



Does Quality Management Need for Today

Anil Kothari

Department of Training and Placement,
Rajiv Gandhi Proudyogiki Vishwavidyalaya Bhopal, (MP)

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ABSTRACT

Due to global economy in the present scenario, the business organizations are quality focused instead of profits. The present trend is to manufacture the product and cater the needs of customer that means the product is customer oriented. The survival and success of any manufacturing industry is based on quality perfection. These are building blocks for excellence in goods, services, and infrastructure of an organization. Therefore, the continuous quality improvement becomes compulsive in all aspects.

Keywords: Continuous Improvement, Quality, Organizational Improvement, Efficiency etc.

INTRODUCTION

Quality, as a concept, does not easily fit into any given timeframe. It may be defined as meeting certain set standards and specification requirements, being suitable for use, or the degree of customer satisfaction. The journey of quality has passed through significant changes in the previous century. Figure 1 shows the successful changes in the quality management. The quality improvement enhances the performance efficiency in all the fields applicable to manufacturing environment.

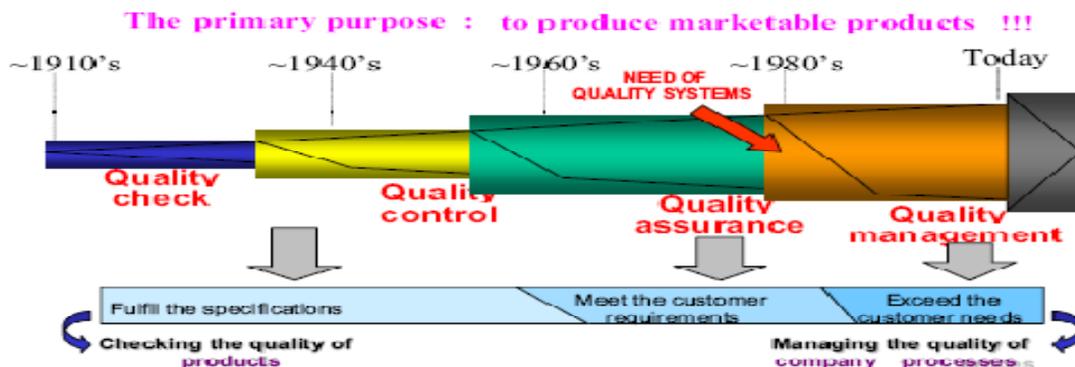


Fig. 1.

In today's competitive era, the manufacturing industry has experienced an unprecedented degree of change involving drastic changes in management approaches, new products and process technologies, and customer expectations including supplier attitudes. The global marketplace has witnessed an increased pressure from customers and competitors in manufacturing as well as service sector due to these rapid changes. The rapidly changing global marketplace affects in improvements of a company's performance by focusing on cost cutting, increasing productivity levels, quality and guaranteeing deliveries in order to satisfy customers.

Organizations that want to survive in today's highly competitive business environment must address the need for diverse product range with state-of-the-art product features, coupled with high quality, lower costs, and more effective, swifter Research and Development (R&D).

Most of the manufacturing industries should actively look for opportunities to exploit their strategic abilities, adapt and seek improvements in every area of the business, building on awareness and understanding of current strategies and successes. Accordingly, measures of modern quality management aiming for sustainable success do not only mean to avoid the delivery of defective products to the customer but seek to establish maximum efficiency in the performance of all processes of the company. With such optimized procedures, products of high quality can be provided with minimum effort of time and costs. To achieve a positive ranking and thus assure a high level of perceived quality, the company has to find a suitable position in the triangle of conflicting requirements on quality, costs and time. The quality of a product is depends on the perception of its end users for any given situation. Some important Quality definition's are:

- According to Webster's Collegiate Dictionary, Quality of a product includes a peculiar and essential character (feature). Character applies to a peculiar and distinguishing quality of a thing or class.
- According to Dr. J. M. Juran, Quality is "Fitness for the purpose".
- According to Crosby, "Quality means getting every one to do what he has agreed to do and do it right in the first time".
- Roget Thesaurus defines quality as characteristics, trait, goodness or excellence.

In the early 1900's the work of F. W. Taylor led to a new philosophy of production. It was to separate the planning function from execution function. Managers and Engineer's were assigned the task of planning; supervisors and workers were assigned the task of execution. By segmenting a job into specific work tasks and focusing on increasing efficiency, Quality Assurance fell into the hands of inspectors.

All the Continuous Improvement tools & techniques have their different methodology and frequency for application in industry and different perceived effect on the performance depending upon type of organization. Use of tools and techniques play a key role in process of continuous improvement by allowing (McQuarter *et al.* 1995):

- Monitoring and evaluation of process
- Involvement of everyone
- Enhancement of problem solving ability
- Change of mind set
- Reinforcement of team work

A planned continuous improvement in an organization involves different strategies, of which use of tools and techniques is one. As the word tools and techniques are generally used together, so is there use.

Tools are independent aids with clear role; techniques may use a predefined systematic procedure to deliver planned improvements.

A technique has a wider role and may be considered as a collective use of tools. Depending on the type and size of organization and requirements of products, different tools and techniques are being used. It is not only the versatility of a particular tool or technique but also the ability, level of quality commitment and training of personnel, which dictates the use.

Commonly used QT & T are identified and grouped under different categories. These tools and techniques are large in numbers, so to avoid mathematical complexities these tools are categorized on the basis of their use and affinity.

CI TOOLS/TECHNIQUES: BASIC INTRODUCTION

Right from the beginning of this new century, many companies have adopted quality improvement techniques. Quality improvement models add such steps as assigning process owners, forming teams, and establishing process measures etc. are helpful in improving the performance as well as goodwill of the company. The five major aspects for adopting Quality Improvement Tools are as follows:

- Quality emphasis extends through market analysis, design, and customer services rather than only the production stages of making a product.
 - Quality emphasis is directed toward operations in every department from executives to clerical personnel.
- Quality is the responsibility of the individual and the work group, not some other group, such as inspection.

- The two types of quality characteristics as viewed by customers are those that satisfy and those that motivate. Only the latter are strongly related to repeat sales and a “Quality” image.
- The first customer for a part or piece of information is usually the next departments in the production process.

By: Wayne S. Reiker

The quality Guru’s have suggested various quality improvement techniques which have been applied from 1980 onwards. Implementation of QC tools can be effectively worked out through modeling. The detail stories about Quality Improvement Tools are as follows:

1. **Statistical Process Control:** Statistical Quality Control (SQC) or Statistical Process Control (SPC) for repetitive, high volume production began in the 1930's when Shewhart developed control charts. Small production samples were measured periodically to monitor quality. Sample mean (\bar{X}) and range (R) charts were used to detect when a process was going out of "economic control." A set of steps to follow in solving many kinds of problems also used to report on the improvement process is known as Control Charts. The basic seven tools for Statistical Process Control Are as follows:

Basic SPC tools	New SPC tools
Cause and effect diagram	Affinity diagram
Check sheet	Arrow diagram
Control chart	Matrix diagram
Flow Chart	Matrix data analysis
Histogram	Process decision program chart
Pareto diagram	Relations diagram
Scatter diagram	Systematic diagram

2. **Design of experiments:** Strategies for selecting a limited number of runs (observations of responses) in a possibly high dimensional factor space so as to gain the maximum information about how the response values depend on the factors.

3. **5S:** 5S is a housekeeping methodology for the shop floor. There are five rules of housekeeping for a lean environment and they help to expose waste and support the discipline needed to implement the Toyota Production System.

4. **Just In Time (JIT):** A strategy that exposes waste, makes continuous improvement a reality, and relies on total employee involvement. It concentrates on delivering what the customer wants, when they want it, in the quantity they want. The key elements of JIT are flow, pull, standard work (with standard in-process inventories), and takt time.

5. **Total Productive Maintenance (TPM):** Preventative maintenance carried out by all employees. It is equipment maintenance performed on a company wide basis. TPS has five goals:

- Maximize equipment effectiveness.
- Develop a system of productive maintenance for the life of the equipment,
- Involve all departments that plan, design, use, or maintain equipment in implementing TPM.
- Actively involve all employees.
- Promote TPM through motivational management.

6. **Total Quality Management (TQM):** TQM emphasized using multi-functional teams (professional staff and workers from all departments involved) to solve problems. The teams were trained to use basic statistical tools to collect and analyze data.

7. **Six-Sigma:** Six Sigma process improvements emphasize getting quantitative data on the effect of key variables in production, service, or administrative processes. Many process improvement efforts go astray because people assume they know all of the key variables -- key variables and especially interactions between variables are not always obvious. Simple statistical data gathering or testing can be used to verify or determine these key variables.

8. Lean Manufacturing: Lean manufacturing is an end to end collection of processes that create value for the customer and is popularized by Toyota. Lean is a systematic approach to identify and eliminate waste through continuous improvement following the product at the pull of customer in pursuit of perfection.

9. Others: The other Quality Improvement Techniques including Continuous Improvement, Waste Minimization, SAP, Simulation, Zero Defects, ISO/QS 9000 and Cellular Manufacturing etc.

Other tools	Techniques
Brainstorming	Benchmarking
Control plan	Departmental purpose analysis
Force field analysis	Design of experiments
Questionnaire	Failure mode and effects analysis
Sampling	Fault tree analysis
Quality costing	Poka yoke
	Problem solving

LITERATURE REVIEW

The literature reviews that Continuous Improvement Tools are building blocks for excellence in goods, services, and infrastructure of an organization.

McQuater *et al.* (1995) outlines the key factors in the successful use of quality management tools and techniques in a process of continuous improvement. The research also revealed that some of the common difficulties in use and application together with tips to overcome and steer around them. Details of a health check for assessing tools and techniques is also given by them.

Gosen *et al.* (2005) examines the literature on quality management in developing countries and explores the influence of important international and organizational variables on quality in developing countries.

Grover and Singh (2007) examined that the large number of tools, techniques and systematic methodologies are being used in industries for enhancing their performance. These may range from age-old tools like histogram and control charts to systematic methodologies like Just in time and total productive maintenance. Quality initiatives have a remarkable effect on meeting the needs of TQM culture in an organization. This paper attempts to convert quality initiatives of an organization in measurable terms.

Paliska *et al.* (2007) carried out research on universality systematic application of seven basic quality tools (7QC tools) in different areas that include power plant, process industry, and government, health and tourism services etc. The main aim of the research was to show on practical examples that there is real possibility of application of 7QC tools. Furthermore, the research has to show to what extent are selected tools in usage and what reasons of avoiding their broader application are. The simple example of successful application of one of quality tools are shown on selected company in process industry.

Tari *et al.* (2007) identifies the relationships between quality management practices, and also examines the direct and indirect effects of these practices on quality outcomes by means of replication research.

Putri, and Yusof (2008) conclude on the basis of review that the QE tools and techniques practices of Malaysia and Indonesia Automotive Industries in their quality improvement efforts. This paper also highlights the importance of implementation of QE tools and techniques in company in various countries and the problems encountered when using QE tools and techniques found in the literature.

Khanna *et al.* (2010) provides empirical evidence on top management's awareness and understanding of the quality management and its role towards business survival and competitiveness.

Shahin *et al.* (2010) proposed a new roadmap to apply seven basic and new quality tools and techniques in an integrative framework. For this purpose, a number of experts have been asked to fill a matrix questionnaire.

Singh *et al.* (2012) dictates the highlights of all major quality tools and techniques used for quality management in a manufacturing industry.

IV. REVIEW ON CONTINUOUS IMPROVEMENT TOOLS

The success of these quality models has to match the organizational culture and its people for ultimate success. The success of quality denotes market superiority of an organization. S.C. Wheelwright has identified six characteristics so far as competitive advantages are concerned. These characteristics are

- It is driven by customer needs. The company is to provide value to its customers which are not addressed by competitors.
- It makes a significant contribution to the success of the business.
- Every organization has its unique resources and opportunities and no two companies can have the same resources, strategies for effective resource utilization.
- A superior R&D department can help in developing new products and processes to be part of competitive market.
- It provides a basis for further improvement.
- It provides direction and motivation to the entire organization.

Since Quality Improvements is a continuous process therefore, the focus is on human resources, waste elimination, costs and simplicity through application of QC tools. The application QC tools need a very low investment but the results are exuberant in terms of capacity utilization, negligible the rejection and rework including high morale of workforce and the cost savings. In further, these tools help in making the workforce participative and decision making process fast enough to achieve organizational objectives, since the effectiveness of the tools is concerned with the attitude of workforce.

V. CONCLUSIONS

This paper identifies Quality Improvement Tools/Quality Management Techniques used in various organizations. The classification of literature shows that most of the work in Quality Improvement has been done to improve productivity of the industry. The global market is becoming customer oriented in place of product oriented. Therefore, waste control and continuous improvement need to be attended on priority to cater the upcoming market.

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