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Total quality management (TQM): an overview

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Abstract

In the manufacturing industry, product quality has become a key factor in determining a firm's success or failure in the global marketplace. Advanced, highly reliable manufacturing methods have made it possible to achieve very high standards of product quality. As a result, more and more firms are making product quality a keystone of their competitive strategy. The success of many major Japanese companies is truly rooted in their long-term commitment to the improvement of quality. The improvement of production quality is a long-term commitment to continuous improvement in every aspect of the production process. Today's competitive market, in almost every category of products and services, is characterized by accelerating changes, innovation, and massive amounts of new information. Changing customer needs fuels much of the rapid evolution in markets. Most organizations that have been successful with their quality improvement effort have adopted an integrated approach commonly referred to as total quality management (TQM).

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Introduction

Total quality management (TQM) started in the USA in the early 1980s when Hewlett-Packard criticized US chip manufacturers for poor product quality when compared with their Japanese competitors. It is ironic that when W. Edward Deming first introduced TQM, the Japanese adopted the philosophy while the USA rejected its principles. During the ensuing years, the Japanese very successfully made progress with quality and production by adopting the TQM principles of Deming along with Josep M. Juran, Genichi Taguchi, and others. Yet even in 1995, ten years after Hewlett-Packard's abrupt introduction of TQM to the USA, domestic companies were still struggling with the theory and practical use of TQM. That is not to say TQM has not been successful. A survey conducted for a report made by the magazine *Electronic Business* in 1992 showed that no companies contacted had ended their TQM program, and 91 per cent of 70 companies using TQM had indicated that their quality had improved when compared with their competitors. It is too soon to accurately say how TQM has performed in the USA. The Japanese did not gain recognition as a quality leader until the 1970s, two decades after their commitment to TQM.

TQM refers to the broad set of management and control processes designed to focus an entire organization and all of its employees on providing products or services that do the best possible job of satisfying the customer. According to Sashkin and Kiser (1993), TQM means that the organization's culture is defined by, and supports, the constant attainment of customer satisfaction through an integrated system of tools, techniques, and training. This involves the continuous improvement of organizational processes, resulting in high quality products and services.

Thus, the TQM philosophy of management is customer-focused. All members of a TQM (control) organization strive to systematically manage the improvement of the organization through the ongoing participation of all employees. TQM incorporates the concepts of product quality, process control, quality assurance, and quality improvement.

Consequently, it is the control of all transformation processes of an organization to better satisfy customers' needs in the most economical way. TQM is based on internal, or self-, control, which is embedded in each unit of the work system (technology and people). Pushing problem solving and decision making down in the organization allows all employees to both measure and take corrective actions in order to deliver a product or service that meets the needs of their customers (Schlenker, 1998).

Managers and experts disagree about how to most effectively apply TQM in their organizations. Some advise that customer satisfaction is the driving force behind quality improvement; others suggest quality management is achieved by internal productivity or cost improvement programs; and still others consider TQM as a means to introduce participatory management. In general, the Japanese concentrate on customer satisfaction with a particular focus on understanding customer needs and expectations. Until very recently, Americans in general have emphasized the "cost of non-conference" and the importance of employees meeting the agreed upon requirements for each process. Leopold Vansina, president and founder of the International Institute of Organizational and Social Development, cautions that such efforts are based on the (faulty) assumption that processes and tasks that lead to the desired quality are already understood. However, he states, control of the production process will not likely help a business's market share when the product or service does not meet customer requirements (Schlenker, 1998).

Quality as a competitive tool

The American Society for Quality Control defines quality as the total features and characteristics of a product or service made or performed according to specifications to satisfy customers at the time of purchase and during use. Many companies throughout the world – for example, Hewlett-Packard and Ford Motor Company in the USA and Canada; British Telecom in the UK; Fujitsu and Toyota in Japan; Crysel in Mexico; and Samsung in

South Korea – have emphasized quality as an important strategic dimension. This is because a quality focus reduces costs and increases customer satisfaction. Several high-profile awards – the Malcolm Baldrige Quality Award in the USA, the Deming Prize in Japan, and the Premio Nacional de Calidad in Mexico – are given to companies that have produced high-quality products.

What is ISO 9000?

ISO 9000 comes from a non-governmentally run organization established in 1947 – the International Organization for Standardization (ISO) – and is a combination of national standards from 100 countries. In general, ISO 9000 is an attempt to focus the world's manufacturers on an agreed upon level of quality and standards in products. ISO standards are an extension of TQM that consists of a series of various quality standards for products and services. These standards are very generic and can be applied to a broad range of businesses and companies in order to improve quality in the work process. ISO standards are divided into many elements that make up the guidelines for quality. The elements of ISO 9000 are actually broken into smaller groups which are labeled ISO 9001 through 9004. Each of these succeeding elements is more comprehensive than those preceding them and can be more easily applied to a specific industry. A brief outline of each of these subgroups illustrates the unique characteristics of the ISO 9000:

- ISO 9901 is a model for quality assurance systems in design, development, production, installation, and servicing. It is appropriate when conformance to specified requirements is to be assured by the supplier during several phases of an activity which may include design, development, production, installation, and servicing.
- ISO 9002 is a model for quality assurance systems in production and installation. It is appropriate when conformance to specified requirements is to be assured by the supplier during production and installation.
- ISO 9003 is a model for quality assurance systems in final inspection and testing. It is

appropriate when conformance to specified requirements is to be assured by the supplier solely during inspections and testing.
· ISO 9004, the final model of ISO, is a guide for the development of quality management systems.

All of the elements of ISO 9000 can be of great assistance in helping an organization improve quality and the process cycle of their industry. The ISO 9000 is a good guideline for international quality standards that represent consumers. Implementation of ISO 9000 procedures not only benefits consumers, but also helps manufacturers or service providers to be more efficient.
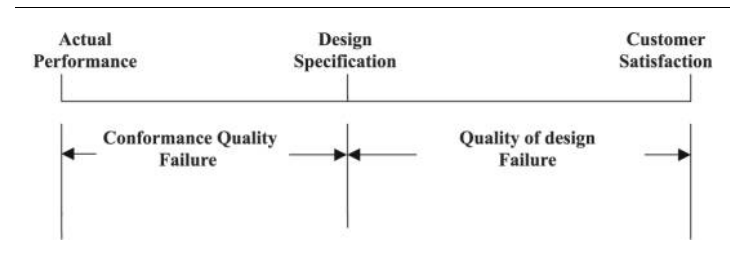
Quality of design

Quality of design refers to how closely the characteristics of a product or service meet the needs and expectations of customers. As an example, if customers using photocopy machines want copiers that combine copying, faxing, scanning, and electronic printing, photocopiers that fail to meet these functions fail in the quality of their designs. Likewise, if a bank's customers are able to access accounts other than their own, the design of the bank's system fails.

Conformance quality

Conformance quality refers to the performance of a product or service relative to its design and product specifications. For example, if a photocopy machine misfeeds paper or breaks down regularly, it fails to satisfy the quality standard. A bank that deposits its customers' checks into the wrong accounts also fails on their conformance to quality.

To ensure that performance will achieve customer satisfaction, companies must first design products to satisfy customers through the quality of design. They must then meet design specifications through conformance to quality. Figure 1 illustrates that actual performance can fall short of customer

Figure 1 Actual performance vs customer satisfaction

satisfaction as a result of quality-of-design failure and due to conformance-quality failure.

Quality improvement vs quality assurance

It is important to avoid equating quality improvement with quality assurance. Quality assurance is a system of activities designed to ensure production that meets pre-established requirements. It gives the customer a guarantee of quality by measuring product conformance with processes and performance specifications. Quality improvement refers to all efforts directed to increase effectiveness and efficiency in meeting accepted customer expectations. It is a continuous process to achieve a better understanding of the market; to innovate products and processes; to manage and distribute material and products; and to provide service to customers. The success of quality improvement is based on an understanding by every member of the organization concerning the needs of their customers (internal and external). Maintenance of that understanding requires continuing dialogues and negotiations with customers and measurement of one's products and services against customer expectations (Schlenker, 1998).

TQM for small business

A new company or small business has limited financial, personnel, and capital plant/equipment resources and it is especially vulnerable to the instability of rapid changes in customer behavior. One way to help ensure a business's success is to make quality and customer satisfaction the primary priority for all employees in the company. Ensure that the

company is providing "customer management", not just "product management".

Large companies committed to TQM programs may appoint a special manager or vice president of quality. In smaller companies, the chief executive officer (CEO), or the owner, usually undertakes this function. There are many aspects of a successful TQM program implementation. It may require months or years to fully incorporate TQM into every employee's value system. There are six keys to a successful TQM program for small businesses:

(1) Quality work and customer satisfaction must be a commitment of all employees.
(2) Improving quality and customer satisfaction must also be a commitment of all employees.
(3) Every company activity must incorporate quality and customers and suppliers.
(4) It does not have to cost more to make quality and customer satisfaction the priority.
(5) Significant changes may be required to make quality and customer satisfaction improvement.
(6) Small advantages in all company functions can set its quality and customer satisfaction apart from that of its competitors.

Developing a TQM strategy

The overall TQM strategic plan takes the vision and values outlined in the company's philosophy and turns these principles into long-term goals. Successful TQM strategies identify specific results which the organization wants to achieve. Many businesses also have each of their departments develop their own strategies outlining how these strategies will help them achieve their quality goals. The process must involve everyone, empowering everyone to contribute to continuous quality improvement. Employees need to have the authority to solve problems and implement new ways of working. An effective quality improvement strategy helps people take initiative to improve their own, and other, departments. Each person is accountable for their role in producing the desired results. The organization should also ask customers for ideas on how to provide better service.

Techniques used in the quality process include brainstorming, flowcharts, Pareto charts, trend charts, and cause-and-effect diagrams, to name just a few. Using these methods helps identify improvement opportunities, promote the collection of information and measures results before, during, and after implementation. The role of a TQM committee is key to the quality management process by assuring that all employees have the right mix of knowledge, skills, and abilities to use TQM in achieving goals and objectives. Recruitment and selection also needs to include quality factors as part of the process. The organization must also develop an effective employee incentives program integrated with TQM to reward the achievement of results.

Role of TQM in purchasing

Organizations that try to successfully compete in their respective markets do so on the business of quality and customer satisfaction. With difficulties in establishing and maintaining technological advantages, firms often rely on these important factors to gain market share and to sustain their competitive advantage both in domestic and international markets. The roles of purchasing and material management are critical to the success of TQM in an organization. From the customers' point of view, quality is the total package of product and service received and perceived, including all the small details that suppliers often overlook.

Within the realm of purchasing, TQM has been the concept partnering agreements between buyers and their suppliers to improve the quality of the suppliers' products and services. Many North American companies have established supplier partnerships. In fact, Deming has recommended limiting the number of suppliers and forming single-source relationships to reduce variances in product quality. Studies have shown achieved benefits in productivity and quality when partnering techniques are implemented. It is accepted that TQM and partnering are positively linked, although quantifiable data are often not available. The partnership philosophy expands the relationship with a supplier beyond that

found in traditional purchasing plans. The partnering relationship typically involves the use of long-term contracts, reduced number of supply sources, and a high degree of mutual trust between the two parties. One researcher defines the partnership as a:

> ... mutual, ongoing relationship involving a commitment over an extended period, and a sharing of information and the risks and rewards of the relationship (Ellram, 1990).

Adhering to the expectations from both parties, the customer and the supplier can work out mutual definitions of quality so that both processes are mutually focused. When the two processes are controlled, the supplier and purchaser can reduce expenses and the time associated with the transaction. This directly reduces overall costs through reduction of waste and increased productivity. The supplier becomes an extension of the purchasing organization's process, and a partner in the total quality effort.

Conclusion

There can be no doubt that change is everywhere and businesses must keep up to survive. While the future is uncertain, one constant is certain – TQM will be there. It is essential to the success of a business. As the world changes and expands, businesses will change and expand within it. TQM ensures that businesses will meet the demands of customers well into the twenty-first century. Awards like the Baldrige and Deming have become goals companies now compete to win. The highest

standards of today, ISO 9000, may be replaced in the future with even higher and more demanding standards, but whatever the future has in store, TQM will take us there.

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