So you want to be a Quality Engineer?

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April 4th 2012

Introduction

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. The second is to obtain experienced individuals or Certified Quality Engineers to help implement these systems. These systems are based on standards such as ISO-9000 (International Standard), TS-16949 (Automotive Standard) or the ISO-13485 (International Medical Standard) and others. There is still discussion on the role and business value of implementing these systems. A review of different studies in various countries on their application and implementation of these quality requirements, shows a wide range of applications. I evaluated the results of different studies and compared them to each other to obtain an understanding of how Quality Engineers of different cultures and industries view and implement Quality Systems (QS). The increased use of statistical process control, lean systems, continuous improvement methods and certification does not always mean that quality is present in the manufacturing process. Performance is not affected by implementation in all cases. Yet manufacturers and customers require certification from their suppliers and their Engineers. This push has created a new industry of companies that assist people in obtaining their certification. This paper attempts to demonstrate that becoming a Quality Engineer is a worthwhile endeavor and that there are more

rewards than costs to the company. Generally the old argument was that Quality Costs more money than it is worth.

Reasons for becoming a Quality Engineer

The manufacturing industry is constantly seeing competitive threats both globally and domestically that challenge them to improve 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 quality and support systems some managers are slow to change and adopt this infrastructure. The purpose of this report is to demonstrate that a Quality Engineer is essential to the success of an organization.

Review

A Quality Engineer (Q.E.) uses current fundamental strategies of global organizations to turn companies into leaders in their fields. A Q.E. uses a group of processes that require all the employees in a company to work for continuous improvement. The role of a Q.E. is to help 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 focused to meet customer requirements. My first example starts with a study of the automotive industries in Taiwan (Lin, Liu, Hsu & Lai, 2004). This study used surveys of successful and unsuccessful companies to understand how they view a Quality Management System. Another study was from the Figi Islands (Djerdjour & Patel, 2000) and used

four companies in Figi to understand how a third world country understands and implements quality. They also used interviews and surveys to gather information for their study. Due to Figi being a small country they used companies from different industries to come to their conclusion. Improvements in employee participation, customer satisfaction and increased market share were all results of having Quality Engineers implementing a Quality Management System. Several other studies including one from the American Society for Quality, ASQ, (Ernst & Young, 1991) were reviewed and found these 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.

Surveys Used for 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 show 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.

So wouldn't one want to be in a position to improve the goals, profitability and customer satisfaction of a company? Quality Engineers do just that!

Results of an Australian Study

An Australian study took surveys over a period of 5 years to better assess the implementation of a Quality 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. I 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 Quality System. The surveys found that in companies with a QMS in place:

- Their mission statement noted that quality was in place or emphasized.
- 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 Systems.

I have never seen a Quality Engineer in H.R. or Sales and Marketing. They have a strong need to be quality oriented with a focus on quality. The people you hire to make your product or provide your service must have quality in mind. If not, then will the Sales force get the quality requirements recorded and to the designers, Engineers or Quality Engineers.

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 Quality Engineers in the organizations chosen. The four companies chosen were considered progressive in the quality movement and had been using a Quality system for the last two years. Three of the companies were ISO 9002 certified yet only one had implemented a Quality System plant wide. Two companies had clearly defined quality policies that were explained and understood by all employees. The benefits achieved by the companies after implementing a QS/QMS 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, for their Q.E.'s had a different focus.

Potential Issues to a Q.E. and Quality Management Systems

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" for development, for then they will have little support from their internal and external suppliers and customers. This is discouraging at best if you are a Q.E. for a company. In a company as stated above you would be overpaid "window dressing" Then there will become a time where you will have to move on for you are not going to improve their systems. Quality Engineers are "change agents". So if you don't like change, do not be a Quality Engineer.

Conclusions from the Studies

The highest motive for the implementation of a company to have Quality Engineers is the realization that it is needed to implement continual improvement. Which means that the attitude to implement a Quality System must be very positive at the executive level. (Kunkle & Westerling, 2006) This desire is needed at the executive level or you will get no support. Cooperation between departments is heightened, due to the increase of obtaining customer satisfaction and the continual improvement processes. There is significant cost reductions when employing knowledgable Quality Engineers. Training and developing employees increases the understanding about a Quality System (QS)

and increases the cooperation in meeting goals. There is higher the level of job satisfaction and internal efficiencies after the implementation of a QS. Initially there are some gaps between the expectation of the customers and the vendors' and the perception of customers after they have implemented a QS, but that is where the Q.E. comes in to fill in those gaps. 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. I know I want to be a part of a team where these things occur, for it only helps everyone. That is why I am a Quality Engineer.

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