

Identification of Critical Total Quality Management Factor for Productivity Improvement

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Abstract- The purpose of the paper is to annotate the various critical success factors (CSFs) of TQM to improve the productivity of manufacturing organization through the effective implementation of TQM. A literature study was conducted to find out critical factors of TQM considered by various authors which are based on the philosophy of Deming and Crosby. A questionnaire survey was also conducted to know the impact of Deming and Crosby in today's scenario. This research analysed the data of 175 SMEs and find out 13 most critical success factors of TQM which are responsible for improving the product quality and productivity of Indian manufacturing SMEs by reducing cost of quality and waste at the same rated input.

Keywords— Productivity, Quality Improvement, Total Quality Management.

I. INTRODUCTION

In this competitive global environment, economic liberalization is providing opportunities to the Indian manufacturing organization to improve the quality of their product to participate globally. Total Quality Management (TQM) is one of the most important quality improvement techniques for Indian manufacturing organization through which organization can achieve the success and improve the product quality. The basic philosophy of TQM is to develop the concept of quality in employee which will increase the product quality as well as decrease cost of production and increase productivity also. Michael J. Stahl explained TQM as "TQM provides market and sector leadership by the establishment of processes and systems which promotes excellence, prevents errors and waste, without duplication and ensures that every aspects of the organization is aligned to the needs of both the external and internal customer [12]". The DOD defines quality as, "TQM is both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. TQM is the application of quantitative methods and human resources to improve the

material and services supplied to an organization, and the degree to which the needs of the customer are met, now and in the future. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous improvement [11]".

The quality products enhance the customer requirement and willingness. A successful producer must enhance the total value of product by giving quality product to the customer while his own cost of production is low enough to make profit. The customer satisfaction by the quality product increases the market shear of the producers and gives him opportunity to compete at the global level. This will increase the productivity and the producer gain more profit. The satisfaction of the customer, productivity improvement and increase in market shear all these three are the positive outcomes of the successful implementation of the TQM.

A. TQM Model

A simple TQM model consists of two components:

- TQM philosophy.
- TQM factors & supportive tools.

It is necessary for successfully implementation of TQM to accept the complete philosophy of TQM by the organization. Once the basic philosophy is accepted then different factors and tools can be initiated to develop and facilitate a successful implementation of TQM.

1) *TQM Philosophy:* The core philosophy of TQM is "unwavering customer focus". Figure-1 describes the individual component of TQM philosophy and their inter-relationship with unwavering customer focus. The organization needs to continually examine their quality system to see if it is responsive to ever changing customer requirements and expectations or not. Deming [5] added that quality also means anticipating the future needs of the customers. Clear identification of customer expectation is

necessary for gaining more customers and for enticing new ones and for improving the productivity.

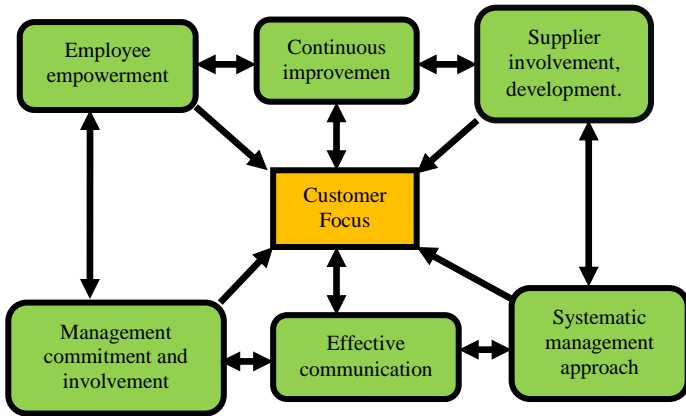


Fig. 1 Components of TQM philosophy and their interrelationship.

B. TQM and India

With the winds of globalisation and liberalization sweeping across the world, to enhance its competitiveness Indian manufacturing organization focused on improving the quality of their product. In order to gain competitive advantage the company should provide value to its customer than the competitors. In this concern Indian government also take an active involvement. In the year of 1980, confederation of Indian industries (CII) was established by the government of India that took the initiatives to set up TQM practices in India. In 1982 quality circles were introduced first time in India and the organizations which implement the concept of quality are Bharat Electronics Ltd, Bangalore and Bharat Heavy Electricals Ltd, Trichy. In 1986 Dr. Kaoru Ishikawa was invited by CII to India, to address Indian Industry about quality. In 1987, CII set up a TQM division for the development of quality concept in Indian organization and formed the National committee on quality. CII Institute of Quality has started its partnership journey with Japanese Union of Scientists & Engineers (JUSE). India has the largest number of Deming Prize winning companies in the world, outside of Japan. In February 1991 an Indian company obtained the first ISO 9000 certification in India with assistance of the CII. In 1996, Govt. of India announced the setting up of quality council of India to operate national accreditation structure and promote quality through National Quality Campaign [4, 19].

II. METHODOLOGY

An extensive literature search revealed various critical factors of TQM which are used by various authors in their respective studies based on the philosophy of Deming and Crosby. With the literature survey a questionnaire survey was conducted which targeted a random sample of Indian manufacturing industries to know how well organization beware about the quality improvement procedure for better productivity. A letter was sent to 360 organizations, addressed to their quality manager, and asking whether they would be prepared to participate in an investigation by completing a postal questionnaire.

A pilot questionnaire was drafted and tested on a number of recipients. Which was then sent to the 175 organization who both responded and indicated their willingness to participate in the survey. The questionnaires were accompanied by an additional covering letter and self-addressed envelope.

III. CRITICAL SUCCESS FACTOR OF TQM

According to Australian Manufacturing Council, "The critical factors of TQM can be described as best practices in which "firms and their employees undertake business activities in all key processes: leadership, customers, suppliers, planning, community relations, services, production and supply of products and the use of benchmarking" [1]. Critical factors are those attributes which affect and influence the implementation of TQM. TQM plays a vital role for the improvement of productivity. In the concern of productivity improvement Deming [6] also suggested some key points which are "constancy of purpose", "adopting the philosophy", "ceasing mass inspection", "refusing toward business solely on price, continuous improvement", "training on the job", "institute leadership", "driving out fear", "breaking down barriers", "eliminating slogans", "eliminating quotas", "taking pride in workmanship", "self-improvement (education & training)" and "putting everybody to work".

In the concern of TQM implementation Crosby [3] discussed 14 quality steps which includes "management commitment", "quality improvement team", "quality measurement", "cost of quality evaluation", "quality awareness", "corrective

action”, “engaging a zero defect commitment”, “supervisor training”, “zero defect days”, “goal setting”, “error cause removal”, “recognition”, “quality councils” and “doing it over again to achieve quality”. In this study, the literature which is based the philosophy of Deming and Crosby are considered and find out various critical factors of TQM. These CSFs are also considered by various author in their respective studies these are Motwani [13], Mehra [14], Prajogo and Sohal [17], Sila and Ebrahimpour [22], Lagrosen and Lagrosen [10], Singh and Smith [21], Bergman and Klefsjo [2], Ooi et al [15], Gadenne and Sharma [8], Psychogios [18]. Table-1 explain various CSFs of TQM which are suggested by literature study with the description.

TABLE I
COMPARATIVE LIST OF CRITICAL FACTORS OF TQM IDENTIFIED BY LITERATURE STUDIES

S.No	Critical factors	Description
1.	Benchmarking	Real life standard for the measurement of product quality and its development programs with respect to its peers.
2.	Customer Focus	Product development by considering customer’s needs.
3.	Cultural Change	Modification of a society through discovery, innovation, or interaction with other societies.
4.	Continual Improvement	Measurement of effectiveness of organization’s processes and strive to meet more difficult objectives to satisfy customers.
5.	Customer Satisfaction	The degree of satisfaction provided by the products.
6.	Effective Communication	The development of common idea, understanding, desire and observation among people.
7.	Employee Empowerment	Employee is free to make his own decisions in a specific work related problem.
8.	Employee Involvement	Effective participation of employees in goal setting, planning, forecasting and monitoring of their performance.
9.	Education & Training	The act of imparting knowledge, development of thinking, and preparing oneself intellectually for mature life.
10.	Human Resources Management	HRM develops policies and goals of an organization, managing resource, providing manpower through recruitment, screening, training and appraisal.
11.	Information Analysis	Analysis of required information among various alternatives to select the best possible or relevant course of action.

12.	Leadership	An act of managing group of people and a science to mould them self’s according to our requirement with logically and effectively with maturity.
13.	Product Design	Conversion and translation of intellectual wisdom or ideas required by company and need of customer in to a specific product.
14.	Process Improvement	Systematic approach for identification, improvement of existing process by streamlining the process and by reducing the cycle time.
15.	Process Management	Deals communication and improvement of business processes across enterprise.
16.	Reward and Recognition	Positive reinforcement given by the organization for the extraordinary work of employee.
17.	Supplier Quality Management	Keen observation and inspection given by the company to maintain the quality of their suppliers.
18.	Supplier Management	Supplier management enables organization to control the cost of raw material, service excellence and risk management to gain value from their vendors.
19.	Top Management Commitment	Higher level executives are committed to provide better assets, working condition, effective equipment, when it required by the employee or worker of organization.

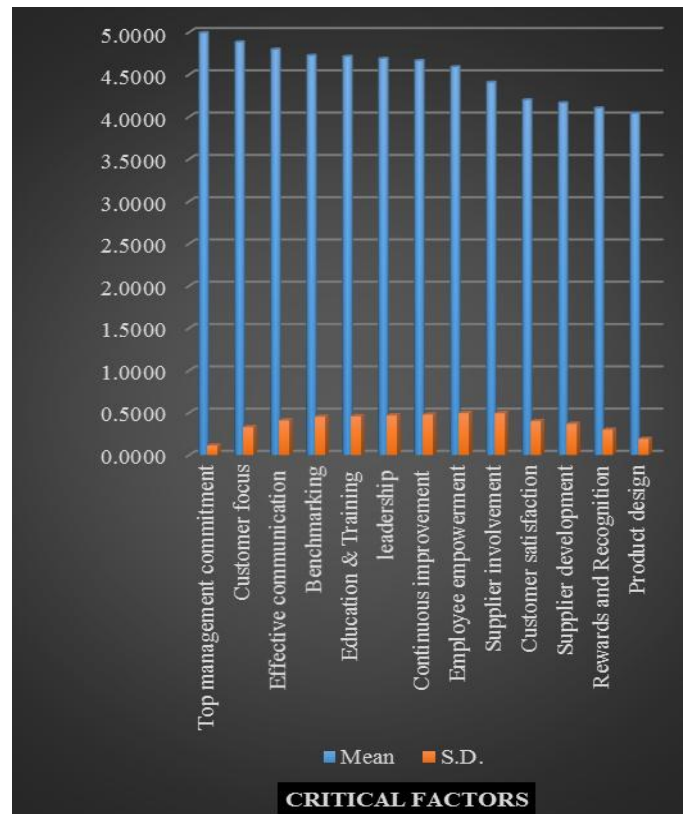
IV PRODUCTIVITY AND TOTAL QUALITY MANAGEMENT

Productivity improvement having a great importance for the organization’s ability to compete at global market. Without sound productivity no organization can achieve high quality product and improved product quality will reduce defects, costs and increases profitability but when organization think about productivity and quality the first thought which comes in mind is that why organization should invest in quality, when at same time organization can emphasis on producing more to cater to increasing competition which is omnipresent? A simple explanation is that when the quality of the product is improved more usable outputs is available at the same rated input. High quality product and low production cost enhance the competitive position in market through the better customer satisfaction and improve the productivity of the organization. Quality and productivity are directly related to each other. In today’s scenario, customers are much conscious

about the quality of the product. To survive in the market organization have to focus on both the factors i.e. productivity and quality. TQM is the best technique to improve both quality and productivity. In this concern questionnaire survey was conducted to collect the data regarding the critical success factors of TQM responsible for productivity improvement of Indian SMEs. Questionnaire was send to 360 SMEs throughout the India and out of which 175 SMEs responded. Data was also collected by the face to face interaction with manager and general manager of quality department of various organizations. In questionnaire five point Likert scale was used where five represent strongly agree and one represent strongly disagree and data was analysed by the use of SPSS and excel. Study analysed 13 most critical success factors of TQM which are responsible for productivity improvement of Indian SMEs explained in table-2.

TABLE II
CRITICAL SUCCESS FACTOR OF TQM RESPONSIBLE FOR PRODUCTIVITY IMPROVEMENT

Rank	Critical Success Factor	Mean	Standard Deviation
1.	Top management commitment	4.987805	0.110432
2.	Customer focus	4.878049	0.329243
3.	Effective communication	4.792683	0.407879
4.	Benchmarking	4.719512	0.452002
5.	Education & Training	4.707317	0.457794
6.	leadership	4.682927	0.468200
7.	Continuous improvement	4.658537	0.477119
8.	Employee empowerment	4.585366	0.495691
9.	Supplier involvement	4.402439	0.493407
10.	Customer satisfaction	4.195122	0.398733
11.	Supplier development	4.158537	0.367491
12.	Rewards and Recognition	4.097561	0.298546
13.	Product design	4.036585	0.188897



V. CONCLUSIONS

Study suggests that successful implementation of TQM is depends upon the active participation of top management because TQM is most reliable approach used to improve the product quality and productivity and the other selected factors are also affecting the productivity by minimizing waste. TQM has proven itself most powerful technique for improving the quality of product. TQM provide a framework for organization who wants to improve quality of their product because to survive in global market, it is necessary to provide quality product to their customer with adequate price and within required time duration. Because quality is never an accident; it based on continuous progress with high intention and commitment through effective or skilful execution.

The limitation of this paper is that these findings are totally for the Indian manufacturing SMEs. This may differs for other character of the organization and nature of nation. In future researchers focused on developing a frame for improving productivity by the use of these CSFs.

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