TOTAL QUALITY MANAGEMENT(TQM) PRACTICE AND ORGANISATIONALPERFORMANCE IN ISO 9000 CERTIFIED MANUFACTURING ORGANISATIONS IN KERALA

[1]Dr Mathew Joseph ,[2] Ms. Asha C M

[1]Assistant Professor, Dept. of Business Administration, St Berchmans College, Changanacherry, Kerala.

[2] Ph D Research Scholar,

Abstract-Total Quality Management (TQM) has been a widely researched area, and numerous researchers have highlighted the benefits of implementing TQM philosophy in organisations. TQM practices in organisations have advanced over time and have significant impact on organisational performance. The study attempts to gain insight of the nature of practice of Total Quality Management and to understand the relationship between organisational performance and practice of TQM in the ISO 9000 certified manufacturing organisations in Kerala. Variables related to TQM and Quality performance and Organisational performance in the Kerala state scenario are identified in the light of review of literature and consultation from experts. The changes in the practice of TQM in the organisations after the acquisition of ISO 9000 certification is analysed. Data is collected from managers in ISO 9000 Certified manufacturing organisations in public and private sector. Findings reveal that there is improvement in practice of TQM in manufacturing organisations after getting ISO 9000 certification. A causal model on relationship of the practice of TQM and organizational performance in ISO 9000 certified manufacturing organisations in Kerala is put forth. The study revealed that there exists significant relationship between TQM practice and ISO 9000 certification among the manufacturing organisations in Kerala. Suggestions for the better implementation of TQM in ISO 9000 certified manufacturing organisations are formulated.

Index Terms: **Total Quality Management (TQM), Organisational Performance, ISO 9000 certified manufacturing organisations, Kerala.**

1.INTRODUCTION

In an economic environment, standardization in management systems has had a high growth in the recent years. In this context, certain standards such as International Organization for Standardization (ISO) stand out. Manufacturing organisations are still striving for continuous improvement in order to survive in a dynamic, competitive and uncertain environment**.** Total Quality Management (TQM) is seen as a way for organisations to improve the quality of their products and services. TQM is the key to survival and achieving competitive advantage in current business environment. However, there are mixed views in the literature concerning whether ISO 9000 and TQM complement or contradict each other.TQM when successfully implemented helps in gaining sustainable competitive advantage (Prajogo and Sohal, 2004). Total Quality Management (TQM) is a philosophy and process intervention to maintain organizational performance. This study attempts to gain insight of the nature of practice of Total Quality Management in ISO 9000 certified manufacturing organisation in Kerala. The relationship between organisational performance and Total Quality Management in ISO 9000 certified manufacturing organisation in Kerala is explored.

2.OBJECTIVES.

1.To assess the practice of Total Quality Management (TQM) in ISO 9000 certified manufacturing organisations in Kerala.

2.To understand the changes in practice of Total Quality Management (TQM) in the organisations after ISO 9000 certification.

3.To analyse the organisational performance in ISO 9000 certified manufacturing organisations in Kerala.

4.To develop a model on relationship of the practice of Total Quality Management (TQM) and organizational performance in ISO 9000 certified manufacturing organisations in Kerala.

5. To evaluate the relationship between practice of Total Quality Management (TQM) and ISO 9000 certification in the ISO 9000 certified manufacturing organisations in Kerala.

3.HYPOTHESIS

H_o: There exists no significant difference in the practice of Total Quality Management in ISO 9000 certified manufacturing organisations in Kerala.

H_1: There exists significant difference in the practice of Total Quality Management in ISO 9000 certified manufacturing organisations in Kerala.

4.LITERATURE REVIEW

Terziovski et al. (1997) studied 1,341 companies in Oceania and concluded that there is a positive relationship between ISO 9000 and TQM implementation and operating results. Terziovski (1999) clarified that there is an important influence of total quality management on operational performance especially at large companies that are specialized in manufacturing processes. Operational performance of one organisation is directly handled with the enhanced delivery performance, flexibility, minimizing costs and errors and enhancing process productivity (Nunnally, 1978). Organisational performance could be measured either depending on operational performance that includes financial performance, customer satisfaction and effectiveness of product quality (Brah et al.,2000). Study conducted by Romano (2000) in 100 Italian companies revealed that ISO 9000 certification contributes to improving quality costs, internal and external quality and production times, even though it increases inspection costs. ISO 9000 contributes to improving internal company organization and operating results (Gotzamani & Tsiotras ,2002). The implementation of TQM is related to improvement in company results (Brah et al. ,2002) Talha(2004) asserted that the practices of TQM directly contribute in enhancing the performance of organisations by minimizing costs , enhancing the performance of staff members , and increasing the degree of customer satisfaction .TQM directly impact the performance of organisations in positive way (Saizarbitoria, Landin, Fa,2006).

5.THEORETICAL FRAMEWORK

Theoretical framework of Total Quality Management (TQM) and Organisational performance in manufacturing organisations in Kerala is developed for the study in the light of meticulous review of literature of the previous studies and discussion. Discussion done with experts in the field of Engineering, Management and Quality Audit to explore on the application of Deming's principles in TQM. Consultation done with experts to identify the critical factors of TQM and organisational performance applicable in the ISO 9000 certified public sector and private sector manufacturing organisations in Kerala. Content validity and face validity were assessed to confirm the relevance of these identified TQM factors and organisational performance factors in the Kerala context.

Twelve TQM factors extracted are: Employee Participation, Teamwork, Supplier Teaming, Continuous Improvement, Unity of Purpose, Top Management Commitment, Customer Focus, Benchmarking, Employee Education and Training, Usage of Statistical Process Control tools, Information Usage about Quality and Value Analysis.

Twelve organisational performance factors identified are: Change in customer satisfaction, Profitability, Employee satisfaction level, Labour efficiency level after ISO 9000 certification, Competitive position, Market share, Quality of work force level, Multi-skilled work force level, Delivery time, Cost of production, Customer complaints and Supplier lead-time.

6.METHODOLOGY

The type of research design for the study is descriptive research. The study focused on the medium and large-scale ISO 9000 certified manufacturing organisations in the state of Kerala in India. A detailed review of literature was undertaken on Total Quality Management (TQM) and organisational performance. Theoretical framework on TQM and Organisational performance in manufacturing organisations in Kerala is developed for the study in the light of meticulous review of literature of the previous studies and discussion. Twelve TQM factors and organisational performance factors extracted as specified in the above subsection of Theoretical framework. Primary data collected by valid and reliable questionnaire from managers of thirty ISO 9000 certified manufacturing organisations across Kerala. State The responses of 63 managers from private sector and 63 manager's responses from the public sector are collected. Data analysed using SPSS. Data presented in tables and figures.

7. FINDINGS

7.1. Practice of Total Quality Management (TQM) in ISO 9000 certified manufacturing organisations in Kerala

All the managers strongly agree that they practice the twelve TQM Principles such as: Employee participation, Teamwork, Supplier Teaming, Continuous Improvement, Unity of purpose, Top Management Commitment, Customer focus, Benchmarking, Employee Education and Training, Statistical Process Control (SPC) tools, Information about Quality, Value Analysis in their manufacturing organisation

7.2. Changes occurred in the practice of Total Quality Management (TQM) after the ISO 9000 certification

The following table illustrates the responses of the managers on the changes occurred in the twelve TQM variables obligatory for efficient and effective practice of TQM in their manufacturing organisations after the ISO 9000 Certification of the firm.

Table.7.1. Managers' opinion on the changes occurred in the Variables related to

Total Quality Management (TQM) after the ISO 9000 certification

Sl. No	Variables related to Total Quality Management	Opinion of managers on changes in variables related to Total Quality Management			
		Yes		No	
		Frequency	%	Frequency	%
1	Employee participation	49	39	77	61
2	Team work	43	34	83	66
3	Supplier teaming	35	28	91	72
4	Continuous improvement	49	39	77	61
5	Unity of purpose	39	31	87	69
6	Top-management Commitment	40	32	86	68
7	Customer focus	40	32	86	68
8	Bench marking	41	33	85	67
9	Education and training	71	56	55	44
10	Statistical Process Control (SPC) tools	21	17	105	83
11	Information usage	34	27	92	73
12	Value analysis	28	22	98	78

7.2.1. Employee participation: Employee participation is considered as the basic requirement in TQM implementation and practice. Only 29% managers agreed that the employee participation has changed after ISO 9000 certification.

7.2.2. Teamwork: The transition from traditional hierarchical structure to a team structure is expected in the TQM practicing organisations. 66% managers opined that there is no change in practice of teamwork in their organisation after ISO 9000 certification.

7.2.3. Supplier Teaming: A reliable supplier is an asset of any organisation. 28% managers are of the opinion that the firm-supplier relationship of the organisation has been improved. 72% managers opined that the firm-supplier relationship did not change after ISO 9000 certification.

7.2.4. Continuous Improvement: Continuous Improvement is a vital factor of TQM. 39% managers who opined that there were changes on continuous improvement. 61% managers opined that there is no change on continuous improvement.

7.2.5. Unity of purpose: The universal responsibility principle is a very important factor of TQM. 31% managers opined that there is a change and 69 % of the managers were of the opinion that there is no change on this variable after ISO 9000 Certification.

7.2.6. Top Management Commitment: Top management has the ultimate responsibility for quality. There are 32% managers supporting that there is improvement in the top management commitment and 68% managers opined that there is no change in the top management commitment.

7.2.7. Customer focus: Being a customer driven organisation is a strategic concept. 32% managers are of the opinion that the customer focuses has been improved in their organisations after ISO 9000 certification. 68% managers are of the opinion that there is no change in the TQM variable customer focus after ISO 9000 certification.

7.2.8. Benchmarking: Benchmarking is the process of measuring performance against the best in the same another industry.33% managers are of the opinion that there is improvement in the practice of benchmarking in their organisation. 67% managers opine that there is no change in benchmarking in their organisation.

7.2.9. Employee Education and Training: 56% managers are of the opinion that the training has been improved after ISO certification;44% managers are of the opinion that employee education and training has not changed in their organisation.

7.2.10. Statistical Process Control (SPC) tools: The ISO 9000 certified organisations are expected of using SPC tools for process and product improvement.17% managers opined that the SPC tools usage has been improved after ISO 9000 certification. But 83% managers are of the opinion that the usage of SPC tools has not changed in their organisation after ISO 9000 certification.

7.2.11. Information about Quality: 73 % managers opined that the usage of information has not changed ISO 9000 certification of their organisation. The ISO 9000 certified organisations are expected of having improved usage of information if they are practicing TQM.

7.2.12. Value Analysis: Value engineering is an important function to be followed by those organisations that practice TQM. 78% managers opined that there is no change in the practice of value analysis in their manufacturing organisations.

7.3. Analysing the organisational performance of the ISO 9000 certified manufacturing organisations after its ISO 9000 certification

The organisational performance is analysed by using the twelve identified organisational performance measurement measures, which are mentioned below.

7.3.1. Change in customer satisfaction after ISO 9000 certification :48% of the managers opined that the customer satisfaction level has increased significantly. 29% of the managers opined that the customer satisfaction level has been increased marginally. 22% of the managers are of the opinion that there is no change in the customer satisfaction level. None of the managers opined that the customer satisfaction level has been either decreased significantly or marginally.

7.3.2. Change in profitability after ISO 9000 certification: 41% of the managers are of the opinion that there is no change in the profitability and 37% of the managers are of the opinion that the profitability has been marginally increased. 19% of the managers are of the opinion that the profitability has been significantly increased. A very small percentage of the managers are of the opinion that the profitability has been either significantly or marginally decreased.

7.3.3. Change in employee satisfaction level after ISO 9000 certification :25% of the managers opined that the employee satisfaction level has been increased significantly. 33% of the managers opined that the employee satisfaction level has been increased marginally. 33% of the managers opined that there is no change in the employee satisfaction level. 5% of the managers opined that there is a marginal decrease in employee satisfaction level. 4% of the managers are of the opinion that there is a significant decrease in employee satisfaction level.

7.3.3.1. Absenteeism of the employees post ISO 9000 Certification: 69% of the managers opined that there is reduction in absenteeism of employees, post ISO 9000 Certification.

7.3.3.2. Change in attitude of employees towards quality after ISO 9000 certification: 72 % of the managers opined that there is positive change in the attitude of employees towards quality, post ISO 9000 Certification. 28 % of the managers opined that there is no change in the attitude of employees towards quality, post ISO 9000 Certification.

7.3.4. Change in Labour efficiency level after ISO 9000 certification:24% of the managers opined that the labour efficiency level has been increased significantly. 48% of the managers opined that the labour efficiency level has been increased marginally. 24% of the managers opined that there is no change in the labour efficiency level. Also 4% of the managers are of the opinion that labour efficiency level has been either significantly or marginally decreased.

7.3.5. Change in Competitive position after ISO 9000 certification:25% of the managers opined that the competitive position has been increased significantly. 33% of the managers opined that the competitive position has been increased marginally. 34% of the managers opined that there is no change in the competitive position. 9% of the managers are of the opinion that the competitive position has been decreased either significantly or marginally.

7.3.6. Change in the Market share after ISO 9000 certification: 25% of the managers opined that the market share has been increased significantly. 41% of the managers opined that the market share has been increased marginally. 34% of the managers opined that there is no change in the market share. None of the managers are of the opinion that the market share has been decreased either significantly or marginally.

7.3.7. Change in Quality of work force level after ISO 9000 certification :44% of the managers opined that the quality of workforce level has been increased significantly. 35% of the managers opined that the quality of workforce level has been increased marginally. 19% of the managers opined that there is no change in the quality of workforce level. 2% of the managers are of the opinion that the quality of workforce level has been decreased marginally.

7.3.8. Change in Multi-skilled work force level after ISO 9000 certification :34% of the manager opined that the multi-skilled workforce level has been increased marginally. 23 % of the managers opined that the multi-skilled workforce level has been increased significantly. 27% of the managers opined that there is no change in the multi-skilled workforce level. 13% of the managers are of the opinion that the multi-skilled workforce level has been decreased marginally. 3% of the managers are of the opinion that the multi-skilled workforce level has been decreased significantly.

7.3.9. Change in Delivery time after ISO 9000 certification:44% of the managers are of the opinion that the delivery time has been decreased marginally. 36% of the managers are of the opinion that the delivery time has been decreased significantly. 16% of the managers are of the opinion that there is no change in the delivery time 3% of the managers have opined that the delivery time has been increased significantly. 1% of the managers opined that the delivery time has been increased significantly.

7.3.10. Change in Cost of production after ISO 9000 certification :43% of the managers are of the opinion that the cost of production has been decreased marginally. 33% of the managers are of the opinion that the cost of production has been decreased significantly. 24% of the managers are of the opinion that there is no change in cost of production. None of the managers have opined that the cost of production has been either increased significantly or marginally.

7.3.11. Change in Customer complaints after ISO 9000 certification :33% of the managers are of the opinion that the customer complaints has been decreased marginally. 30% of the managers are of the opinion that the customer complaints have been decreased significantly. 37% of the managers are of the opinion that there is no change in customer complaints. None of the managers have opined that the customer complaints have been either increased significantly or marginally.

7.3.12. Change in Supplier lead-time after ISO 9000 certification :43% of the managers are of the opinion that the supplier lead-time has been decreased marginally. 26% of the managers are of the opinion that the supplier lead-time has been decreased significantly. 28% of the managers are of the opinion that there is no change in the supplier lead-time. 2% of the managers have opined that the supplier lead-time has been increased significantly. 1% of the managers have opined that the supplier lead-time has been increased significantly.

7.4. Hypothesis

H_0: There exists no significant relationship between TQM practice and ISO 9000 certification among the ISO 9000 certified manufacturing organisations in Kerala.

H_1: There exists significant relationship between TQM practice and ISO 9000 certification among the ISO 9000 certified manufacturing organisation in Kerala**.**

Hypothesis tested to determine whether any statistically significant relationship exists between the ISO 9000 certification and the Total Quality Management practice. The statistical technique One sample t-test is performed for testing the mean value of a distribution.

Table 7.2. Relationship between TQM practice and ISO 9000 certification among the ISO 9000 certified manufacturing organisations in Kerala.

	t	df	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference	
					Lower	Upper
Score	-44.74	125	0.000	-17.0952	-17.8612	-16.3293

From the table, the sample t-statistic is –44.174 and the p value is 0.000. As p value of 0.000 is less than significance value 0.05, failed to accept the null hypothesis. Hence research hypothesis is accepted. It is concluded that there exists significant relationship between TQM practice and ISO 9000 certification among the ISO 9000 certified manufacturing organisations in Kerala.

7.5. Relationship of TQM practice and Organisational Performance among the ISO 9000 certified manufacturing organisations in Kerala

In Figure 6.1.Causal model on relationship of TQM practice and Organisational Performance among the ISO 9000 certified manufacturing organisations in Kerala is presented. Causal models are models that represent causal relationships within an individual system or population. The model aids in visualizing how different variables in a system are causally interrelated. This model facilitates inferences about causal relationships from statistical data.

PRACTICE OF TOTAL QUALITY MANAGEMENT(TQM)

Employee participation, Teamwork, Supplier Teaming,

Continuous Improvement, Unity of purpose,

Top Management Commitment, Customer focus, Benchmarking,

Employee Education and Training,

Statistical Process Control (SPC) tools, Information about Quality, Value Analysis

ORGANISATIONAL PERFORMANCE

Fig 7.1 Model on relationship of Total Quality Management(TQM). and Organisational Performance

8.SUGGESTIONS

A transition from the traditional hierarchical system to a functional team system is vital for practice of Total Quality Management (TQM). Hence it is suggested to adopt functional team structure for improving organisational performance. A collaborative culture is highly sought in a TQM practicing organisation.

Education and training need to be effectively organised and carried out properly in organisations. The benefits regarding the practice of the philosophy of TQM for the employees and to the organisation are to be properly communicated to the employees during training programmes, for effective implementation of TQM.

Quality circle is to be very effectively practiced by the organisations in their quest of TQM. The practice of KANBAN (Card system) system will simplify the internal logistics system of the organisation.

It is suggested to follow the practice of ergonomics principles, for improving the organisational productivity. Up-gradation of the technology should be done for meeting the ergonomics demands.

5S is basically a systematic and rational approach to methodological housekeeping built on a sound economic base. It is indeed the first step towards continuous improvement. So, the practice of 5S will ensure service efficiencies, better quality system, safer workplace, higher employee morale, efficient workplace layout and better material handling.

ISO 9000 certified organisations are expected to follow Plan-Do-Check-Act (PDCA) principles for enabling continuous improvement. PDCA philosophy to be adopted for the better practice of TQM. Up-gradation of the technology should be done as the value analysis demands.

9.CONCLUSION

From the study, it has been inferred that there exists significant relationship between TQM practice and ISO 9000 certification among the ISO 9000 certified manufacturing organisations in Kerala. Apart from getting Quality certifications, continuous improvement is to be done for improving the Total Quality Management practice and organisational performance of manufacturing organisations in Kerala. In the ISO 9000 certified manufacturing organisations in Kerala, there is a strong need to reflect systems approach in TQM practice. Systems approach in TQM practice is fulfilled with the sense of shared values, organisational trust, team work, and all other constituents necessary for the process of implementing continuous improvement in the organisation. For the successful Total Quality Management practice, there must be a strategic plan that identifies the clear organisational goals. This plan involves a

long-term endeavour to create and sustain the new culture of TQM, optimise the organisational performance and ensure continuous improvement.

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