQM in different organizations and industries in many countries. One study conducted in Italy sought to find out how well TQM principles were known and

understood by health care professionals from the employees' point of view and the factors affecting it.

The researcher in this study surveyed the health care system in Trieste to design the subjects and research, using the measures of total quality test, and a novel and quick instrument that aimed at conducting a routine assessment of the penetration and exteriorization of TQM principles within the health care structure.

Results of this study showed that direct exposure to public, job role and time spent working within the same structure were related to the penetration of TQM principles, whereas previous formative intervention did not prove to be associated with the penetration of TQM principles. This study concluded that the implementation of a quick and simple instrument to monitor the TQM implementation highlighted several critical areas for intervention. **(Gregori, et. al., 2009).**

Other studies identified the extent and the levels of TQM application in the industrial sectors. The studies were conducted in Jordan, Yemen and Syria, They sought to determine the extent of application of TQM philosophy in light of technical capabilities available in the organizations. The researchers concluded that the Jordanian and Syrian industries implemented TQM philosophy with a much higher degree than the Yemeni industry **(Saleh, 2003; Al-Kameem, 2003; Al-Khalil, 2000)**.

Some studies examined the relationship between TQM and the competition policy in the companies. One study was conducted in the pharmaceuticals industries in Jordan. It aimed at identifying the impact of adopting total quality strategy in improving competitiveness of the pharmaceuticals industries. The main finding of this study was that there was a significant relationship between adopting total quality strategy and competitiveness. The strongest strategic element of total quality strategy on competitiveness was quality culture. The researcher concluded that the importance of quality, as a strategic issue to achieve competitiveness, is essential to maintain organizations. He suggested merging the Jordanian pharmaceuticals companies to increase their competitive edge on the international level **(Al-Qutha, 2006)**.

Another study dealt with the relationship between TQM and the competitive policy. One study was conducted on the Palestinian industrial organizations. This study analyzed the relationship between some of TQM dimensions, as independent variables, and the competitive policies applied in the industrial organizations as a dependent variable. The study found that the Palestinian industrial organizations adopted most of TQM dimensions at different positive levels. The study proved that there was a statistical significant difference between TQM dimensions and the competitive policies applied in the Palestinian industrial organizations **(Qandil, 2008).**

Other studies focused on the relationship between TQM and innovation performance. One study showed the importance of knowledge

management, and studied the relationship between knowledge management, TQM and innovation performance. The researcher administered a questionnaire to 223 managers in 1,139 Taiwanese high-tech companies to collect the empirical data needed. The study used a structural equation modeling to analyze simultaneously the relationships between knowledge management, TQM and innovation performance. Finally, it was found that knowledge management was positively associated with both TQM and innovation performance and the TQM philosophy was a mediator between knowledge management and innovation performance **(Hung, et. al., 2010).**

One study dwelt on the relationship between TQM and organizations performance. The study was conducted on Yemeni industrial organizations and aimed to discern if there was a relationship between integrating knowledge management and TQM, and highlighting its role in improving and promoting the performance of organizations. The study found that there was an integration and strong relationship between knowledge management and TQM, and there was a significant impact of the integration on the performance of the companies, chosen as samples for the study **(Basardah , 2006).**

Many other studies examined the relationship between TQM and other topics. One study investigated the influence of quality management on the speed of new product development (NPD) because there was a lack of literature on the relationship between quality management and NPD. The

researcher found that TQM, teamwork, value analysis (VA) and quality function deployment (QFD) were all positively correlated with the speed of NPD, which means quality management philosophy and tools have a positive influence on the speed of NPD. This implies that companies which have implemented TQM and other quality tools will have a better basis for implementing new NPD approaches like concurrent engineering (CE) and design for manufacturing and assembly. This is especially encouraging for those OEM (Original Equipment Manufacturing) firms that would like to change from OEM to ODM / OBM (Original Design Manufacturing / Original Brand Manufacturing). OEM companies normally implement TQM but very little in NPD **(Sun & Zhao, 2010)**.

Another study addressed the changing role of government in the rapidly changing environment of globalization, a process through which worldwide integration is pursued by forces of global capitalism. Government is challenged by conflicting and contradictory forces of globalization of corporate capitalism seeking absolute profit, while at the same time challenges for quality services and quality assurance are mounting worldwide. As a result, in this study, an impossibility theorem develops, with new challenges and opportunities facing governments. Alternative theories of government were presented, and suggestions were offered on what government should do to promote quality assurance and TQM in the age of globalization **(Farazmand, 2005).**

Unlike other studies, this study was based on examining the possibility of the application of TQM in PCS, and discussed the most important challenges and difficulties facing these applications.

Chapter 2

Theoretical Framework for the Study

2.1. Definition of quality

Quality concept is an old concept that has evolved like any other management concepts. It is adopted by many international organizations to improve and develop the quality of their services and production and assistance in facing the extreme challenges and getting satisfaction of the customers **(Goetsch & Davis, 2006).**

As a result of the importance of this concept and the spread of its application in the world, the attention of researchers and scholars have increased, resulting in many contributions that have helped in adopting and applying it. Many definitions of this concept have been given and each definition has highlighted a particular theme **(Oakland**, **2003).** These definitions also vary according to users and the purpose of use. Several definitions for quality are shown in Table 2.1. These definitions are given from the perspective of scientists and associations which are based on quality study.

Table 2.1: Some definitions for quality

Scientists and associations of quality	Quality definitions
Guran definitions **(Juran & Cryna,1993)**	Quality is fitness for use, the basic criterion for judging the quality product if a product is suitable for use or is not, regardless of the status and condition of the product.
Crosby definitions **(Ross, 2000)**	Quality is conformity to requirements; that means when more product specifications conform to the customer requirement, this product has a good quality.
Edward Deming definition **(Evans & Dean, 2003)**	Quality is a trend to satisfy consumer needs at present and in the future.
American Society for Quality Control definitions **(Goetsch & Davis, 2010)**	Quality is a group of goods and services able to meet the specific needs.
International Organization for Standardization; ISO definitions **(Alwan, 2005)**	Quality is meeting all features in the product to customer requirements.

Quality can be defined from different perspectives. For example, the customer or client define quality as "all advantages and characteristics of the product or service that contribute to satisfy the desires of consumers and these include price, safety, availability, reliability, dependability and the ability to use" **(Al-Ali, 2010).** We can notice here that this definition does not give importance to the dynamic situation and limits the quality to the product only.

Also quality can be defined from the producers' viewpoint.: quality of conformity, and that means making sure product or service is produced according to design **(Judeh , 2006).**

In fact, quality definitions, as mentioned above, show that quality is a multifaceted concept, and it expresses a particular viewpoint for a particular product in a given period and varies from one phase to another to improve the goal of this organization to satisfy the wishes of the consumers **(Oakland**, **2003).**

Therefore, the most recent definition of quality is that it is "a dynamic process that includes continuous attention to all products and services, and personnel and operations and the environment (internal and external) to ensure meeting the expectations of customers and fulfilling their needs and desires to achieve satisfaction and happiness to them" **(At-Ta'i , 2010)**.

2.2. Dimensions of quality

From quality definitions, we notice that quality consists of different dimensions (**Goetsch & Davis**, **2006**; **Oakland**, **2003**; **Omachonu**, **2004**). These dimensions depend on the type of product or provided service. The following is summary of these dimensions:

1. **Performance:** basic operating characteristics of a product, such as the clarity of picture colors or machine speed etc. This characteristic varies from one product to another and from one person to another,

so an acceptable level of new product depends on the attitudes and desires of people.

2. **Features:** secondary, or “extra” items added to basic characteristics, to support its image in the eyes of the consumer, such as a stereo CD or a leather interior in a car or a remote control for some devices. There is a difficulty in separating primary and secondary characteristics that can be measured, but translation of these characteristics remains due to individuals’ evaluation according to their importance.

3. **Conformity:** degree to which a product meets pre–established standards or industry standards. The importance of this dimension started after the appearance of the World Trade Organization and ISO that impose specific standards on products. This dimension considers objective measures that are not affected by the wishes of consumers, so limits are imposed on the specifications of different products and are maintained by the government and the competent bodies.

4. **Aesthetics:** this dimension means a sense of personal and human characteristics such as the favorite general form and a variety of colors and accessories in the product and accessories. That means how a product looks, feels, sounds, smells, or tastes. One example is external finishes in a building. This will change depending on the

dimension of environmental change. It also varies from person to person.

5. **Reliability:** potential breakdown of product during a specific time period or, in other words, the probability that a product will operate properly within an expected time frame. This dimension depends on durable products and does not apply to products that have a short validity period.

6. **Durability:** expected operational life, i.e. how much a product can be sustained before repair with care, and it shows the period during which the product can be exploited before its repair and after which its repair becomes less feasible/practical than buying a new product.

7. **Serviceability:** The provided service is a maintenance and repair service; it is measured by ease of getting repairs, speed of repairs, courtesy and competence of repair person, and this dimension does not apply to chemical industries because they do not need repair or maintenance. But there are other services which can be provided such as writing the appropriate storage conditions on the cover of the product and explaining how to use it, and this is the most important thing that confirms the quality assurance systems and ISO.

8. **Safety: It is** assurance that customer will not suffer injury or harm from a product through attention to the physical and chemical specifications of the product and the final packaging.

9. **Perceptions:** These are subjective perceptions; the facts of the product are based on brand name, advertising, and the like, so modern methods must be used in advertising and very good promotion of the product should be launched because this affects the image of the product in the minds of consumers.

10. **Reputations:** These refer to experience and previous information about the product, where consumer passes a judgment on the product quality through its reputation in the market.

11. **Responsiveness:** How the seller responds to the client: showing kindness and courtesy in dealing with the client.

Although there are different dimensions of quality, they cannot be separated from each other completely. Rather, each dimension is translation of several other dimensions. For example, to determine performance, it is based on reliability, compliance, characteristics, and aesthetics, and this indicates that the product has a lot of these dimensions at the same time.

Depending on the multiplicity of dimensions, companies rely on one or more quality dimensions due to the difficulty of taking all dimensions due to high cost, and this makes the organization able to outperform its

competitors through showing one or more dimensions of quality, without neglecting the other dimensions **(Al-Azawi , 2005)**.

2.3. Total quality management definitions and philosophies

The rise of global challenges have influenced later issues of quality economic globalization, widespread of information technology, information networks, the Internet, international standards (ISO, for example), global trade agreements, GATT ..., etc. These have been imposed on economic organizations/enterprises and service companies, make them more a thus making them more aware of these challenges. These organizations should adopt scientific methods to face these challenges and should have investment capacity to reinforce flexibility of production, and increase efficiency and effectiveness **(Al-Ali, 2010).**

In trying to define TQM, it is worth considering the relevance and meaning of the three words in its title.

Total – "the responsibility for achieving quality rests on everyone in the business no matter what their functions are. It recognizes the necessity to develop processes across the business; that together leads to the reliable delivery of exact, agreed customer requirements. This will achieve the most competitive cost position and a higher return on investment" **(Sowerbutts, 2004)**.

Quality – "The prime task of any business is to understand the needs of the customer, then deliver the product or service at the agreed time, place and price, on every occasion. This will retain current customers, assist in acquiring new ones and lead to a subsequent increase in market share" **(Sowerbutts, 2004).**

Management – "Top management leads the drive to achieve quality for customers, by communicating the business vision and values to all employees; ensuring the right business processes are in place; introducing and maintaining a continuous improvement culture" **(Sowerbutts, 2004)**. This is equivalent to an integrated, principle-based, organization-wide strategy for improving product and service quality.

Total Quality Management (TQM) is an integrated management philosophy aimed at continuously improving the performance of products, processes, and services to achieve and surpass customer expectations **(Ugboro and Obeng, 2000).**

TQM is a systems approach to management that aims to enhance value to customer by designing and continually improving organizational processes and systems. It provides a new vision for management leadership. It places customers as the principal focal point and redefines quality as customer satisfaction. TQM relies on fact-based decision making. TQM is a broad-based approach used by world-class companies to achieve organizational

excellence, the highest weighted category of all the quality and excellence awards **(Oakland, 2001).**

TQM is a philosophy aimed at achieving business excellence through the use and application of tools and techniques, as well as the management of soft aspects, such as human motivation in work (**Zadry & Yusof, 2006**).

TQM views an organization as a set of processes, and this organization must improve and develop these processes by arming all their employees with the skills and experiences necessary to do their responsibilities **(Ibn Antar , 2008)**.

Another definition of TQM is that it is an integrated and comprehensive system of planning and controlling all organizational functions (marketing, finance, design, engineering, and production, customer service, etc.) , so the products or services are produced to meet or exceed customer expectations and organizational objectives **(Al-Azawi, 2005)**.

Therefore, TQM is a philosophy and style of management that gives everyone in an organization responsibility for delivering quality to the customer. TQM connects each task in the organization as a process, and manages in a customer/supplier relationship with the next process. The objective at each process is to define and meet the customer's requirements in order to maximize the satisfaction of the final consumer at the lowest possible cost (**Zadry & Yusof, 2006**). Total quality management constitutes a challenge to organizations that have to manage the conflict

between cost-cutting and the commitment of employees to continuous improvement. Achievement of quality can be assessed by quality awards and quality standards **(Al-Azawi, 2005).**

TQM seeks to identify the sources and reasons for possible defects during the work to be removed from the roots and prevent them in the future to get the final product without any defects by reinforcing other methods of quality assurance to meet changes in products and services by improving the effectiveness of operational processes**(Hmood , 2000)**. According to **Zaire and Simintiras (1991)** "TQM is combination of total system process towards doing the right things (externally), everything right (internally) in the first time and all the time, with economic viability considered at each stage of each process".

2.4. Historical development of total quality management

The application of total quality management goes through four main stages **(Hmood , 2000; Goetsch & Davis, 2006; Talib, 2010).**

1. **Inspection and corresponding stage**

Sometimes this is called the phase of examination. It represents the beginnings of the quality. It does not prevent the error, but it is an attempt to detect and fix it, and separate the defective products among the accepted products.

2. **Quality control stage**

This stage started in the early twentieth century, with the advent of statistical methods for quality control. Then it focused on the standardization and unification of production as a means to prevent errors when processing product or service, as the primary objective of quality control is to prevent mistakes and avoid them before they occur.

3. **Quality assurance stage**

This stage is adopted to extend all efforts to prevent the occurrence of errors, and thus it relies on a system based on preventing the errors from the outset, which is known as zero defects principle.

4. **Total quality management stage**

This stage is characterized as the wishes of customer interest in its wider sense within the organization and achievement. It has become necessary to search for the philosophy of organizational control of the organization based on continual improvement in the performance and analyzing problems and solving them, in an era of fierce competition, to lead to a radical change in concepts of quality to become a management tool rather than a control tool.

2.5. Success factors of total quality management

In order to be successful in implementing TQM, the critical success factors of TQM should be identified. These factors, which are found in the literature, vary from one author to another. Many researchers defined critical factors as those "critical areas of managerial planning and action that must be practiced to achieve effective quality management in a business unit". There are numerous factors to be stressed as facilitators for successful TQM implementation (**Zadry & Yusof, 2006**).The philosophy of total quality management depends on the following factors:

- **Commitment and support of senior management**

Pheng & Jasmin (2004) and Emerald (2005) maintained in their research that top management commitment is the most critical and crucial element for institutional success when implementing TQM. The success volume of any project depends on the level of top management commitment **(Olorunniwo and Udo, 2002).** Top managers in particular have the power to put TQM at the top priorities of the organization **(Hmood , 2000).** According to **Townsend & Gebhardt (2006),** commitment is “the willingness to invest one's self; that is, your ego, time and effort". Top management must make a commitment to their employees and to capital investment when starting to implement TQM in an organization to create an organization with the culture, knowledge and equipment needed to serve its market. Top managers must commit themselves to a set of values that

continuously strengthens and encourages TQM factors with the existence of form of policies, support structure and individual responsibility **(Savolainen, 2000).**

Every person within the organization from the low level to high level (the president of the board of directors) should be committed entirely to TQM and should make it a permanent part and parcel of the culture of the organization or company **(Savolainen, 2000).**

The successful implementation of total quality management requires more attention and support of top management for all administrative levels of the organization by giving more flexibility to the various departments to solve the problems they face and find effective communication ways between the various sections in the company, and monitor the course of action of quality programs to reach the strategic goals **(Judeh , 2006).**

Emerald (2005) also emphasized that quality leadership by top management is the basis for proper implementation of TQM in order to achieve customer satisfaction, quality product, continuous improvement and job satisfaction.

In order to achieve TQM, the top managers should clearly define the quality goals, and set quality as a priority when allocating adequate resources, and evaluating employees based on their performances **(Minjoon et al. 2006). Pearson et al. (1995)** also pointed out that managerial leaderships require management at all levels. They should shift

their role from authoritarian decision makers to coaching facilitators. In the same line, **Emerald (2005)** stressed that the commitment to quality strategy is reflected in the organization's mission, goals and objectives, policy and strategy, so the top management initiative has to prepare documents relating to the initial strategy of quality and distribute them to all members of the work.

The degree of support that management takes in the TQM implementation is very critical to the success of TQM implementation. TQM cannot be fully implemented if there is a lack of commitment from top managers in TQM. Implementation will enable the employees to follow their direction and way of working **(Pheng and Jasmine, 2004).** Commitment of top managers in TQM implementation will enable the employees to follow their direction and way of working. Many organizations have failed in implementing TQM because of the reluctance of top management in delegating some authorities and empowering employees **(Minjoon et al. 2006).**

According to management research, the success of any effort aims at changing the operational philosophy of the organization, and this is strongly linked to the top management commitment. It is very arduous to change the behavior of the members of the organizations without the support of top management **(Ahire, et al. 1996).** It has been argued that change will be more successful if the top management is committed to the change **(Senge, 1990).** It is also noted that top management plays a critical

role in shaping the success of strategic changes in organizations. **(Pearson et al. 1995).** Top management plays a decisive role in paradigm shifts in critical areas such as quality management, product development and innovation **(Hoffman and Hagerty, 1994).**

Clearly, the majority of literature on TQM and other organizational studies reached the same result. That is, the leadership is a key element in successful implementation of large-scale change **(Norman & Keys, 1992).** The leader sets the vision and defines the basic goals, and parameters or requirements of TQM **(Packard, 1995).** In the same way, **Kanji (1998)** put a model called, 'Kanji's Business Excellence Model (KBEM)'. KBEM is based on Kanji's pyramid principles of TQM, and links together the prime leadership, the four principles (Delight the Customer, Management by Fact, People-based Management and Continuous Improvement), and the eight core concepts, to provide forces of excellence in an organization (see Figure 1). The primary focus of KBEM is on measuring customers, employees and shareholders' satisfaction simultaneously within an organization in order to obtain a comprehensive evaluation of the organizational performance. Specifically, KBEM can be used to measure the Business Excellence Index (BEI) in order to show how well different areas of the organization – leadership, continuous improvement and other TQM principles – are performing, in different geographical areas and, more importantly, over time.

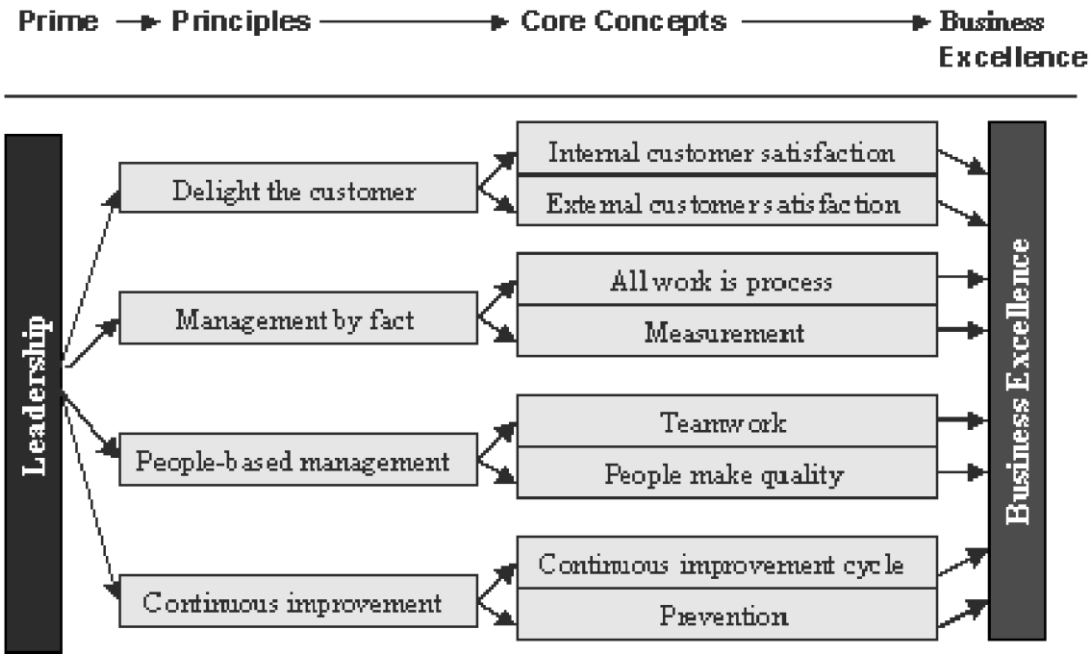

Figure 1: Kanji's Business Excellence Model (KBEM). Source: www.gopal-kanji.com/kbem (accessed May 2004).

Soltani (2005) pointed out that KBEM represents a significant addition not only to the TQM literature but also to general organizational writings for two reasons. First, previous research attempts to treat leadership/top management as having little impact on organization's success and it can not be considered always valid and reliable. But Kanji's approach to business excellence explicitly considers leadership as the prime for business excellence. Second, previous research has either failed to take into account linkages between top management and other concepts of TQM or clarify the nature of the role of top management as a fundamental driver of business excellence.

Olorunniwo and Udo (2002) clarified three main aspects that support top management and these are considered an important factor in TQM practice:

1. Showing interest by participating in team meetings, willingness to spend time with people and listen to feedback as well as willingness to help solve problem.

2. Providing necessary resources, including training and other crucial resources.

3. Providing the organization with a strong leadership by helping it to translate plans into action, make regular revision of project programs and official commissioning of project leaders and project teams.

According to **Kanji (1998),** top management must be actively involved in creating a Total Quality Culture (TQC) with a clear vision through the following leadership roles:

1. Define mission, vision and goals that promote a quality culture.
2. Establish a set of shared values.
3. Define a quality strategy.
4. Better coordinate the use of resources in order to improve financial performance.
5. Establish goals and systems to enhance customer satisfaction.
6. Establish effective information systems and use objective data in the decision process.

7. Promote the development of human resources, invest in training and education and recognize quality achievements.

8. Communicate, define and motivate continuous improvement.

- **Employee participation and development**

A number of authors have noted that there is a tradition in Western economies based on encouraging employee involvement and participation in many different forms/ways. One of these is employee empowerment. This trend made first appearance in the 1990s in response to an increasingly complex and competitive external environment **(Siegall & Gardner, 2000).**

Conger and Kanungo (1988) defined empowerment as "a process of enhancing feelings of self -efficacy among organizational members through the identification of conditions that foster powerlessness, and through their removal by both formal organizational practices and informal techniques of providing efficacy information". **Lawler (1994)** referred to employee empowerment as "one of the most important tenets of TQM". **Bowen and Lawler (1992)** defined empowerment as "sharing with front-line employees information about an organization's performance".

The emergence of TQM helped in achieving employee empowerment and participation because it aims at developing a quality culture, whereby everyone in the organization shares a commitment to continuous

improvement aimed at customer satisfaction **(Wilkinson & Brown, 2003). Kanji and Asher (1993)** defined TQM as "a process of management based on people and emphasized the importance of people in achieving quality". **Dale and Cooper (1993)** have described employee involvement in an organization practicing TQM as "obtaining employee participation and interest in the process of improving quality".

TQM improving employee satisfaction and loyalty leads to higher service productivity and profits. Employee satisfaction and loyalty constitute crucial factors for the capability of service organizations to respond effectively to customer needs **(Silvestro, 2002). Chang et al. (2010)** cited numerous research which indicated that employee satisfaction is positively related to employee loyalty to their companies. The results of this research suggests that the organization must satisfy employees to make them loyal. TQM empowers employees by delegating responsibility for functions that were formerly within management's domain, to institutionalize empowerment on a more or less permanent basis **(Hill & Huq, 2004).**

It is well known that front-line staff know the needs of customers more than bosses, and when staff is available for enough power to accomplish their work entrusted to them, the results appear better and faster than the intervention managers in the delivery processes **(Al-Ali, 2010).** The success of TQM requires providing all employees with the skills and capabilities necessary for TQM implementation and succession, so it must work on the training of this personnel by providing training programs that enable them

to deliver the information and skills positively, to reflect on the performance of individuals. The process of training must be based on scientific grounds to improve the performance of individuals **(At-Ta'i, 2010).**

Research indicated that training has a positive impact on employee productivity, which leads to higher levels of employee satisfaction **(Choo & Bowley, 2007).** Employee training provides opportunities for the employees to improve their knowledge and skills to achieve individual growth and development. Numerous studies observe that workers who receive training report higher levels of job satisfaction than those who do not, and the development of competencies through various training programs has a positive impact on employee satisfaction **(Saks, 1996).** Many benefits can be achieved through a training process, such as facilitating the updating of skills, motivation, higher productivity, knowledge transfer of their employees, increasing professionalism and increasing employee commitment and satisfaction to the organization. In particular, employee training increases an employee's ability to perform tasks. The lack of training has been attributed to shorter employment tenure, frustration and job dissatisfaction **(Chang et al. 2010).**

According to **Townsend and Gebhardt (2006),** "To win, one needs to keep score, but the way one keeps score defines the game". In other words, if top management wants employees to behave in a certain way, it should measure and reward that behavior to reinforce the required behavioral

patterns and support the organizational strategies. Numerous research emphasizes the reward systems. It suggests combining participation in decision making and democratic supervision with skills and organizational performance. The organization must study some plans that are associated with employee involvement efforts and reward system as gain-sharing plans, profit-sharing plans, and employee ownership plans **(Lawler, 1994).**

- **Continuous improvement**

Continuous quality improvement is an important issue in the field of organizational management. Continuous quality improvement has its roots in total quality management according to **Dooley and Johnson (2000).** Numerous studies have made considerable progress in explaining how TQM could benefit continuous quality improvement **(Lai et al. 2009).** TQM emphasizes that any customer-oriented activity depends on continuous devotion to quality improvement throughout a whole company. On the basis of TQM, quality improvement has an impact on financial performance of the companies **(Wayhan & Balderson, 2007).**

Continuous quality improvement is essentially an agreed upon company-wide strategy which consists of integrated and sequential steps that help track progress towards improving business processes **(Dassisti, 2010).** Continuous quality improvement focuses on small and incremental changes that modify with time and create a large and cumulative effect and radical breakthroughs. It is sometimes described as a bottom-up approach – a form

of ‘learning by doing’ (**Dooley and Johnson, 2000)** that maximizes competitiveness of an organization through the continual improvement of the quality of its products, services, people, processes and environment **(Conca et al. 2004).**

Continuous improvement strategies are "the recognized way of reducing waste by focusing on small incremental changes" (**Singh & Singh, 2013).** Most of the manufacturing industries need to adopt such strategies in their manufacturing environment to respond to rapidly changing customer needs, desires and tastes, and to compete in this competitive environment because such strategies ensure that the manufacturing processes become leaner and fitter, and also eliminate waste where value is added **(Singh & Singh, 2013).**

Continuous improvement strategies are based on making small changes on a regular basis—reducing waste, continuously improving productivity, safety, and effectiveness and making significant reduction to production costs **(Williams, 2001).** The companies must seek new methods to remain competitive and flexible, simultaneously enabling them to respond quickly to the new demands **(Singh & Singh, 2013).** The effective integration of improvement function with engineering and other manufacturing functions in the organization can help save huge amounts of time, money and other useful resources in dealing with reliability, availability, maintainability and performance issues **(Moubray, 1997).** The continuous improvement strategies constantly seek to identify and implement ongoing enhancements

in a firm's products, services and processes. Companies are therefore applying these strategies to enhance their systems and operations **(Reid, 2006).**

Ongoing improvement works towards achieving the customer requirements through a variety of processes to reduce or limit the activities that do not add significant value in the production of goods and services **(Singh & Singh, 2013).** The basis of continuous improvement is to reduce the differences, and work to avoid defects **(Williams, 2001).** Business organizations need continuous improvement in all their operations, activities and products, and must not forget that the customer needs and expectations are constantly changing, and the external environment changes over time; therefore, the organization should improve and develop products and processes in line with the change in the external environment **(Al-Ali, 2010).**

TQM encourages employees to make improvements to the regulatory systems, processes and procedures, and to provide suggestions and initiatives to effect change in the organization **(Lai et al. 2009).**

Opportunities for improvement comes from many sources, such as the ideas of staff, operations research, and development. The information is obtained from customers, competitors, the Internet and others **(Al-Ali, 2010)**. Improvements take several forms: providing new products and services to customers, improving responsiveness to customer complaints,

improving productivity and increasing the effectiveness of the exploitation of resources, providing machinery and equipment and advanced technology constantly. All this will increase the level of product quality, and compare its internal operations with more successful companies' operations **(Al-Ali , 2010)**.

- **Customer - driven quality**

Service quality is closely related with customer satisfaction. A number of researchers have explained that the purpose of measuring service quality and customer satisfaction is to provide information to enhance customer loyalty and improve overall financial performance of the company. Besides, many researchers have established a relationship between customer perceptions of quality and satisfaction and profit **(Anderson et al. 1994).**

Customer satisfaction is generally defined as "a post consumption evaluative judgment concerning a specific product or service" **(Gundersen et al. 1996).** Customer satisfaction can be conceptualized in two perspective transaction-specific satisfaction and cumulative satisfaction. Transaction-specific satisfaction is defined as "assessment on the experience and consumer's reactions to a specific company's encounter", whereas cumulative satisfaction refers to "customers overall evaluation of patronage experience from inception to date" (**Tahir & Abu-Bakar, 2007).**

Customer expectations are attributes of performance reference levels which a customer uses when carrying out perception and evaluation processes of individual attributes. Individual attribute evaluations are collected to form evaluated aggregate quality, which determines customer satisfaction **(Golder. et al. 2012).**

TQM believes that the customer is the one who sets the criteria that should be available in products owned, and not organization. It also focuses on the overall quality management to satisfy all customers - including internal customers - and the development of strong partnerships on long-term does not depend on lower prices with vendors (**Evans & Dean, 2003**).

Customer satisfaction is a primary goal of any organization in terms of both public services as in the public sector or producing goods, as in the private sector, and quality is defined as meeting or exceeding customer expectations. The success of any organization depends on the organization's belief and awareness of the efficient service delivery and high efficiency (**Evans & Dean, 2003**).

Finally, to meet customer's needs, there must be a channel of communication between the organization and its customers, as well as presence of a system to collect systematic data about customers' needs and to receive customer complaints to study, resolve, and avoid them in the future and take the opinions of customers when developing new products **(At-Ta'i, 2010).**

- **Suppliers participation**

In recent decades the supply chain has experienced a major international expansion as a result of market globalization and the increase in competition. Therefore, several authors point to the need for a good SCM as a key tool to remain competitive in the global race **(Childerhouse and Towill, 2003).** And that is by improving product performance and service while simultaneously reducing cost **(Davis, 1993).** Thus, the importance of SCM appeared in several different areas such as logistics, marketing, internal organization or integrated information management **(Kaynak & Hartley, 2008).**

Purchasing function is a key business process within SCM. It is typically responsible for selecting suppliers, managing long-term contracts, monitoring supplier performance and maintaining close and effective supplier relations. All these activities are also part of the competence of TQM; therefore, the integration of TQM and SCM is crucial to company competitiveness **(Kaynak & Hartley, 2008).**

The purchasing function has recently faced significant challenges through the process of supplier selection , so the following elements are likely to be important in considering new or existing suppliers in the companies **(Handheld, et al, 1999):**

- Targets: Is the supplier capable of working within reasonable targets regarding cost, quality and performance of the product?

- Timing: Will the supplier be able to meet the product development schedule?
- Ramp-Up: Will the supplier be able to increase capacity and production fast enough to meet volume production requirements?
- Innovation and Technical: Does the supplier have the required engineering expertise and physical facilities to develop an adequate design, manufacture it, and solve problems when they occur?
- Training: Do the supplier's key personnel have the required training to start-up required processes and debug them?

All of the above criteria must be tied into the evaluation and measurement system. Therefore, in order to develop a comprehensive supplier assessment, it should answer the following questions **(Handheld, et al, 1999):**

- What is the likelihood that this supplier has the ability to bring the product to market?
- How does this risk compare to other potential suppliers (if there are others)?
- At what point are we willing to reverse this decision if we proceed, and what are the criteria/measures for doing so?

- What is the contingency plan that takes effect in the event the supplier fails to perform?

The choice of supplier, whether the supplier is internal as a department personnel or external as financiers and contractors, is a decision made by the whole team, but not everyone on the team necessarily gets directly involved. A smaller group within the commercialization team may make a recommendation. Following the recommendation, the company audits the supplier's facilities for contamination, environmental compliance, quality, technical capability, cost, quality, and location, all of which are weighted by commodity **(Handheld, et al., 1999).**

Suppliers have a large and direct impact on the cost, quality, technology, and time-to-market of products. So many different companies stimulate their engineers to learn the systems, procedures, and processes of suppliers in order to improve communication, reduce errors, and understand capabilities. Now many companies are working to involve suppliers in new product, process and service development to provide a significant results **(Asanuraa, 1996).**

The relationship between companies and suppliers must be based on participation and cooperation to achieve common interests between them for a long period of time, so companies should preserve and not change them, because this may adversely affect implementation of the quality strategy, which is based on one of its principles: the existence of a strong

relationship between the organization and suppliers is stable and steadfast, and is based on honesty and mutual trust (**Al-Azawi, 2005**).

- **Organization culture**

The organization culture is a framework which defines the system of values dominant in the organization that enhances the quality, drives toward continuous improvement, encourages development and reduces resistance to change. Many researchers have defined organization culture. **Cameron and Quinn (1998)** defined organization culture as "the taken-for-granted values, underlying assumptions, expectations, collective memories, and definitions present in an organization; it reflects the prevailing ideology people carry inside their heads; it conveys a sense of identity to employees, provides unwritten and, often, unspoken guidelines for how to get along in the organization, and enhances the stability of the social system that they experience". **Hofstede (1991),** defined organization culture as "holistic, historically determined, related to things like rituals and symbols, socially structured, created and preserved by the group of people who together form the organization, soft and difficult to change".

All organizations have individual and unique cultures as well as subcultures that determine all actions, operations and relationships in the organization. **Schein (1992)** has identified three levels of culture; artifacts, values and beliefs, and underlying assumptions. The underlying assumptions that make employees accept TQM are a major factor in the

success or failure of the program since culture helps in acceptance or rejection of any change in the organization's culture .

The implementation of TQM practices and organization culture are mutually dependent. Organization culture constrains the way TQM practices are implemented in organizations **(Yeung, et al, 1991). Kanji and Wallace (2000)** state that "creating a quality culture within an organization is one of the crucial conditions for the successful implementation of TQM". Furthermore, **Scarnati and Scarnati (2002)** pointed out that "the essence of every quality organization is its human resources and the company culture". A workforce that is not quality oriented will resist changing to a quality conscious culture and therefore it is important to have a culture that is focused on producing quality goods and services to ensure the successful implementation of a TQM program. Thus, TQM requires a culture that is flexible and ready to change whilst working to continuously improve its products and services **(Kanji & Wallace, 2000).**

Philip Crosby argues that "changing a culture is not a matter of teaching people a bunch of new techniques, or replacing their behavior patterns with new ones. It is a matter of exchanging values and providing role models. This is done by changing attitudes"**(1986).** The cultural change is achieved by changing people's mindsets and by shifting responsibility of quality from a functional department towards that of individuals **(Yong & Wilkinson, 2001).** Employees have to be taught new ways of working in

an environment focused on quality and any deviations should not be supported. Once a quality conscious culture is established, it generally becomes pervasive and changes very slowly, if at all **(Huq & Martin, 2000).** Therefore, building a culture of quality means modifying the organizational culture to fit with the environmental variables internal and external to the organization. This helps to achieve its mission and new strategy and make it able to solve problems effectively when they occur.

An TQM culture is characterized by an orientation towards the consumer and it encourages employees to become independent, creative, and it also encourages them to innovate new ideas that improve quality and increase productivity, and strengthen the organizational affiliation and loyalty among employees **(Al-Ali , 2010)**.

- **Using statistical control and feedback**

Statistical process control (SPC) is one of the most effective tools of TQM and is used to monitor and minimize process variations **(Dale, 2003).**

Statistical control system is used for control of processes quality within the organization, so if employees are to identify and correct quality problems, they need proper training. They need to understand how to assess quality by using a variety of quality control tools **(Al-Ali , 2010).**

The use of quality tools in the organization reveals the quality problems and helps to solve them consistently. For this reason, quality control

programs in the company must use appropriate measurement tools during the manufacturing process, and the samples should be taken from the production stage, during the manufacturing process, and the final product stage to make sure they are in conformity with the required specifications according to the examination system in the laboratories of the company **(Montgomery, 2005).**

There are seven tools of quality control **(Montgomery, 2005; Asaka & Kazuo, 1990)**; they are easy to understand, yet extremely useful in identifying and analyzing quality problems. Sometimes workers use only one tool at a time, but often a combination of tools is most helpful. These tools are as follows:

1. Cause-and-effect diagrams. These are charts that identify potential causes for particular quality problems. They are often called fishbone diagrams because they look like the bones of a fish (**Montgomery, 2005**). The cause –and- effect diagram is a graphic showing of the relationships between a given fact and the causes that produce it. It helps to find the true causes by representing them in an ordered and complete way. It serves to obtain an improvement of the process and products to face the problems and to obtain a cost reduction **(Sarazen, 1990).** It is an excellent graphical tool for team working, allowing the group to see at once the relationships between causes **(Mears, 1995).**

2. A flowchart: This is a schematic diagram of the sequence of steps involved in an operation or process. It provides a visual tool that is easy to use and understand **(McQuater, et. al., 1995).** In quality management, they are used to describe processes during continual improvement efforts and also in other contexts. Flowcharts provide valuable documentation and show the interrelatedness of the steps to completion. Flow charting is particularly useful in the service industries, where the work process involves unseen steps. It is useful for teams to know how to improve their work processes **(Draper & Ames, 2000).**

3. A checklist: This is a list of common defects and the number of observed occurrences of these defects. It is a simple yet effective fact-finding tool that allows the worker to collect specific information regarding the defects observed (**Asaka & Kazuo, 1990**). The checksheet is a simple way for a team to collect data and begin problem solving; it provides structure for data **(Mears, 1995).**

4. Control charts: These are charts that are used to evaluate whether a process is operating within expectations relative to some measured value such as weight, width, or volume (**Asaka & Kazuo, 1990**). Control charts are the most widely applied SPC tools used to reveal abnormal variations of monitored measurements, as well as to locate their assignable causes **(McQuater, et. al., 1995).** Common causes are considered to be due to the inherent nature of normal processes. Assignable causes are defined as abnormal shocks to processes, which

should be identified and eliminated as quickly as possible. When an abnormal variation is signaled by control chart, quality practitioners or engineers search for assignable causes and take the necessary correction and adjustments to bring the out-of-control process back to the normal state **(Sarazen, 1990).**

5. Scatter diagrams: These are graphs that show how two variables are related to one another. They are particularly useful in detecting the amount of correlation, or the degree of linear relationship, between two variables (**Asaka & Kazuo, 1990**). They can also be used to make predictions about future performance using knowledge of the past **(Mears, 1995).**

6. Pareto analysis: This is a technique used to identify quality problems based on their degree of importance. The logic behind Pareto analysis is that only a few quality problems are important, whereas many others are not critical. **(McQuater, et. al., 1995).** It helps to show the priorities in order to act in an objective way and with consensus. In this way, it is useful to develop a mentality suitable to understanding complex situations and to focus on the true important factors. The techniques allow one to see at a glance which items account for most cost or failure **(Sarazen, 1990).** Their use gives rise to the 80-20 rule according to which 80% of the problems stem form 20% of the causes.

7. A histogram: This is a chart that shows the frequency distribution of observed values of a variable. It is used when the data is spread over a continuous range **(McQuater, et. al., 1995).** Histograms are most effective when an institution needs to identify and display the distribution of data through bar graphing the number of units in each category. The purposes of histogram are to visually determine the central tendency, to visually determine the variation, and to visually determine the shape of the distribution (**Asaka & Kazuo, 1990**).

Quality tools play important roles in the quality improvement process. **Juran (1998),** said that "the quality tools should be integrated with a structured quality improvement process. Different tools have different functions in the quality improvement process". The quality tools allow the continuing flow of information and feedback from the production and performance of staff, and that helps to raise the quality levels and increase the potential for creativity and excellence(**Montgomery, 2005**).

Dale (2003), also defined the roles of tools and techniques in quality management. The main roles include the following:

1. Summarizing data and organizing its presentation.
2. Collecting data and smattering ideas.
3. Identifying relationship.
4. Discovering and understanding a problem.

5. Implementing action.
6. Finding and removing the causes of the problem.
7. Selecting problems for improvement and assisting with the setting of priorities.
8. Planning.
9. Performing measurement and capability assessment.

Dale (2003) also suggested that there are two factors about the tools which should be remembered: "The first is without a strategy and plan; the implementation of any tool and technique in isolation will not get the long-term benefit; the second is, there is no one tool or technique which is more important than others because the statistical tools play an important role at some point of the quality improvement process".

2.6. Quality Gurus

Recently many thinkers have worked to establish and develop the concepts of quality. Their great ideas have been adopted by some countries and institutions. Deming, Feigenbaum, Ishikawa, Juran, Tajuchi, Crosby and others are the most prominent of these pioneers **(Zadry & Yusof, 2006; Kanji & Wallace, 2000**). Every one put the intellectuals' form for the application quality; so total quality is not just one individual concept, but it is a number of related concepts pulled together to create a comprehensive

approach to do business. The three major contributors were W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby. To these three, many would add Armand V. Feigenbaum and a number of Japanese experts, such as Shingeo Shingo **(Goetsch & Davis, 2006; Chang, et al. 2010).**

2.7. Cost of quality

The costs of achieving an effective program of TQM includes three types of costs **(Al-Ali , 2010; Anderson, et al. 1994; Ross, 2000)** (Figure 2).

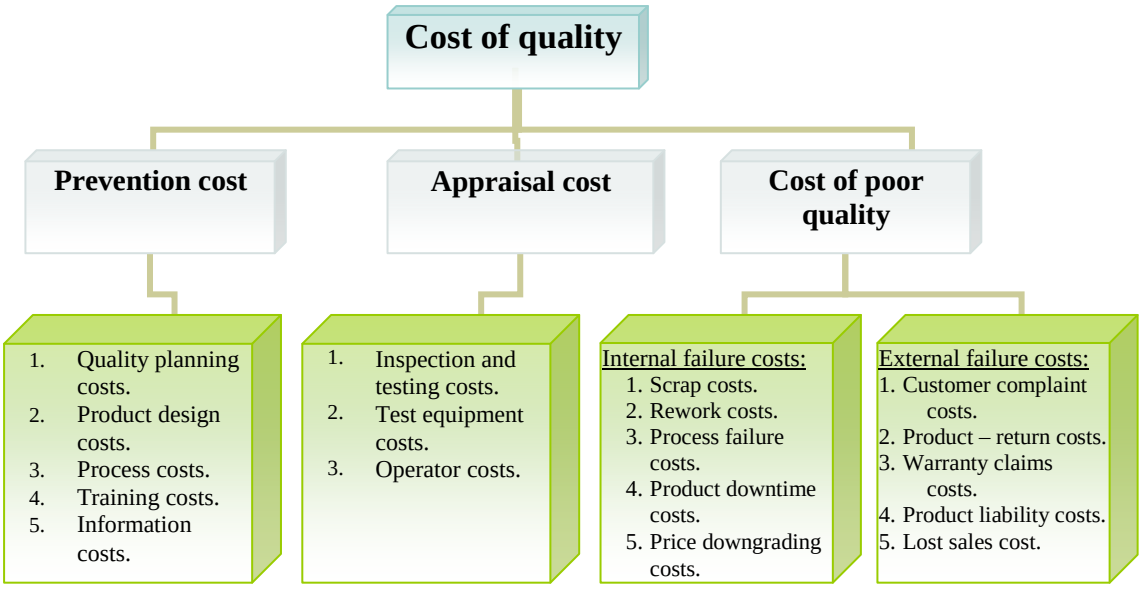

Figure 2: Cost of quality

2.8. Differences between traditional management & TQM

Although many organizations are still working by traditional administrations, the trend towards TQM has increased in recent years. Many organizations are seeking to adopt a management style that ensures

it to stay and continue to improve productivity and increase their competitiveness in the market (**Ross, 2000)**.

The system of total quality management was found after a very long time of research and studies to try avoiding the shortcomings and mistakes that occurred with traditional management. The following table shows the differences between traditional management and total quality management, (Table 2.2) **(Judeh , 2006)**.

Table 2.2: Differences between traditional management and total quality management

No.	PRINCIPLES OF TQM	TRADITIONAL QUALITY MANAGEMENT
1.	Focus on customers	Focus on rules isolated individuals
2.	Team collaboration	Isolated individuals
3.	Work seeking vision of group or organization	Work seeking individual's purposes
4.	Systematic continuous improvement of process	Solution of single problems or there is no improvement
5.	Systematic collection and usage of empirical data	Decisions are made referring to feelings or opinion
6.	Looking for external information	Referring only to internal information
7.	The criticism is not avoided	Rejecting the criticism as wrong
8.	Workers are conceded a right to decide	Individuals wait for explanations how to do the work
9.	Prevention	Costs of repairing
10.	Horizontal and decentralized organizational structure	Vertical and centralized organizational structure
11.	Achieve customer satisfaction and meet their needs	Maximize the return on investment and achieve the highest possible profit
12.	Balance between short-term and long-term plans	Focus on short-term plans
13.	Leadership characterized by democratic, participation and the devolution of powers	Leadership characterized by authoritarianism and issuing administrative orders to implement without objection

2.9. Quality definitions as ISO standards

There are several global standards of service, with the prominent concern for improving the services provided to customers and keeping pace with rapid developments in all areas, and strengthening capacity to implement the concepts of modern management **(Alwan, 2005)**. During the past few years, there has been a significant growth in the standards are that issued by agencies specialized in standardization in the economic field. This growth of standardization has been largely due to the marked process of economic globalization and integration that western economies have experienced throughout the last two decades **(Marimon, et al., 2009).**

Such standards include International Standards Organization (ISO);these standards and procedures are for the control and quality assurance.

ISO 9000 standards are a generic standards of quality management systems; they are designed to help organizations to ensure the meeting of the needs of customers and other stakeholders**(Alwan, 2005)**.

Internalization of ISO 9000 practices covers aspects such as training of employees, organization-wide communication of policies, extensive documentation of processes and the use of the ISO 9000 practices as a basis for continuous improvement **(Marimon, et al., 2009).**

Firms adopt ISO 9000 standards for two important reasons. First, ISO 9000 standards provide a set of generic guidelines that potentially result in

improved processes. These standards give a high degree of emphasis to documentation, which enables better communication across an organization. Second, ISO 9000 certification also positively reflects on the quality image of a firm **(Williams, 2004).**

The ISO 9000 series serves as a reference model for the establishment of a quality assurance system in corporations. Since the end of the Second World War, a large number of models or quality assurance standards have arisen. Thus, in order to control the rampant development of different quality assurance standards, the British Standards Institute developed the BS 5750 series in 1979, later to be used as the basis for the structure of the ISO 9000 standards series **(Marimon, et al., 2009).** Indeed, ISO 9000 standards were established for the first time in 1987. In 1994, these standards were revised. During the last quarter of 2000, a new review was carried out in which an attempt was made to highlight the orientation towards integrated quality management and the excellence of the series. The ISO 9000:2000 series comprises three standards. Only one of them, ISO 9001:2000, is certifiable. All companies are certified by demonstrating that their efforts comply with the requirements specified in ISO 9001:2000**(Marimon, et al., 2009).** In recent years, several research studies have argued for a greater integration of ISO 9000 with TQM or continuous improvement. This integration has been reinforced with the revised version of ISO 9000:2000, which requires firms to shift from a compliance attitude to an improvement attitude. This is reflected in the

audit process which now explicitly evaluates the level of continuous improvement within the organization **(West, 2002).**

ISO issued a new version called ISO 9001: 2008.This standard is very strong and comprehensive. "It contains a fascinating documentation system that enables the organization to record day-to-day operations in a manner that not only meets customers' requirements but also paves the process for continually improving products or services to exceed customers' expectations. This results in a powerful combination of documentation along with the remarkable number of continual improvement approaches included in the standard, such as internal quality audits, corrective and preventive action systems, and data analysis. Complete implementation and serious adoption of this international standard definitely leads organizations to satisfying external customers as well as other stakeholders" **(El Tigani, 2012).**

ISO issued new standards for International Environmental Management System called ISO 14000. This is related to environmental protection aimed at reducing waste and pollution according to the environmental prevailing laws (**Faergemand, 2008)**. With regards to ISO 14000, it is important to point out that this is a standard establishing a reference model for implementing a company environmental management system, defined as that part of the global management system that describes the organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for preparing, applying, reviewing and

maintaining the company's environmental policy. The ISO 14000 standards were published in September 1996 (although some companies had already been certified in accordance with a previous draft). The last review of the standard dates back to 2004. A transition period that ended in May 2006 was established. From that point onwards, the ISO 14001:2004 standard has been the only one acknowledged by the IAF (International Accreditation Forum) member states **(Marimon, et al., 2009).**

In 2005, ISO issued another new standards, called ISO 22000, that specifies requirements for a food safety management system where an organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption **(Faergemand, 2008)**.

ISO 9000 certification brings recognition and credibility to the organizations and provides a structure on which a total quality management (TQM) system can be built although an organization can adopt the TQM system without getting the ISO certification, by setting their own standards **(Al-Ali , 2010)**.

Furthermore, there are some other differences between ISO & TQM as shown in Table 2.3.

Table 2.3: Differences between ISO and TQM models

	ISO System	***TQM System***
1.	It can be considered a preliminary stage to reach TQM model.	It can be considered more general and comprehensive model.
2.	It focuses on the technical side.	It focuses on the social and human side.
3.	It does not focus on the customers; it deals with him indirectly through the application of quality standards in the product or service provided to customer(**Al-Ali , 2010**).	It focuses on internal and external customers, and handle it directly through working on field studies to meet their needs and desires, and work to satisfy them (**Al-Ali, 2010**).
4.	Companies applying ISO are subject to periodic inspection and should make the modifications according to the International Organization for Standardization.	Organizations applying TQM have their own model, and could modify it as they wish.
5.	It is a standard of specific procedures and methods of work (**Al-Ali, 2010**).	Its main topics are continuous improvement and development (**Al-Ali , 2010**).
6.	The quality responsibility is adopted by the control department and quality assurance (**Alwan, 2005**).	The quality responsibility is adopted by every member in the organization (**Alwan , 2005**).
7.	It can be applied to specific sections, and not necessarily applicable to all levels of the organization (**Alwan, 2005**).	It is applied to all sections, departments and sections of the organization (**Alwan, 2005).**

2.10. Potential benefits of TQM

Many of the institutions that have applied the concept of total quality management TQM have achieved many successes in the field of production and services. That had an impact on other institutions that work on the application of this concept, in order to achieve sustainability and growth.

Table 2.4 shows benefits of applying TQM by industrial companies **(Oakland, 2003; Al-Lawzi , 2004; Talib, 2010).**

Table 2.4: Benefits of applying TQM

Areas	Benefits
1. Customers	* Meet the requirements of the customers.
2. Employees	* Involve all workers in the management of the enterprise. * Ensure that each individual knows his role and responsibilities. * Involve workers in the development and improvement process. * Raise and increase awareness of the quality of work and rules of the workers through their commitment to quality.
3. Services	* Ensure the quality of services despite the different types of workers due to differences in their environments.
4. Work System	* link parts of the organization and its work in line leading to discipline and commitment. * Help create a documented system to ensure performance in case an individual is absent or left the service. * Reduce administrative bureaucracy to a great extent and get rid of many of the recurrent procedures, which sometimes run into conflict with the commitment to the instructions of officials.
5. Quality System	* Reduce waste in the possibilities of the institution in terms of resources, and time. * Establish the image of the institution in the society and the obligations of quality systems in the services.

2.11. Common problems and mistakes when applying TQM

Several problems and mistakes might occur in the organization during the application of TQM. These mistakes may prevent the successful implementation of the TQM program, and may also prevent obtaining its benefits . Following is a summary of these problems and mistakes: **(At-Ta'i , 2010)**.

1. Imitate the experiences of other organizations without studying and analyzing their quality experiments and taking the successful methods only.

2. Accelerate the organization to achieve quick results without providing all materials necessary for the success of the TQM program.

3. Inconsistency between the sayings of leaders with their actions, making them lose credibility in front of the staff.

4. Believing in the importance of technology, rather than in the importance of human resources, because the success of the TQM program is taken only through the development of capable human resources to use technology skillfully to achieve the desired objectives.

5. Following the regulations, policies and routine procedures that are not consistent with the TQM program because they stand in the face

of employees' interaction with the TQM program and reduce the continuous improvement.

6. Lack of information provided to employees concerning achievements from the application of TQM, and this reduces the motivation and enthusiasm at work.

7. Administration's failure to listen to the opinions, desires, and problems of employees, suppliers and customers, as this reduces the success of the TQM program.

8. Neglecting the balance between long-term goals and short-term objectives because the application of TQM needs long-term commitment and not only gains in the short term.

2.12. Introduction to Palestinian chemical industry

2.12.1 Present situation of Palestinian chemical industry

The industrial sector in Palestine included 14,179 registered companies in the West Bank and the Gaza Strip **(PCBS, 2008).** The manufacturing industry accounted for 95% of them. The majority of these are small and medium family-owned businesses, and only about 100 of the manufacturing, mining and construction enterprises in Palestine had a workforce of more than 100 employees. The industry accommodated nearly 65.5 thousand workers, and their production was worth about 976.9 million US dollars, while the added value amounted to 367 million U.S

dollars. The fixed capital total gross formation topped 10 million US dollars, and depreciation of assets amounted to approximately 66.4 million US dollars**. (PCBS, 2008).**

The industrial sectors are represented by the Palestinian Federation of Industries (PFI) and include food and beverages, construction, stone and marble, pharmaceuticals, chemicals, metals and engineering, textiles, garments and leather, paper, printing and packaging, handicrafts, plastic and rubber, and furniture **(Palestinian Federation of Industries, 2009)**.

This research will concentrate on three sectors: pharmaceuticals industry, food industry, detergents and cosmetics industry. These industrial sectors are important because they directly affect human health and environment.

Table 2.5 shows some general information about the three selected PCS. (**Palestinian Federation of Industries, 2009**).

Table 2.5: General information about selected PCS (2009)

Sector / Industry type	No. of firms	Total investment (million)	GDP %	No. of employees	Market share %	Employee productivity ($)
Pharmaceuticals	6	90	<1	1,200	55	**44,000**
Food & Beverage	224	480	4.8	8,000	50	**28,000**
Detergents & Cosmetics	**55**	**NK**	**NK**	**825**	**35**	**NK**

According to Table 2.5, the pharmaceuticals industry is comprised of six manufacturers; four are located in Ramallah, one is in Beit-Jala, and one is in the Gaza Strip. This industry produced 1,118 medicines (mostly generics) according to the ministry's registry while the market registered about 4,500 medicines available in the pharmacies and hospitals. The total number of workers was about 1,200 workers. This industry is considered one of the highest in worker productivity ($44,000 in 2005). This industry is represented by a strong industrial association (**Palestine Trade Center & Union of Palestinian Pharmaceutical Manufactures, 2009).**

The second sector is the food sector. Growing rapidly, this sector had more than 1,600 working firms ,including bakeries. Excluding bakeries, the actual number of firms was 224 manufacturing firms including the large-scale milk cow farms (>50 cows). More than 150 of them were active members of the strong industry association. The large number of female cooperatives working in food processing sector and traditional sweets and confectionary makers were not included. The labor force was estimated at 8,000 worker. The industry is spread all over the West Bank **(Palestinian Enterprise Development. Cluster Competitiveness Assessment, 2006).**

The third sector is detergents and cosmetics sector. Represented by an industrial association , it needs to be strengthened and institutionalized. The estimated number of regulated companies working in this industry was 60, five in cosmetics industry, five in the production of paints and inks and the remaining were working in the detergents production. The actual number of

producers (unregulated) was more than that. Some factories produce both detergents and cosmetics. The average number of workers in these firms was estimated at 15, and the total work force topped 900 workers. The actual number is greater than this because of the non-regulated manufacturers. The industry is spread all over the West Bank (**Palestinian Enterprise Development. Cluster Competitiveness Assessment, 2006).**

2.12.2. Challenges and difficulties facing the three selected industries

There are many potential opportunities and reasons for investment in the industrial sectors. The most prominent reasons are the abundant human resources and the absorptive capacity of the market. **(Grant et. al., 1994)**.

This sector, however, suffers from a number of obstacles; the major ones are the political instability and restrictions on movement. Israel has pursued a policy of closing the border crossings, and external ports that connect the Palestinian territories with the outside world and with Israel. This is in addition to the fragmentation of the Palestinian cities and their isolation from each other. Also it has prevented tens of thousands of workers from reaching their places of work in various economic enterprises. Lastly, there is a lack of competition with the Israeli products, especially in light of openness of the global economy **(Ghneim, 2010)**.

Emergence of the family-oriented nature of the Palestinian industry, and the small size of the industrial enterprises have also played a role in shaping this industry. About 87% of Palestinian industrial institutions were

individually owned , and 90% of them employed fewer than five workers thus weakening their ability to face the changes on the local and regional levels. Palestinian industry still adopts old technology which has led to increased production costs, low quality, and therefore lack of sales **(Mass, 2005).**

Moreover, this industry has institutionalized problems in terms of financial management , poor and costly infrastructure, complexity and the high cost of the transactions of import and export. In addition, the high cost of transportation of goods and services and raw materials has resulted in a crisis to the Palestinian industry. The weakness of the financing programs by banks and credit institutions that support the industrial sector is considered one of challenges **(Paltrade , 2010)**.

There is a direct relation between the industrial sector and the agricultural production. The industrial sector declined because it was affected by the decline of the agricultural sector as a result of Israeli policies aimed at confiscating the Palestinian land for different purposes and in various ways **(Da'eeq , 2010).**

Although many Palestinian institutions have sufficient experience in terms of dealing with the market, the Palestinian industry is considered rigid and primitive, and suffers from many problems and imbalances. For example, there were no well- known brand names. The produced goods are not distinct and do not satisfy all customers, and they do not focus on the

narrow geographic areas during marketing and other problems **(Mass, 2005).**

It is clear that the selected chemical industries suffer from the unfair mechanisms of the local market. This has forced the incompatible illegal products to leave the market. The availability of raw materials is a real threat to the industry. Encouraging small companies to merge with others or form a strategic relationship with them can enhance their competitiveness in the market. Besides, this would minimize the negative effects of family business management and practices in the industry **(Paltrade , 2010)**.

2.13. Current quality management situations in the selected Palestinian chemical industries

The quality level of the Palestinian industrial production in general has improved greatly in the last decade. Its contribution to total GDP increased from 8% in the mid-eighties to 17% in the late-nineties, then dropped down during the first years of the second intifada and approached nearly 16% in recent years. During 2007, the industrial sector employed an average of 81,586 workers, an average of 13% of total Palestinian work force **(Palestinian Federation of Industries, 2009)**.

The following table presents some of the current important quality issues and difficulties faced by the selected chemical industry sectors.

Table 2.6: Current important quality issues in three selected Palestinians chemical industries (Palestinian Federation of Industries, 2009).

No.	Criteria	Pharmaceutical Industry	Food Industry	Detergents and Cosmetics Industry
1	Direct relationship to human health	Yes	Yes	Yes
2	Presence of adequate laboratories	Yes	Some	Some
3	Availability of qualified human staff	Yes	Some	No
4	Availability of raw materials	Yes	Some	Some
5	Availability of good training system	Yes	Some	Some
6	Acquiring ISO Certifications	Yes	Some	Some
7	Acquiring GMP Certifications	Yes	Some	No
8	Acquiring HACCP Certifications	No	Yes	No
9	Acquiring PS Certifications	Some	Some	Some

The local pharmaceuticals manufacturers covered only around one third of the Palestinian Essential Drug List (PEDL). So efforts must continue towards producing more drugs **(Massar , 2005)**.

The pharmaceuticals industry has invested heavily in building GMP quality facilities and systems. Over 50 million USD were spent between 2005 and 2010. Palestinian drug prices are more competitive than their Israeli and foreign counterparts and bonuses on Palestinian medicines surpass other rivals. Nevertheless, the availability of medicines is another noticeable competitive factor **(Palestinian Federation of Industries , 2010)**.

For the food industry, the major obstacle facing it is the current local market mechanisms. The weak inspections over the marketed products, their compatibility, validity, composition and source of origin created an unfair competition with the locally made products. Another obstacle was the then latest policies and decisions of the Ministry of Education. These threatened some of food companies.The ministry prevented the selling of many food products in school canteens that would harm the students' health during the school day because the products specifications failed to meet the required specifications. So the inconsistency and overlapping of ministries' procedures and powers confused the food sector companies **(Massar, 2005)**.

Food products are directly related to human health and safety; hence they deserve special attention in terms of quality assurance and quality control. Short expiry dates are another factor concerning quality. The accumulated experience of the industry helped in the consolidation of quality culture. The public awareness at the consumer's side and the severe competition has created a challenge for continuous improvement of quality. Many firms

have acquired the necessary certifications of ISO versions and HACCP. About 95% of food stuff is covered by the technical specifications of the Palestinian standards. Many firms have also acquired the necessary national certificate, PS, and the international HACCP, ISO 22000 standards. Halal food stuff is a growing business; the sector has the potential to produce according to Halal certification. Fair trade certification is another example of increase of the quality and hence the sales **(Palestinian Federation of Industries , 2010; Sinokrot, 2009).**

Pertaining to the detergents and cosmetics sector, it lacked adequate technical knowledge and expertise in products such as washing powders and solid soaps. Developing the existing packing and packaging was an issue that had to be handled with special care (**Palestinian Federation of Industries, 2009**).

Detergents and cosmetics industry is a quality demand. Quality would help increase the fair competitiveness of the locally regulated licensed industries. ISO certification could suit 2-3 manufacturers, but all need to follow certain documented procedures in manufacturing to maintain quality and consistency **(Palestinian Federation of Industries , 2010)**.

Some of the sector branches depend totally on raw materials from Israel while others depend partially on Israeli suppliers. Several raw materials are prohibited from entering the country for security concerns; this is a real threat to the industry **(Ghanem , 2010)**.

Laboratory testing and facilities are very important for the survival of the industry; it needs high attention and development. Quality management systems, manufacturing systems and quality assurance are of great importance to the sector. Promotional campaigns and tools along side with management and technical training would be an important asset to the industry (**Palestinian Federation of Industries, 2009**).

2.14. A proposed framework for application of TQM in PCS

TQM is not a radical solution to solve all company management problems, or a quick and magic method that can change the old and solid traditional culture to a free culture that is able to adapt to the new changes by applying it in a short time period, as quality circle or other management techniques; also it must stressed that TQM is not a public treatment but it is a management style that is closest to success.

TQM is considered as a commitment to innovation and development and continuous improvement, where it can be considered as the success of the application of this new administrative approach in different organizations. This depends on the extent of the participation and contribution of all members of the organizations to its activation, and the central role of all these efforts is based on the leadership of the organizations.

Figure 3 suggests a framework for application of the stages of TQM system in the PCS: adoption of this idea, working on its dissemination, and raising the level of performance and productivity in the PCS.

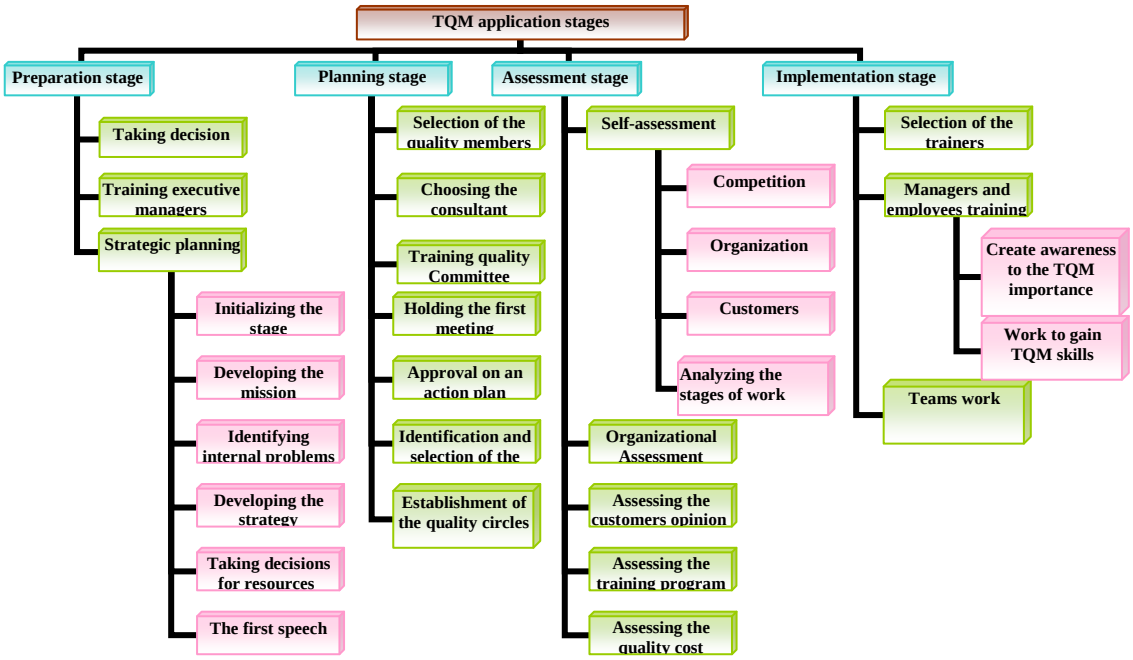

Figure 3: TQM application stages

2.14.1. TQM application stages

There are four stages to achieve a successful approach in TQM in the various organizations and plants. **(Ibn Eishawi, 2006;Al-Lawzi , 2004).**

2.14.1.1. Preparation stage (zero stage)

The successful implementation of TQM system starts with the beginning of this stage; it has been called as zero stage because it precedes the construction stage, and it is one of the most important stages in the application process, where this stage starts by re-formulating the vision, policies and objectives of the organization and outlining the future course of action and procedures. This stage ends with an obligation to allocate the necessary resources for planning to apply TQM. In this stage, it must make

sure that the team is able to perform tasks for application of TQM, in terms of skills, competencies and training.

This stage includes a set of steps:

1. Decision to apply TQM: In this step, the directors decide on their interest to apply TQM system, which requires having positive attitudes towards this approach.

2. Training executive managers on TQM: This training includes necessary aspects of the TQM, where the functional managers are subjected to the initial training of TQM; it is preferable to train all managers at one time to begin organization of their thoughts on the application of total quality to ensure maximum interaction and coordination among them.

The Palestinian chemical organizations can train the production manager, quality manager, laboratory director, administration technical manager, and research and development manager. The training courses could be held in the chamber of industry and trade or any other suitable place.

3. Strategic planning for TQM: the strategic planning starts to prepare for the next stage, and to think and predict the future scenarios, and take into account the nature of the organization's work and the strategies to be followed to achieve the long-term goals. After that,

specific plans are developed for the work of managements, staff and activities.

The strategic plan of total quality management includes several steps :

1) Initializing the stage:

Top management must create a good environment within the organization, and create a new atmosphere for work and a new culture which individuals accept to work according to new work mechanisms of implementation of TQM system; it should, furthermore, clarify and bridge the gap between the current image and the future image. Every management can work to carry out this stage. The following conditions must be available:

- Involving workers.
- Developing new training programs that suit the new environment.
- Working to change the prevailing culture of the organization.

2) Developing and clarifying the organization's mission

The clarification of the organization fundamental objective, to get the moral and material support, is a cornerstone to the success of strategic planning. It should therefore translate the organization's mission and strategic objectives to the various functional levels through planned and documented policies. And it should design policies to help the organization to participate in and interact with the different departments. The managers

must explain to all employees the policy and assure them that the application of TQM is the conviction of management, not just a slogan of the moment.

3) Identifying internal problems

To avoid confusion and chaos, the internal problems facing the application of TQM plan must be identified, and work must be done to provide solutions to avoid the element of surprise on the job.

4) Developing the strategy

Development must have a comprehensive plan for each dimension to reach the goals efficiently and effectively; however, the following dimensions must be available at this stage:

- Services to be developed in the future
- Requirements and needs of the customer
- Development of a culture of quality
- Development of long-term goals
- Development of proposals
- Development of a report. The report should be written and sent to the top management for implementation purposes.

5) Taking decisions on the allocation of necessary administrative resources:

   The necessary resources should be allocated to accomplish the next stage (planning stage), but this might be a difficult decision and it is a point of the failure of many of the managers where central problems do occur in some companies, especially in the public sector companies, where management asks for more data from each administrative level, and it tries to blame those who are in the higher administrative levels or below them. This wastes time and diverts responsibility. Therefore, it is necessary to delegate responsibility and authority to those who are closer to the reality of work which needs assessment.

6) First speech

   It should be in this stage to promote the ideas and thoughts, and the success of this promotion depends on the person who speaks and how proficiently he promotes the ideas of TQM and the extent of his faith in them. In the first speech, the message should be carefully selected and conveyed to individuals accurately to reach them effectively, away from the style notes from top to bottom to encourage spreading the enthusiasm and collective commitment to TQM.

2.14.1.2. Planning stage

This includes a detailed implementation plan. To this end, it includes the following steps:

1. Selection of the members of the quality board: the organization president, and representatives at a high level. They should direct the program of TQM within the organization, and remove the obstacles that exist between functional entities, and overcome resistance to change.

2. Choice of the consultant: This is often chosen from the higher administrative levels, and he should have a strong support for the TQM, and it must be taken into account his credibility. He should enjoy a mixture of qualities and skills, personal excellence. His previous experience indicates his success in introducing innovation and ensuring communication and interaction between work teams and administrative levels.

3. Training quality committee and quality advisor: it must pay attention to the training quality early, and the adviser must receive extensive training on the issues of total quality.

4. Holding the first meeting of the TQM board: The meeting includes drafting a charter for the board and the division of the responsibilities to support implementation of the plan and the agenda of the next meeting, and the draft of the application of TQM.

5. Approval of an application plan and on the allocation of needed resources: At this stage the plan is approved to apply TQM program, and financial resources necessary are allocated to implement this program.

6. Identification and selection of the goals and all important processes within the priority by using the tools of TQM, such as brainstorming and Pareto chart and other tools that help in the selection process.

7. Establishment of working groups and quality circles: Coordination between the quality council and quality circles or work teams should be made to identify problems facing the application process and working to solve them, and it should focus on the training of executives and the top management to support the establishment of these circles, considered a minimized form of the council quality, but within each section or a specific administrative level.

2.14.1.3. Assessment stage

This stage includes providing necessary information to support the other stages: preparation, planning, implementation, and exchange of experiences. It contains some of procedures such as making surveys, calendars, and interviews at all organizational levels, and all that is considered as inputs for the application of TQM, and direct support to the strategic plan. These procedures may be repeated more than once as it is found necessary.

This stage include the following:

1. Self-assessment

This assessment aims to assess knowledge and raise awareness of the workers to importance of TQM. Therefore, it should assess the reality of the organization to determine the gap between the organization's mission and strategic objectives on one hand and the current situation of the organization, on the other hand. To that end the following aspects should be studied:

- Competition: where the organization should assess the status of competition by testing several aspects, including knowledge of who the current competitors are, and why customer favors them, determine the basis that the competition is based on, determine the competition shape, and the reasons of changing the rules of dealing with the suppliers.

- Organization: it must identify and develop the status of organization through studying several aspects, including a future goal, the followed work procedures, the technical proficiency of employees, the best way to take advantage of the newest techniques, and the how of employing them to benefit organization, external relations and forms of cooperation needed, internal and external forms of communication that hinder the improvement of work completion, and identifying the developing difficulties on the organization performance.

- Customers: where the organization should evaluate some aspects related to the customer, which includes determining the current customers, and making sure not to change their demands, and if change happens, it must be known why and how to take advantage of this change, the possibility of the continued customers' loyalty to the organization and how to achieve it, and channels that should be used to gain access to near future customers.

- Analyzing the stages of work: the organization should analyze all the activities of the workers, and review the steps and actions, to reduce the large operations cycle, by simplifying procedures and cancellation of missed working circles and transition from consecutive processes to concurrent processes. To these ends, it should study several things, including the steps that contain work completion stages, and identification of who is responsible for their fulfillment , the time required to complete each stage, difficulties facing completion of each stage, how to delay or deliver the work, and determine the different degrees between current performance and expected performance.

2. Organizational assessment: this is done through personal interviews with employees to determine the gap between the current organizational culture, and wanted future culture, with respect to TQM.

3. Assessing the opinion of customers: To know what customers want from the organization, it must conduct a comprehensive survey of customers, and invent new methods to collect information from customers, such as

asking questions during a meeting directly or by telephone, without making the customer feel that the company is collecting information from him. It can measure the satisfaction degree of customer from some aspects including the company's products, policies and procedures, the company's sales representatives, the company's performance when asked to deliver a particular service or product specific, the overall customer perception towards the company, and the reason for the customer's choice of the company's products.

4. Assessing the training program: due to the importance of training process in the development of technical and managerial competencies, the organization should assess the training issues, and benefit from the views of trainees to reach the appropriate level of training, so a lot of things must be studied with regard to training, including appropriateness of training material to be used, the difficulty level of the training material , the length of the training program, the effectiveness of the trainer, presentation of training material, the possibility of the application of training material on the work, identification of the strengths and weaknesses of training program, and proposed improvements that could be introduced to the training program.

5. Assessing the cost of quality: it is an assessment of the financial costs of quality. It should be noted that the major part of the TQM budget is earmarked for training expenses.

2.14.1.4. Implementation stage

At this stage, the work of the team and its role are reviewed. The work development is also discussed during regular meetings, so it can be said that TQM is a collaborative effort to complete the work that depends on the employees and managers' abilities and talents to achieve high quality and productivity. The TQM department usually includes the following key ideas:

1. Attention to the product or service quality

2. Emphasis on the importance of feedback

3. Focus on quality control

4. Adoption of the overall cost of quality principle

5. Emphasis on the importance of employees' participation

6. Use of scientific methodology

7. Application of the cooperation and integration concept at work.

This stage include the following steps:

1. Trainers' selection in the organization: Trainers should be selected on the basis of their TQM experience: reception of training on TQM system and participation in seminars and conferences on how apply TQM. They must also have credibility and strong commitment to the development of

the organization, and they are often recruited from outside bodies specializing in such training.

2. Managers and employees' training: the application of TQM in Palestinian chemical plants needs to train the labor force and administrative entities. The training process includes the following:

- Creating understanding and raising awareness of the TQM importance by focusing on what TQM is, who benefit from it, how it is used , and why its application is necessary for the survival of organization and its sustainability and continuity.

- Working to gain knowledge and soft skills: team-building, group dynamics, communication, and problem solving.

3. Teams work: in this step the work teams are set up and that contributes to information collection, giving suggestions and possible solutions to the problems at hand, and of interest to the quality field.

2.14.2. Important issues to be considered during the application of TQM stages

2.14.2.1. Exchange of experiences (Ibn Eishawi, 2006)

The completion of the previous stages, from the preparation to the implementation stage, provides the organization with the fundamental knowledge base, so the policies have been identified, and the objections to

the process of change have been overcome, and the success stories have been written. This stage should take advantage of experiences gained from the quality field. Accordingly the exchange and dissemination of experiences will take place.

2.14.2.2 Full implementation of the proposed framework

In light of the outcome of the monitoring and evaluation process, and to increase chances of success of the overall application of TQM , it may be circulated after ensuring the availability of the following factors:

1. Achieving success of the mini experiment for the partial application

2. Making sure that there is a quality team to transfer their experience to others

3. Working to provide all the features necessary for the success of the model.

4. Taking advantage of any errors that may pass during the application progress, and avoiding their occurrence again in the future.

5. Expansion of the base of participation in the application form, in a competitive framework, between the various sub-units in the organization, where they could think about proposal quality award, to be given to the department or administration that was characterized in the application

form, according to the declared criteria, designed specifically for this purpose.

2.14.2.3 Organization of quality (Ibn Eishawi, 2006)

It means the board is oriented for the quality process in the company. It consists of the following structures, as shown in Figure 4:

1. Steering quality committee: the committee head, the president of the organization, and top officials who represent the key sectors in the organization.

2. Team quality coordinator: the top management appoints a coordinator for the quality to supervise a small team, and his duties include activation of the quality, and ensuring its application .

3. Team facilitating the quality process: its role is to support the work of improvement and development teams, by ensuring the necessary training, and guiding the selection of opportunities to help in implementing solutions provided to this improvement.

Figure 4: Structure of quality organization

2.14.2.4. Preparation and distribution of comprehensive quality manual

This is one of the technical issues necessary to support the idea of applying TQM. It aims at raising awareness of the principles and techniques of TQM to work at all administrative levels, and to highlight the benefits of returning to the application of total quality. This manual includes the following:

1. Explanation of the concept of TQM, and the advantages of its application

2. Foundations and application requirements

3. Key stages that must be followed for the application of TQM

4. Technical tools for the application of TQM

5. Necessary forms and instructions.

2.14.2.5. Changes necessary for implementation of TQM system (Saleh, 2003)

The methodology of TQM needs to make a number of necessary changes as shown in Figure 5, and it must be noted here that any change in whatever form or kind might be resisted by employees within the organization, and it must win the trust of workers and their support through awareness programs that explain the dimensions of TQM and its benefits and importance for the survival and continuation of the organization.

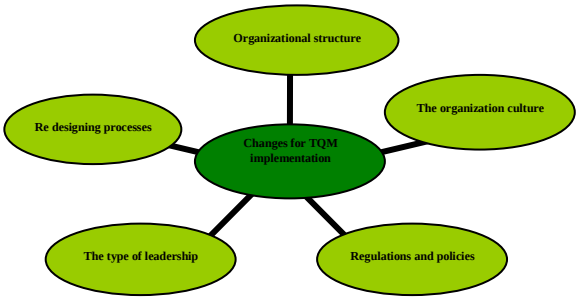

Figure 5: Changes necessary to implement TQM system

The most important changes that help in application of TQM are as follows:

1. **Organization culture**

It The old organization's culture must be replaced by a new one that includes a set of principles, concepts and values that help to understand the newest events, and adapt to internal and external variables in order to make the organization remain stable, develop the relationship between

workers, facilitate the communication process within the organization, and make decision-making process more efficient and effective.

2. Organizational structure

Like the old culture of the organization, the old and traditional organizational structure must be changed to a whole new integrated system approach which considers the organization as composed of sub-integrated structures, thus achieving the overall and common goal, and accordingly encourages managers to look to the plan and work in an integrated manner not in a partial one. It also makes the work flow horizontally and vertically at the same time, and that facilitates transmission of their orders and instructions, and information smoothly and easily.

3. Redesigning processes

In order to improve the high level of quality, the integrity of the process design and ease of implementation must be maintained, because the old design, based on entering modifications only, does not serve the methodology of TQM, so new processes must be designed and these must also comply with the requirements of TQM.

Recently, many methods have been used in the re-engineering processes. They are based on making radical changes on the basic processes, techniques, methods of work, and procedures in the organization. These

methods aim at getting rid of routine work, reducing costs, and providing quick and excellent services.

4. Regulations and policies

Regulations are considered a tool to carry out the work in the organization through the controls and general rules and the overall organizational performance. So the application of TQM needs the development of new regulations to serve the new strategic plan for the organization and achieve its objectives. But policies must offer flexibility, so as not to impose restrictions on the freedom of who has applied it. However, these policies should not exceed the limit of excessive flexibility so as not disrupt the system.

5. Type of leadership

The application of TQM system requires changing the current leadership style to a new leadership style in the organization that has certain properties and special work method consistent with the new style, because the responsibility of the administrative leadership and great success depends on the correct application of TQM system.

Chapter 3
Methods and Procedures

3.1. Introduction

This chapter deals with the methods and procedures that researcher followed and used to determine the sample and the population of the study. It explains the steps and procedures followed in describing the study and constructing the study tool. It concludes with an explanation of the study design scheme and variables, and the types of statistical tests used in the study.

3.2. Population of the study

The population of the study consisted generally of chemical plants in Palestine, but limited to pharmaceuticals, food and detergents sectors.

3.3. Sample of the study

The study sample consisted of 40 different plants from selected sectors (pharmaceuticals, food and detergents); it was selected by a purposive sample method, because these type of method helps to know the views of targeted community, so the name of targeted companies was gotten from the chamber of industry and commerce.

3.4. Tool of the study

The study tool consisted of a 54-item questionnaire prepared by the researcher to study the level of TQM implementation in companies. Items 13 and 14 studied the obstacles and challenges facing their implementation respectively. The scale of answers consisted of five points (Likert five-point scale), as shown in tebles (3.1 and 3.2)

Table 3.1: Distribution of Likert five-point scale

Strongly agree	5 degrees
Agree	4 degrees
Neutral	3 degrees
Disagree	2 degrees
Strongly disagree	1 degree

Table 3.2: Distribution of likert five-point scale on the study dimensions

Dimensions	No. of statement	Highest degree in the scale	Lowest degree in the scale
Level of implementation of TQM in companies	1 – 54	5 × 54 = 270 degrees	1 × 54 = 54 degrees
Obstacles facing implementation of the principles of quality	1 – 13	5 × 13 = 65 degrees	1 × 13 = 13 degrees
Challenges facing implementation of the principles of quality	1 – 14	=5 × 14 70 degrees	1 × 14 = 14 degrees

3.5. Data collection and method

Data needed for the study were collected from the following sources:

3.5.1. Primary and direct sources

1. Questionnaire: the researcher used a questionnaire because it is suitable for the purposes of the study. The researcher administered and collected the questionnaires via e-mail, with an emphasis on keeping the answers of different companies confidential and using them only for study purposes. After data collection, a detailed analysis was conducted(Chapter Five).

2. Annual reports and brochures available for research purposes

3. Interviews: The researcher conducted several interviews with a number of PCS supervisors working in the company to hear their views about the variables of the study and use their expertise and guidance on a suggested model. Appendix 4 has a list of the names of the interviewed PCS supervisors . The researcher conducted the interviews, and then analyzed the answers to extract the most important results.

3.5.2. Secondary sources

1. Theoretical studies, and literature on total quality management

2. Scholarly journals available and relevant to the topic of study

3. Relevant scientific theses

4. Information published on the internet

3.6. Testing the degree of reliability of data

3.6.1Content validity and tool validity

Content validity indicates that every dimension and field in the study is accurately representative by an appropriate set of statements or phrases.

Tool validity was tested by submitting the questionnaire to a group of referees and experts in the field of the study. The researcher responded to the referees' comments and feedback by introducing the necessary modifications.

3.6.2 Tool reliability

Tool reliability means that the tool measures what it is designed for in the varying periods of time.

The researcher used the internal-consistency method through calculation of reliability coefficient (Cronbach alpha) which applied to all questions of the study except the properties of the sample questions. Reliability coefficient was calculated for the study dimensions(Table 3.3 and Table 3.4)

First dimension: Level of implementation of TQM system in companies

Table 3.3: Reliability coefficient for studying the level of implementation of TQM system in companies

Constructs	Reliability coefficient
Commitment and support of senior management	0.84
Customer – driven quality	0.81
Employees' participation and development	0.79
Continuous improvement	0.74
Suppliers' participation	0.65
Organization culture	0.81
Using statistical control and feedback	0.87
Reliability coefficient (total score)	**0.94**

Second dimension: Obstacles and challenges facing the implementation of the principles of quality

Table 3.4: Reliability coefficient for studying the obstacles and challenges facing the implementation of the principles of quality

Field	Reliability coefficient
Obstacles facing the implementation of the principles of quality	0.95
Challenges facing the implementation of the principles of quality	0.88

As Table 3.3 and Table 3.4 show, the values of reliability coefficient in this study were greater than 70% except for the suppliers' participation construct (65%) This small value indicates the lack of interest of the sample members in answering these constructs, but it was higher than the acceptable value (60%) in most studies and previous research. The total study constructs reached the value of $\alpha = 94$ %, which is highly acceptable. This shows the reliability of the constructs in the questionnaire to measure the variables of the study.

3.7. Study methodology and design

The questionnaire was used and administered to the study sample. The results were taken and statistically analyzed.

The study included a number of variables:

3.7.1. Independent variables

The independent variables were explained through the company data profile: type of industry, ownership of the company, the scope of the current market, the nature of the ownership of the company, specifications which the company operates according to, the number of branches of the company, the company's capital, the number of the company's products, the number of workers in the company.

3.7.2. Dependent variables

The dependent variables were explained through the level of application of TQM in selected PCS from the perspective of senior management. These variables were as follows: commitment and support of senior management, customer – driven quality, employee participation and development, continuous improvement, suppliers' participation, organizational culture, using statistical control and feedback, the most important obstacles and challenges facing the application of the principles of quality in the company.

3.8. Statistical processing

In order to process the data, SPSS program was used to analyze the various collected data. To this end, the descriptive statistical analysis methods were used to access a lot of information that describes the study sample.

Frequencies, percentages, means and standard deviations were used to

provide a comprehensive description of the acceptable degree of the study sample on the different questionnaire statements.

1. Frequencies and percentages for analysis of the answers of the study sample regarding the company data profile.

2. Means as one of central tendency measures, and standard deviation as one of dispersion measures to identify the extent of dispersion of individuals' answers about the means in the various questionnaire statements.

Chapter 4

Interpretation and Analysis of the Study

This study sought to identify the level of implementation of TQM in selected Palestinian chemical sectors (pharmaceuticals, food and detergents) from the perspective of top management. Also it aimed at determining and finding out the impact of independent variables (type of industry, the ownership of the company, the scope of the current market, the nature of the ownership of the company, specifications according to which the company operates, the number of branches of the company, the company's capital, number of the company's products, number of employees in the company) After collection, the data were processed statistically by using the statistical package programs for social sciences (SPSS).

Description of the study sample according to its independent variables was given on Tables 4.1 – 4.6.

Statistical indicators such as means, standard deviations and percentages were used in the study fields calculation to answer the study questions, and to achieve the study objectives.(Tables 4.7 – 4.16).

4.1. Independent variables analysis

1. Type of industry

Table 4.1: Distribution of the study sample according to type of industry variable

Type of industry	Frequency	Percentage %
Pharmaceuticals	4	10.0 %
Food	29	72.5 %
Detergents	5	12.5 %
****Others**	2	5.0 %
Total	**40**	**100 %**

****Others** means cosmetics industry.

It is very clear, as Table 4.1 shows, that the highest percentage in this study sample was food industry, where the number of individuals within this variable was 29 or 72.5%. In contrast, the detergents industry and the pharmaceuticals industry had12.5% and 10.0% of employees respectively. Other industries had the lowest rank (5.0%). These results show that the food industry was more dominant than other Palestinian industries. The number of food factories registered with the ministry of industry was very large, and in terms of geographic distribution, these factories were fairly distributed among most Palestinian cities as illustrated in Appendix 1.

2. Ownership of the company

Table 4.2: Distribution of the study sample according to ownership of the company variable

Ownership of the company	Frequency	Percentage %
****Public**	5	12.5 %
Private	35	87.5 %
Total	**40**	**100 %**

****Public** means that the company is listed on the stock market and offers its stocks for trading, but the private company cannot trade its stocks on the stock market.

According to Table 4.2, private ownership had the highest percentage (87.5%), whereas public ownership had 12.5% of total sample. These results show that the private industry was more widespread than the public industry in Palestine. This is due to the deteriorating political and economic situation of the Palestinian government.

Scope of the current market

Table 4.3: Distribution of the study sample according to the scope of the current market variable

Scope of the current market	Frequency	Percentage %
Local	17	42.5 %
Regional	5	12.5 %
International	6	15.0 %
****Local + Regional**	3	7.5 %
Local + International	9	22.5 %
Total	**40**	**100 %**

**** Local + Regional** mean the company works within the local and regional market areas together and at the same time. The same applies to **Local + International**.

Table 4.3 shows that the local scope had the highest percentage (42.5%), while the local + international scope was the second highest(22.5%), while international and regional markets had15.0%and 12.5% respectively. The lowest rank was local + regional. These results show that the local scope was more prevalent in the Palestinian industry because of the low income and the bad political situation in Palestine.

Nature of the ownership of the company

Table 4.4: Distribution of the study sample according to the nature of the ownership of the company variable:

Nature of the ownership of the company	Frequency	Percentage %
National	34	85.0 %
Franchise	2	5.0 %
National + Partnership strategy	2	5.0 %
National + Branch of another company	2	5.0 %
Total	**40**	**100 %**

According to Table 4.4, national ownership represented 85% or 34 individuals while franchise and national + partnership strategy and national + branch of another company represented 5.0% each.

Specifications according to which the company operates

Table4.5: Distribution of the study sample according to specifications according to which the company operates

Specifications which the company operates according to	Frequency	Percentage %
Palestinian	14	35.0 %
ISO	5	12.5 %
****Others**	4	10.0 %
Palestinian + ISO	10	25.0 %
Palestinian + Others	2	5.0 %
Palestinian + ISO + others	5	12.5 %
Total	**40**	**100 %**

** **Others** means any other specifications : GMP, Halal, Haccp, etc.

According to Table 4.5, 35% of companies adopted the Palestinian specifications. This was because these specifications fit the Palestinian industries, and the general Palestinian economic and political situation. In contrast, 25.0% of companies operated according to Palestinian + ISO +; others had the lowest.

3. Number of the branches of the company

Table 4.6: Distribution of the study sample according to the number of the branches of the company variable

Number of the branches of the company	Frequency	Percentage %
One branch	31	77.5 %
Two branches	4	10.0 %
Three branches	2	5.0 %
Five branches and more	3	7.5 %
Total	**40**	**100 %**

As Table 4.6 shows, 77.5% of the study sample had only one branch and only 7.5% of study sample had five branches and more.

4.2. Dependent variables analysis

To verify the extent of TQM principles implementation in the sample companies, and to study most important difficulties and challenges facing these implementation, the dependent variables were analyzed by calculating means, standard deviations and percentages.

4.2.1. Analysis of the level of implementation of TQM in selected PCS from the perspective of top management

1. Commitment to and support of senior management construct

Table 4.7 shows the extent of the commitment of senior managements in the selected PCS to the requirements of strategy of total quality management.

Table 4.7: Means, standard deviations and percentages for commitment and support of senior management construct

Commitment to and support of senior management domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Senior management adopts a clear strategic policy and specific objectives in the application of quality.	1	2	4.65	0.66	93.00
2. Senior management seeks to build a good reputation among the customers of high-quality and perfection.	2	1	4.83	0.38	96.50
3. Management provides facilities, equipment and personnel necessary to implement quality.	3	3	4.55	0.55	91.00
4. Management works to clarify the objectives to the workers especially the goals related to quality.	4	4	4.48	0.55	89.50
5. Management establishes a system of incentives to improve quality.	5	8	4.08	0.83	81.50
6. Management cares to find effective communication ways between the various sections in the company.	6	5	4.45	0.55	89.00
7. Senior management gives flexibility to the various departments to solve the problems they face.	7	7	4.28	0.75	85.50
8. Senior management monitors and tracks the course of action of quality programs to reach the strategic goals.	8	6	4.40	0.74	88.00
Total			**4.46**	**0.44**	**89.20**

As Table 4.7 shows, more than 80% of the sample companies had support and commitment of the senior management.

This construct was handled through eight statements. It achieved 4.46 means with a standard deviation of 0.44 where the percentage amounted to 89.20 % in general.

Table 4.7 shows that building a good reputation among the customers by senior management came in the first rank. Its means was 4.83 and the standard deviation was 0.38 That shows the great interest of the management in focusing on customers as a way to achieve quality from the viewpoint of the customer.

The senior management adoption of a clear strategic policy and specific objectives for the application of quality had a mean value of 4.65 and standard deviation of 0.66. Providing necessary facilities, equipment and personnel to implement quality had a means value of 4.55 and standard deviation of 0.55. It is clear that there was a great interest by management in providing appropriate services needed by the customer. Working to clarify the objectives to the workers especially the goals related to quality had a mean value of 4.48 with a standard deviation of 0.55.

Pertaining to finding effective communication ways between the various sections in the company, the mean value was 4.45 while the standard deviation was 0.55.

And 88% of the study sample reported that the senior management monitored and tracked the course of action of quality programs to reach the strategic goals. The means value was 4.40 and the standard deviation was 0.74. Regarding whether senior management was giving flexibility to the various departments to solve the problems they faced, the means value was 4.28 and the standard deviation was 0.75. Concerning the management's establishment of a system of incentives to improve quality, the mean value was 4.08 and the standard deviation was 0.83.

2. Customer – driven quality construct

Table 4.8 shows the extent of the focus of the selected PCS on the customer as an important element of TQM.

Table 4.8: Means, standard deviations and percentages for customer – driven quality construct.

Customer – driven quality domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Company always studies the needs and desires of customers and their satisfaction with the products.	1	2	4.58	0.59	91.50
2. When designing quality strategies, the company takes into account the desire of the consumer commodity.	2	3	4.55	0.75	91.00
3. There is a special section in the company which works on study of the customer behavior continuously.	3	6	4.18	0.87	83.50
4. There is a system in the company to ease customer feedback access to officials in the administration.	4	7	4.18	0.93	83.50
5. Company takes the view of customers when developing new products.	5	4	4.45	0.81	89.00
6. Company studies customer complaints constantly and provides appropriate solutions.	6	1	4.68	0.53	93.50
7. Employees in the company looks to each other as if they were internal customers.	7	5	4.23	0.77	84.50
Total			**4.40**	**0.52**	**88.00**

As Table 4.8 shows, more than 80% of the sample companies allowed their customers to express their opinion about the quality of their products, in terms of satisfying their needs and meeting their expectations, and studied their complaints.

This construct was handled through seven statements. Its mean value was 4.40 and its standard deviation was 0.52 The percentage was 88.00 % in general.

As Table 4.8 shows, the studying of customers complaints constantly and providing appropriate solutions to them had the highest means: 4.68. The standard deviation was 0.53. This shows the commitment of the Palestinian chemical plants to solving the customers' complaints, and their serious concern to resolve them. Studying the needs and desires of customers and their satisfaction with the products regularly had a mean value of 4.58 and standard deviation of 0.59.

When designing quality strategies, the company's taking into account the desire of the consumer commodity had a mean value of 4.55 and standard deviation of 0.75. These statements are considered the most important from the perspective of the researcher because focusing on customers begins with development plans and strategies to ensure achievement of this domain.

Regarding taking the view of customers when developing new products, the mean value was 4.45 and the standard deviation was 0.81.

However, regarding how employees in the company looked to each other as if they were internal customers, the mean value was 4.23 and the standard deviation was 0.77.

About 83.5 % of the study sample believed in the importance of the presence of a special section in the company to work on the study of the customer complaints continually. The mean value was 4.18 and the standard deviation was 0.87.

Concerning the presence of a system in the company to easily access customer's feedback to officials in the administration had lowest means (4.18) and the standard deviation was 0.93.

3. Employee participation and development construct

Table 4.9 shows the extent of focus on the employee's participation and development in the selected PCS.

Table 4.9: Means, standard deviations and percentages for employee's participation and development construct

Employee's participation and development domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Company takes in consideration the opinion of workers about the opportunities for improvement of operations.	1	3	4.40	0.71	88.00
2. Company trains workers on modern techniques and skills that will help to develop their performance and quality improvement.	2	4	4.38	0.70	87.50
3. Cost of training in the company does not affect the decision of workers' training to raise their efficiency.	3	5	4.33	0.83	86.50
4. Training programs in the company aim at raising the level of quality.	4	1	4.63	0.54	92.50
5.Management believes that the higher degree of efficiency of training is directly related to the level of product quality.	5	2	4.45	0.68	89.00
6. Training process in the company includes all employees within all levels of management.	6	6	4.18	0.90	83.50
7. Long period of time for some training courses weakens the decision to approve participation in such courses.	7	8	3.80	0.91	76.00
8. Workers are rewarded in the company when they learn new skills to motivate them for more innovation and initiative.	8	7	3.83	0.96	76.50
9. Employees own shares in the company and that contributes to raising the quality level.	9	9	3.58	1.17	71.50
Total			**4.17**	**0.51**	**83.40**

As Table 4.9 shows, more than 80% of the sample companies took the opinions of employees about the opportunities for improvement in operations, and provided training programs for them.

This construct was handled in nine statements. The means was 4.17 and the standard deviation was 0.51 The percentage was 83.40 % in general.

Table 4.9 shows that the training programs in the company aimed at raising the level of quality. The means was 4.63 and the standard deviation was 0.54. This shows the importance of training programs in the Palestinian chemical plants to keep the employees at a high level of experience, knowledge and development.

Regarding the management's belief in the higher degree of efficiency of training and its direct relationship to the level of product quality, the means value was 4.45 and the standard deviation was 0.68. Taking into consideration the opinion of workers about the opportunities for improvement in operations, the means value was 4.40 and the standard deviation was 0.71. This statement is considered very important from the perspective of the researcher because listening to opinions of employees raises their morale and makes them feel that they belong to their work, and this encourages them to work effectively and increase their productivity over time. Training workers on modern techniques and skills had a means value of 4.38 and a standard deviation of 0.70. This statement is important because it helps to develop their performance and quality improvement.

However, regarding whether the cost of training in the company affected the decision to train the workers or not to raise their efficiency, the means value was 4.33 and the standard deviation was 0.83.

Concerning the training process in the company and whether it included all employees within all levels of management, the means value was 4.18 and the standard deviation was 0.90. Pertaining to incentives system in the company, the means value was 3.83 and the standard deviation was 0.96. The workers must be rewarded when they learn new skills to motivate them for innovation and initiative.

Pertaining to training courses time, the mean was 3.80 and the standard deviation was 0.91. The length of some training courses weakened the decision to approve participation in such courses. Ownership of shares by employees in the company's had the lowest means (3.58) and lowest standard deviation (1.17).This contributes to the raising of the quality level in the company.

4. Continuous improvement construct

Table 4.10 shows the extent of continuous improvement in selected PCS as an important element of TQM.

Table 4.10: Means, standard deviations and percentages for continuous improvement construct

Continuous improvement domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Company seeks to solve the problems of quality drastically and constantly.	1	4	4.65	0.48	93.00
2. Company is keen on developing its products and introducing new products continuously.	2	1	4.80	0.41	96.00
3. Company has a special department for research and development for continuous improvement of its products.	3	7	4.38	1.13	87.50
4. Continuous improvement of goods and services earns the company a competitive advantage compared to companies.	4	2	4.80	0.52	96.00
5. Company is interested in improving productivity and increasing the effectiveness of the exploitation of resources.	5	3	4.75	0.44	95.00
6. Company is interested in providing machinery and equipment and advanced technology to increase the level of product quality.	6	5	4.60	0.71	92.00
7. Company compares its internal operations with the operations of more successful companies , whether they are in the same industry or in other industries.	7	6	4.38	0.98	87.50
Total			**4.62**	**0.45**	**92.40**

As Table 4.10 shows, more than 80% of the sample companies used continuous improvement construct in developing their products, improving productivity, solving the quality problems, and using modern advanced machinery.

This construct had seven statements; its means was 4.62 while the standard deviation was 0.45 The percentage amounted to 92.40 % in general.

As Table 4.10 shows, the companies were keen on developing their products and introducing new products continuously The means and the standard deviation were 4.80 and 0.41 respectively. This shows the importance of developing products and services in the Palestinian chemical plants to achieve total quality. Pertaining to continuous improvement of goods and services and earning the company a competitive advantage compared to companies competition, the means was 4.80 and the standard deviation was 0.52.

And regarding the company's interest in improving productivity and increasing the effectiveness of the exploitation of resources, the means value reached 4.75and the standard deviation 0.44.

Concerning the company's endeavor to solve the problems of quality drastically and constantly, the mean value was 4.65and standard deviation was 0.48. This statement is important because it helps to not accumulate

the problems in the work which otherwise would become rooted and difficult to solve.

But regarding the company's interest in continual procurement of machinery and equipment and advanced technology , the means value was 4.60 and the standard deviation 0.71. Using modern advanced machinery increases the level of product quality. When it came to comparing company's internal operations with more successful companies' operations, whether they were in the same industry or in other industries, the means value was 4.38 and the standard deviation 0.98.

Pertaining to whether the company had a special department for research and development for continuous improvement of its products , the means was 4.38 and the standard deviation 1.13.

5. Suppliers participation construct

Table 4.11 shows the extent of suppliers' participation in selected PCS as an important element of TQM.

Table 4.11: Means, standard deviations and percentages for suppliers' participation construct

Suppliers' participation domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Company deals with a specific set of suppliers.	1	6	4.38	0.81	87.50
2. Company makes great efforts to establish long-term relationships with suppliers.	2	2	4.60	0.50	92.00
3. Company uses specific criteria in the selection of suppliers and these criteria are based on quality.	3	1	4.75	0.59	95.00
4. Company is interested in the regulations of purchases with lower price suppliers regardless of quality.	4	10	2.58	1.53	51.50
5. Company shares with the supplier quality requirements.	5	4	4.40	0.96	88.00
6. Company requests from suppliers to make some tests on raw materials.	6	3	4.45	0.68	89.00
7. Suppliers performance is evaluated on basis of quality and commitment to time.	7	5	4.38	0.95	87.50
8. Opinions of suppliers about the materials and prices are taken into consideration	8	8	4.03	0.70	80.50
9. Company maintains an integrated database for suppliers and the quality of their products.	9	7	4.28	0.96	85.50
10. Opinions of suppliers are heard when developing new products in the company.	10	9	4.03	1.05	80.50
Total			**4.19**	**0.45**	**83.80**

As Table 4.11 shows, more than 80% of the sample companies allowed their suppliers to express their opinions about the quality of their products, used a specific criteria in the suppliers selection based on quality criteria, and established long-term relationships with suppliers. However, 51.50% of the sample companies were interested in the regulations of purchases with lower prices from suppliers regardless of quality.

This construct had ten statements. The overall mean was 4.19 and the standard deviation was 0.45 The percentage reached was 83.80 % in general.

Table 4.11shows that the company's use of a specific criteria in the selection of suppliers, and basing these criteria on quality, had a means of 4.75 and a standard deviation of 0.59. This shows the importance of selecting suppliers in a correct way in the Palestinian chemical plants to achieve the highest degree of the desired quality to reach total quality management.

And concerning making great efforts to establish long-term relationships with suppliers, the means was 4.60 and the standard deviation was 0.50. The long-term relationships between the company and suppliers are important because they lead to emergence of an atmosphere of mutual trust between them and that helps to achieve the total quality.

Regarding the company's request from suppliers to make some tests on raw materials, the means value was 4.45 and the standard deviation was

0.68. Conducting tests on the raw materials helps in producing the final products with a high degree of quality.

Pertaining to sharing some information about quality requirements with the supplier, the means value was 4.40 and the standard deviation was 0.96.

However, regarding suppliers' performance , whether it was evaluated on basis of quality and commitment to time, the means value was 4.38 and the standard deviation 0.95.

When asked whether the company dealt with a specific set of suppliers, the means value was 4.38 and the standard deviation 0.81. Regarding the company's keeping of an integrated database for suppliers and the quality of their products, the means value was 4.28 and the standard deviation 0.96. Taking the opinions of supplier about the materials and pieces had a means value of 4.03 and a standard deviation of 0.70. And regarding taking the opinions of supplier when developing a new product in the company, the means value was 4.03 while the standard deviation was 1.05.The company's interest in the regulations of purchases with lower prices from suppliers, regardless of quality, had a means of 2.58 and a standard deviation of 1.53.

6. Organization culture construct

Table 4.12 shows how the organization culture affects the extent of application of TQM in selected PCS.

Table 4.12: Means, standard deviations and percentages for organizational culture construct

Organizational culture domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Values and beliefs dominant in a company would encourage development and reduce resistance to change.	1	6	3.95	1.04	79.00
2. Senior management emphasizes that quality is the collective responsibility of all employees.	2	1	4.53	0.55	90.50
3. Management is always keen on providing all the means to strengthen the organizational affiliation and loyalty among employees.	3	3	4.38	0.74	87.50
4.Organizational climate prevailing in the company encourages creativity and innovation.	4	5	4.05	0.85	81.00
5. Top management encourages individuals to share their ideas and views among themselves.	5	2	4.40	0.67	88.00
6. Senior management cares to make changes in the organizational culture to serve the access to quality.	6	4	4.38	0.93	87.50
Total			**4.28**	**0.58**	**85.60**

As Table 4.12 shows, more than 80% of the sample companies provided all means to strengthen the organizational affiliation and loyalty among employees, and encouraged creativity and innovation in the company. In contrast, 79.00 % of the sample companies could not reduce resistance to change.

This construct was dealt with through six statements. The overall means was 4.28 while the standard deviation was 0.58; the percentage reached 85.60 % in general.

As Table 4.12 shows, the senior management's emphasis of quality as a collective responsibility of all employees had a means of 4.53 and a standard deviation of 0.55. This shows the importance of conviction of all employees in the company in the application of TQM regardless of their position level and this helps to achieve the desired results of this application.

Concerning the encouragement of individuals to share their ideas and views among themselves, the means was found to be 4.40 and the standard deviation was 0.67. This helps to develop and exchange experiences, and it creates an atmosphere of harmony within the company and reduces the resistance to changes that may occur within the company, and also it makes the worker feel that his opinion is heard within the organization.

And regarding the provision of all means to strengthen the organizational affiliation and loyalty among employees, the means value was 4.38 and the standard deviation was 0.74. The researcher believes that when belonging to the company, to work and to the management increases, the production increases accordingly and the company approaches achievement of total quality.

Pertaining to the making of changes in the organization's culture to serve and ease access to quality, the means value was 4.38 while the standard deviation was 0.93. However, regarding the encouragement of creativity and innovation in the company, the means value was 4.05 while the standard deviation was 0.85. Concerning whether the prevailing values and beliefs in a company would encourage development and reduce resistance to change, the means was 3.95 and the standard deviation was 1.04. The radical changes in the company accompanied by several changes in the employees require attending training courses or training on new machinery or may be a transfer from one department to another. Other changes are often not welcomed by employees, so they resist them strongly and that may not help the culture of the organization to get rid of resistance and the conflicts arising within the organization and that adversely affects the production processes, development and spread of a quality culture in the company.

7. Using statistical control and feedback construct

Table 4.13 shows how using statistical control and feedback help in application of TQM in selected PCS.

Table 4.13: Means, standard deviations and percentages for using statistical control and feedback construct

Using statistical control and feedback domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Quality control programs in the company are used to control schemes during the manufacturing process.	1	5	4.48	0.75	89.50
2. Samples are taken from the production stage during the manufacturing process to make sure they conform to the required specifications (according to the examination system in the laboratories of the company).	2	2	4.60	0.74	92.00
3. The company uses statistical techniques widely to reduce the variation and deviation in the production process.	3	7	4.08	1.00	81.50
4. Quality control programs in the company use appropriate measurement tools during the manufacturing process.	4	3	4.55	0.64	91.00
5. Samples are taken from the final product to make sure they conform to the required specifications.	5	1	4.70	0.72	94.00
6. Company uses the records (daily or computerized) to record the results of the examination and testing in order to benefit from them in the future.	6	4	4.50	0.96	90.00
7. Quality control programs in the company are used to control schemes during the manufacturing process.	7	6	4.43	1.08	88.50
Total			**4.48**	**0.64**	**89.60**

As Table 4.13 shows, more than 80% of the sample companies used statistical control and feedback during the manufacturing process.

This construct had seven statements. The overall means was 4.48 and with a standard deviation of 0.64 The percentage amounted to 89.60 % in general.

Table 4.13 shows that the taking of final product samples to make sure they conformed to the required specifications came in the first rank. The means was 4.70 and the standard deviation was 0.72.

And concerning the taking of samples from the production stage during the manufacturing process to make sure they conformed to the required specifications, the means was 4.60 and the standard deviation was 0.74. What matters first and foremost is quality of the product and not quantity because high quality of the product meets the customer's need and desire greatly.

But regarding the use of appropriate measurement tools during the manufacturing process, the means value amounted to 4.55 and the standard deviation amounted to 0.64.

And pertaining to the use of the records (daily or computerized) to record the results of the examination and testing, the means value was 4.50 and standard deviation was 0.96. These records are very important in order to benefit from them in the future

But regarding the use of the control schemes during the manufacturing process, the means value was 4.48 while the standard deviation was 0.75.

And for having a special department (quality control and quality assurance) to monitor the quality of production, the means value was 4.43 and the standard deviation was 1.08. The researcher believes that these percentages are small due to the importance of this statement. Most companies in the study sample were registered under the Palestinian Standards Institute. They were informed of and were aware of the importance of the presence of a special department to check the quality of the product.

The company's use of statistical techniques widely to reduce the variation and deviation in the production process had a means of 4.08 and a standard deviation of 1.00.

4.2.2. Analysis of the total means, standard deviation and percentages

Table 4.14: Total means, standard deviations and percentages for the level of implementation of TQM in selected PCS

Constructs of implementation level of TQM in Palestinian chemical plants	Rank according to percentages	Means	Standard deviations	Percentages
1. Continuous improvement construct	1	4.62	0.45	92.40
2. Use of statistical control and feedback construct	2	4.48	0.64	89.60
3. Commitment to and support of senior management construct	3	4.46	0.44	89.20
4. Customer – driven quality construct	4	4.40	0.52	88.00
5. Organization culture construct	5	4.28	0.58	85.60
6. Suppliers' participation construct	6	4.19	0.45	83.80
7. Employee participation and development construct	7	4.17	0.51	83.40
Total		**4.37**	**0.40**	**87.40**

As Table 4.14 shows, more than 80% of the sample companies implemented the TQM constructs: continuous improvement, using statistical control and feedback, commitment and support of senior

management, customer – driven quality, organization culture, suppliers' participation, employee participation and development.

The total percentages for the level of implementation of TQM in selected PCS amounted to 87.40 %. This shows the seriousness of the study sample companies to achieve the highest level of quality.

4.2.3. Analysis of the obstacles facing the implementation of the principles of quality in the company

Table 4.15 shows the obstacles facing the implementation of the principles of quality in selected PCS.

Table 4.15: Means, standard deviations and percentages for the obstacles facing the implementation of the principles of quality domains

Obstacles facing the implementation of the principles of quality domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Senior management commitment to the concepts of traditional management.	1	6	2.40	1.17	48.00
2. Lack of top management commitment to and understanding of the quality programs.	2	9	2.15	0.92	43.50
3. Top management focus on performance in the short term.	3	1	2.60	1.15	52.00
4. Absence of a clear strategy for quality management in the company.	4	10	2.13	0.99	42.50
5. Quality system implementation requires changing the organizational culture of the company and it is not what the company can do.	5	3	2.50	1.22	50.00
6. Iimplementation of quality programs is an unnecessary cost.	6	12	2.03	1.00	40.50
7. Actual results of implementation of quality program does not encourage continuity	7	11	2.08	1.00	41.50
8. Quality program implementation does not solve the problems of the company.	8	13	1.98	0.89	39.50
9. Team in charge of quality improvement is busy with solving simple problems rather than in getting to the root cause of problems.	9	7	2.28	1.01	45.50
10. Lack of quality programs, education and training for workers to drive the improvement process in the company.	10	2	2.53	1.09	50.50
11. Lack of employee's commitment to and interest in the quality programs in the company.	11	5	2.43	1.08	48.50
12. Workers' resistance to quality programs in the company.	12	8	2.25	0.98	45.00
13. Absence of rewards and appreciation of the achievement of individuals.	13	4	2.48	1.01	49.50
Total			**2.29**	**0.82**	**45.80**

As Table 4.15 shows, 50% - 59.9% of the sample companies focused on performance in the short term, and could not change the organization culture of the company. below However, less 50% of the sample companies did not use a clear strategy for quality management in the company, and considered implementing quality programs an unnecessary cost and that these program would not encourage continuation of improvement or solving of the quality problems.

This domain had thirteen statements. The overall means was 2.29 and the standard deviation was 0.82 The percentage amounted to 45.80 % in general.

As Table 4.15 shows, the top management focus on performance in the short term came in the first rank. Its means was 2.60 while its standard deviation was 1.15.

Concerning the lack of quality programs in education and training for workers to drive the improvement process in the company, the means was 2.53 and the standard deviation was 1.09. It was mentioned previously how much important training programs for staff and employees in the company are to achieve total quality.

And regarding quality system implementation requirement to change the organizational culture of the company, and it is not what the company can do, the means value was 2.50 and the standard deviation was 1.22. It must be mentioned here that changing the culture of the organization is not

between night and overnight. Change needs patience and knowledge on how to change things for a very long time. Pertaining to the absence of rewards for and appreciation of the achievement of individuals, the means value was 2.48 and the standard deviation was 1.01. An incentives and rewards system in the company must be introduced because it contributes to the raising of the morale of the employees and brings the company closer to achievement of total quality.

But regarding the lack of employee's commitment to and interest in the quality programs in the company, the means value was found to be 2.43 and the standard deviation was 1.08. And regarding commitment to the concepts of traditional management, the means value was 2.40, and the standard deviation was 1.17.

Regarding solving simple problems rather than getting to the root cause of the problem, the means value was 2.28 and standard deviation was 1.01. And for resistance to quality programs in the company, the means value was 2.25 while the standard deviation was 0.98. And concerning the lack of commitment to and understanding of the quality programs, the means value was 2.15 and the standard deviation was 0.98.

And about the absence of a clear strategy for quality management in the company, the means value was 2.13 while the standard deviation was 0.99. Concerning the statement which says that the actual results to implement quality programs do not encourage continuation, the means value was 2.08

while the standard deviation was 1.00. The statement concerning the consideration of implementing program quality to reduce unnecessary costs, the means value was 2.03 while the standard deviation was 1.00.

Pertaining to the failure of the quality program implementation to solve the problems of the company, the means was 1.98, and the standard deviation was 0.89.

4.2.4. Analysis of the challenges facing the implementation of the principles of quality in the company

Table 4.16 shows the challenges facing the implementation of the principles of quality in selected PCS.

Table 4.16: Means, standard deviations and percentages for the challenges facing the implementation of the principles of quality domains

Challenges facing the implementation of the principles of quality domains	No. of domain in the questionnaire	Rank according to percentages	Means	Standard deviations	Percentages
1. Fear of employee empowerment.	1	13	3.25	1.03	65.00
2. Schedule and cost are treated as the main priorities during the work.	2	11	3.53	0.91	70.50
3. Lack of documentation of ability in the company.	3	14	2.53	1.18	50.50
4. Adapting to changing trends, behaviors and attitudes in the company.	4	12	3.40	1.01	68.00
5. Improving efficiency of production processes to reduce cost, time, and product development.	5	9	3.93	1.07	78.50
6. Providing services to consumers, to commensurate with their needs and expectations.	6	6	4.03	0.92	80.50
7. Keeping pace with global development and improvement in the specification of services and methods of submission.	7	8	3.93	1.05	78.50
8. Competition-oriented move from local to global level.	8	10	3.93	1.05	78.50
9. Using innovation methods and new management techniques to meet the current rapid and continuous changes.	9	5	4.15	0.89	83.00
10. Reducing consumer complaints and the cost of quality to contribute to the achievement of customer satisfaction.	10	3	4.15	0.95	83.00
11. Increasing productivity and profits which leads to raising market share.	11	2	4.28	0.82	85.50
12. Reducing accidents and problems of work to contribute to improvement of administrative efficiency.	12	1	4.33	0.69	86.50
13. Improving the communication process between the various levels of the organization and ensuring the effective participation of all its members to improve performance.	13	4	4.15	0.83	83.00
14. Attracting qualified people in the IT world and modern management methods to contribute effectively to the development of high quality products.	14	7	4.03	1.03	80.50
Total			**3.83**	**0.60**	**76.60**

As Table 4.16 shows, more than 80% of the sample companies reduced consumer complaints and the cost of quality to achieve customer satisfaction, increased productivity and profits, reduced work accidents and problems, improved the communication process between the various levels of the organization.. In contrast, 70 – 79.9% of the sample companies treated the schedule and cost as the main priorities during the work, improved efficiency of production processes to reduce cost, time, and product development, keeping pace with global development and improvement in the specification of services and methods of delivery. Finally, 60% - 69.9% of the sample companies adapted to change of behaviors and attitudes in the company. About 50.5% of the sample companies had a lack of documentation ability in the company.

This domain had fourteen items. The overall means was 3.83 and the standard deviation was 0.60 where the percentage was 76.60 % in general. Table 4.16 shows that reducing accidents and the problems of work had a means of 4.33 and a standard deviation of 0.69. Follow up and fixing the problems and accidents contribute to the improvement of administrative efficiency. Concerning the increase of productivity and profits, the mean was found to be 4.28 and the standard deviation 0.82. Increasing productivity leads to raising the company's market share.

Regarding the reduction of consumer complaints and the cost of quality, the means value amounted to 4.15 while the standard deviation amounted

to 0.95. It must be mentioned here that these contribute significantly to the achievement of customer satisfaction.

Pertaining to improvement of the communication process between the various levels of the organization and ensuring the effective participation of all its members to improve performance, the means value was found to be 4.15 while the standard deviation was 0.83.

But regarding the use of innovation methods and new management techniques, the means value was 4.15 and the standard deviation was 0.89. Therefore, continuing to keep abreast of new technology and global development is very important to meet the current rapid and continuous changes.

Pertaining to providing services to consumers, which commensurate with their needs and expectations, the means value was 4.03, while the standard deviation was 0.92. Regarding the attraction and recruitment of qualified staff involved in the IT world and modern management methods to contribute effectively to the development of high quality products, the means value was 4.03 whereas the standard deviation was 1.03. The means value of keeping pace with global development and improvement in the specification of services and methods of submission, the means value was 3.93 while its standard deviation was 1.05. Concerning the improvement of the efficiency of production processes to reduce cost, time, and product development, the means value was 3.93 while the standard deviation was

1.07. The means value of moving the competition-oriented from local to global level was 3.93 while the standard deviation was 1.05. Treatment of the schedule and cost as the main priorities during the work had a means value of 3.53 and a standard deviation of 0.9. The means value of adapting to changing trends, behaviors and attitudes in the company was 3.40, and the standard deviation was 1.01 Fear from employees empowerment had a means value of 3.25, and a standard deviation of 1.05. Lack of documentation ability in the company had the lowest mean and lowest standard deviation: 2.23 and 1.18 respectively.

Chapter 5

Results, Conclusions and Recommendations

5.1. Results and conclusions

As the title indicates, this chapter sums up the main results of the study, and the conclusions that can be drawn from these results. The chapter ends with a number of suggestions and recommendations.

1. The results of data analysis showed that 87.40% of the selected PCS were committed to the application of the TQM . About 92.4% were interested in continuous improvement of total quality. The use of statistical control and feedback was practiced by 89.60%. Commitment to and support of senior management was practiced by 89.20% of the PCS. Customer – driven quality field was practiced by 88.00% of the companies in the sample. The organizational culture was practiced by 85.60%. Suppliers participation was practiced by 83.80% of companies. Finally, employee participation and development was practiced by 83.40%.

2. The results show a great commitment and support, by top management, to apply TQM in the selected PCS. Top management is considered as the cornerstone in the application of TQM. This is due to the extent of organization management awareness of the importance of applying this system. This result concurs with many other studies , where the top

management showed great support **(Chowdhury, et. al., 2007; Al-Khalil, 2000).**

3. The selected PCS gave a high value to the customer. Meeting the ever-changing needs, expectations and desires of external customer is the only way to maintain existing customers and win new customers in the future. This focus is not only on the external customer, but also on the internal, too. This is an important element in achieving a competitive advantage. However, the periodic meetings between these companies and their customers were not according to the desired level. Delivery of customer comments to officials in the administration was not effective. This result could be applied to the West Bank and the Gaza Strip **(Qandil , 2008)**.

4. Regarding the continuous improvement, as one TQM application level, the selected PCS showed an interest in making the responsibility a collective responsibility for various administrative levels, by providing high quality products. They also gave enough attention to the evaluation of the performance of employees on the basis of continuous improvement. They, furthermore, showed a serious interest in the opinions of employees concerning the opportunities to improve their operations. Finally, they considered the employees' participations a key element to achieve improvement and provide the right product from the first time and every time to maximize their competitiveness.

5. The companies used to inform suppliers about the quality requirements of their products. The selection of suppliers was based on evaluation of their performance on the basis of quality of production requirement materials. Suppliers were regulated to conduct some tests on the materials. These results show that there was a focus on a specific set of suppliers. Establishment of long-term relationships with suppliers is very important, and ensures supplying materials according to the required specifications. However, some companies showed an interest in the regulations of purchases with lower prices of suppliers regardless of quality. Most previous studies stressed great importance and attention which should be given to the suppliers in the chemical industry **(Al-Qtha , 2006; Al-Zu'bi , 2005)** There were, however, studies which argued against giving such importance to the suppliers for a specific reason **(Al-Khalil ,2000)**.

6. Management is always keen on providing all means to strengthen the organizational loyalty and affiliation among employees, but values and beliefs, dominant in a company, do not encourage development and increase the resistance to change. Also the prevailing organizational climate in the company does not encourage creativity and innovation to an acceptable level. The importance of availability of enough organizational affiliation among employees was shown in the Syrian chemical industry **(Al-Khalil, 2000)**.

7. The selected PCS test product quality by taking samples from the production stage during the manufacturing process and take final product

samples to make sure they conformed to the required specifications, but the companies could not use statistical techniques to an acceptable level despite their importance in reducing the variation and deviation in the production process.

8. Several obstacles faced the application of TQM system. First, there was a focus by the management on performance in the short -term and the results associated with the implementation of the TQM system and considered it as an unnecessary cost. Second, there was a lack of quality education and training programs for workers to drive the improvement process in the company. The companies also faced a difficulty or inability in changing the organizational culture. They also failed to give due attention to the employment of the quality culture to suit the new nature of work based on total quality. In this respect, the Yemeni chemical industry was a case in point **(Al-Kamim, 2003)**.

9. The most important challenges facing the application of TQM system was the checking on the problems of work. Dealing with the errors and problems improves the administrative efficiency. Accordingly, these contribute to reducing the number of consumer complaints and reducing the quality cost, thus achieving customer satisfaction. Another challenge was companies' attempt to increase productivity and profits, leading to raising market share.

5.2. Recommendations

1. Continuing the work to achieve suppliers' participation in order to reach a comprehensive application of combined TQM dimensions. This will enable the evaluation of suppliers on the basis of the supplied materials quality and not on the basis of price. Companies should not expand relations with all suppliers, but should limit the relations to a limited number of talented suppliers.

2. Giving greater importance to the use of statistical techniques and quality control tools. They help in identifying and analyzing quality problems.

3. Giving enough powers to employees to change and improve their working methods after receiving the necessary training and qualification . Appreciation of their achievements allows them to achieve optimum utilization of the workforce through collective action and provide a suitable regulatory environment, and freedom to express opinions, let alone giving confidence to employees.

4. Applying the philosophy of total quality management by companies that did not adopt this system previously is very important. This is considered an administrative system and it includes investigating its many advantages such as cost reduction, productivity increase, raise of the level of performance, increase of customer satisfaction, maximization of their competitiveness, increase of optimum utilization of their resources, and increase of profits in the long term.

5. Increasing awareness of the concept of total quality management to make it the most important part of the prevailing organizational culture in the Palestinian chemical plants.

6. Creating a strong infrastructure for imports and exports and facilitating the flow of Palestinian goods and services to foreign markets.

7. Giving more attention to the product quality in the PCS because of its direct impact on human health. Therefore, increasing the awareness of both the manufacturers and the consumers is vitally important for the development of their industry.

8. Bridging the research gap between the pharmaceuticals industry and universities because it is an essential point for development. Cost-effective systems, and financial and management information systems are necessary. Acquiring GMP certifications from local and international authorities is considered the entry permit to international markets. Market studies and registration of medicines are, therefore, continually needed .

9. Conducting similar studies based on ISO system, or Six-Sigma system is highly recommended because they would contribute to the highlighting of the importance of the quality system and its impact on the Palestinian chemical plants.

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Appendices

Appendix 1: Questionnaire of the Study

بسم الله الرحمن الرحيم

Dear Mr.:

Dear Mrs. \ Miss:

This study aims at identifying the level of application of TQM in the Palestinian chemical plants and in pharmaceuticals, food and detergents sectors from the viewpoint of top management to develop this industry, and to keep up with global development movements.

Please fill out this questionnaire accurately and objectively to be able to depend in the analysis on reliable information and come up with valid results and recommendations . Please note that this study is being conducted as a requirement for obtaining a master's degree in engineering management.

All information provided will be treated confidentially, and all data will be used for research purposes only. Results of this research would be provided to you upon request.

Thank you for your cooperation and your patience. I highly appreciate your valuable efforts in supporting this scientific research.

Researcher: Deema Rabay'a

M. Sc. student of Engineering Management

An - Najah National University

Please fill out this questionnaire carefully:

Part one: Company data profile:

1. Type of Industry: ☐ Pharmaceuticals ☐ Food ☐ Detergents ☐ Other

2. Ownership of the company: ☐ Public ☐ Private

3. Scope of the current market: ☐ Local ☐ Regional ☐ International

4. Nature of the ownership of the company: ☐ National ☐ Branch of another company ☐ Franchise ☐ Partnership strategy

5. Specifications according to which the company operates: ☐ Palestinian ☐ ISO ☐ Other

6. Number of branches of the company: Local & International

7. Company's capital:

8. Number of the company's products:

9. Number of workers in the company:

Part Two:

This part contains questions which aims at identifying the level of application of total quality management in your plant. Please study them carefully and then fill out:

No.	Statement	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
First: Commitment to and support of senior management						
1.	Senior management adopts a clear strategic policy and specific objectives in the application of quality.	☐	☐	☐	☐	☐
2.	Senior management seeks to build a good reputation among the customers of high-quality and perfection.	☐	☐	☐	☐	☐
3.	Management provides facilities, equipment and personnel necessary to implement quality.	☐	☐	☐	☐	☐
4.	Management works to clarify the objectives to the workers especially the goals related to quality.	☐	☐	☐	☐	☐
5.	Management establishes a system of incentives to improve quality.	☐	☐	☐	☐	☐
6.	Management cares to find effective communication ways between the various sections in the company.	☐	☐	☐	☐	☐
7.	Senior management gives flexibility to the various departments to solve the problems they face.	☐	☐	☐	☐	☐
8.	Senior management monitors and tracks the course of action of quality programs to reach the strategic goals.	☐	☐	☐	☐	☐
Second: Customer – driven quality						
1.	Company always studies the needs and desires of customers and their satisfaction with the products .	☐	☐	☐	☐	☐
2.	When designing quality strategies, the company takes into account the desire of the consumer commodity.	☐	☐	☐	☐	☐
3.	There is a special section in the company which works on study of the customer behavior continuously.	☐	☐	☐	☐	☐
4.	There is a system in the company to ease customer feedback access to officials in the administration.	☐	☐	☐	☐	☐
5.	Company takes the view of customers when developing new products.	☐	☐	☐	☐	☐
6.	Company studies customer complaints constantly and provides appropriate solutions.	☐	☐	☐	☐	☐
7.	Employees in the company looks to each other as if they were internal customers.	☐	☐	☐	☐	☐

Third: Employee participation and development						
1.	Company takes in consideration the opinion of workers about the opportunities for improvement in operations.	☐	☐	☐	☐	☐
2.	Company trains workers on modern techniques and skills that will help to develop their performance and quality improvement.	☐	☐	☐	☐	☐
3.	Cost of training in the company does not affect the decision of workers' training to raise their efficiency.	☐	☐	☐	☐	☐
4.	Training programs in the company aim at raising the level of quality.	☐	☐	☐	☐	☐
5.	Management believes that the higher degree of efficiency of training is directly related to the level of product quality.	☐	☐	☐	☐	☐
6.	Training process in the company includes all employees within all levels of management.	☐	☐	☐	☐	☐
7.	Long period of time for some training courses weakens the decision to approve participation in such courses.	☐	☐	☐	☐	☐
8.	Workers are rewarded in the company when they learn new skills to motivate them for more innovation and initiative.	☐	☐	☐	☐	☐
9.	Employees own shares in the company and that contributes to raising the quality level.	☐	☐	☐	☐	☐
Fourth: Continuous improvement						
1.	Company seeks to solve the problems of quality drastically and constantly.	☐	☐	☐	☐	☐
2.	Company is keen on developing its products and introducing new products continuously.	☐	☐	☐	☐	☐
3.	Company has a special department for research and development for continuous improvement of its products.	☐	☐	☐	☐	☐
4.	Continuous improvement of goods and services earns the company a competitive advantage compared to companies .	☐	☐	☐	☐	☐
5.	Company is interested in improving productivity and increasing the effectiveness of the exploitation of resources.	☐	☐	☐	☐	☐
6.	Company is interested in providing machinery and equipment and advanced technology to increase the level of product quality.	☐	☐	☐	☐	☐
7.	Company compares its internal operations with the operations of more successful companies , whether they are in the same industry or in other industries.	☐	☐	☐	☐	☐

Fifth : Suppliers participation						
1.	Company deals with a specific set of suppliers.					
2.	Company makes great efforts to establish long-term relationships with suppliers.					
3.	Company uses specific criteria in the selection of suppliers and these criteria are based on quality.					
4.	Company is interested in the regulations of purchases with lower price suppliers regardless of quality.					
5.	Company shares with the supplier quality requirements.					
6.	Company requests from suppliers to make some tests on raw materials.					
7.	Suppliers performance is evaluated on basis of quality and commitment to time.					
8.	Opinions of suppliers about the materials and prices are taken into consideration					
9.	Company maintains an integrated database for suppliers and the quality of their products.					
10.	Opinions of suppliers are taken when developing new products in the company.					
Sixth: Organization culture						
1.	Values and beliefs dominant in a company would encourage development and reduce resistance to change.					
2.	Senior management emphasizes that quality is the collective responsibility of all employees.					
3.	Management is always keen on providing all the means to strengthen the organizational affiliation and loyalty among employees.					
4.	Organizational climate prevailing in the company encourages creativity and innovation.					
5.	Top management encourages individuals to share their ideas and views among themselves.					
6.	Senior management cares to make changes in the organizational culture to serve the access to quality.					
Seventh: Using statistical control and feedback						
1.	Quality control programs in the company are used to control schemes during the manufacturing process.					
2.	Samples are taken from the production stage during the manufacturing process to make sure they conform to the required specifications (according to the examination system in the laboratories of the					

	company).					
3.	The company uses statistical techniques widely to reduce the variation and deviation in the production process.	☐	☐	☐	☐	☐
4.	Quality control programs in the company use appropriate measurement tools during the manufacturing process.	☐	☐	☐	☐	☐
5.	Samples are taken from the final product to make sure they conform to the required specifications.	☐	☐	☐	☐	☐
6.	Company uses the records (daily or computerized) to record the results of the examination and testing in order to benefit from them in the future.	☐	☐	☐	☐	☐

Part Three:

This part contains statements which aim at identifying the most important **obstacles** facing the application of the principles of quality in your company. Please study them carefully and then fill them out :

No.	Statement	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	Senior management commitment to the concepts of traditional management.	☐	☐	☐	☐	☐
2.	Lack of top-management commitment to and understanding the quality programs.	☐	☐	☐	☐	☐
3.	Top management focus on performance in the short term.	☐	☐	☐	☐	☐
4.	Absence of a clear strategy for quality management in the company.	☐	☐	☐	☐	☐
5.	Quality system implementation requires changing the organizational culture of the company and it is not what the company can do.	☐	☐	☐	☐	☐
6.	Implementation of quality program is an unnecessary cost.	☐	☐	☐	☐	☐
7.	Actual results of implementation of quality program does not encourage continuity.	☐	☐	☐	☐	☐
8.	Quality program implementation does not solve the problems of the company.	☐	☐	☐	☐	☐
9.	Team in charge of quality improvement is busy with solving simple problems rather than in getting to the root cause of a problem.	☐	☐	☐	☐	☐
10.	Lack of quality education and training programs for workers to drive the improvement process in the company	☐	☐	☐	☐	☐
11.	Lack of employee commitment to and interest in the quality programs in the company.	☐	☐	☐	☐	☐
12.	Worker's resistance to quality programs in the company.	☐	☐	☐	☐	☐

13.	Absence of rewards for and appreciation of the achievement of individuals.	☐	☐	☐	☐	☐

14. Others (please mention)

Part Four:

This part contains statements which aim at identifying the most important **challenges** facing the application of the principles of quality in your company. Please study each carefully and then fill it out :

No.	Questions	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	Fear of employee empowerment.	☐	☐	☐	☐	☐
2.	Schedule and cost are treated as the main priorities during work.	☐	☐	☐	☐	☐
3.	Lack of documentation ability in the company.	☐	☐	☐	☐	☐
4.	Adapting to changing trends, behaviors and attitudes in the company.	☐	☐	☐	☐	☐
5.	Improving efficiency of production processes to reduce cost, time, and product development.	☐	☐	☐	☐	☐
6.	Providing services to consumers to commensurate with their needs and expectations.	☐	☐	☐	☐	☐
7.	Keeping pace with global development and improvement in the specification of services and methods of submission.	☐	☐	☐	☐	☐
8.	Competition-oriented move from local to global level.	☐	☐	☐	☐	☐
9.	Using innovation methods and new management techniques to meet the current rapid and continuous changes.	☐	☐	☐	☐	☐
10.	Reducing consumer complaints and cost of quality to contribute to the achievement of customer satisfaction.	☐	☐	☐	☐	☐

11.	Increasing productivity and profits which leads to raising market share.	☐	☐	☐	☐	☐
12.	Reducing accidents and the problems of work to contribute to improvement of administrative efficiency.	☐	☐	☐	☐	☐
13.	Improving the communication process between the various levels of the organization and ensuring the effective participation of all its members to improve performance.	☐	☐	☐	☐	☐
14.	Attracting qualified people in the IT world and modern management methods to contribute effectively in development of high quality products.	☐	☐	☐	☐	☐

15. Others (please mention)

Appendix 2: Names of companies (under study)

Type of industry	Number	Name of company	City
Chemical Industry (Detergents and Cosmetics)	1	شركة الصناعة العربية	Ramallah
	2	شركة الصداقة الفلسطينية للكيماويات	Ramallah
	3	شركة الرائد لصناعة مواد التجميل	Bethlehem
	4	شركة الكرمل التجارية الصناعية	Nablus
	5	مصنع الراجح للمنظفات الكيميائية	Nablus
	6	شركة البريق للمنظفات و التسويق	Jenin
	7	شركة الشلهوب للصناعات الكيميائية	Tulkarem
Pharmaceuticals Industry	8	شركة بير زيت للأدوية	Ramallah
	9	شركة القدس للمستحضرات الطبية	Al- Bireh
	10	شركة فارماكير للأدوية	Ramallah
	11	شركة بيت جالا للأدوية	Beit Jalah
Food Industry	12	شركة حدائق فلسطين	Jericho
	13	مصنع جريكو للمياه المعدنية	Jericho
	14	شركة الجنيدي لمنتجات الألبان	Hebron
	15	شركة الحمودة للمنتجات الغذائية والزراعية	Jerusalem
	16	شركة مصنع ومطاحن النصر	Jenin
	17	شركة زادنا للتصنيع الزراعي	Jenin
	18	شركة السلوى للمنتجات الغذائية	Ramallah
	19	شركة سنقرط للمنتجات الغذائية	Ramallah
	20	شركة المشروبات الوطنية (كوكا كولا)	Ramallah
	21	مصنع البينار لمنتجات الألبان	Ramallah
	22	المؤسسة الإسلامية للمنتجات الغذائية	Tulkarem
	23	شركة مراوي/كابي	Tulkarem
	24	شركة دواجن فلسطينPPC	Tulkarem
	25	شركة مصانع الزيوت النباتية م.ع.م	Nablus
	26	شركة الشرق الأدنى للصناعة والتجارة - عنبتاوي	Nablus
	27	شركة مصنع بوظة الأرز	Nablus
	28	شركة مصنع الزهراء للمواد الغذائية والشراب	Nablus

	29	مشروع الزكاة التاهيلي لمنتجات الألبان	Nablus
	30	شركة المسلماني	Nablus
	31	مصنع ألبان القيسي	Tulkarem
	32	مصنع فروت توب للعصائر	Tulkarem
	33	شركة الحياة للصناعات الغذائية م.م	Jerusalem
	34	شركة الريان لمنتجات الألبان	Ramallah
	35	شركة مطاحن القمح الذهبي	Ramallah
	36	شركة الخيزران للأعشاب الطبية	Jenin
	37	شركة المعمل الوطني للشوكولاته	Tulkarem
	38	مصنع طحينة و حلاوة علاء الدين	Tulkarem
	39	شركة السلطان لتعبئة المياه المعدنية	Jericho
	40	شركة القصراوي التجارية الصناعية	Hebron

Appendix 3:The Structured Interview

نص أسئلة المقابلة

1. هل يوجد دراسات تحليلية و تغذية راجعة عكسية في الشركة؟ و هل يوجد قاعدة معلوماتية و بيانات ضرورية؟
2. هل تطبق أنظمة الحوافز المادية و المعنوية؟
3. هل تقدمون خدمات أو سلع لا تطبق عليها معايير الجودة المستخدمة عندكم؟
4. هل يتم توزيع الأدوار و هل هناك تفويض للمسؤوليات؟
5. هل تطبقون مفهوم البوادر الوقائية و ليس العلاجية عند تطبيق معايير الجودة و ذلك لزيادة قدراتكم في مواجهة المشكلات قبل حدوثها و لتقليل التكاليف و زيادة الإنتاجية؟
6. هل تحاول الشركة التعرف على منافسيها في السوق المحلي و العالمي،
7. هل تقوم الشركة بتحليل الأسواق للتعرف على الجهات المنافسة من حيث الحجم و الموارد و المنتج و إجراء المقارنات لرفع المستوى للحد المطلوب؟
8. هل يوجد أنظمة تكاليف فعالة و أنظمة محاسبية للتكاليف؟
9. ما هو نظام تكاليف الجودة المتبع في الشركة؟
10. هل يوجد ميزة تنافسية تعملون على تحسينها و تطويرها؟
11. هل يوجد برنامج لتطبيق TQM داخل الشركة؟
    - أ. ما هي التغيرات التي تم عملها لتطبيق TQM ؟
    - ب. ما هي الوسائل و الأدوات المستخدمة لتطبيق TQM ؟
    - ت. ما هي فوائد تطبيق TQM ؟
    - ث. ما هي المشاكل و الأخطاء الواقعة عند تطبيق TQM ؟

Appendix 4: Interviewed PCS Supervisors

اسم السيد/السيدة	المسمى الوظيفي	اسم الشركة	المدينة	تاريخ المقابلة
1. إحسان أبو مريم	مدير قسم الجودة	شركة سنقرط للمنتجات الغذائية	رام الله	3/ 2011/12
2. إبراهيم جبارين	مدير قسم التسويق	شركة الصناعة العربية	رام الله	2011/12/3
3. فاطمة صادق	مدير المختبرات	شركة مصانع الزيوت النباتية م.ع.م.	نابلس	2011/12/10
4. إياد أبو خيزران	مدير عام	شركة الخيزران للأعشاب الطبية	جنين	2011/12/15

جامعة النجاح الوطنية

كلية الدراسات العليا

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إعداد

ديما ربايعة

إشراف

د. عامر الهموز

قدمت هذه الأطروحة استكمالا لمتطلبات الماجستير في الادارة الهندسية بكلية الدراسية العليا في جامعة النجاح الوطنية، نابلس- فلسطين .

2013

واقع وتحديات تطبيق إدارة الجودة الشاملة في الصناعات الكيماوية الفلسطينية

إعداد

ديما ربايعة

إشراف

د. عامر الهموز

الملخص

تهدف هذه الدراسة إلى تقييم واقع الصناعات الكيماوية الفلسطينية ودراسة مستوى تطبيق نظام إدارة الجودة الشاملة في المنشات الصناعية الفلسطينية وخاصة في قطاعات (الأدوية، الأغذية والمنظفات)، وذلك من وجهة نظر الإدارة العليا. بالإضافة إلى التعرف على المعيقات والتحديات التي تواجه تطبيق نظام إدارة الجودة الشاملة في المنشآت الصناعية الفلسطينية.

يتكون مجتمع الدراسة من الشركات الصناعية الفلسطينية التي تمارس النشاط الإنتاجي وخاصة قطاعات الأدوية، الأغذية والمنظفات. أما عينة الدراسة فقد تكونت من 40 شركة صناعية اختيرت عشوائيا، وقد تم جمع البيانات منها عن طريق استبانه تهدف إلى الدراسة الميدانية لمتغيرات مشكلة الدراسة واختبار فرضيات الدراسة.

توصلت الدراسة إلى عدد من النتائج أهمها أن هناك اهتمام كبير من قبل المنشآت الصناعية عينة الدراسة بتطبيق متغيرات نظام إدارة الجودة الشاملة، وتطبيق أغلب هذه المتغيرات بدرجات ومستويات مختلفة، فقد كان أعلى مستوى تطبيق من نصيب التحسين المستمر، ثم يليها استخدام الوسائل الإحصائية والتغذية الراجعة، كما تمثل مشاركة العاملين وتطويرهم أقل مستوى من حيث التطبيق.

خلصت الدراسة بعدد من التوصيات للشركات الصناعية الفلسطينية أهمها ضرورة تطبيق فلسفة إدارة الجودة الشاملة من قبل الشركات التي لم تعتمد هذه الفلسفة سابقا.

كما أوصت الدراسة بالعمل المستمر لتدريب العاملين وتطويرهم وسماع آرائهم والأخذ بها لتحقيق المنفعة القصوى من القوى العاملة، وكذلك أوصت الدراسة بأعطاء الأهمية الكافية لاستخدام الأساليب الإحصائية وأدوات مراقبة الجودة، لأنها تساعد في تحديد وتحليل مشاكل الجودة.