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A Systematic Approach of Total Quality Management Practices towards Operational Excellence with Reference to Auto Components Manufacturing Companies

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ABSTRACT

In the era of global competition, the manufacturing companies across the world are looking for maintaining their operational excellence through superior quality product or services. Quality practices followed in manufacturing process are the basic criterion for growth and survival of business organizations in dynamic and complex competitive environment. The ability to influence higher level of efficiency along with the enhancement of product or service quality is possible only by implementing effective Total Quality Management (TQM) practices such as managerial approach, team approach, customer approach, process approach, system approach and cultural approach in the organization. This paper attempts to drive the relationship on dimensions of TQM practices towards operational excellence in auto component manufacturing companies by examining the performance of quality and employee.

Keywords: *Total Quality Management practices, Operational Excellence, Quality and Employee performance.*

INTRODUCTION

For the past 20 years, the auto component manufacturing companies had undergone the notable shift in implementing the quality practices in their organization to meet out the competition in global market. This shift makes the auto component manufacturer to revamp their selection of business partners and to achieve quality standards in their functional activities. The manufacturers have started to redesign their strategic planning and create structural changes in the organization as per the quality practices of global companies. The manufacturing companies start to implement different quality practices like Statistical Process Control (SPC), Six sigma, Kaizen and Total Quality Management (TQM) for determining their standards in competitive environment.

Total quality management is a holistic approach to combine various functions of management to address the challenges faced among manufacturing companies on quality issues to sustain their position in the competitive environment. However, competition has become more challenging than ever before, which creates the expectations of product quality at higher level than ever. In order to deliver superior product quality, organizations has to redesign their systems, process, culture and adopting suitable strategies as required for global competition.TQM practices are considered as a key component and critical factor for implementing and achieving quality standards in manufacturing as well as service organizations.

TOTAL QUALITY MANAGEMENT PRACTICES

TQM practice is a philosophy which integrates management, employees and customer as a whole to achieve the objectives of quality excellence through continuous improvement and effective measures of performance. TQM practice is a description of culture, process, system and involvement of employee and customers' with products and services to satisfy their needs. The quality culture has to follow in all aspects of organizational activities which reflect the policies and procedure of top level management. The systematic procedure of organizational process should ensure right output at the first time and minimizing the defects and waste which produce during the

time of production. The culture of involvement and participation from the employee in decision making, problem solving activities reflects the collective approach of organization in achieving operational excellence.

The outcome of TQM practices is determined by the means of continuous improvement in performance and satisfaction of customer needs. TQM practices require organizations to develop customer centric processes and at maintain the stability of improvement towards the excellence of organizational performance. The different approaches of TQM enables the cultural changes in the organization and able to attain the operational excellence by improving the performance of product quality and employee as a whole. TQM practices initiate the cultural changes by involving the employees and management as single unit of achieving organizational objectives.

OPERATIONAL EXCELLENCE

Operational Excellence is the strategic initiative process which determines the effeteness and efficiency of organizational performance. Quality performance is a measure to attain the zero defect products on consistent and continuous basis with the help of process management. Operational excellence is a quantifying measure of product quality along with the culture, commitment and performance of management and employee in the organization. In order to achieve operational excellence, organization requires the successful implementation of a quality system by integrating the different approaches of TQM practice in the form of strategy planning and implementation, performance management, process excellence, and effective work teams.

Operational excellence organizations follow a distinct strategic planning process to define their objectives and to ensure coordination and alignment along with other functional areas of the organization. Organizations should effectively transform its strategic or operational objectives into measurable indicators for assessing their performance in each process and its overall system. Operational excellence is a process-centric activity which has to create effective and efficient management practices, value creation and deliver quality products or services consistently as per the requirements of customers. The culture of operational excellence drives the organizational environment towards engagement, empowerment and encouragement of their employees through leadership qualities, standard work procedures strong values and principles.

LITERATURE REVIEW

Total Quality Management is a management approach which insists the collective method of delegating the responsibility to every stakeholder of a manufacturing organization. It ensures the participation of stake holders in decision making and problem solving process through quality circles, team work and partnership. The implementations of TQM practices will creates the culture of quality and produce quality product at the first time by improving the efficiency of each process and minimize the internal and external failure cost. The effective implementation of TQM practices will ensures the organizational efficiency by maintain the systematic approach on eliminating waste, employee involvement and customer satisfaction.

Turkyilmaz, A., Tatoglu, E., Zaim, S. and Ozkan, (2010) attempt to explain that TQM practices are used to improving the product quality and also maintain the stability of production process. Continuous improvement is an important TQM principle, reduce the product cycle time and improve the productivity of an organization as a whole. The study also considers other TQM practices like training, information system and supplier relationship would also have a positive impact on operational performance. The total quality approach develops an integrated system of analyzing the operational processes of production towards product quality and customer satisfaction.

Hassan, Mukhtar, Qureshi and Sharif (2012) have studied the relationship between quality management practices and organizational performance which measures the quality and business as a whole. The quantitative data are collected through survey method from171 quality managers of Pakistan's manufacturing industry. The study concludes the hypothesis by stating that the quality management practices have positively impact on organizational performance. The tools and techniques of quality management practices consider in the study are Incentive and Recognition System, Process, Monitoring and Control and Continuous Improvement. The behavioral factors like fact based-management, top management's commitment to quality, employee involvement and customer focus also contributes strongly for successful implementation of quality management systems. The study reports show that the adoption

and implementation of quality management systems practices results in improving business and quality performance of organization. The result findings from managers towards quality management systems practices in manufacturing organizations are most likely to achieve better performance in customer satisfaction, employee relations, quality and business performance.

Irfan, Ijaz, Kee and Awan (2012) have the attempt to understand the improvement of operational performance in Pakistan's Public Hospital. The data are collected with the help of questionnaire by considering 14 quality management practices to measure its impact on operational performance.

Structural Equation Modeling (SEM) model is framed to determine the relationship of variables and analyze the data using statistical software package of AMOS 16.0. Totally 239 questionnaires is collected in the study to find out the results which show that selected quality management practices have a significant positive impact on quality management systems implementation and operational performance in means of increasing flexibility, improvement in quality of services and minimize the service time.

Mwaniki, & Bichanga (2014) determines the effect of TQM practices on financial performance in banking sector with a reference of Kenyan nationalized banks. The study is limited with some related variables of TQM practices such as employee relationship, customer relationship, process management and top management involvement.

The four variables of TQM are considered as an independent variable which helps to assess the influence of financial performance in banking sector. The study found that there is a positive relationship between the variables like top management involvement, process management and employee relationship with financial performance. Most of the previous studies represent the overall TQM practices and shows positive impact on operation performance, quality performance, employee satisfaction and performance, product and process innovation, financial performance, and overall organizational performance.

The success of TQM implementation would result in improving employee involvement, participation, communication, better productivity, improved quality and customer satisfaction, (**Arumugam & Mojtahedzadeh, 2011**).

RESEARCH METHODOLOGY

The main objectives of this paper are:

- To identify the relevant TQM practices that is followed in Auto Components manufacturing companies.
- To assess the relationship between TQM Practices and performance variables that is used to measure operational excellence in manufacturing organizations.

DATA COLLECTION

The primary data are collected from the employees of selected auto component manufacturing companies in Coimbatore region using survey method. The data comprises of 374 respondents from 10 selected auto component companies on the basis of ISO 9000, TS16949 certification. The questionnaire consists of six independent variables with related questions and measures the opinion of respondent in Likert scale. Multistage sampling technique is used to determine the suitable respondent for this study. The purpose of the paper is to understand the relationship and impact of TQM practices towards operational excellence in Auto Component manufacturing companies.

The survey questionnaire consists of closed-ended questions, in order to categories the relationship of TQM practices on demographic factors, quality and employee performance. TQM factors such as managerial approach, team approach, process approach, system approach, cultural approach and customer approach are considered by reviewing previous studies and applicable for manufacturing organization. Five point Likert scale is used in the questionnaire to convey the attributes of the respondents effectively towards the TQM practices in manufacturing organization. Likert Scale questions determine the degree of acceptance in the form of strongly agrees to strongly disagree.

Reliability and Validity Analysis

Table 1 explains reliability and validity analysis for variables consider in this study. The coefficients of Cronbach' salpha were higher than 0.70, meeting the desirable value recommended by Nunnally and Bernstein (1994). In addition, the analysis calculated composite reliability and according to Bagozzi and Yi (1988), a composite reliability of 0.60 or above is deemed acceptable in assessing the reliability of scales. For this study, all scales were reliable as the Cronbach's alpha values were in a range of 0.790 -0.912, and composite reliability values

were between 0.876 and 0.922. Convergent validity is established when a measure of a variable produces AVE of 0.50 or higher (Fornell and Larcker, 1981). As showed in Table 1, the average variance extracted (AVE) coefficients of all constructs were in a range of 0.720 - 0.81, providing strong evidence of convergent validity.

Table1. *Reliability and Validity Analysis*

Scales	No. of items	Cronbach's Alpha	Composite reliability	Average variance extracted
Managerial Approach (MA)	5	0.845	0.910	0.77
Customer Approach (CA)	5	0.889	0.897	0.74
Team Approach (TA)	5	0.790	0.914	0.72
Process Approach (PA)	5	0.890	0.884	0.76
System Approach (SA)	5	0.865	0.876	0.742
Cultural Approach (CLA)	5	0.885	0.922	0.762
Quality Performance (QP)	6	0.912	0.910	0.794
Employee Performance (EP)	6	0.900	0.913	0.81

Table2. *Correlation Analyses*

Variables	MA	CA	TA	PA	SA	CLA	QP	EP
MA	0.847							
CA	0.749	0.843						
TA	0.724	0.715	0.847					
PA	0.71	0.742	0.743	0.802				
SA	0.658	0.649	0.658	0.795	0.799			
CLA	0.651	0.528	0.578	0.501	0.658	0.892		
QP	0.458	0.574	0.547	0.482	0.52	0.572	0.912	
EP	0.488	0.614	0.48	0.38	0.395	0.482	0.419	0.85

Note. *All Correlations Are Significant At: 0.01 Level (Two-Tailed); The Italic Values in the Diagonal Row Are Square Roots of the AVE*

Discriminate validity is the degree to which measures of different latent variable are unique enough to be distinguished from other constructs (Hatcher, 1994). In this study, discriminate validity is also established also using CFA. CFA Models were constructed for all possible pairs of latent constructs. These models were run on each selected pair, first allowing for correlation between the two various constructs, and then fixing the correlation between the various constructs at 1.0. A significant difference in chi-square values for the fixed and free models indicates the distinctiveness of the two constructs (Bagozzi et al., 1991). The chi-square difference is tested for statistical significance ata $P < 0.01$ confidence level. For the four constructs, a total of eight different discriminate validity checks are conducted.

Analysis and Results

Impacts of TQM Practices up on Employee Performance

Employee performance may highly be influenced by the TQM practices adopted in the company. Multiple regression analysis is used to analyses the impact of each one of TQM practices on the employee performance. TQM practices like managerial approach, customer approach, team approach, process approach, system approach and cultural approach are considered as the independent variables and employee performance is taken as the dependent variable to perform regression analysis. The following table clearly represents the number of independent variables and dependent variable used for the study. The above regression coefficient table illustrates the impact of each independent variable of TQM practices on the employee performance and the order of influence of each variable is also displayed in the standardized coefficient. Regression equation is built with assumed independent and dependent variables are,

Employee performance = 1.165 + .099 of Managerial Approach + .122 of customer Approach - .015 of Team Approach + .206 of Process Approach + .092 of System Approach + .171 of Cultural Approach

The above regression equation explains the positive influence of each one of TQM practices like managerial approach, customer approach, process approach, system approach and cultural approach on employee performance whereas team approach express the negative influence of employee performance.

Table3. *Coefficients – Employee Performance*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.165	.102		11.467	.000
Managerial Approach (MA)	.099	.035	.119	2.816	.005
Customer Approach (CA)	.122	.037	.146	3.255	.001
Team Approach (TA)	-.015	.033	-.019	-.450	.653
Process Approach (PA)	.206	.036	.251	5.698	.000
System Approach (SA)	.092	.035	.113	2.596	.010
Cultural Approach (CLA)	.171	.037	.204	4.637	.000

Impact of TQM Practices on Quality Performance

Quality performance may also have high influence by the TQM practices adopted in the organization. Multiple regression analysis is applied to analyses the impact of each one of the TQM practices on quality performance. TQM practices like managerial approach, customer approach, team approach, process approach, system approach and cultural approach are considered as the independent variables and quality performance is assigned as the dependent variable to perform regression analysis. The following table clearly indicates the number of independent variables and dependent variable assumed for the study

Table4. *Coefficients – Quality Performance*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.504	.113		13.266	.000
Managerial Approach (MA)	.099	.039	.120	2.519	.012
Customer Approach (CA)	.085	.042	.103	2.046	.041
Team Approach (TA)	.026	.037	.033	.710	.478
Process Approach (PA)	.148	.040	.181	3.674	.000
System Approach (SA)	.087	.039	.107	2.193	.029
Cultural Approach (CLA)	.203	.041	.244	4.926	.000

Table 4 explains the regression coefficient table that the impact of each independent variable of TQM practices on the quality performance and the order of influence of each variable is presented with standardized coefficient. Regression equation is built with the assumed independent and dependent variables as,

Quality performance = 1.504 + .099 of Managerial Approach+ .085 of Customer Approach + .026 of Team Approach + .148 of Process Approach + .087 of System Approach + .203 of Cultural Approach

The above regression equation explains the positive influence of each one of TQM practices like managerial approach, customer approach, team approach, process approach, system approach and cultural approach on quality performance.

Conclusion

The paper concludes that TQM is a management approach which aligns the various functional processes into a common objective of an organization. It develops the culture of involving management in forming quality environment by participating and empowering their employees towards customer satisfaction. It is a systematic method of integrating different tools, and techniques to improve the process on continuous basis towards the quality of products or services in a competitive environment. Operational excellence of any organization can achieve only through effective strategic planning, high level of system approach on process management and collective efforts of team work in consistent and continuous manner. The study analysis the relationship of TQM practices such as managerial approach, customer approach, team approach, process approach, system approach and cultural approach on operational excellence by measuring the performance of quality and employees in the organization. Furthermore, the study is conducted to know whether these approaches of TQM practices are reliable and valid to enhance the performance of operations as a whole. The sample of respondents is collected from 10 auto component manufacturing companies in Coimbatore region based on ISO certification. The study finds out the positive relationship of TQM practices on employee and quality performance and has strong influence on the parameters of operational excellence. However, the results prove that cultural approach of an organization is an effective TQM practice

which influences greater level to achieve operational excellence in a competitive environment.

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