Is Implementing a Quality Management System a Worthwhile Endeavor?

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**Abstract**

Increasing requirements for improved quality products or services have led to two important changes in global business practices over the last 20 to 30 years. The first is the growing realization that a Quality Management System (QMS) philosophy and methods are required to meet customer requirements and the second is to obtain a quality certification such as ISO-9000 (international certification), TS-16949 (automotive certification) or ISO-13485 (international medical certification). There is still discussion on the role and business value of implementing these systems. The literature review evaluated several studies in different countries on their application and implementation of quality systems. This paper will evaluate the results of the papers and compare them to each other to obtain an understanding of how different cultures or industries view and implement a Quality Management System. The increased use of statistical process control, lean systems, continuous improvement methods and certification does not always mean that quality is not present in the manufacturing process. And performance is not affected by implementation in all cases. Yet manufacturers and customers require certification from their suppliers. This push has created a new industry of companies that assist people in obtaining their certification. This paper attempts to demonstrate that implementing a QMS is a worthwhile endeavor and that there are more rewards than costs to the company.

**Reasons for Developing Quality Systems**

The manufacturing industry is constantly seeing competitive threats both globally and domestically that challenge them to increase their products or productivity. Technological change is constant and ever increasing in its pace as well as is consumer sophistication. Products are seeing shorter life cycles due to customer demands and competition. Despite the strong international views on the value of QMS some managers are slow to change and adopt these systems. The purpose of this report is to demonstrate that a QMS is essential to the success of an organization.

**Literature Review**

A Quality Management System (QMS) is a current fundamental strategy of global organizations who are leaders in their fields. A QMS is a group of processes that require all the employees in a company to work for continuous improvement. The QMS requires an organization to understand their customer requirements so they design their products and services around these customer requirements. Even the support activities of marketing, distribution, human resources and others are focuses to meet customer requirements. The literature review starts with a study of the automotive industries lin Tiawan (Lin, Liu, Hsu & Lai, 2004). This study used surveys of successful and unsuccessful companies to understand how they view a Quality Management System. The study also used regression analysis and cluster analysis to analyze the variables. Another study from the Figi Islands (Djerdjour & Patel, 2000) used four companies in Figi to understand who a third world country understands and implements a QMS. They used interviews and surveys to gather information for their study. They also used companies from different industries to come to their conclusion. Improvements in employee participation, customer satisfaction and increase market share were all results for implementing a Quality management System. Several other studies including one from the American Society for Quality, ASQ, (Ernst & Young, 1991) were reviewed and found several similarities:

* Every company believes that quality is a factor in increasing performance.
* Japanese businesses place more importance on implementing customer responses into their design changes on new products and services.
* Companies in all countries are increasing their use of technology to help meet or exceed customer expectations
* Companies in the United States and Japan place special emphasis on customer satisfaction in all of their practices.

**Survey Methods Used in the Studies**

Surveys were employed in the Figi Islands Study (Djerdjour & Patel, 2000); the Tiawan Study (Lin, et al, 2004); Sweden Hospital Study (Kunkle, Rosenquist and Westerling, 2006) and Companies in Italy who were ISO certified since 1995 (Romano, 2002). The only small sample was the Figi Island study where they used 4 companies, the others used multiple companies and people to develop their thesis. Pietro Romano’s (2002) sample was chosen from a population of the 2730 Italian companies who were already ISO 9000 certified. The original population was reduced to 967 companies which were chosen on the basis that (1) they were in the machinery and electronics sectors and that (2) they had obtained their certification during the two-year period from June 1993 to June 1995.(Romano) Therefore the author was limiting the time period to eliminate variation from companies who were certified after changes in the requirements were made. Were surveys the best possible method to evaluate the success or failure of implementing a Quality Management System? Would looking at financials, process improvements, cost reductions or even employee retention be better metrics?

**Results of the US Study**

The US General Accounting Office Study (1991) found that getting payback from adopting and implementing a Quality Management System took an average of 2.5 years. Stating this will pull questions such as how did they get the data? A survey was used and a question was asked; how long did it take to get payback from implementing a QM System.” Another survey from the US General Accounting Office (1996) reported, that companies who were ISO 9000 certified and were working to achieve the Malcom Baldridge Quality Award achieved:

* Had an increase in performance of 8.6% increase in sales per employee and an increase in market share.
* Employee turnover, attendance and employee satisfaction all improved.
* Customer satisfaction improved based on fewer customer complaints and retention.
* Internal errors, delivery, timeliness of completing projects and cost savings all improved.

**Results of an Australian Study**

An Australian study took surveys over a period of 5 years to better assess the implementation of a Quality Management System (Hannan, 1999). The surveys were sent to the CEO or director of the company being surveyed. The mailed surveys went to 885 companies three times in the 5 years. The first year yielded a 41% return rate. The second time they got 32% of the surveys returned and the final survey resulted in a 15% response to the survey. One would question why the response rate dwindled down to such a low response rate. Several statistical methods were used to analyze the data. Hannan’s (1999) used tests of independence as well as factor analysis to reflect the impact of a QMS. The surveys found that:

* A mission statement noting quality was in place
* All people in the company were trained in quality methods and all employees were responsible for focusing on quality as their responsibility.
* There was a closer focus on suppliers, customers and internal suppliers/customers to help improve quality.
* Statistical process control and other methodologies were being employed to control quality.
* Human Resourses and Sales or Marketing functions were the last or had not embraced Quality Management systems.

**Results of a Figi Study**

The Figi Islands Study only chose 4 companies to study for their research paper (Djerdjour & Patel). Questionnaires were answered and then they conducted on-site interviews with the coordinators of the quality program in the organizations chosen. The four companies chosen were considered progressive in the quality movement and had been using a QM system for the last two years. Three of the companies were ISO 9002 certified yet only one had implemented QMS plant wide. Tll companies had clearly defined quality policies that were explained and understood by all employees. The benefits achieved by the companies were:

* Productivity improved and work instructions were clearly understood.
* Higher Customer Satisfaction.
* Improved relations between management and employees as well as improved job satisfaction.
* Better understanding between departments and problem were shared.

The biggest concept that was missed by the Figi companies was the lack of defined targets to achieve quality goals.

**The Italian Studies**

This study examines whether an ISO 9000 quality system can really influence quality management practices/procedures and operational performance companies (Romano, 2002). This was examined through the analysis of a survey that was sent to a sample of over 100 certified Italian manufacturing companies. There are 40,000 firms that are ISO 9000 certified at the time the study was taken. (Romano) The study has determined that the supply base and customers are key in the link to develop the overall quality system. This has meant a shift in the managerial approach to quality, from a perspective focused on only internal systems to a broader view that also considers customers and suppliers.

The survey was designed to answer two questions.

1. What are the differerences between firms that, before certification, had a large number of certified suppliers and certified firms that had a small number of certified suppliers? This was to assess if ISO 9000 certified supplies advances the goals of the company they supply.
2. What are the effects of different levels of upstream and downstream supply chain sensitivity to certification on quality management practices and operational performances?

Over 120 companies completed and returned the questionnaire. The surveys were reviewed and examined and an analysis of outliers was repeatedly carried out, and both individual and combined questions were examined. Any questions that were very different from those of the rest of the sample were re-contacted in order to check on the

accuracy of the information provided (Romano). Any gaps in the data on some questionnaires,

where too much information was missing, which consequently made evaluation difficult to assess, were eliminated from the sample. The results of the data scrubbing suggest that the sample was representative of the overall population. From the analysis, it was found that ISO 9000 certification was often considered the main improvement project of companies.

**QS 9000 in Taiwan**

QS 9000 was established by GM, Chrysler and Ford to establish a standardized method of certification for suppliers and the car companies themselves. It was based on the ISO 9000 requirements and then they added standards that the three automotive companies desired and then they added special requirements of the individual automotive companies (Lin; Liu; Hsu & LAI, 2004). Obtaining this certification has been a key requirement in being able to do business with Ford, GM or Chrysler. However, there is still only a minority of the companies who have obtained QS 9000 certification. According to the statistical results from the Industrial Development Bureau Ministry of Economic Affairs in Taiwan (Lin, et al.) , there were only 300 out of the 6140 automotive and spare part companies that have acquired the QS 9000 certification in Taiwan. The main reason has been that the majority of these companies are small and medium size enterprises, which have a problem in providing resources for the QS 9000 quality system process. It is obvious, from the above illustration, that there were few who successfully qualified in QS 9000, despite the thousands who have certified for ISO 9000. This is largely due to the added requirements of the QS 900 standards that are more difficult to achieve due to the lack of resources to help carry out the requirements. Two kinds of questionnaires were sent for investigation. The interviewees for the first one are those companies who have already certified in QS 9000; the second one is for the customers of the above companies. The weighting method for all the questionnaires was measured by using a five-point, Likert-type scale, (Lin, et al.) where 1 is disagree most, most dissatisfied or most un-emphasized and 5 is agree most, most satisfied or most emphasized. Statistical analysis methods used to evaluate the data include:

1. t-test

2. Service quality attribution evaluating cycle

3. Pearson’s correlation analysis

4. Factor analysis

5. Regression analysis

6. Cluster analysis

7. Single-factor ANOVA (Analysis of Variance)

The questionnaire was developed through interviews of several automotive and automotive consultant companies. Thus, the contents are considered valid. The authors (Lin, et al, 2004) used factor analysis, to extract communication, managing efficiency, organization status, documentation and integration of QS 9000 systems from the internal efficiency framework. The results are almost the same as the

original designed structure. The same conditions happen on customer service,

service quality, professionalism and efficiency extracted from the service quality

framework. As before, the results are almost the same as designed. Therefore the authors state that the design of the survey is valid.

The results of the Taiwan study noted that the price of the product is less than the vendor’s realization of customer’s level of expectation. Even more so, the quality of the product, the completeness of the product, understanding the needs of the customer, commitment to fulfill the request of the customer was much higher than the price of the items. Finally the customer’s level of expectation perception is higher than the vendor’s realization of the customer’s level of expectation.

**Potential Issues from Implementing a Quality Management System**

The most significant problem to implementing a Quality Management System is the time taken to integrate the documentation system and the lack of talent to fully understand the requirements. Then there is the potential for a lack of employee involvement and participation in the quality improvement programs as well as lack of management commitment and motivation. If management believes that quality costs money, then there will be negligible capital investment in technologies, R&D and employee’s education. Management does not want to give the perception of quality as an optional extra and not as a necessity for development for then they will have little support from their internal and external suppliers and customers.

**Conclusions From the Studies**

The highest motive for the implementation of a Quality Management System

is the realization that it is needed by the executive level, which means that the

attitude to implement a QMS is highly positive. (Kunkle & Westerling, 2006) Cooperation between departments is more specific, due to the increase of obtaining customer satisfaction and the continual improvement processes. There is significant cost reduction after the certification of a QMS. Training and developing employees increases the understanding about a QMS

and increases the cooperation in meeting goals. There is higher the level of job satisfaction and internal efficiencies after the implementation of a QMS. Initially there are some gaps between the expectation of the customers and the vendors’ of the perception of their customers after they have implemented a QMS. Vendors have to put more effort into improving aspects of the products and services. This therefore improves the products and services through continuous improvement and the voice of the customer. Costs do decrease and customer satisfaction increases. Market share increases and companies bottom line improves.

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