

17 April 2003

### **Total Quality Management (TQM) In Smaller Companies**

During the past two decades, the manufacturing sector has learned that improving product quality is crucial to remain competitive. Once considered a competitive advantage, quality has now become a market segment mandate. Many Total Quality Management (TQM) initiatives have been implemented by large manufacturing companies, either being absorbed or incorporated into continuous improvement initiatives, reengineering activities, or ISO 9000 practices. Over the years, these quality initiatives have integrated themselves into nearly every facet of these manufacturing companies.

It has been observed that most TQM studies and implementation frameworks originally focused on the characteristics of large companies. To change this, three cases were studied to develop a simple framework for the implementation of TQM in Small and Medium Enterprises. These case studies revolved around three main issues:

- The background of these smaller companies
- Major aspects of TQM implementation
- The implementation framework employed by smaller companies

The study tried to understand the strategies, plans, approaches, and other issues that could be scrutinized, analyzed, and developed into a general guide. Two vital questions that arose here were:

- How did the company implement TQM?
- What were its opinions about the chosen approach?

#### **The Classification**

The researchers conducted interviews with key personnel who were responsible for implementing quality initiatives in these smaller companies, and they studied the relevant documents. Following this, the companies were classified as 'TQM' or 'lesser TQM' companies. A TQM company was one that had achieved an advanced level of TQM adoption, with many of the quality initiatives being successfully implemented over a longer period of time. Lesser TQM companies were those that had implemented fewer initiatives and were still in the early stages of their quality journey. The quality initiatives were judged based on the case study results, observations at the premises, and actual progress after the implementation of TQM efforts.

#### **The Protocol**

A case study protocol was developed to make it easier to collect efficient data. The first section of this protocol focused on general information about the companies, such as their types of products, their number of employees, and the number of quality initiatives they had implemented. This section also encompassed four major factors, namely:

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- Coordination and management leadership
- Continuous improvement
- Systems and businesses
- Actual implementation

The second section of the protocol was designed to help understand both technical and motivational aspects, such as communication links and employee recognition systems. This section also utilized the measures developed for quality performance. The third section was designed to help develop a general framework for implementation in SMEs and to help validate this framework.

### **The First Case**

The first company being studied, Company A, manufactured wiring harnesses for the automotive industry. It also produced interior lamps for cars and was a first-tier supplier to Honda and a second-tier supplier to Nissan, Rover, and Jaguar. The researchers' first impression of the company was that it was well maintained and had a pleasant atmosphere. The company had 90 employees, with 8 in the quality department. This implied that production operators were given a lot of responsibility for quality. It was observed that although the quality department was established in the early 1980s, the emphasis towards continuous improvements, teamwork, and adoption of modern quality management concepts began only in the mid-1990s. Company A had gained QS 9000 certification in 1998 and was certified as an Investors in People (IiP) organization.

The Board of Directors was involved in making policies, creating visions, and planning for quality to ensure continuous business improvement. Management was totally committed to quality issues. Company A employed an improvement facilitator, who reviewed quality problems to identify improvement opportunities. The quality manager explained that methodologies, such as rearrangement of parts and workplace layout, had been implemented in order to improve production process efficiencies.

Company A did not have a framework to implement TQM, but quality had been a part of its philosophy from the start. It progressively implemented various quality methodologies, such as continuous improvement, statistical tools, advanced quality planning, and a quality assurance system. The used the overall structure of QS 9000 for TQM implementation. Being ISO 9000 certified, Company A decided to go ahead and adopt QS 9000 to keep up with pressing customer demands. It reviewed existing practices to bridge the gap between existing practices and the additional requirements of QS 9000. Following this, it planned for appropriate training and consultancy support, and it introduced new tools and procedures. The new systems were implemented and constantly reviewed to analyze their progress. Once the company was satisfied that the new procedures had become standard, it sought QS certification. Many improvements occurred after the company attained QS 9000 certification, including an increase in the number of sales orders from non-automotive companies.

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Company A believed that the above framework was a simple and sensible approach towards building quality into their company. To further enhance the general implementation framework, Company A proposed that a training system be included in the quality initiatives toolbox to facilitate faster learning among employees. Moreover, it emphasized the need to evaluate benefits like improvements to work culture and environment.

### **The Second Case**

The researchers then observed another case at a smaller automotive manufacturer.

The SME in study, Company B, manufactured automotive interior trim parts, like door trims and head linings, and was a first-tier supplier to Rolls Royce, Jaguar, and Aston Martin. It manufactured components to customer requirements but was not involved in the design process. Of the 160 employees in Company B, only five were in the quality department, implying that much of the quality inspection responsibilities rested with the shop floor employees. Among its various quality achievements, Company B had attained ISO 9002 certification in the early 1990s and the Ford Q1 award in 1995. Its next initiative was to attain QS 9000.

Company B had a quality steering committee made up of senior management and select members from the shop floor, like supervisors and team leaders. The committee's main responsibilities included performing annual reviews of the quality policy, monthly reviews of procedures, reviews of work instructions, examinations of audit results, and employee training.

The company implemented cellular manufacturing, which placed related processes and quality engineers in various cells. Company B also tried other forms of quality improvement, such as product improvement groups. These groups met weekly to resolve any production problems and find better ways to perform tasks. Improvements in process layout and inventory management resulted in a leaner manufacturing environment. Even logistics personnel were involved in most of these improvement activities, which highlighted the use of cross-functional teams.

Company B also implemented a Quality Assurance (QA) system, a training system, and a computerized information and data collection system. It believed that the development of a comprehensive business plan, with its vision and mission, was the first important business process. The business plan outlined Company B's improvement strategies in terms of its people (human resources) and customers, along with action plans of achievement in both the short (one year) and long terms (five years). The company worked to identify customer needs through a detailed Customer Satisfaction Index (CSI), in addition to measuring quality performance, logistics, on-time deliveries, etc.

As a new way of managing and improving quality, Company B began to focus on employees. It believed that a cultural transformation was necessary to achieve its business excellence goal. It originally used a top-down style of managing quality, where management made all decisions. It had claimed to be an empowered company, but employees were not given the necessary responsibilities and authority. To bring about a

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shift in this practice, Company B made changes in the organizational structure, and introduced training, skills development, and open communication across all levels. In the process, it observed that the managers did not have the necessary skills to perform many of the improvement activities that the company had been planning to make them responsible for. Training helped to overcome this problem.

Company B believed that the action plan for TQM was contained within its business plan in terms of policies, objectives, and approaches. The SME had also developed a new project management system to carefully monitor the progress of projects, all the way from the start of production to the final shipping. This comprehensive system facilitated planning, monitoring processes, equipment and tool preparation, and material requirements, and was managed by the business systems manager.

Thus, all quality initiatives at Company B were implemented based on a progression of activities and by adopting appropriate new techniques as the need arose. The next step in its quality journey was a supplier development program. The company had developed a progressive systems approach, from ISO 9002, QS 9000, project management, and supplier development, along with organizational restructuring and teamwork, to change the culture. As a result, the responsibility for quality had been transferred from the quality department to everyone in the company.

The six steps towards a quality system implementation at Company B were:

1. *Awareness*: The quality manager presented the need for quality systems to managers and other employees.
2. *Assessment*: Existing procedures were analyzed to compare their shortfalls to the ISO 9002 and QS 9000 requirements.
3. *Establish action plans and areas of responsibility*: New procedures and a new matrix of responsibility were developed.
4. *Development of system*: Procedures were established and documented.
5. *Review of quality system*: New procedures were reviewed.
6. *Certification and Standardization*: A third party performed an audit and gave its approval.

Company B believed that the allocation of resources, especially human and financial, was the best way to overcome the constraints faced by smaller companies. Therefore, smaller companies have to move from smaller initiatives to more challenging ones in order to ensure a smooth implementation process. Likewise, making a cultural transformation in any company requires strong management support. Therefore, smaller companies do not have to implement quality initiatives all at once, but should progress from one initiative to another. It is important to consider restructuring early in the TQM implementation process to ensure a cultural change.

### The Third Case

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Company C produced various types of springs used in the automotive industry. Its main customers were Ford, Rover, and Lucas HDBS (Heavy Duty Breaking Systems). It had 160 employees, 90 of who were production personnel and six of who worked in the quality department. Having achieved certification in the third edition of QS 9000, the company was quite advanced in its TQM implementation. In addition, the company was in the second year of a Masters Improvement project by the Society of Motor Manufacturers & Traders (SMMT). This had resulted in substantial improvements in quality and productivity. Company C had first restructured its production department into manufacturing cells. The cellular arrangements also doubled as improvement teams, where the sales team was also involved. Thus, non-production related employees also were involved in the improvement activities.

With customers demanding perfect quality or zero defects, Company C implemented many required initiatives, like quality assurance, data collection and measurement, and training. The data collection system was very comprehensive and the measurement system outlined three major performance indicators.

- Parts per million
- Failure to meet customer demand
- Due date performance

All these initiatives were coordinated by an improvement manager. In addition to these, Company C conducted detailed process audits and implemented poka-yoke to ensure that the parts were manufactured to the right specifications. It also had a customer complaints system in place.

Company C emphasized that ‘people focus’ was the best way to manage business. Employees had been empowered to carry out improvements throughout the cellular set-up. Motivational, people-oriented, cultural aspects were promoted through newsletters, monthly meetings, and multi-skilling.

Although the company did not have a formal implementation framework, it ensured continuous improvement by looking beyond, to the adoption and upgrading to the third edition of QS 9000 through the Quality Assurance system and the improvement project by SMMT. The success of improvement initiatives was attributed to a high level of management commitment, tangible improvement projects, and non-complacency. Employee involvement and support at the early stages of quality initiatives played a crucial role in their success. Company C believed that employees had to be informed of both the need for improvement initiatives and the benefits to be gained by complete commitment.

Company C also expressed concerns regarding the time and money required to implement various TQM initiatives given the constraints faced by all smaller companies. Yet, it believed that implementing simple initiatives without remaining complacent would eventually help smaller companies evolve into quality organizations.

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Company C added that to enhance the above framework, training and supplier development had to be included in the quality initiative toolbox. Targets had to be set and reviewed constantly to monitor the progress of any initiative. Overall, the approach was considered suitable for any smaller company.

### Lessons from the Research

Upon analyzing the three case studies, the researchers concluded that the TQM implementation framework in smaller companies should involve three vital aspects:

1. *'People Focus' as the driver of cultural transformation*: Forming cross-functional work teams and empowering them to perform their jobs efficiently ensures smoother information flow and quick action. There should also be open communication between employees at various levels.
2. *Certification as a means of achieving quality improvements*: Certifications like QS 9000 have stringent requirements for continuous improvement in terms of level of practice, improvement tools, and techniques. SMEs often tend to stop at ISO 9000 certifications, citing resource constraints. This is the wrong move. To sustain TQM, SMEs have to overcome complacency and build continuous improvement as a working culture.
3. *Continuous and progressive implementation of initiatives based on resource availability*: TQM initiatives must begin with simpler techniques like statistical tools and certifications, and then move on to the more difficult ones that demand greater resources. They should be considered as a total quality spectrum, where a series of initiatives are progressively implemented. The adoption of a particular technique depends largely on the success of previous initiatives. Smaller companies must make a 'slice-by-slice' effort, with every technique or initiative representing a slice that has to be fully adopted by the company before moving to the next. It is particularly important to ensure that TQM initiatives fit company constraints and characteristics before venturing into them. The initiatives that form the softer aspects of cultural transformation should not be forgotten.

### Summary

TQM is not merely a set of statistical tools and methods for improving a company's product and service quality level. It rather comprises a business strategy for harnessing the full capacity of all the company's resources to achieve excellent quality at minimum costs.

The globalization of markets and growing interrelationships between economies are prompting proactive manufacturing companies to reexamine and modify their competitive strategies. Smaller companies, of course, are not exempt from these challenges and pressures. Traditionally, business strategy development, particularly manufacturing strategy development, has focused on large companies. This is because smaller companies generally suffer from deficiencies in knowledge, resources, and time. The above frameworks should prove to be valuable guides for SMEs in developing competitive strategies.