

MANAGEMENT PROGRAMME

Term-End Examination

December, 2011

MS-96 : TOTAL QUALITY MANAGEMENT

Time : 3 hours

Maximum Marks : 100

(Weightage 70%)

Note : (i) *There are two Sections : A and B.*

(ii) *Attempt any three questions from Section A which carry 20 marks each.*

(iii) *Section B is compulsory and carries 40 marks.*

SECTION - A

1. (a) Why is quality likely to be better when following the TQM concept than a system that depends on final inspection ? Explain.
- (b) What, according to Crosby, are the five symptoms of a problem organization ? Briefly describe the four absolutes of quality.
2. (a) What could happen if a firm is too much obsessed with competitors and overlooks its customers ? How can it bring about a balance between the two ?
- (b) Discuss the meaning and significance of life cycle costs in connection with quality.

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3. (a) Why are teams considered vital in TQM ?
How can TQM teams be structured ?
- (b) Identify the training and education needs of an organization's personnel in TQM.

4. (a) What are the purposes of an Environmental Management System (EMS) ? Briefly discuss its core elements.
- (b) What do you understand by Control of Document and Data in ISO QMS ? Discuss.

5. Briefly explain *any Four* of the following :
 - (a) Code of ethics for quality auditors
 - (b) Quality accreditation system
 - (c) Competitive and non-competitive quality awards
 - (d) Three primary applications of control charts
 - (e) Robust design and its significance
 - (f) Pareto analysis and its applications.

SECTION - B

Read the following case and answer the question at the end

ALLEN-BRADLEY COMPANY

One of the marks of a truly quality-minded company is that it strives for constant improvement. Even if things are already going well, there's no reason why an organization can't challenge itself to do even better when it comes to quality.

Many companies implement quality management systems because they need to improve quality. Unlike these companies, however, Allen-Bradley Co. (Mil-waukee, WI) found itself in the enviable spot of launching its quality system to position itself for even greater competitiveness in the future.

This manufacturer of industrial automation and quality management components and systems, formed in 1903, has always had a tradition of high quality because of its Old World German and Swiss culture. "The company had the Old World mentality of the value of quality," explains Roger Hartel, vice president of Quality Assurance for the company's Industrial Computer and Communications Group (Highland Heights, OH). "As a result, it always had an enviable market position with all of its products."

Cause for Change

In the mid-1970s, however, three important things occurred that forced the company to reevaluate the way it managed quality:

1. **Management decided to move the company into the "electronic age."**

Until that point, all the company's products were electromechanical. Management realized that the future of the industry would be electronic. As such, the company's quality system would need to be refocused.

At the time, quality was based on a lot of inspection, testing, and rework. This worked well, because the majority of defects in the electromechanical devices were very visual (parts out of shape, out of dimension, cracked, or broken). "Quality problems in electronic components, however, are more subtle, hidden in the software of electronic circuitry," points out Hartel.

Such problems can occur as a result of temperature changes, interactions between and among different products, and so on. "A problem might be there one minute and gone the next," he adds.

Because of this, the company needed a quality system based on prevention, rather than appraisal, simply because appraisal

would be difficult; and it would certainly not be cost-effective.

2. **Allen-Bradley was also in the process of acquiring a number of new companies** as part of its strategy to move into electronic manufacturing. But these new companies did not have the strict quality culture of the original Milwaukee facility. And when management attempted to transfer this culture to them, it met with great difficulty.
3. **Part of the company's strategy in moving into electronics involved moving into the world marketplace.** That meant that it had to become world-class in its operations, and, of course, this required quality based on prevention, not appraisal.

Early Problems

To address these challenges, Allen-Bradley implemented a Total Quality Management System (TQMS), one that emphasizes continuous improvement in quality, productivity, and customer satisfaction. It is based on the belief that everything can be improved and that improvement must be continuous.

Early efforts involved implementing many of the standard quality control systems, such as statistical tools and training, problem-solving techniques, manufacturing controls, and supplier

management. While the efforts themselves were not difficult to implement, management met with resistance in many locations for two reasons :

- Those locations that were part of the "Milwaukee quality culture" didn't see the need for a new system, since their quality was already so impressive.
- Those locations that were recently acquired by the company often reported that they were too busy solving quality problems to find the time to adopt a new system.

Pressure from management to adopt the new system was one component of success, but another event spurred adoption even more: "Many of the divisions realized the need to move into a just-in-time (stockless) production system," reports Hartel. "In so doing, they quickly realized that they would never be able to manage such a system without a prevention-based quality system".

In other words, there was no way to be able to predict how many individual units would have to be fed into a process in order to produce the right number of final products in a short-run system. "You simply cannot do JIT when you have low yields or when you handle quality by inspection and rework," emphasizes Hartel.

Teamwork : A Crucial Element

Teamwork plays a vital role in TQM. Prior to the introduction of the system, people at Allen-Bradley performed their work to high standards, but did not necessarily do so in a spirit of information exchange and cooperation. "They lacked the awareness of what their internal customers needed," he says. Each department, in other words, set its own standards and procedures without consulting other departments.

An important part of TQM involves turning this mentality around to one of teamwork and cooperation. "The idea is to define how the organization as a whole wants to do business," says Hartel. The next step is to break down these goals into individual steps and elements as they affect quality and service. This requires the visible and permanent involvement of all functions. Hartel refers to the process, which addresses how each function serves and is served by all other functions, as "defining and managing interfunctional deliverables and receivables."

Today, the concept is often referred to as parallel engineering. Unlike other companies that have just begun to adopt this strategy, however, Allen-Bradley launched its teamwork concept a decade ago.

- **The Process in Action.** From the time a marketing person has the glimmer of a product idea or receives a suggestion from a customer for a new product, until the time the product is actually manufactured and shipped, most companies allow the functions involved to operate somewhat independently of one another. Allen-Bradley insists that all the critical functions work together as a team to design, develop, and manufacture the product. Each function becomes both a customer and a supplier of the other functions. In every instance, each function considers the ramifications of its actions on all the other functions.

Certifiable Quality

Another critical element of TQM success is departmental certification. Each department in the company is required to determine what systems must exist in its department in order to satisfy its part in reaching the company's overall goals. Management then audits these systems to verify that they are in place, that they are working, and that they are achieving the quality improvement results that are expected. When a department achieves these three goals, it is formally certified.

Each year, the department must also be

recertified. Recertification audits ensure not only that the systems are in place, working, and achieving quality goals, but that they are improving.

“Each certifiable department must enhance its system by adding new elements to its quality activities,” emphasizes Hartel. “Status quo causes atrophy, and there is no place for atrophy. We must continue to grow and improve in our quality efforts.”

Therefore, the department must establish its quality improvement goals and state how it plans to achieve them. An additional component of recertification involves surveys of internal and external customers that assess departmental performance.

The Benefits It Brings

As a result of its TQM system, Allen-Bradley has seen dramatic decreases in its internal and external failure costs. For example :

- Final test yield percentages for most products are in the very high 90s. Also, many first test yield percentages are in the very high 90s.
- One division that quadrupled its size over the past 10 years has seen an absolute reduction in warranty returns over the same period (representing over a 75 percent reduction in warranty returns).

- Between 1982 and 1988, the company saved in excess of \$ 100 million as a result of reduced quality costs. "We have a payback in excess of 13 to 1 on everything we have invested in quality improvement," Hartel says.
- Allen-Bradley has experienced a dramatic increase in market share, "and we feel that a major portion of this is attributable to improved quality and reduced cost," concludes Hartel.

Questions

1. The company needed a quality system based on prevention rather than appraisal. What is the difference? What are the organizational implications?
2. Early efforts involved implementing many of the standard quality control systems, such as statistical tools and training, problem-solving techniques, manufacturing controls, and supplier management. These efforts resulted in resistance. Why? How would you have avoided or overcome this resistance?
3. Why would teams have been more appropriate if the company were organized by process rather than by function? What would be the role of teams in a process organization?

4. Among the benefits achieved by the new TQM system is final test yield percentages in the very high 90s. How would the new system improve this percentage? Would you accept a target of "very high 90s"? If not, how would you go about improving it?
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