

Key Factors of TQM Implementation and Impact in Industries of Nepal: A Conceptual Model

Prof. (Dr.) Hemant Kothari

Dean, P.G. Studies,
Pacific Academy of Higher Education and Research University, Udaipur, Rajasthan

Dr. Sapna Shrimali

Assistant Professor, Faculty of Engineering,
Pacific Academy of Higher Education and Research University, Udaipur, Rajasthan

Bijay Lal Pradhan

Research Scholar, Faculty of Science,
Pacific Academy of Higher Education and Research University, Udaipur, Rajasthan

Abstract

The implementation of TQM in manufacturing industries is linked with its key factors which are responsible for achieving effective results. The purpose of this study is to identify key factors of TQM implementation and impacts. This study identifies nine key factors of TQM implementation and four factors of TQM impact from the extant literature which can help industry to achieve business excellence. The nine TQM implementation key factors are Top management commitment & involvement, Policy deployment, process control and improvement, Research and development, training and education, maintaining suppliers' empowerment and relationship, customer relationship, employee empowerment and involvement, evaluation and assessment whereas key TQM impact factors were excellence and performance in Customer satisfaction, Employee satisfaction, Product quality and Product performance.

Keywords: Total Quality Management, Quality Awards, Business Performance, Customer Satisfaction, Employee Management, Top Management Commitment and Involvement, Policy Deployment, Training and Education, Employee Empowerment and Involvement, Product Quality

Introduction

Organizations carry out quality management and improvement programmes for a range of objectives. The successful implementation of TQM in manufacturing sector would promote exports, attract foreign direct investment, improve business performance, achieve a competitive advantage, and customer and staff satisfaction (Magd, 2014). These benefits are important for all organizations, especially in developing countries, such as Nepal, where the general quality level is relatively low and need to be increased in the chase of effective inter-organizational cooperation.

During the process of implementation, organization has to face different difficulties and often fails to get benefits from quality management implementation. Fotopoulos et al. (2009) and Kumar et al. (2009) discussed the impact of TQM practices on quality management results and explains the relationship between different TQM practices like leadership, strategic quality planning, employee management & involvement, supplier management, customer focus, process management, continuous improvements and their effect on quality management

results in the form of market benefits like increase in profits, improved competitive position, improved performance and increased sales. While customer satisfaction is measured by decline in customer complaints, increase in loyalty, and customer retention rate.

Acquiring knowledge of quality management implementation in a unique, and influencing, organizational environment and situation is a relevant issue for investigation. This study is focused on obtaining key factors of quality management implementation along with its impact and is expected to provide new insights into the implementation process in order to improve organizations ability to meet their internal and external objectives.

There is a consensus that TQM is a way of managing an organization to improve its overall effectiveness and performance (Zhang et al., 2000). There is less agreement as to what the primary constructs of TQM are, or what the overall concept of TQM is. No uniform view of TQM exists today. So far, TQM has come to mean different things to different people (Hackman & Oldham, 1995). This study aimed at identifying TQM implementation constructs, developing an instrument for measuring these constructs.

This study may be beneficial to the practitioners who are using or planning to use the TQM practice in their industries.

TQM concept from Quality Gurus

TQM gurus have highlighted the importance of the theory to effective management. W. Edward Deming is considered the founding father of the TQM and is perhaps the most famous of quality gurus because of his contribution to the creation of quality principles. Deming has focused on the following four points i) idea of internal and external customers or stakeholder satisfaction ii) concept of continuous improvement iii) thought of common and special variation on quality problem iv) management and worker's responsibilities. Deming believes in continuous improvement. He also believes that the consumer is the most important part of a production line. Meeting and exceeding the customers' requirements is the task that everyone within the organization needs to accomplish with total commitment. Furthermore, Deming believes in the use of statistical process control (SPC) charts as major method for solving problems.

Like Deming, Juran worked extensively with quality management and perhaps he has best summed up in his 'quality trilogy' of quality planning, quality control and quality improvement (Juran & Gryna, 1993). Juran's emphasis in this respect is in three main areas: changing management behavior through adopting quality, training and then spilling down new attitudes to supporting management. Juran has focused on responsibilities, training, education and reward and encouragement for quality.

Philips Crosby suggests for the continual measurement to determine conformance to requirements (Crosby, 1979). He also focused on the cost of quality which is measurable and is equal to the expense of nonconformance- the cost of doing things wrong (Crosby, 1979). Crosby's quality philosophy is that there is an economics of quality. It is always cheaper to do it right first time (Crosby, 1979). He is a concept developer of Zero Defect program. Crosby has given emphasis on management and has stated that management leads workers to a quality outcome. Perfection is the standard to aim for through planning, process and continuous improvement.

Kaoru Ishikawa helped thousands of companies including IBM, Bridgestone and Komatsu to turn out higher quality products at much lower costs. His book "What is Total Quality Control?" The Japanese Way, Prentice Hall, Inc. was a best seller business books (Pradhan, 2014). Ishikawa has developed cause and effect diagram (also called the "Ishikawa" or "fishbone" diagram) with which management leader made significant and specific advancements in quality improvement. With the use of this diagram, the user

can see all possible causes of a result, and hopefully find the root of process imperfections. Ishikawa also showed the importance of the seven quality tools: control chart, run chart, histogram, scatter diagram, Pareto chart, run chart and flowchart. Additionally, Ishikawa explored the concept of quality circles, a Japanese philosophy which he drew from obscurity into world wide acceptance.

Armand V. Feigenbaum is best known for originating the concept of Total Quality Control (TQC). He viewed quality as a strategic business tool that requires involvement from everyone in the organization and promoted the use of quality measurement and evaluated tool. Feigenbaum has focused on quality leadership, Modern quality technology and Organizational commitment. The concept of "Total Quality Control" was used as the foundation by Japanese for their practice called Company-Wide Quality Control (CWQC) which began in 1960s. Feigenbaum's ideas also have become important elements of the Malcom Baldrige National Quality Award Criteria.

Quality Awards

Quality awards or Business excellence award in line with Total Quality Management are installed and operated by several countries for improving organizational performance excellence. They aim to encourage the simulation of excellence exhibited by the award winners. Some of the countries have their own national awards for quality and performance excellence uniquely developed in their own way, but many have either applied directly the original award that is developed elsewhere, or with little adjustments in the internationally appreciated quality awards developed by other countries. Most of the quality awards were based on the European Quality award, Malcolm Baldrige National Award and Deming award. Most important observation is that all these awards are designed based on the application of Total Quality Management. All these awards can also be said as international quality awards as they are open globally to all countries. The quality award of Nepal NS quality award and FNCCI quality award is also included under study since study proposed in the context of Nepal.

The oldest Prestigious Award is the Deming Application prize (Deming Prize) of the union of Japanese Scientists and Engineers (JUSE). Initiated in 1951 and named after W. Edwards Deming, the Deming Prize has long been recognized as an indicator of excellence in business (Izadi et al., 1996). It is applied annually to find the foremost quality company in Japan. The award criteria cover all aspects of TQM from Policy to organization and management, education and dissemination, collection dissemination and used of information of quality, analysis, standardization, control, quality assurance, results and planning for the future.

The Malcolm Baldrige National Award is the American equivalent of the prestigious Japanese Deming Prize. The award is named for Malcolm Baldrige, who served as Secretary of Commerce from 1981 until his tragic death in a rodeo accident in 1987. The Malcolm Baldrige National Award recognizes quality improvement among manufacturing, service and business. The award criteria reflect the following seven categories: leadership, information analysis, strategic quality planning, human resource development and management, management of process quality, quality and operational results, and customer focus and satisfaction (Izadi et al., 1996).

The European Quality Award aims to recognize organizations that are paying exceptional attention to total quality, and to encourage others to follow their example. The organization which seeks the Award is assessed on the following four criteria: customer satisfaction, employee satisfaction, business performance, and the organization's impact on society (Sallis, 2002)

The NS quality award is an annual award provided by Nepal Bureau of Standards & Metrology (NBSM) to Nepalese Industries for the good quality management system and product quality achievement. It motivates the product of high quality goods according to relevant Nepalese standards and enables to compete more efficiently in the regional (or global) markets. There are two types of award; one is "NS Quality Award" whereas the next is "Runner Up" letter of appreciation. The award criteria reflect the following eight categories: Leadership, Customer focus, process and system management, Human resource management, information management, Corporate social responsibility, performance and improvements, Infrastructure and housekeeping.

FNCCI National Award is another quality award in Nepal which was instituted by the Federation of Nepalese Chamber of Commerce and Industry (FNCCI) in the year 2001. The award is based on a comprehensive model focusing on the organization practices and performances under nine different criteria, which are further divided into thirty-one sub criteria. The criteria are developed to suit the Nepalese business environment considering the conceptual criteria found in the Deming award, Malcolm Baldrige award and EFQM award. Prizes are given annually in each of three categories; Large, medium and small scale organizations. The best in each three categories will be given the National Excellence Award. The nine criteria of performance excellence to evaluate for awards and prizes are: Institutional policy, planning and commitment, organizational form, work plan development and deployment, Operational information dissemination and utilization, employees' development, work system and standardization, customer satisfaction and relationship, employee satisfaction, performance results and future plan.

Review of empirical research

Although there are many empirical researches available under TQM implementation and impact, this study has selected few but mostly cited, chronologically ordered 24 researches which have been discussed below.

Garvin (1983) published the first empirical investigation of quality management factors. Nine US and seven Japanese window air conditioner manufactures were examined. Quality management practices and their associated impact on performance were studied. Garvin used self-report questionnaires and on-site observations. The management practices examined included: quality programmes, policies, and management attitudes; quality information systems; product design; production and employee policies; and supplier management. Surrogate measures examined were assembly line reject rate and the rate after delivery service calls.

Saraph et al. (1989) conducted one of the first empirical efforts to validate an instrument for integrated quality management. They had developed 120 requirements for organizational quality improvement. The constructs were generated from the literature review of quality management. A factor analysis produced eight factors of quality management that measure the quality practice of an organization, which were: role of management leadership and quality policy; Role of the quality department; Product/service design; Process management; Supplier quality management; Quality data and reporting; Employee relationships; and Training.

Motwani et al., (1994) examined quality practices in India using an empirical approach. They synthesized literature of quality concepts and identified quality factors which create an organizational evaluation framework. On the basis of concept developed they conducted a field survey to examine the level of conformance for identification of practices in Indian manufacturing. They had derived the following nine key factors: Top management; Quality policies; role of the quality department; Training; Product design; Vendor quality management; Process design; Quality data; Feedback and employee relations.

Flynn et al. (1995) has used path analysis to determine the relation and construct of total quality management practices and its performance. Their study made link between quality management practice, quality performance and competitive advantages. The study was done on 3 industries with 42 plants in US which contains roughly two-third world class plants. And the information was taken from top & middle level manager and shop floor workers. Path analysis was used to test the proposed model with multiple regression analysis after determining the path coefficients, which were decomposed into their various effects. After trimming the

model they had proposed the following ten TQM constructs, Top management support; Customer relationship; Supplier relationship; Workforce management; Work attitudes; Product design process; Process flow management; Statistical control feedback; External quality performance; Competitive advantage.

Ahire et al. (1996) scientifically developed and tested constructs which represent an integrative Quality management philosophy. They had detailed analysis of the literature and identified 12 constructs of integrated quality management strategies. They had conducted empirical study of 371 manufacturing firms which validate twelve constructs which were: Top management commitment; Customer focus; Suppliers' quality management; Design quality management; Benchmarking; SPC usage; Internal quality information usage; Employee empowerment; Employee involvement; Employee training; Product quality; Suppliers' performance.

Black and Porter (1996) had made a self assessment framework to make organizations more effective in the development of total quality systems. They had identified ten critical components of TQM, which are: supplier partnership; People and customer management; customer satisfaction orientation; external interface management; communication of improvement information; strategic quality management; operational quality planning; quality improvement measurement systems; teamwork structure for improvement; and Corporate quality culture.

Zhang et al. (2000) had done extensive review of the literature and found 11 constructs of TQM implementation. They had employed various methods of test and validated these constructs using the data from 212 Chinese manufacturing companies. The eleven constructs of TQM implementation were: Leadership; Education and training; Employee participation; Supplier Quality Management; Product Design; Process control and improvement; Customer focus; Vision and Plan Statement; Evaluation; Quality system improvement; and Recognition and Reward.

Conca et al. (2004) conducted a study to identify critical success factors of TQM and empirically tested with the answers of 108 ISO certified firms in Spain. The purpose of this study was to identify the factors of TQM and classify the relative importance of each of them in a successful TQM implementation and also measure the readiness of the manufacturing industry to adopt it. The study investigated the degree to which TQM practices were adopted in the manufacturing industry and identified the impact of different factors on successful TQM implementation. The study had identified the following critical factors of TQM: Leadership; Training; Specialist training; Supplier management; Process Management; Customer focus; Learning; Continuous Improvement; Quality planning; and Communication.

Projogo and Sohal (2004) examined the relationship between TQM and innovation performance and compare the nature of this relationship against quality performance. The empirical data were obtained from a survey of 194 managers in Australian industry encompassing both manufacturing and non manufacturing firms. The result suggested that TQM significantly and positively relates to both product quality and product innovation performance although it appears that the magnitude of the relationship is greater against product quality. The constructs they had used were: Leadership; Strategic planning; Customer focus; Information and Analysis; People Management; Process Management; Product Quality; Product Innovation; and Process Innovation.

Sila and Ebrahimpour (2005) explored the relationships among TQM factors such as leadership, strategic planning, customer focus, information and analysis, human resource management, process management, supplier management and the results from adopting such practices such as human resource results, customer results, organizational effectiveness and financial and market results.

Lin et al. (2005) conducted a comparative study between Taiwan and Hong Kong Manufacturing companies. The aim was to investigate supply chain Quality Management and organizational performance. The results showed that Quality Management Practices are significantly correlated with the suppliers' participation strategy and this influences tangible business results and customer satisfaction. They had used the following constructs: Top management leadership; Training; Product/service design; Supplier quality management; Process management; Quality data reporting; Employee relations; Customer relations; Benchmarking; learning; Supplier participation; suppliers selection; Satisfaction level and Business results.

Tari (2005) studied 106 ISO 9000 certified firms of Spain to identify the components of TQM implementation. The total construct used were divided into factor oriented and result oriented constructs. The factor oriented construct were: Customer focus; Process management; Leadership; Suppliers management; Learning; Quality Planning; Continuous improvement; Employee management. Similarly the result oriented constructs were: Customer satisfaction; Staff indicators; Quality performance; Social impact and Employee satisfaction.

Yang (2006) determines the following TQM practices: process management, employee empowerment and teamwork, customer satisfaction management, quality goal setting and measurement, supplier's cooperation and quality tools training which has positive effects on customer satisfaction and that the adoption of TQM principles is an effective means by which companies can gain competitive advantage. The implementation of the TQM practices also helped companies to improve their image, employee's satisfaction and quality awareness.

Jitpaiboon and Rao (2007) used the meta-analysis approach to examine issues regarding the TQM measurement reliability and the relationships between TQM practices and organizational performance. They had verified that the quality management not only helps companies to improve their internal environment and effectiveness but also their external status. They had used the following TQM constructs: Top management support, strategic quality performance, supplier quality, benchmarking, employee training, customer focus, employee involvement.

Das et al. (2008) has identified the constructs of TQM and the measurement instrument for newly industrialized countries (in the context of Thailand) in manufacturing sectors to evaluate the TQM implementation process and to target improvement areas. They had constructed ten TQM constructs (nine implementation constructs and one outcome construct) using detailed literature review. Empirical research of 275 questionnaires of selected ISO 9000 certified manufacturing companies has conducted. Exploratory factor analysis was done to ensure that items in each scale reflected sufficiently the scope of each construct. These 10 constructs were: Top management commitment; Supplier quality management; Continuous quality improvement; Product innovation; Benchmarking; Employee involvement; Reward and recognition; Education and training; Customer focus and Product quality.

Arumugam et al. (2008) explored the relationship between TQM practice and quality performance with special emphasis on ISO 9001:2000 certified manufacturing organizations in Malaysia. The findings revealed that total quality management practice were found partially correlated with quality performance. It is also found that customer focus and continual improvement were perceived as dominant TQM practice in quality performance. The construct they had used as a TQM practice were: Leadership; Process Management; Information Analysis; Customer focus; Supplier relationship; Quality system improvement; Continual improvement and People involvement.

Fotopoulos et al. (2009), surveyed 370 Greek companies to determine the relationships between the TQM factors and organizational performance. They found that, leadership, process management, service design, human resource management, customer focus, Education and Training, and supplier quality management are critical success factors in TQM implementation. They applied questionnaire method and used exploratory and confirmatory factor analysis to assess the measurement model reliability and validity. The relationships between the latent constructs were examined through Structural Equation Modeling.

Kumar et al. (2009) studied the various factors important for total quality management implementation and its relevance in various manufacturing organizations in the context of

Indian manufacturing organizations. They had collected 75 questionnaires from various sectors such as automobile engineering, textile engineering, electrical and electronics engineering, light weight engineering and heavy weight engineering from India. The different factors used in their study were: Customers' satisfaction; Managements' effective participation; Employees' effective participation; Reward schemes; Communication system; Vendors' power; Statistical quality control; Fast result techniques; Quality planning and cost involved and Analytical techniques.

Zakuan et al. (2010) investigated the relationship between TQM implementation and organizational performance using structured equation modeling. They had studied the quality performance of SMEs in the Portuguese organizations. The constructs they had used were: Quality Leadership; Customer focus & Satisfaction; Quality information & Analysis; Human Resource Development; Strategic Planning Management; Suppliers Quality Management; Quality results; Quality Assurance; Satisfaction Level : customer and employee; Business Result: Productivity, number of successful new product, cost performance and profitability.

Hoang et al. (2010) Studied 222 manufacturing and service companies and used Structural Equation Modeling to study the relationship between implementation of TQM and organizational characteristics in a newly industrialized country in south east Asia. They found that larger companies had higher implementation level across almost all practice of TQM. TQM practices were statistical more significant in Manufacturing companies compared to service companies and the firms having higher level of innovation also showed higher level of TQM practice implementation. The constructs used by Hoang et al. (2010) were as follows: Top management commitment; Employee involvement; Employee empowerment; Education and training; Teamwork; Customer focus; Process management; Information and analysis system; Strategic planning; Open organization; and Service culture

Valmohammadi (2011) used seven TQM criteria namely leadership, process management, suppliers, customer focus, employee management, communication and quality information system and tools & techniques to study the impact of impact of TQM implementation. Sixty five self administered questionnaire were collected from managers of Iranian manufacturing SMEs to study their organizational performance. The study found that the leadership plays an important role in enhancing organizational performance of the Iranian manufacturing SMEs. The study also observed the significance relationship between TQM practices and organizational performance.

Phan et al. (2011) has done empirical study on relationship between quality management practices and competitive performance in Japanese manufacturing companies. They

had gathered data from two surveys including the common sample of twenty seven Japanese manufacturing companies. The study used the eleven quality management practice constructs to determine the degree of TQM implementation and then impact on different dimension of competitive performance between two periods. The quality management practice and competitive performance used in this study were as follows:

QM Practices

Top management leadership

Formal strategic planning

Training

Small group problem solving

Employees suggestions

Cross functional product

House Keeping

Process control

Information feedback

Customer involvement

Supplier quality involvement

Competitive performances

unit cost of manufacturing

conformance to product specification

On-line delivery performance

Fast delivery

Flexible to change product mix

design Flexible to change volume

Inventory turnover

Cycle time

Speed of New product introduction

product capability & performance

Customer support and service

Bhari et al. (2012) has used Structural Equation Modeling and Confirmatory Factor Analysis with the help of Amos to validate eleven constructs of TQM implementation extracted from literature of TQM. They found that implementation of TQM has positive and significant influence in shaping the organizational culture of the company. The construct used by Bhari et al. (2012) were: Leadership; Suppliers quality management; Vision plan statement; Evaluation; Process control improvements; Product design; Quality system improvements; Employee participation; Recognition and reward; Education and training; Customer focus.

Munizu (2013) has done empirical study with data of fifty five big and small scale fishery industry. The data has been collected from managers of those firms and has used path analysis to validate the constructs. The study showed the TQM practice has positive and significant effect both on organizational performance and competitive advantage. The different constructs had categorized under these three categories: TQM practice, Competitive advantage and Organizational performance. Under TQM practice they had included Leadership; Strategic planning; Customer focus; Information & Analysis; People management; Process management; and Suppliers management. Similarly under competitive advantage they included Cost Price; Delivery dependability; Product Innovation and Time to market. On the same way in organizational performance they adopted Return on Investment (ROI); Market share and Sales.

Key factors of TQM implementation and Impact

In this study, to identify the key factors of TQM three category of TQM construct has been used. They are: concept of quality gurus; quality award models and empirical research findings. In order to provide a clear picture of the key factors of TQM, all the factors (constructs) are listed in the table below, according to quality gurus, quality awards and empirical studies and most repeated has taken consideration as a factors of TQM implementation in this study.

Table 1: Comparison of different scholars and award constructs

Quality Gurus	TQM Implementation constructs	Top Management Commitment /Leadership	Policy Deployment/Strategic Quality Mgmt	Process Control & Improvement	Research & Development / Product Design	Education and trainings	Suppliers Empowerment & Relationship	Customer relationship / customer focus	Employee Involvement and Empowerment	Continuous improvement	Evaluation & Assessment / information	Benchmarking	Reward and Recognition	Society and Environment	Statistical process control	Culture
Juran, 1974	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Deming	✓			✓	✓	✓	✓	✓	✓	✓					✓	
Crosby, 1979	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	
Ishikawa	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	
Feigenbaum, 1983	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	
Quality Awards																
Deming QA 2005	✓	✓				✓					✓					
MBQA 2005	✓	✓	✓				✓	✓	✓	✓	✓					
EFQM 2005	✓	✓	✓	✓			✓	✓	✓	✓				✓		
NSQA	✓	✓	✓	✓			✓	✓	✓	✓				✓		
FNCCI QA	✓	✓					✓	✓	✓	✓	✓					
Empirical Studies																
Gravin (1983)	✓	✓		✓			✓		✓		✓					
Saraph et al.(1989)	✓		✓	✓		✓	✓		✓		✓	✓				
Motwani (1994)	✓	✓	✓	✓		✓	✓		✓		✓					
Flvnn et al. (1994)	✓		✓	✓		✓	✓	✓	✓		✓					
Ahire et al. (1996)	✓		✓	✓		✓	✓	✓	✓		✓			✓		
Black & Porter (1996)		✓	✓	✓		✓	✓	✓	✓		✓					✓
Zhang et al. (2000)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓			
Conca et al. (2004)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
Projogo & Sohal (2004)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
Sila & Ebrahimpour (2005)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
Lin et al. (2005)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓				
Tari (2005)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
Yang (2006)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					
Jitpaiboon & Rao (2007)	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓				
Das et al. (2008)	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓			
Anumugam et al. (2008)	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓				
Fotopoulos et al. (2009)	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓				
Kumar et al. (2009)	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓			✓	
Zakuan et al. (2010)	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓				
Hoang et al. (2010)	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓				✓
Valohammadadi (2011)	✓		✓			✓	✓	✓	✓	✓	✓	✓				
Phan et al. (2011)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓				
Bhaji et al. (2012)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓			
Munizu (2013)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓				
Frequency of repetition	33	24	5	16	9	25	25	31	8	22	5	3	2	5	2	

TQM concept covers a broader scope of TQM in comparison with their constructs. From above table this study has taken nine most repeated constructs in this study. They are Top management commitment & involvement, Policy deployment with process control and improvement, Research and development, training and education, maintaining suppliers' empowerment and relationship, customer relationship, employee empowerment and involvement, and evaluation and assessment. Implementing each construct is through a set of TQM practices. The

detailed explanations of these constructs and the set of practices that support their implementation are described below.

TQM implementation constructs

Top Management commitment & involvement

Leadership is defined as the ability to positive influence people and system under one's authority to have a meaningful impact and achieve important result (Bhat,

2007). The top management should have the qualities of clarity of vision, long-term orientation, coaching management style, participative change, employee empowerment, and planning and implementing organizational change. According to Bhat (2007), important role of top management are: Define and communicating business direction, ensuring goal and expectation are met, reviewing business performance and taking appropriate action, creating a work environment that promotes creativity, innovation and continuous improvement, soliciting input and feedback from customers, ensuring effectiveness of employee contribution, motivating, inspiring and energizing the employees, recognizing employee contribution and providing reliable feedback. The European Quality Award (2005) and the Malcolm Baldrige Quality Award (2005) recognize the crucial role of top management in creating the goals, values and systems that guide the pursuit of continuous performance improvement. Therefore, the TQM literature reveals the top management as a noticeable determinant for successful TQM implementation.

Policy Deployment

Policy Deployment is a structured process for establishing long range quality goals, at the highest levels of the organization and defining the means to be used to reach these goals (Bhat, 2007). Policy deployment is the process of defining the broad mission vision and goals for the company and then determining the means to be used to reach these goals. A vision statement describes how a firm wants to be seen in its chosen business. All employees should be able to realize how they can contribute to the vision. A firm should have a long-term vision statement. A quality policy is a guideline for the action to be taken in order to reach the quality goals (Bhat, 2007). Similarly, a quality policy describes how a firm wants to be seen regarding its quality. A variety of employees should be involved in the development of the vision statement and quality policy, which in return, should be well communicated to employees at different levels to stimulate commitment. In fact, a vision statement usually cascades down to mission statements that detail short-term firm goals or departmental aims. In order to realize a vision statement, a firm must make plan statements that support the realization of its vision. Quality improvement plan should be developed along with the long term strategic plan.

Employee Involvement & empowerment

Employees are the internal customers. Quality betterment is not possible without the employee participation (Pradhan, Acharya, Yadav, Upadhayaya, Shah, & Timalisina, 2014). Employee involvement refers to any activity by which employees participate in work-related decisions and improvement activities with the objectives of tapping the

creative energies of all employees and improving their motivation (Bhat, 2007). By personally participating in quality management activities, employees acquire new knowledge, see the benefits of the quality disciplines, and obtain a sense of accomplishment by solving quality problems. Involvement is decisive in inspiring action on quality management (Juran & Gryna, 1993). The range of activities involved in employee involvement approaches are : sharing of information; providing input on work related issues, making suggestion and self directed responsibilities such as setting goal, making business decisions and solving problems often in cross functional teams. Employee involvement is exemplified by things such as teamwork, employee suggestions, and employee commitment. A team may well be composed of people from different staff areas, everyone having a chance to contribute ideas, plans, and figures. A quality control circle is a group of workforce-level people, usually from within one department, who volunteer to meet weekly to address quality problems that occur within their department (Juran and Gryna, 1993).

Supplier empowerment and relationship

Organization must stop awarding business based on the low bidders because price has no meaning without quality (Bhat, 2007). A continuous supply of raw materials with the required quality is basic stage of manufacturing. Suppliers' quality management represents Industry-supplier partnership, product quality as the criterion for supplier selection, participation in suppliers, communication with suppliers, understanding of supplier performance, and supplier quality audit. Evaluating suppliers is an important activity to assure the dependable high quality of incoming materials in the firm (Feigenbaum, 1991). Supplier rating is a technique to provide supplier assessment. Each supplier is measured against another specific supplier or group of suppliers, for price, quality, delivery, and other important performance measures. Industries need to have detailed information about supplier quality information such as drawings, specifications, and other necessary data. It is also very important to establish a supplier information feedback system, which can be used for giving feedback to suppliers about their product performance. Supplier quality audit is an organized evaluation of supplier capabilities to furnish materials of the necessary quality and quantity is an important basis for initial supplier selection and ongoing supplier quality surveillance (Feigenbaum, 1991).

Evaluation & Assessment

Evaluation can identify the variation between actual performance and the goal. Evaluating the situation in an organization's quality provides an important base to improve its quality management practices. Uncontrolled variance in processes or in finished goods is the main cause of quality problems and must be evaluated and controlled by

those who perform the organization's front-line work. Employee can take the appropriate action only if the root causes of variability have been identified. Quality audit is systematic and independent examination to determine whether quality activities and related results comply with planned arrangements, and whether these arrangements are implemented effectively and are suitable to achieve objectives. One purpose of a quality audit is to evaluate the need for improvement or corrective action. Benchmarking is measuring performance against that of best-in-class companies, determining how the best-in-class achieve those performance levels and using the information as a basis for our company's targets, strategies and implementation (Bhat, 2007). Timely measurement and reporting of quality level data are used in assessing quality performance, setting quality-level goals, and evaluating corrective-action efforts. Quality-related indices should be combined with general employee performance standards. A customer satisfaction survey (customer feedback) is a vital to a business. Through feedback, a company learns how satisfied its customers are with its products and services and sometimes about the competitor's product or services (Pradhan, 2014). In order to have an effective evaluation, a quality information system is truly necessary, as it is an organized method of collecting, storing, analyzing, and reporting information on quality to assist decision-makers at all levels (Juran and Gryna, 1993).

Research and Development

Product design is a special activity which may originate from the customers' need or desire. Basically, it is the essence of the organizations that to fulfill the new wants or desire of the customers as well as to adjust with the changes in the customer's demand (Pradhan et al., 2014). Research and development is the prominent branch which create the product design according to customer expectations for functional requirements into specific engineering and quality characteristics, which can be called specifications. There is a set of practices that can be used to design products. In order to have effective product design, design engineers are required to have some shop floor experience such as processing technology, understanding of performance of production equipment, skill for operating production equipment, and production process. In fact, product design starts with market research. Different departments with the coordination of Department of Research and development should participate in new product design. Experimental design is a widely used tool in product design. Its application has significantly reduced the time and expense needed to develop the new product, greatly improved the performance of the new product, and led to the success of new product design. Quality function deployment is also an important and effective method in product design.

Process Control and Improvement

Process refers to certain unique combinations of machines, tools, methods, materials, and people engaged in

production. Process control and improvement connotes a set of methodological and behavioral practices, which are implemented to control and improve processes that produce products and services (Juran and Gryna, 1993). In fact, process control and improvement can make the manufacturing process operate as expected, without breakdowns, missing materials, fixtures, tools, etc., and despite workforce variability (Flynn et al., 1994). One aspect of process control and improvement is equipment maintenance, which ensures that variation is kept within acceptable bounds, keeping the manufacturing process running. Statistical process control is the application of statistical methods to the measurement and analysis of variation in any process (Juran and Gryna, 1993). A number of quality tools or techniques can be implemented to control and improve processes. These methods include the seven QC tools and the seven new QC tools. The PDCA cycle is essentially the scientific method applied to continuous process improvement (Dale, 1999; Deming, 1986). Quality improvement is not the static thing but it is dynamic. Managers should always search for problems in order to improve every activity in company for better quality, increase in productivity and decrease in cost continuously (Pradhan et al., 2014).

Customer relationship

Customer relationship can be defined as the degree to which a firm continuously satisfies customer needs and expectations. A successful firm recognizes the need to put the customer first in every decision made. Based on customer complaint information, it is important to identify the "vital few" serious complaints that demand in-depth study in order to discover the basic causes and to remedy those causes (Juran and Gryna, 1993). The results of customer satisfaction surveys can be used to take immediate action on customer complaints, identify problems requiring generic corrective action, and provide a quantitative measurement of customer satisfaction (Juran and Gryna, 1993). In-depth marketing research can identify suddenly arising customer needs. In order to pursue customer focus, firms should always provide warranties on their products sold to customers. Thus, customers will reduce their risk in buying products. In addition, firms should pay sufficient attention to customer services.

Education and training

Training refers to the acquisition of specific skills or knowledge. Training programs should teach employees how to perform particular activities or a specific job. Education, on the other hand, is much more general, and attempts to provide employees with general knowledge that can be applied in many different settings (Cherrington, 1995). Learning is the ability and willingness of the firm to engage in knowledge seeking activities at the individual, group or team, and organizational levels (Anderson et al., 1994). In order to have effective learning activities, a firm should

continually encourage employees to accept education and training. In order to use various quality tools or methods effectively, employees should be trained in these methods. More training should be given to employees such as quality inspectors, supervisors, and production operators. Employees should accept quality consciousness education in order to improve their commitment to quality. Newly recruited employees should accept more education on quality awareness. Newsletter, poster slogan, and quality day are commonly used for educating and/or training employees (Zhang, 2000). Education and training have failed if they do not result in a change of behavior (Juran and Gryna, 1993).

TQM Impact construct

Gravin (1983) listed eight critical dimension of quality performance which were performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. Flynn et al. (1995) used perceived quality market outcome, percentage which passed final inspection without requiring rework and competitive advantages as a impact variable. They used perceived quality market outcome as a multidimensional construct including conformance, reliability, performance, durability, serviceability and perception of customer satisfaction as in Gravin (1983) They defined competitive advantage as value created for customer whereas percentage of items that passed final inspection without requiring rework indicates the plants ability to control its product rather than defects inspected out.

Zhang et al. (1999) used product quality as TQM impact where they used performance, conformity, reliability, durability, defect rates, internal failure cost and warranty percentage. Kaynak (2003) used three levels of performance measures namely financial, market and operating. They found that there is positive effect of TQM practice on financial and market performance is mediated through operating performance.

Sila and Ebrahimpour (2005) used organizational effectiveness, financial and market results as a impact of TQM implementation. Lin et al. (2005) has showed the relationship between TQM implementation with satisfaction level of employee and customer along with different business results including productivity, cost performance, profitability, sales growth, earning growth and market share. This suggestion was also followed by Zakun et al. (2010).

Tari (2005) used factor and result oriented constructs of TQM, where result oriented constructs were customer satisfaction, staff indicators, quality performance, social impacts and employee satisfaction. The study suggested that if the management is properly aware about the different

components of TQM then only they can develop activities for implementation of TQM. Kakkar and Narag (2007) has showed the relationship between contributing variables and contribution variables. Using the literature review they had determined and validate the following contributing variables: product quality, customer satisfaction, market performance, employee satisfaction, business result, cost & waste reduction, safety, productivity improvement and impact on society.

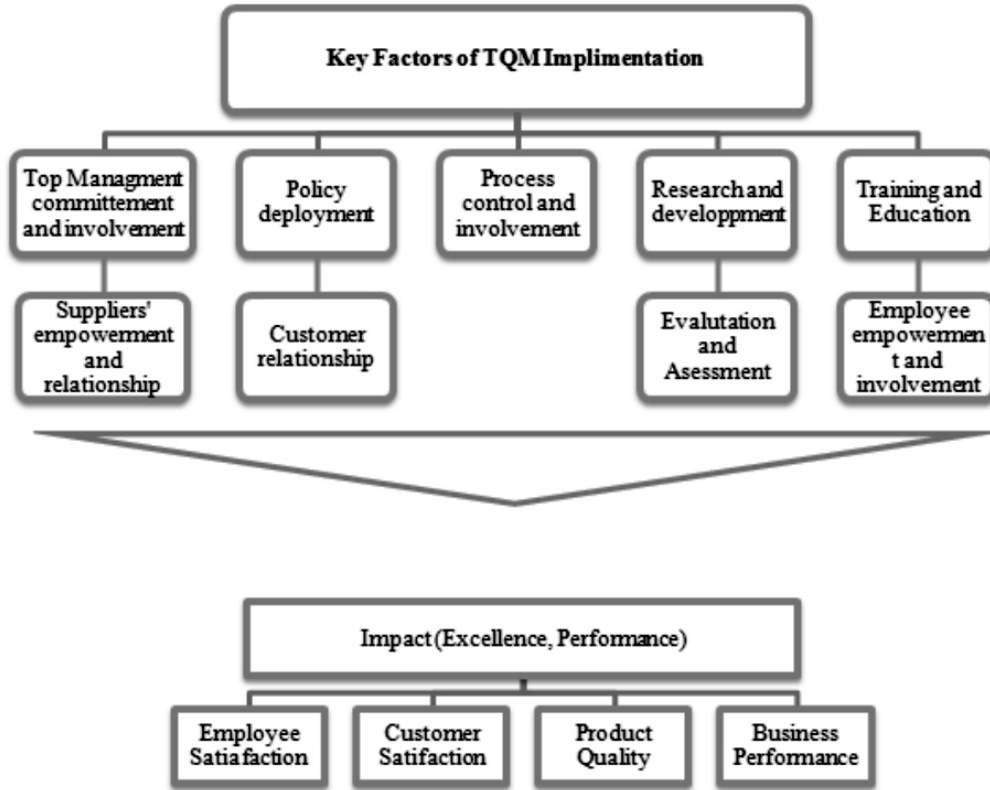
Das et al. (2008) has used performance, reliability, durability, defect rate of primary product as a product quality. Fotopoulous and Psomas (2008) used quality improvement, market benefit, customer satisfaction and protection of natural and social environment as an impact variables. Reduction of defect product, obsolete product, non conformance, reprocessing, warranty compensations were taken as quality improvements. Sales, profit, performance and competitive position were taken as market benefit instruments. Customer loyalty, satisfaction and complaints were taken as market benefit instruments. Health and security risk, waste and pollution and social issues were in additionally addressed by Fotopoulous and Psomas (2008) than other previous research.

Reviewing the above different empirical studies, this study has selected the following four constructs of impact of TQM implementation namely Customer satisfaction, Employee satisfaction, Product quality and Business performance. Organization's primary purpose is to stay in business, so that it can support the stability of the community, produce products and services that are useful to customer, and provide a setting for the satisfaction.

Customer satisfaction has drawn much more attention nowadays. Different quality guru and quality awards also had focused on customer satisfaction. So the customer satisfaction is taken as one of the firms' key performance measure. Employee satisfaction is taken as an another important part in business success because employees are taken as internal customer and employee satisfaction can direct to behaviors by employees that affect a firm's performance.

Quality product is one of the most prominent factors for manufacturing industries in the world market. Business strategy development must place high priority on product quality which is the fundamental aspect for business success. Business performance is a indicator to test the effect of TQM implementation. It reflects the competitive capability of a firm in the marketplace and its financial health and predicts its future success or failure. Annual sales, sales growth, profit and market share are the prime factors to measure the business performance.

Figure: Conceptual framework of the TQM implementation and Impact



Conclusion

The extensive TQM literature suggests that TQM covers a vast spectrum of constructs. The different constructs were identified in the literature are based on their own experience in working as consultant, managers or researcher. This study identifies the nine key factors for TQM implementation and four key factors of impact of the TQM implementation. So, this study can define TQM as a management philosophy for continuously improving performance and excellence (Customer satisfaction, Employee satisfaction, Product quality and Business performance) based on Top management commitment & involvement, Policy deployment with process control and improvement applying Research and development, adopting training and education, maintaining suppliers empowerment and relationship, having customer relationship, employee empowerment and involvement, by using evaluation and assessment

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