

Quality Management System: A Tool to Effect Operational Performance

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ABSTRACT

The aim of the research is to find out the impact of QMS on firm's operational performance. The focus of study is to identify the factors of QMS implementation and operational performance, and their mutual relationship. In modern business world the business has shifted from hard techniques of quality management to soft techniques of quality. They involve ISO Certifications and quality models. Among all these standards ISO 9001 or QMS is the most significant. It involves set of practices that have significant impact on the performance of the firm. The impact of ISO 9001 certification of firm's financial performance is established, but the study investigates its impact on firm's operational performance. Different companies that are QMS certified were taken under the scope of study and questions were asked as per QMS implementation and operational performance, later on test were performed to confirm and validate the hypothesis.

KEYWORDS: QMS, Operational Performance, Quality Management, ISO 9001.

1.0 INTRODUCTION

It is a well established fact that the manufacturing industry has transformed and still transforming as the process of change and improvement is never ending. This accelerates research and development in each and every single area. There was a time when America and Europe was the hub of global development and their industries were progressing at a very high pace but now the industrial dominance has melted and the arenas of development are opened for every nation who want to progress. The guarantee of success is not sure in this world of fact competition as every slipping second is contributing a lot in field of knowledge. There are many facts that validate astonishing realities. It is evident that the failure of most of the corporations and business entities is not caused by their human resources or mismanagement in allocation of resources; their failure was the function of poor technical handling and ill definition of procedures, lack of training and process handling methods that cause a delay in company operations. Thus quality management has a significant impact of company's operations and performance [1]. Early empirical studies have highlighted quality management, efficiency and performance as pillars of a corporation. Many researchers have highlighted the performance of US manufacturing sector and their some outsourced plants of Japan and pointed out quality as a pillar of these corporations [2]. Benson, Schroeder and Saraph [3] also reported similar fact in their researches. The loophole in these studies was that they remain silent in identifying the exact scales of quality as there were many hard techniques of quality implementation.

Since the inception of soft techniques of quality, there has been a tremendous growth. In 2008 a report was published accruing to which 1 million companies around the globe were ISO 9000 certified and their number tends to increase [4]. A lot of efforts were put in documentation of quality management systems but the formation of business process and its documentation was initially a difficult task. On further investigations and researches separate quality management system was developed that layout a proper guidelines for the process documentation and its boundaries. Once a process is defined it is then matched with ISO 9001 requirement matrix [6]. Thus ISO 9000 family is a family of standards that are deployed in company to develop and document their procedures and process to lay a solid foundation of management system which is more efficient and quality oriented. These standards create uniformity in the processes of company that will give same level of satisfaction to the customers. ISO 9001 QMS addresses different areas of organization that can lead to effective quality management. A total of five such pillars exist that are helpful in laying a sound foundation on QMS. Furthermore an organization can be audited against these set of procedures by conducting an external or third party audit. Thus registration is one time process and the audit against this registration is a continuous process [7]

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Current research focuses on the implementation of QMS and its impact on operational performance. QMS certification is one among many tools to implement a quality management system which will create a harmony in the operations of the company. The operational harmony leads to effective and cohesive procedures that will definitely affect the operational performance of a company. The study will highlight the magnitude of this relation by validation of hypothesis.

2.0 LITERATUREREVIEW

As this family (ISO 9000 series) of quality standards was developed in 1987, many authors and researchers took initiative towards its implementation and detailed analysis [8]. There is long debate among industrial professional and critics of quality, that how well a standard can be compared with the overall Total Quality Management System. If we talk about the over quality management system or framework, there are two dimensions of quality management. The first on is the hard dimension or the technical one and the second dimension is soft dimension under which human related activities are being catered [9]

The most common hard tools for quality measurement are SPC (Statistical Process Control) and Ishikawa's tools for solving complex aspects. They appear to be difficult while implementing in any industry. Thus it is preferred to move towards the soft side of TQM which was addressed in ISO 9001:2000 Quality Management System. In this standard certain new point have been added in the area of leadership, commitment of management, continuous improvement, management of customers and employees (human resource) management [10].

Many believe that ISO certification can be viewed as a step on the road to total quality. Van den Heuval discusses six approaches to defining quality in an article the payoffs of ISO 9000 certification [11]. They range from total quality management to organizational performance indicators of quality management. For many organizations the major motivation for the certification is that it retains and even opens new customers' doors [12].

ISO certification may help a firm retain or increase market share, and hence improve performance by increasing sales or revenue [13]. According to Nancy Tague in "Managing Services Quality," the initial intents of ISO certification were for organization to gains confidence in the quality management system of their suppliers as well [14]. Only one variable of QMS was discussed in a study conducted by Parnell and it was resource management. It showed mix results and studies of [15] also prove mix relationship of ISO certification with the operational performance of company.

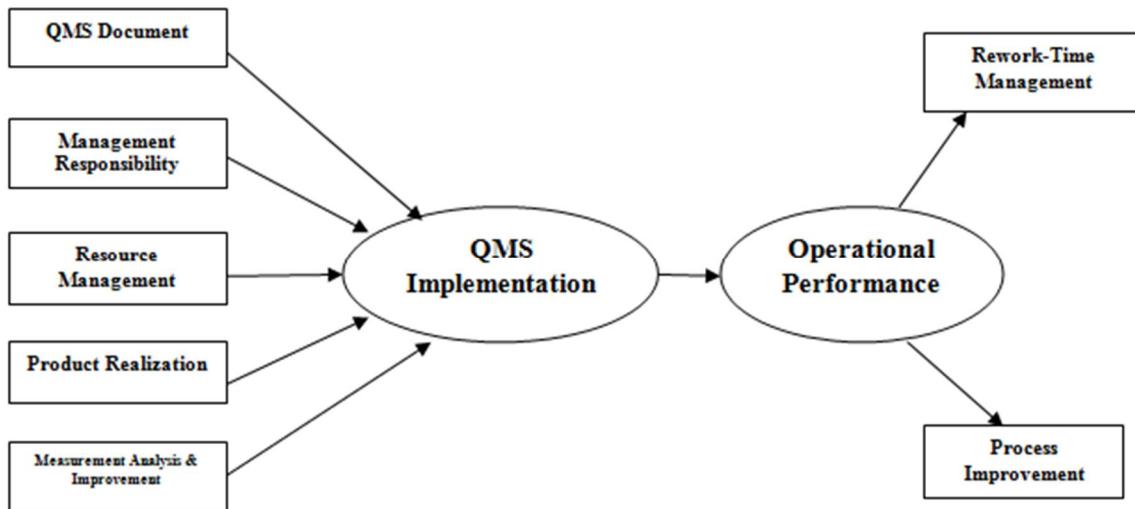
Structural modeling equation was used to study quality of 184 manufacturing firms in New Zealand. Mixed results were found while relating quality to the performance. Many firms showed direct impact on quality practices and financial performance but the results were not significant but there exists a significant relationship between quality and operations of company, this includes process output, utilization of process, inventory levels, timely delivery, work in process and coast associated with production. Sometimes execution to these tasks requires re-work which creates low motivation and morale for the workers, that is the primary reason that many companies give up in the beginning or even in the middle of the whole process [16].

3.0 Hypothesis:

After knowing all the relevant variables we are able to define our main hypothesis of research and it is as follows:

- H₁:** QMS Implementation significantly affects Operational Performance.

Thus our proposed model for research is as follow



4.0 METHODOLOGY

A quality management questionnaire is used in the study and it was adapted and modified from QMS Audit checklist. Total five variables were used to measure QMS Implementation and two variables were used to capture the effect of Operational Performance. QMS documentation, management responsibility, product realization, resource management and measurement analysis and improvement are the variables that were used to capture the effect of QMS implementation. Rework-time management and process improvement are the variables that were used to capture the effect of operational performance. This bifurcation gives us our independent and dependent variables. QMS Implementation was used as an independent variable of the research on the other hand Operational Performance was used as out dependent variable in the research. A 5 point Likert scales was used in the questionnaire denoting 1 for strongly disagree and 5 for strongly agree.

4.1 Data Collection:

The data was collected from fifteen QMS (ISO 9001) Certified firms. Among the sample seven firms were IT corporate and consultants whereas eight companies were operating in the capacity of manufacturers. Total 300 questionnaires were distributed in companies. Some responses were collected online and some were collected by paying on-site visits. The respondents were personals who are responsible for implementation of quality management system in the organization. Some of the respondents were quality assurance engineers, associate projects managers and technical quality leads. After all the responses were gathered they were computed in an excel file initially. Incomplete and carelessly filled questionnaires were discarded. Finally 202 responses qualified for final analysis. This means that 67% of the responses out of our sample were used for the study. The results were analyzed by using SPSS 18.0

5.0 RESULTS

Once the data was compiled in SPSS the first step was to check the scale reliability of the data set. For scale reliability we performed three different scale reliability tests on our data set. First the whole data set was analyzed through SPSS and overall reliability of the model was tested. Next we find out the scale reliability of dependent and independent variables i.e. operational performance and QMS implementation respectively. The overall and individual scale reliability tests and their interpretation is shown and explained below.

The scale reliability of overall model is given below in which all the questions are taken into consideration, resulting the n=44. QMS is determined by 32 questions and 12 questions determine operational performance.

Table 1	
Reliability Statistics	
Cronbach's Alpha	Number of Items
.896	44

According to Fornell and Larcker [5], the value of Cronbach's Alpha is good hence our overall questionnaire is reliable and can be carried for research. Once the collective reliability is proved we will move towards individual reliability of both dependent and independent variable. In order to carry this task both QMS implementation and Operational Performance were passed through reliability test individually. Reliability statistics of QMS implementation are mentioned, according to the mentioned statistics of reliability the value of Alpha is .882 which is again significant according to Fornell and Larcker [5], while n=32 in case of independent variable. The reliability of our dependent variable i.e. Process Improvement is mentioned, its value is 0.656 which is significant according to Fornell and Larcker [5], while n=12.

As we can see that our data was reliable, both of the variables i.e. independent and dependent variables are reliable individually and separately. This means that over all model is reliable. In order to test our main hypothesis regression analysis was performed in SPSS and after their regression following outputs were generated.

Table 2			
Descriptive Statistics			
	Mean	Standard Deviation	N
Operational Performance	3.5961	39361	202
QMS Implementation	3.6569	.41229	202

The descriptive statistics of the respondents is shown in table 2, it is evident that the means of both dependent and independent variables i.e. dependent and independent variables is greater than 3.5, which shows a positive response of the respondents as per the mentioned scale.

Table 3					
Model Summary					
R Square					
Model	R	Adjusted R Square	R Square Change	F Change	Sig. F Change
1	.625 ^a	.391	.388	.391	128.260
a. Predictors: (Constant), Implementation					
b. Dependent Variable: OP					

It is evident from our model summary i.e. Table-3 that the value of R-Square (R^2) is .391 which is almost 40%. It means that our independent variable explains 40% of our dependent variable. In more simple words we can say that our R^2 explains 40% of the unexplained variable which in our case is operational performance. The F-Value is also significant, which confirms the significance of our overall model. The Beta value of the model is significant while on the other hand Significance value is .000. If we talk about un-standardized beta coefficient, we can say that one unit change in our independent variable i.e. QMS Implementation, will bring .597 change in our dependent variable that is operational performance in our case. This concludes our overall hypothesis and we can say that operational performance of a company is effected by QMS Implementation i.e. ISO 9001 Implementation.

6.0 CONCLUSION

Based on the above results we can conclude that QMS Implementation has a significant effect on the operational performance. This not only validates our hypothesis but also suggests that if ISO 9001 is implemented in an organization by keeping in view all the relevant process areas, operational harmony can be created. Any organization that want to extract best out of its operations must, implement QMS in its true sense. All the determinants i.e. QMS document, Management Responsibility, Resource Management, Product Realization and Measurement Analysis and Improvement must be translated and implemented in an understandable way. The goals and quality policies must be communicated within the organization in such a way that it must be embedded in every worker's mind rather than a fancy slogan mounted on the wall of manager's room. Moreover operational performance can be increased if resources are managed properly which is pre-requisite of QMS. In nut shell we can say that QMS is a source of operational performance as it positively affects that organization's operational performance, keeping in view it true sense and industrial layout.

7.0 IMPLICATION

The research can be beneficial for the managers to invest in QMS i.e. ISO 9001 certification. The study can be used to predict the areas that need to be improved for both quality management system and operational performance. The research signifies the degree to which both the variables can be modified. The research is beneficial for the management as well as quality managers, in a way as it investigates the key process areas of the QMS implementation that can be controlled to have desired outcomes. This research is equally applicable in manufacturing and service sectors. The research will guide the managers to make necessary adjustment in that particular area of QMS that has significant relationship with operational performance.

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