

Implementation of Total Quality Management in Rajasthan SME's

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Abstract

Quality of product is still an important issue for the locally produced goods. only a few companies are producing high quality products with higher customer satisfaction. Many of them are holding quality certificates but a few has reached a stage of development where they are able to apply modern quality principles and techniques effectively. Research on product quality improvement shows that meeting customer satisfaction, increasing profits and reducing losses to a minimum level can be attained through the application of modern quality philosophies and principles such as Total Quality Management (TQM). Understanding the tools and techniques of TQM is considered to be significant in order to get useful results. A better understanding is required to investigate the current status of TQM implementation. This study presents a survey on current quality control practices within the small, medium and large enterprises in Rajasthan to assess the potentiality of implementing TQM technique and principles in order to improve the customer satisfactions. . The main objectives of this paper are quantitative analysis of drivers affect TQM (total quality management) in small and medium enterprises in Rajasthan, India. An empirical study was conducted through survey method in small and medium enterprises in Rajasthan, India and analyzed using SPSS. Correlation, regression analysis develops and used to establish the affect of drivers on Total Quality Management. ANOVA test was used to determine the statistical significance of the relationship between the variables. The results were presented using tables. The study established that the drivers has positively affected of total quality management.

Keywords: Drivers, Total Quality Management, Small and Medium Enterprises (SME'S)

1. Introduction

TQM refers to a broad set of management and control processes designed to focus an entire organization and all of its employees on providing products or services that do the best possible job of satisfying the customer (Talha, 2004). TQM means that the organization's culture, which is defined by, and supports the constant attainment of customer satisfaction through an integrated system of tools, techniques, and training. Recent research justifies that TQM directly as well as indirectly affects inventory, quality, and financial performance of the organizations (Kaynak, 2003). The combined effect of marketing and TQM on organizational performance (motivation, marketing, productivity and societal) is also found to be significant (Lai and Cheng, 2005). Almost in all these research studies, TQM practices are assessed using the Malcolm Baldrige National Quality Award (MBNQA) criteria which consist of six decisive factors of organizational practices and one criterion of organizational

performance. The organizational practices embody six criteria, viz., (1) leadership; (2) strategy and planning; (3) customer focus; (4) information and analysis; (5) people management; and (6) process management.

TQM is not about working to someone else's agenda, unless your customers and clients have specified the agenda. It is not something that only senior managers do and then pass their directions down the line.

The total in TQM dictates that everything and everybody in the organization is involved in the enterprise of continuous improvement. The management in TQM likewise means everyone, because everyone in the institution, whatever their status, position or role, is the manager of their own responsibilities. This is a difficult idea to put across, and it is the reason why some organizations talk, as Rolls-Royce do, about Total Quality rather than TQM. TQM programmes do not have to use the initials TQM. Many organizations pursue the philosophy under their own brand name. Boots the Chemist calls its extensive quality programme 'Assured Shopping'.

American Express use the initials AEQL, which stands for American Express Quality Leadership. They prefer to emphasize 'leadership' rather than management. Total quality control, total quality service, continuous improvement, strategic quality management, systematic improvement, quality first, quality initiatives, service quality are some of the many titles used to describe what in this book is called TQM. If a school, for example, felt that it wanted to call its initiative 'Pupils First' or 'The School Improvement Programme' then it should feel free to do so. It is not the name that is important, but the effect that the quality programme will have on the culture of the school. The pupils and their parents will be interested in the change it brings, not what the initiative is called.

TQM is used to describe two slightly different but related notions. The first is a philosophy of continuous improvement. The second related meaning uses TQM to describe the tools and techniques, such as brainstorming and force-field analysis which are used to put quality improvement into action. TQM is both a mind-set and a set of practical activities—an attitude of mind as well as a method of promoting continuous improvement.

2. LITERATURE REVIEW

The essence of this literature review is to understand the impact of TQM on the business excellence of SMEs. In order to get a complete understanding of the theory and practice, various studies were analyzed and reviewed. Several key elements of TQM strategies have emerged in the literature from reported case studies, conceptual papers, and empirical research. For the present study, the researchers have included 12 critical factors dimensions from reviewing the TQM literature. They are: independent variables related to performance, namely, leadership and top management commitment, vision and plan statement, supplier quality management, system process quality improvement, total employee involvement, education and training, performance appraisal and recognition, customer focus and satisfaction, evaluation, work environment and culture, continuous improvement and communication. Pascoe, Larry Bruce (1992) in their study attempted to determine the level of importance placed on the key and important component of TQM, The effectiveness of the TQM programs and the degree of correlation between each of the critical factors of the effectiveness of the TQM programme. The study demonstrated that TQM programs were instrumental in enhancing the business excellence. Senior managers of the manufacturing organizations in USA participated in this research study. Sun (2000) has extensively investigated the relationship between TQM, ISO 9000 certifications, and business excellence through questionnaire. Cerio (2003) has reported that there existed a significant relationship between the levels of implementation of quality management principles and improvement in organized performance in terms of cost, quality and flexibility. The survey was conducted in Spanish firms. He concluded that, as the higher level of implementation of quality management practices increases it improves the organizational performance. The author also found that quality management practices, product design and development, were the most important significant predictors of operational performance.

Garvare and Isakassan (2001) suggested that many different concepts can be applied as measurements and indicators of sustainable development. They have proposed three categories of indicators such as driving forces, state reactive response and active response. They have concluded that excellence for sustainable development can be built on triangle i.e. person-organization- society. Oakland, (1994) and Clayton and Charles (1995) used hard and soft indicators to measure competitive achievement for business excellence. Hendricks and Singhal (1997, 1999) indicated that an effective TQM programme actually improved operating performance. Mann (1992) also agreed that TQM is not only a management tool for producing quality products and services, but also a process that leads to increased productivity and more favorable comparative position. He stressed that there is a relationship between quality and productivity. As quality improves there will be less rework or wastage, meanwhile customer satisfaction will be improved with this business excellence enhancement. Powell (1995) has investigated the possibility of incorporating TQM practice to gain and sustain competitive age. Drawing on the resources approach, his study

examined TQM as potential source of sustainable competitiveness. He found that organizations that put TQM practices in place outperform their competitors and among others, this finding suggested that financial performance was positively associated with quality management practices. Saraph et al., (1989) and Flynn et.al., (1994) proposed empirically validated empirical values of measures for integrated quality management aimed at providing better understanding of quality management practice in relation to an organization's quality environment and quality performance. Researchers have used such measures to understand quality management practice better and to build theories and models that relate the critical factors of quality management to organizational performance to achieve business excellence. Some claimed that successful implementation of TQM could generate improved products and services, reduced costs, produced more satisfied customers and employees and improve financial performance. Walton (1986), Garvin (1988) Piper, Randy, T. (1997) found that there was a significant and positive relationship between TQM and business excellence results. This research will therefore fill a gap in the existing literature by investigating fusible relationship between TQM practices and business excellence of small and medium sized manufacturing enterprises.

Total quality management (TQM) is an integrated management approach that aim to continuously improve the performance of products, processes, and services to achieve business excellence through customer's expectations. To accomplish this objective, some key factors that contribute to the success of TQM efforts are to be identified. These key factors are often termed as critical success factors (CSFs). An extensive review of literature on quality management was performed for the purpose of clarifying critical factors that are essential for TQM implementation. Through the extensive literature review, many critical success elements of TQM implementation are identified based on reviews of various models, Quality Awards, and conceptual frameworks of academics, practitioners along with empirical studies. From the literature review twelve critical success factors of TQM for effective quality management implementation were identified. It has been observed during literature review that most of the CSFs have similar description but are named with slight different name or labels.

3. Methods/Approach

Research methodology is based on empirical data collected through a questionnaire survey. The survey methodology is used for study. The main objective of survey is observing the status of Driver affecting of total quality management in small and medium enterprises in Rajasthan, India. The problem was selected on the gap identified in literature. Data is collected through the questionnaire survey. The questionnaire was administered in various small and medium enterprises in Rajasthan, India. Questionnaire was designed based on the literature. Questionnaire item were develop to represent each variable in the research. Reliability analysis seeks the extend to which a measurement procedure. To ensure data collection procedure is reliable, the cronbach's alpha coefficient was computed using SPSS. A value of 0.8, higher than the threshold of 0.7 was obtaining showing acceptable level of consistency. A correlation analysis was conducted to establish relationship between Drivers and Total Quality Management. A multiple regression analysis was used to test if drivers are affecting Total Quality Management. ANOVA test was used to determine level of significance of the affect of drives and Total Quality Management. The various drivers which are more important for the adoption of Total Quality Management.

4. Results and Discussion

The data are collected from various small and medium enterprises. The SPSS software is used to analysis of collected data following results show:

4.1 Reliability analysis

The Cronbach's alpha was conducted to assess the reliability of each scale. Alpha values over 0.7 indicate that all scales can be considered reliable (Nunally, 1978). Internal consistency analysis was carried out cronbach's alpha more than 0.7 in each For Quality Related(0.822), Management Commitment(0.840), Quality Policy(0.859), Planning(0.805), Responsibility Authority(0.855), Resource Management(0.810), Purchasing(0.843), Measurement Analysis(0.863), Quality Management System(0.842) , Customer Satisfaction(0.864), Product Realization(0.856), Quality Results(0.824), Result of applying TQM(0.855), Environmental Factors(0.833) . Here we are found

cronbach’s alpha for every factor more than 0.8 so the value of 0.8, higher than the threshold of 0.7 was obtaining showing acceptable level of consistency.

Table 1 Mean & std. deviation

	Mean	Std. Deviation
Quality Related	3.423	.481618
Management Commitment	3.407	.516365
Quality Policy	3.443	.80548
Planning	3.441	.78592
Responsibility Authority	3.560	.78022
Resource Management	3.452	.530885
Purchasing	3.468	.75758
Measurement Analysis	3.483	.55778
Quality Management System	3.475	.75375
Customer Satisfaction	3.435	.82403
Product Realization	3.493	.541902
Quality Results	3.451	.772434
Result of applying TQM	3.397	.60273
Environmental Factors	3.403	.591254

Table 1 show the Responsibility Authority show highest mean score value (3.560), this indicate that SME’S giving more importance to responsibility authority factor. Quality Related having mean score value(3.423), Management Commitment mean score value(3.407); Quality Policy having mean(3.443),; Planning mean score(3.441); Resource Management mean score value(3.452); Purchasing mean score value(3.468); Measurement Analysis mean score value are(3.483); Quality Management System mean score value(3.475); Customer Satisfaction having mean score(3.435), Product Realization having mean score value(3.493); Quality Results having mean score (3.451); Results of applying TQM mean score value are(3.397); Environmental Factors(3.403); these results indicate that The driving factors are more helpful for maintaining green supply chain management in SME’S.

4.2 T test:

A t-test is a statistical test that can determine if there is a significant difference between two groups on a dependent variable. Here find the value of $p < 0.05$ Hence there are not significance difference between independent variable(Quality Related, Management Commitment, Quality Policy, Planning, Responsibility Authority, Resource

Management, Purchasing, Measurement Analysis) and dependent variable(Quality Management System, Customer Satisfaction, Product Realization, Quality Results, Results of applying TQM, Environmental Factors). Table 2 show the value are find out in t test: Table 2 show the value find in t test for independent variables and dependent variables have p value are p=0.00 for each factor. The value of t for inferred quality related t(30)= 54.804, management commitment t(30)= 28.366, quality policy t(30)= 40.861, planning t(30)= 37.110, responsibility authority t(30)= 29.134, resource management t(30)= 33.972, purchasing t(30)= 24.455, measurement Analysis t(30)= 34.948, quality management system t(30)= 32.761, customer satisfaction t(30)= 26.939, product realization t(30)= 30.143.quality results. results of applying TQM. environmental factors.

Table 2 T test

	T	Df	Sig. (2-tailed)
Quality Related	39.576	31	.000
Management Commitment	36.739	31	.000
Quality Policy	23.803	31	.000
Planning	24.376	31	.000
Responsibility Authority	24.689	31	.000
Resource Management	36.199	31	.000
Purchasing	25.486	31	.000
Measurement Analysis	34.776	31	.000
Quality Management System	25.675	31	.000
Customer Satisfaction	23.213	31	.000
Product Realization	35.890	31	.000
Quality Results	24.879	31	.000
Results of applying TQM	31.388	31	.000
Environmental Factors	32.048	31	.000

4.3 Correlation analysis

Correlations estimate the extent to which changes in one variable are associated with changes in the other and are indicated by the correlation coefficient (r). Correlation coefficients can range from +1.00 to -1.00. A correlation of +1.00 indicates a perfect positive relationship, a correlation of 0.00 indicates no relationship, and a correlation of -1.00 indicates a perfect negative relationship (Welman & Kruger, 1999). Table shows the correlation between independent variables (Quality Related, Management Commitment, Quality Policy, Planning, Responsibility Authority, Resource Management, Purchasing, Measurement Analysis, Quality Management System, Customer Satisfaction, Product Realization, Quality Results, Results of applying TQM, Environmental Factors).Pearson correlation value are show in the table 3 for each factor and following hypothesis are tested:

H1 $\mu \neq \mu_0$: Quality Related, Management Commitment, Quality Policy, Planning, Responsibility Authority, Resource Management, Purchasing, Measurement Analysis factors have significant influences on, Quality Management System, Customer Satisfaction, Product Realization, Quality Results, Results of applying TQM, Environmental Factors: From the table we can see that r value (show in table3) **, p=.000 for the economical outcomes, Environmental Outcomes Operational Outcomes, Intangible Outcomes, so it is significant as $p < 0.05$. . Less the value of p, stronger is the strength of the relationship.

Table 3 Pearson Correlation

		Quality Management System	Customer Satisfaction	Product Realization	Quality Results	Results of Applying TQM	Environmental Factors
Quality Related	Pearson Correlation	.724	.746	.930	.693	.818	.827
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Management Commitment	Pearson Correlation	.706	.771	.913	.721	.806	.811
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Quality Policy	Pearson Correlation	.976	.999	.704	.967	.650	.621
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Planning	Pearson Correlation	.942	.976	-.688	.997	.647	.577
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Responsibility Authority	Pearson Correlation	.965	.994	.674	.976	.633	.590
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Resource Management	Pearson Correlation	.681	.697	.993	.642	.874	.890
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Purchasing	Pearson Correlation	-.962	.994	.695	.975	.659	.610
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Measurement Analysis	Pearson Correlation	-.686	-.723	-.996	.684	.900	.876
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

4.4 Regression analysis

In statistics, regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables.

- a) Case 1 – Quality Management System is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 47.3% variation in Quality Management System And from coefficients table we conclude that when factors (inputs) is zero then the Quality Management System will be ($B = 3.659$, $\text{sig} = .007$). Alternative hypothesis is accepted. All the input factors collectively support the Quality Management System. It is helpful when we are trying to predict Quality Management System by input. The value of B tells us about the how the individual drivers affect the Quality Management System.
- b) Case 2 – Customer Satisfaction is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 51% variation in Customer Satisfaction. And from coefficients table we conclude that when factors (inputs) is zero then the Customer Satisfaction will be ($B = 1.240$, $\text{sig} = .394$). All the input factors collectively support the customer satisfaction. So, we conclude that all the input factors collectively do not support the customer satisfaction.
- c) Case 3 – Product Realization is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 36.2% variation in operational outcomes. And from coefficients table we conclude that when factors (inputs) is zero then the operational outcome will be ($B = 0.868$, $\text{sig} = .530$). All the input factors collectively support the Product Realization. So, we conclude that all the input factors collectively support the Product Realization.
- d) Case 4 – Quality Result is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 47.1% variation in intangible outcomes. And from coefficients table we conclude that when factors (inputs) is zero then the intangible outcome will be ($B = 3.608$, $\text{sig} = .027$). All the input factors collectively support the Quality Result. So, we conclude that all the input factors collectively support the Quality Result.
- e) Case 4 –Result of Applying TQM is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 35.7% variation in Result of Applying TQM And from coefficients table we conclude that when factors (inputs) is zero then the intangible outcome will be ($B = 1.470$, $\text{sig} = .348$).

All the input factors collectively support the Result of Applying TQM. So, we conclude that all the input factors collectively support the Result of Applying TQM.

- f) Case 4 –Environmental Factors is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 54.3% variation in intangible outcomes. And from coefficients table we conclude that when factors (inputs) is zero then the intangible outcome will be (B =0.764 sig = .508). All the input factors collectively support the Environmental Factors. So, we conclude that all the input factors collectively support the Environmental Factors.

- Following hypothesis are tested for each case:

All the input factors collectively support the quality management system.
All the input factors collectively support the customer satisfaction.
All the input factors collectively support the product realization.
All the input factors collectively support the quality result.
All the input factors collectively support the result of applying TQM.
All the input factors collectively support the environmental factors.

5. Conclusion

In this study we have quantitative analysis of drivers affecting total quality management in Rajasthan small and medium enterprises .The drivers have critical role in increase performance and sustainability of total quality management small and medium enterprises in Rajasthan, India implementation of TQM gives benefits induces cost saving and improve quality in both service and production area. TQM increases productivity with less rejection and faster job. Total Quality Management helps to provide lower cost and higher production to the organization with maximum customer satisfaction and also helpful for business growth. Input factors Quality Related, Management Commitment, Quality Policy, Planning, Responsibility Authority, Resource Management, Purchasing, Measurement Analysis increase performance of output factors Quality Management System, Customer Satisfaction, Product Realization, Quality Results, Results of applying TQM, Environmental Factors.

Every factor has critical role in small and medium enterprises. We have found here critical value is high of Customer Satisfaction factor. They have high importance in SME'S. Furthermore they are explaining variance and they are strongly related to Quality Management System, Customer Satisfaction, Product Realization, Quality Results, Results of applying TQM and Environmental Factors. All factors shows highly positive correlation with

Total Quality Management performance which means every factor critical role for TQM and the organizations which are using the TQM principals and techniques.

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