



## Establishment of Total Quality Management in the Iranian Seaports

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### Abstract

This study aimed to determine the readiness level of the studied seaport' managers for Establishment of Total Quality management (hereinafter referred to as TQM). Thus because all of the ports are of trading kind so they are considered as a servicing organization and due to optimizing the research, the TQM principles such as commitment, customers focus, pragmatism, employee involvement, training and continuous improvement as efficient tools for probing the readiness level of the studied seaport' managers for Establishment of Total Quality management. Then, for collecting the necessary data, the multiple item questionnaires' is prepared. All the question items are organized according to the above mentioned principles. The main hypothesis that outlined the readiness of the Studied seaport' managers for Establishment of TQM is on the appropriate level probed and studied here, but finally the result on which revealed by T-test, showed that the studied port is not in an appropriate level for Establishment of TQM. Therefore the main hypothesis of the study is rejected and the secondary hypotheses of the study are rejected, too.

**Keywords:** Port, TQM, Marine Transportation, Iran, Seaport' Managers

### Introduction

Nowadays the success of the organizations all shed light on the one feature and that should be nothing but the knowledge of the management, on which by modern performance lead to new procedures and it has two features per se: quality and

Development (Prajogo and Brown, 2012; Hung *et al.*, 2011). The quality management will guarantee the managers toward the sudden global sociable, economic and technological structure changes with its organizational progress and continuum stability and dynamically (Zatzick *et al.*, 2012; Lee *et al.*, 2012). It is notable to mention here that the servicing quality features are more complex than physical production quality to define, because the poor quality of the production is directly and

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mainly referred to the inappropriate raw materials or compositional elements but the poor quality of the servicing refer to the individuals behavior straightly (Kumar *et al.*, 2011; Dubey and Chakrabarty, 2011; Ooi *et al.*, 2012). The shortness of educational or the special attentions frequently are main reasons for customer's dissatisfaction (Ooi *et al.*, 2011; Schonberger, 2011; Wiengarten *et al.*, 2013). There were so many years that the top organizations were using TQM order to improve their quality of performance (Singh, 2013).

According to the vital role of Seaports in the national economy, tried to establishment of TQM philosophy can improve the satisfaction level of port users. But for initializing and Establishment of this philosophy, special background should be available in order to avoid and decrease the eventual danger and failure in the futures of organizations. According to this it is better that before each organizations (ports) try to establish this philosophy, it should recognize and eradicate the crucial factors in the establishment of TQM first, then prepare the background for the better operational condition toward the establishment of TQM. So from this point of view, evaluation and assessing these crucial factors in the Establishment of this philosophy and also probing the readiness level of the Iranian seaport' managers for Establishment of TQM is a critical issue and the aim of this study is not out of this domain.

### Research Literature

Worldwide, much research has been conducted in the field of TQM

implementation. After a review of the relevant TQM literature, it has been found that different researchers adopted different TQM definitions and frameworks based on their own understanding of TQM and research objectives. Consequently, there are fewer consensuses on what TQM is and what constitutes it.

TQM can be defined as a set of techniques and procedures used to reduce or eliminate variation from a production process or service-delivery system in order to improve efficiency, reliability, and quality (Steingard and Fitzgibbons, 1993). It integrates fundamental management techniques, existing improvement efforts, and the technical tools under a disciplined approach focused on continuous improvement. According to Kanji and Asher (1996), TQM is a continuous process of improvement for individuals, groups of people, and whole firms; it encompasses a set of four principles (delight the customer, management by fact, people-based management, and continuous improvement) and eight core concepts (customer satisfaction, internal customers are real, all work is process, measurement, teamwork, people make quality, continuous improvement cycle, and prevention). TQM can also be defined as the application of quality principles for the integration of all functions and processes within the firm (Ross, 1993). There is another definition of TQM, which is a management approach for an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction and benefits to all

members of the organization and to society. Flynn *et al.* (1994) defined TQM as: An integrated approach to achieving and sustaining high quality output, focusing on the maintenance and continuous improvement of processes and defect prevention at all levels and in all functions of the firm, in order to meet or exceed customer expectations.

One of the TQM definitions which are printed in England ministry of industry and business by John Okland is as the following TQM in general is a way to improve management of effectiveness, flexibility and competitiveness in manufacturing and service organizations which include all units, activities and individuals at all levels in the organization (Okland, 1991). Also, another citation outline that TQM is a proved systematic way for programming and managing the activities in the organization (Munro and Faure, 1992). Some other definitions for TQM are mentioned in an article about TQM and food industry in pervasive quality management book.

- 1- TQM is a maxim and a set of concepts and methods for Continuous improvement of the organizations.
- 2- TQM is a process system for proper quality of what we do.
- 3- TQM is related to both domestic and foreign customers.

According to Ho and Fung (1994), TQM is a way of managing to improve the effectiveness, flexibility, and

competitiveness of a business as a whole. It is also a method of removing waste, by involving everyone in improving the way things are done. According to Vuppalapati *et al.* (1995), TQM is an integrative philosophy of management for continuously improving the quality of products and processes to achieve customer satisfaction.

Hackman and Wageman (1995) systematically reviewed the three quality gurus' (Deming, Juran, and Ishikawa) propositions about TQM. According to their review results, the following five interventions are the core of TQM: Explicit identification and measurement of customer wants and needs; creation of supplier partnership; use of functional teams to identify and solve quality problems; use of scientific methods to monitor performance and identify points of high leverage for performance improvement; use of process management heuristics to enhance team effectiveness. Dean and Bowen (1994) defined TQM as a philosophy or approach to management that can be characterized by its principles, practices, and techniques. Its three principles are customer focus, continuous improvement, and teamwork. Each principle is implemented through a set of practices, which are simply activities such as collecting customer information or analyzing processes. The practices are, in turn, supported by a wide array of techniques.

Choi and Eboch (1998) studied the TQM paradox using management of process quality, human resources management,

strategic quality planning, and information and analysis as the constructs of TQM implementation. Black and Porter (1996) identified ten critical factors of TQM: People and customer management, supplier partnership, communication of improvement information, customer satisfaction orientation, external interface management, strategic quality management, and team work structure for improvement, operational quality planning, quality improvement measurement systems, and corporate quality culture. In Powell's 1995 study, the following elements were identified as TQM framework: Executive commitment, adopting the philosophy, closer to customers, closer to suppliers, benchmarking, training, open organization, employee empowerment, zero-defects mentality, flexible manufacturing, process improvement, and measurement. Ho and Fung (1994) identified ten TQM elements: Leadership, commitment, total customer satisfaction, continuous improvement, total involvement, training and education, ownership, reward and recognition, error prevention, and cooperation and teamwork. Waldman (1994) identified eight key TQM elements as: Top management commitment to place quality as a top priority, a broad definition of quality as meeting customers' expectations, TQM values and vision, the development of a quality culture, involvement and empowerment of all organizational members in cooperative efforts to achieve quality improvements, an orientation toward managing-by-fact, the commitment to continuously improve employees' capabilities and work processes through

training and benchmarking, attempts to get external suppliers and customers involved in TQM efforts. Mann and Kehoe (1994) divided TQM into ten elements. They are supplier improvement, process control and improvement, internal customer focus, measurement and reporting, leadership, quality system, participation, recognition, education and training, and external customer focus.

In this field of study there is some research in Iran and overseas. For instances the study point to some of them here. Ghodrattollah Bagheri studied the condition of educational managers' experience and degree in Kuhgeiloye and Buyerahmad with the pervasive quality management (Bagheri, 2005). (Ibekwe, 2006) studied the using of TQM for establishing the university scientific plans: an evaluation from economic college masters and principals perception (Cunningham, 2007) studied the teachers' tendencies toward TQM: a study from elementary and high schools teachers.

### **The Principles of TQM**

There are several principles for TQM that organizations would select and adopt the principles based to their condition and start to perform them. The fourteen Deming's principles for TQM are (Chen, 2013a):

- 1) Assigning a good and well-formed plan for continuum improvement of production and servicing
- 2) Adoption and implementation of the new philosophy from the senior

- managers and employees (Azhar *et al.*, 2013)
- 3) Put an end to the product Inspection and replace it with a high quality creation in a process (Mosadeghrad, 2013).
  - 4) Preparing the raw material from the certain resource without to pay attention to low price.
  - 5) Attention to continuous process improvement and optimization in order to reduce waste
  - 6) Establishing job training for managers and employees (Chen *et al.*, 2013b)
  - 7) Setting the modern leading method.( searching for the problem asset and omit it instead of who is the guilty and blame it)
  - 8) Deleting any kind of phobia in the organization (Habidin and Yusof, 2013)
  - 9) Deleting the distances and obstacles among the different units (Sahu *et al.*, 2013)
  - 10) Avoiding from preaching, advising and spouting slogans for the stuff (Sahu *et al.*, 2013).
  - 11) Elimination of quantitative goals for employees and managers
  - 12) Let the obstacles to be deleted and fulfilling the stuff with the glory and honor (Haffar *et al.*, 2013).
  - 13) Encouraging the stuff to upgrading their knowledge and self-studying culture (Singh and Dubey, 2013)
  - 14) Managers should commit on all of the above mentioned principles and present all the stuff for these assets (Singh, 2013)

In the specific environment and condition, of course that these principles will vary,

therefore each organization based on its situation and appropriateness will select these assets and adopt them. Because this study conducted in the Studied seaport', so the appropriate principles will be best selected and matched by the six (Mosadeghrad, 2013) principles, they are not the same as the previous ones and are suitable for a servicing organization.

**Commitment:** All the stuff should be involved in improving the quality of the participation in the TQM and without unanimous cooperation this is not going to achieve. All the individuals should concern about the usefulness and the quality of the improvement. Superior Managers should make a commitment for a new progress and optimized quality. Since the superior and well managing will give a special supports to the organization effort and this is considered a necessary action (Habidin and Yusof, 2013). After the superior managers' commitment, medium managers should undergo of commitment because they also play the important roles for stimulating and rationalizing the stuff, so the commitment is necessary for all the workers in the organization (Singh, 2013).

**Customer Focus:** nowadays the servicing organizations put a special light for the customers and they pave the way of satisfaction for them. This process is increasing recently as we see in the Malcolm Baldrige National Quality Award, about of 30 percent of sores are dedicated to customers satisfaction, organizations weather servicing or productive, they going to face

the customers and they should seek for their satisfaction (Singh and Dubey, 2013).

**Fact Based Decision Making:** Decision should base in facts and they should collect by data and statistics, so this kind of view called pragmatic (Fact Based Decision Making) management, and contrasted with result based management. Result based management only focus of the conclusion and it don't focus on the procedural processes. Therefore it doesn't consider the quality, cost and the improvement of the performance. Finally the short-sight view will replace with a long-sight view. TQM fixates on problems and tries to identify them and encounter them with stuff cooperation. This kind of management does not waste it's time for swift and cursory solution but they look for standard optimized solution by gathering all the data and analyzing them together. Hence, special tools and program are excogitated for such analysis and they are easy to access and learn (Sahu *et al.*, 2013).

**Employee Involvement:** collaboration and cooperation are success keys for the TQM great achievement. Group involvement in the work will lead the co assisting and finally to the more suitable solution for the problems. In fact, cooperation will cause the improvement in the state of the mind and knowledge of the stuff. A particular characteristic of a Japanese worker is working by hands and by mind, too. Mr. Toyoda the principal of TOYOTA Company said. Japanese worker offer about 1/5 million suggestion every year that 95 percent of that

will applied in work, the room of TOYOTA factory is always full of energy and emotion during the work (Singh, 2013)

**Training:** There is a Japanese proverb that says Pervasive quality starts by education and end within it (Singh, 2013). Training should involve all the stuff like superior managers, Middle managers, Supervisors and all workers. The general goals of the training include as, knowing the task and duty of their own and their customers' needs, enhancing the knowledge of the members, familiarizing the members with the new invented technological instrument, being familiarized with TQM's concepts and how to use such related tools for controlling the statistics data. Since managers are in charge of the stuffs training program, therefore they should saturate with new tech and information and hold on training courses. It should be important to empower the managers, this it mean that: it should be a specific effervescent and emotion in their work and also their inner motivation should spark for their tasks. Empowering will vivid a potential capacity of optimized skills for the organization, that guarantee the resumption of the organizations work in the new era of complexity and dynamically challengeable. Hence, the more sudden shift, technological progress, obvious and ambiguous competition in the world, the more empowering of the managers going to be needed (Azhar *et al.*, 2013).

**Continuous Improvement:** Continuous improvement is one of the important assets of the TQM. Sometimes they are used

synonymous in the organization processes. TQM is a journey not a destination; management should use this point for leading and supporting the plans of TQM (Sahu *et al.*, 2013). Totally we can claim that the six principles of commitment, customers focus, pragmatism, employee involvement, training and continuous improvement will lead to TQM operation

## Research Hypotheses

### Main Hypothesis

The readiness of the studied seaport' manager for Establishment of TQM is on the appropriate level.

### Secondary Hypotheses

- 1) The level of commitment of the studied ports' managers is on the appropriate level for TQM operation.
- 2) The level of the customer's focus of the studied ports' managers is on the appropriate level for Establishment of TQM.
- 3) The level of pragmatism of the studied ports' managers is on the appropriate level for Establishment of TQM.
- 4) The level of employee involvement of the studied ports' managers is on the appropriate level for Establishment of TQM.
- 5) The level of training possibility is on the appropriate level for Establishment of TQM from the studied ports' managers' point of view.

- 6) The level of continuous improvement of the studied ports' is on the appropriate level for Establishment of TQM.

## Methodology

With a view to the objective, taking into consideration the type and nature of the problem, objectives and questions, the present study is an applied research this research is descriptive and for gathering the required data field study technique is applied.

The population in this research is the whole experts in studied ports. We used Cochran formula for determining the sampling.

$$n_{\max} = \frac{\frac{TQZ^2}{d^2}}{1 + \frac{1}{N} \left( \frac{TQZ^2}{d^2} - 1 \right)} \quad (1)$$

In this study z equals 1/969 (0/975 percent of standard normal distribution) and T: Q is equal to 0/5 (the society units to wanted features) and d equals to 0/05 (the most accepted error) and n equals to 175. So according to mentioned values, we have n: 120 that mean the Hypotheses of the study.

### Methods and Tools for Data Collection

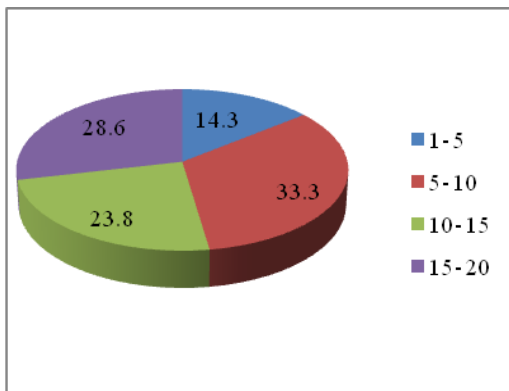
In the current study Questionnaire used as main data collection instruments. All the questionnaires' items are organized and prepared based on the TQM principles. They are prepared according to Likert scale. This questionnaire is theoretical base it has validity, Cronbach Alpha is used reliability

test that shows 0/9454 in the whole on which it considered the reliable.

For data analysis and statistical test SPSS software, version 18 is used. In this study, at the first the normality of data examined by Kolmogorov - Smirnov test, then by using the parametric T-test (one sample), at 95 percent confidences levels the Research hypotheses tested.

**Results**

**Personal Features of Respondents**



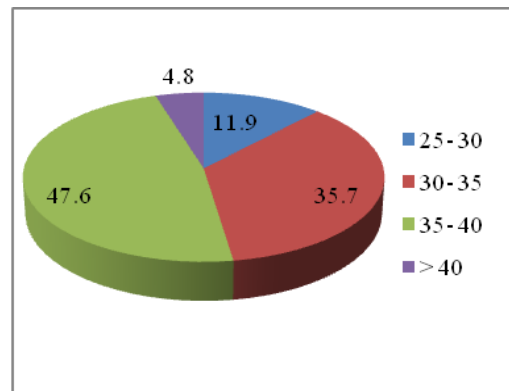
**Figure 2: Respondents' Work Experience Percentage**

First the data were examined in order to be normal for manager's average comparison, and then if the data distribution were normal, one sample T-test is going to use for average comparison. So by Kolmogorov - Smirnov test the normality of data were tested and they proved normal ( $p < 0.05$ ). For all hypothesis survey, the obtained average will compared with 3.5 by T-test.

**Research Hypotheses**

**First Secondary Hypothesis Test**

Figures 2 and 3 represent the age, Marital Status and the years of experience ranges. In the age range they were classified into four classes on which the most were between 35 to 40 year and the least were in the 40 years and upper. Also, from the work experience they were classified into four classes on which the most percent were in the 10 to 15 years and the least were in the 1 to 5 years of experience. In this study 62 percent of the respondents were M.A and 38 percent were B.A whereas 12 percent were women and 88 percent were men.



**Figure 3: Respondents' Age Percentage**

**Hypotheses:** The level of commitment of the studied ports' managers is on the appropriate level for Establishment of TQM.

**H<sub>0</sub>:** The readiness level of managers' commitment in the studied ports is on the appropriate level for Establishment of TQM.

**H<sub>1</sub>:** The readiness level of managers' commitment in the studied ports for Establishment of TQM is not on the appropriate level.

According to T-test result in the table 1, it is easy to understand that the readiness level of



managers' commitment for Establishment of TQM is not on the appropriate level.

**Table 1: T-test Result, for the First Secondary Hypothesis**

Result	One-Sample T .Test - Test Value = 3/5 - First Secondary Hypothesis					
	95% Confidence Interval of the Difference		Mean difference	Sig.	df	t
	Lower	Upper				
H <sub>1</sub> Confirmed	2/05	-1/57	-0/57	0/000	119	-25/02

**Second Secondary Hypothesis Test**

**Hypotheses:** The readiness level of managers' customer focus in the studied ports is on the appropriate level for Establishment of TQM.

**H<sub>0</sub>:** The readiness level of managers' customer focus in the studied ports is on the appropriate level for Establishment of TQM.

**H<sub>1</sub>:** The readiness level of managers' customer focus in the studied ports is not on the appropriate level for Establishment of TQM.

**Table 2: T-test Result, for the Second Secondary Hypothesis**

Result	One-Sample T .Test - Test Value = 3/5 - Second Secondary Hypothesis					
	95% Confidence Interval of the Difference		Mean difference	Sig.	df	t
	Lower	Upper Range				
H <sub>1</sub> Confirmed	-2/69	2/32	0/50	0/000	119	-10/03

For customers focus survey, the obtained average of this asset will compared with 3.5 by T-test. According to the table 2, it is easy to understand that the readiness level of managers' customer focus is not on the appropriate level for Establishment of TQM (Table 2)

**Third Secondary Hypothesis Test**

**Hypotheses:** The readiness level of managers' pragmatism in the studied ports is

on the appropriate level for Establishment of TQM.

**H<sub>0</sub>:** The readiness level of managers' pragmatism in the studied ports is on the appropriate level for Establishment of TQM.

**H<sub>1</sub>:** The readiness level of managers' pragmatism in the studied ports is not on the appropriate level for Establishment of TQM.

**Table 3: T-test Result, for the Third Secondary Hypothesis**

Result	One-Sample T .Test - Test Value = 3/5 - Third Secondary Hypothesis					
	95% Confidence Interval of the Difference		Mean difference	Sig.	df	t
	Lower	Upper				
H <sub>1</sub> Confirmed	-2/21	-2/53	2/38	0/000	119	-18/03

According to Table 3, it is easy to understand that the readiness level of managers' pragmatism is not on the appropriate level for Establishment of TQM.

**H<sub>0</sub>:** The readiness level of managers' employee involvement in the studied ports is on the appropriate level for Establishment of TQM.

**Forth Secondary Hypothesis Test**

**Hypotheses:** The readiness level of managers' employee involvement in the studied ports is on the appropriate level for Establishment of TQM.

**H<sub>1</sub>:** The readiness level of managers' employee involvement in the studied ports is not on the appropriate level for Establishment of TQM.

**Table 4: T-test Result, for the Third Secondary Hypothesis**

Result	One-Sample T .Test - Test Value = 3/5 - Forth Secondary Hypothesis					
	95% Confidence Interval of the Difference		Mean difference	Sig.	df	t
	Lower	Upper				
H <sub>1</sub> Confirmed	-2/22	-2/56	-./39	0/000	119	-21/107

By T-test and according to the table 4 we can also presume that the readiness level of managers' employee involvement is not on the appropriate level for Establishment of TQM.

**H<sub>0</sub>:** The level of training possibility is on the appropriate level for Establishment of TQM from the studied ports' managers' point of view.

**Fifth Secondary Hypothesis Test**

**Hypotheses:** The level of training possibility is on the appropriate level for Establishment of TQM from the studied ports' managers' point of view.

**H<sub>1</sub>:** The level of training possibility is not on the appropriate level for Establishment of TQM from the studied ports' managers' point of view.

**Table 5: T-test Result, for the Fifth Secondary Hypothesis**

Result	One-Sample T .Test - Test Value = 3/5 - Sixth Secondary Hypothesis					
	95% Confidence Interval of the Difference		Mean difference	Sig.	df	t
	Lower	Upper				
H <sub>1</sub> Confirmed	-1/33	-1/78	-./55	0/000	119	-13/94

By T-test and according to the upper table we can also presume that the level of training possibility is not on the appropriate level for Establishment of TQM from the studied ports' managers' point of view.

**H0:** The readiness level of managers' continuous improvement in the studied ports is on the appropriate level for Establishment of TQM.

**Sixth secondary Hypothesis Test**

**Hypotheses:** The readiness level of managers' continuous improvement in the studied is on the appropriate level for Establishment of TQM.

**H1:** The readiness level of managers' continuous improvement in the studied ports is not on the appropriate level for Establishment of TQM.

**Table 6 : T-test Result, for the Sixth Secondary Hypothesis**

Result	Test value = 3/5 - Sixth secondary hypothesis					
	95% Confidence Interval of the Difference		Mean difference	Sig.	df	t
	Lower	Upper				
H <sub>1</sub> Confirmed	-1/16	-1/67	-./41	0/000	119	-11/06

By T-test, and according of the table 6, it is deductible that the readiness level of the continuous improvement is not on the appropriate level for Establishment of TQM.

**H0:** The readiness of the studied seaport' manager for Establishment of TQM is on the appropriate level.

**Main Hypothesis Test**

**Hypotheses:** The readiness of the studied seaport' manager for Establishment of TQM is on the appropriate level.

**H1:** The readiness of the studied seaport' manager for Establishment of TQM is not on the appropriate level.

**Table 7 : T-test Result, for the Main Hypothesis**

Result	Test value = 3/5 - Main Hypothesis					
	95% Confidence Interval of the Difference		Mean difference	Sig.	df	t
	Lower	Upper range				
H <sub>1</sub> Confirmed	-1/29	-1/97	-./63	0/000	119	-9/06

By T-test and according of the table 7, the readiness of the studied seaport' manager for Establishment of TQM is not on the appropriate level.

## Conclusion

One of the leading philosophy in the management field that colorize the customer satisfaction and quality matter in the bright level is the TQM. Recently with huge and multi-dimensional aspects of the new marketing with local ,national and international competition and technology changes from one side and from the other hand, using a good method for management and data analysis is considered of high quality and importance. The main concern of this study is to probe the readiness level of the Studied seaport' managers for Establishment of TQM, since Studied seaport' are considered as servicing organization so, six principles are conducted to apply in this study such as commitment, customers focus, pragmatism, employee involvement, training and continuous improvement. And then for data gathering, a multiple-item questionnaire is prepared and all organized according to that TQM principles, the result which is obtained by T-test rejected the main hypothesis which was The readiness of the studied seaport' manager for Establishment of TQM is on the appropriate level and revealed that this position is maltreated with some shortness. Also, the entire secondary hypothesis were rejected, in the other word, the studied port was not good prepared for those six principles for Establishment of TQM. So at

the end it is inferable that by more stability and authority in manager's confidence and diligent, for Establishment of TQM will face no problem in this port.

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