

Prioritization of Critical Factors Impacting on TQM Implementation in GOLGOHAR Mining & Industrial Company by using AHP

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Abstract— This paper attempts to answer the question that the current situation will improve in Total Quality Management (TQM) in GOLGOHAR mining & industrial company in Iran, we first identify the factors and sub-factors critical for successful implementation of TQM and then they have to prioritize. This article first examines the factors and sub-factors that determine the acceptance and successful application of (TQM). Moreover, the assessment weights are determined by using analytic hierarchy process (AHP) .the findings indicate that these enterprises would stress the basic TQM factors of organizing (OG) and system and techniques (ST), measurement and feedback (MF) and culture and people (CP) are the most important factors. The results show that a hierarchical model for prioritizing the main factors and sub-factors for implementation of (TQM) in GOLGOHAR mining & industrial company in Iran.

Keywords— Total quality management; Analytic hierarchy process; Continuous improvemen

I. INTRODUCTION

In rapidly changing global, dynamic change have taken place in the organization`s strategy. Organizations are paying more attention towards optimizing their management practices. An organization fails to implement a set of management practices that have been successful in other organization. The ability to identify the environmental changes and respond proactively through continuous improvement efforts has been studied as a key element for organizational success [19]. One of the operations management practices is Total quality management (TQM), which has attracted much more attention in the last two decades[17]

Despite the current concept of quality in minds (and total quality management), the feasibility process quality control functions in nowadays considered to take place within a well-defined structure, known as a quality assessment system. Inspection, in turn, is the most important activities in the

quality evaluation system is an industrial process. When the inspection is properly developed, it can possible to carry out a detailed analysis of how the process performance and as a corrective and preventive actions that must be adapted to ensure an acceptable level of quality. [20] Total quality management (TQM) is a general method for improving the effectiveness efficiency, consistency, flexibility and competition in business.

Total quality management (TQM) is often regarded as philosophy which aims to achieve customer satisfaction through continuous improvement and teamwork. Changing towards TQM is coupled with its spread, from the manufacturing to the service sector, large scale industries to the small and medium scale industries [1]. Implementation of TQM becomes senior management agenda in many organizations to achieve positive business benefits. Such as improved product quality, greater customer satisfaction and low cost quality. Several methods and models have been proposed for the TQM introduction and implementation [4]. Studies show that organization that used TQM program have achieved positive results [2] [3].

This article investigates the main findings of recent studies about the critical factors of TQM implementation in GOLGOHAR mining & industrial company. This article considers the components of TQM model suitable for industry, which are working in the industrially region.

II. THE MAIN FACTORS IN TQM IMPLEMENTATION

TQM implementation requires an integrated, continuous and open system based on commitment of senior management and staff as well as continuous and open communication with the customers [2]-[4]. An exhaustive list of critical factors consolidated from literature review on the TQM implementation is depicted in Table 1. For facilitating

discussions, they are divided into four categories of facts or elements, namely, organizing (OG), systems and techniques (ST), measurement and feedback (MF), and culture and people (CP). Both OG and CP categories represent the soft factors, while ST and MF are the hard factors of TQM implementation. Each category of these factors has several of sub-factors that will be discussed later [1].

A. Organizing

This factor includes a coordination of a comprehensive of a TQM of organization and providing a related programs and it means that they are requires for introduce and promote continuous improvement. Organizing requires Top management commitment and leadership, Strategic planning, and provides company-wide education and training. Being its sub-factor, strategic planning functions as a means to integrate the requires quality of commercial activities of organization so that total quality is reflected in corporate vision, mission and strategies [6]-[8]-[12]. Leadership associated with clear vision and guidelines in relation to the act of sharing knowledge can produce strong commitment to education, training is another sub-factor that provides high skilled employee in dealing with work and personal purpose. If this process is carried out on a continuous basis and in work place with real time updates, education and training can form a solid base for continuous improvement. Commitment of senior management for ensuring the (TQM) implementation is an essential factor. In order to transfer connection quality strategy throughout the organization, senior management must create an organizational environment that is focused on continuous improvement. Direct involvement of senior management allows all decisions to be taken quickly and provide the TQM path. Supporting from senior management is essential to stabilize the availability of concrete action. Increased participation means more responsibility, which in turn requires a greater level of skill. This should be achieved through training. Training is an important factor that helps to make efforts for improving the quality. Training quality includes education for all staff, help to increase the knowledge of staff, provide information on the mission, vision; direction and structure that enable them to develop in solve the problem efforts to improve the quality of their business.

B. Systems and techniques

TQM embraces a wide range of systems, approaches, techniques and tools. Systems and techniques are also Process analysis and improvement is another sub-factor that helps organizations evaluate the achievements of predicted results and monitor continuous improvement efforts moving in the right direction. Organizations should develop their quality philosophy, policy, procedures and objectives, and acquire information from employees, customers, suppliers and competitors factors that have their own role in quality management. Furthermore, having effective supplier chain management can contribute to the quality performance in many ways [8]-[11]. Regular assessment will help organization to information sharing and improve understanding. Long-term partnerships with suppliers also help the parties involved the solving program related to quality improvement investment.

C. Measurement and feedback

Measurement and feedback provides a link between strategy and action. Communication of quality-related information and obtaining feedback from customers, suppliers, employees, competitors and other stakeholders as a basis form for developing appropriate measures for continuous improvement. Internal performance measurement is often used as a means to assessing internal quality issues and identifies their strengths and areas for improvement [7]. How , ever more organizations have focused on measuring the performance of the external, evaluation quality performance is carried out either by individuals or institution data out of organization [14]. Despite having the different effects of performance measurement, proper communication can help the organization assure the employees, customers and other stakeholders are being informed of corporate objectives and how to achieve the priorities. Furthermore, it is important for organizations to have recognition and rewards tied to the performance, achievements and within the employees' ability [6]. Rewards can be formal or informal, and underlying for maintaining enthusiasm among employees for the implementation of quality initiatives.

D. Culture and people

Culture and people are also important factors. TQM itself is a culture that advocates a total commitment to customer satisfaction through continuous improvement and innovation in all aspects of the business [9]-[13]-[15]. The behaviors and public opinion reflect a common culture in an organization. First of all, the existing organizational culture will affect TQM implementation unconsciously as a model to be guaranteed. So it seems necessary to understand what culture is and how the application of TQM affects. Culture change must be recognizing as continuous process rather than a prerequisite for the introduction of TQM. Moreover, with effective participation of employee, organization can enhance the ability of people to solve problems and utilize opportunities [13]-[3]. Employee involvement is a process in the employee empowerment in management decision and improves the activities proportional to their levels in the organization. Other aspect of the quality also defines the roles of human resource development to maximize the ability of individuals.

Factors	Organizing	System and techniques	Measurement and feedback	Culture and people
Sub-factor	1.Strategic planning 2.Leadership 3.Education and training 4.Top management commitment	1.Tools and techniques 2.Quality system 3.Process analysis and improvement 4.Supplier chain management	1.Internal performance measurement 2.External performance measurement 3.Communication 4.Recognition and rewards	1.Existing organization culture 2.Culture change 3.Employee involvement 4.Human resource development

TABLE I. Factors and sub-factors of TQM implementation[1]

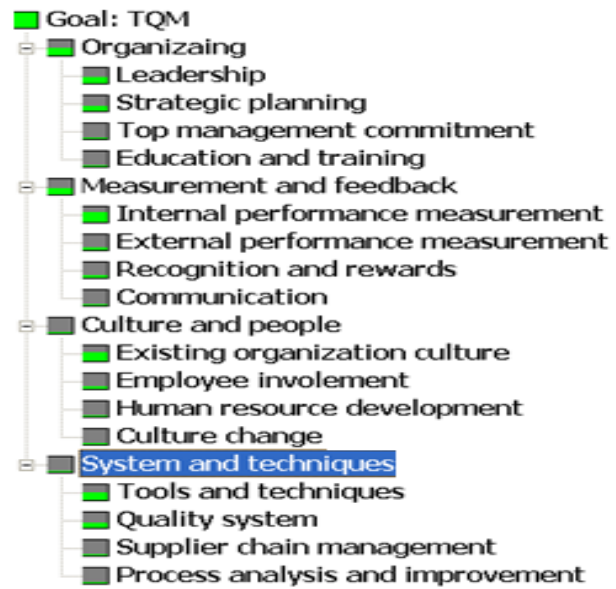
In this study, factors and sub-factors used in the paper an AHP based study of critical factors for TQM implementation in Shanghai manufacturing industries Is modeled, This article has been manufacturing industries in Iran GOLGOHAR Mining & Industrial Company has been implemented.

III. RESEARCH METHODOLOGIES

Decision firmly and using AHP are designed for situation in which ideas, feeling and emotions are quantified based on subjective judgment(opinion, leaders)have been measured as a numerical scale or prioritizing decision alternative [16]. TQM implementation in the form of increasing the number of elements and factors becomes a complex operation. The AHP was invented by the saaty as a powerful technique for solving among factors and sub-factors effective in logical decisions that are important in TQM implementation. In order to check the views of management in effective factors in TQM implementation, the authors, have an article in GolGohar Company by using AHP process. In total, five enterprises were chosen in the manufacturing sector. The study has done through a three-step, includes: (1) structuring the problem and building AHP tree model; (2) collecting data from expert interviews; and (3) determine the normalized.

Phase 1: constructing a hierarchical model for TQM implementation.

Considering the framework of TQM assigned by Dale and Bowden (1993) and difficulty important factor derived from the other research literature. The problem of TQM implementation has been formed as a model of hierarchical structure, this model as you can see in the picture has four levels. Level1: defines the objective of the problem (i.e.decisious about the TQM implementation). Level2: includes the important factor. Level3: lists sub-factors of individual important factors. Level4: favorable results of TQM implementation.



Phase 2: measurement and collecting the data

Quality managers of five companies were invited to participate in the personal interview. Since these managers were familiar with their organizations quality management practices. They were considered as assessment determines the relative weight against a given list of factors and sub-factors affecting of TQM implementation. Among the comparison of pair wise. Assessment must assign a score to each comparison by using this scale. (See table 2) this process was continued at all levels of the hierarchy, and finally a series of judgment for the factors and sub factors was derived.

Preferred values	comparing i with j	Explanation
1	equal importance or no preference	option i in contrast with j is in equal importance or no Preference to each other
3	less importance	option i in contrast with j has a little more important
5	more important	experience and assessments show that the option i in contrast With j has more important
7	much more important	option i has high priority and much more important in Contrast with j
9	infinitely more important	option i in contrast with j has extremely important And cannot compare with j
2,4,6,8		show the intermediate values among preferred values. e.s. 8 indicates the greater significance than 7 in i.

Phase 3: Determine the normalized weights

In order to determine the relative weights of factors and sub-factors those judgments matrices became the biggest problems and normalized and unique priority vectors of weights was calculated with the help of Expert choice software [10]. The resulting identified priorities weight and thus determines the relative importance of factors and sub-factors and in turn identified the areas that the organization must understand in the process of TQM

implementation.



IV. CONCLUSION

TQM implementation requires a complete change in the organization, especially in terms of performance, organizational structure and organizational culture. The complexity and difficulty of TQM implementation was determining as the most basic and the most important factor in organization. The foregoing results are given to show the final score in each criterion, it can be seen that if the criteria are prioritized according to the scores, Priority agent will Organization (OG=0.471) and then the agent arranges Measurement and Feedback (MF=0.380), Culture and People (CP=0.086) and System and Techniques (ST=0.063) factors the most important.

It appears logically that Leadership (LD=0.422), Internal performance measurement (IPM=0.620), Existing organization culture (EOC=0.616) and Tools and techniques (TT=0.534) were the four most important sub-factors found in the study of the TQM implementation in the GolGohar industries.

Despite focusing on the manufacturing industry sector. The result of this study was provided to identify and prioritize the important factors and sub-factors for TQM implementation in GolGohar Company in the mainland Iran.

These results are also provided a hierarchical model base to assess the relative importance of hard and soft data that can affected on the implementation of TQM and development strategy and performance. Different organization can use this model to TQM preserve their special needs and

circumstance. For instance, a cross functional evaluating team can be formed with members from different departments (e.g. quality management, design, engineering, purchasing and production), Or other consultants or external professors'. This model can help to organization to identifying the difference between favorite condition and existing condition and then detected the improvement areas and develop the strategy for the implementation of TQM. Moreover, this company also can use the evaluation results as a benchmark with competitors and other (first-class) organizations.

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