

## Quality Management System Used In Development the Organization

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**Abstract:** To have more benefits from the ISO 9000 quality system, organizations take into consideration that design and implementation of an organization's quality management system is influenced by its strategy, size and structure, its organizational environment, changes in the environment, and risks related to the environment. Literature indicates that organizations often lack flexibility designing and implementing quality management systems and demonstrate low use of employees skills and knowledge. The paper analyzes different patterns of implementing quality management systems in different organizations and examines performance outcomes related to it. Research shows that organizations with different quality management system implementation patterns have significantly different performance outcomes. A mature quality management system should consider success factors for quality management system implementation benefits from the early phases of their planning and designing processes. By requiring that all procedures be documented, the ISO 9000 standard is undoubtedly commonly related to control orientation and explicit knowledge orientation in organizations. There is an interesting relationship between the reasons for the ISO 9001 quality management systems implementation and the corresponding performance outcomes. It is very important to modify maintenance of quality management system during the post-certification period. Quality auditors are in a powerful position to increase the value quality management systems.

**Keywords:** quality management systems, ISO standards, quality management, knowledge management.

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### I. Introduction

Quality is not a new invention in mankind's history. Although quality has been a buzz word in academic journals since 1980s, the origin of quality dates back to ancient Egyptian history. Over the years, decades and centuries there have been numerous ways to see and pursue quality. Quality movement has evolved from the master-apprentice level crafting to standardized quality systems where all the processes and outcomes are measured, documented and analyzed. In 1987 the International Organization for Standardization published its first quality management standards. That year marked the foundation of the first common standard for quality management and its provided guidelines what the quality management systems should contain.

Quality management systems have been developing in a rapid pace over the last century. Technological innovations in quality management systems have changed the business world and organizations have been forced to adapt to current theories of fads. In the following chapters we are going to look back at the history of quality to identify times periods and disruptive innovations in quality management. We are going to examine the three dominating quality management systems and try to predict the future of quality management. In chapter six we are explaining the effect of disruptive technological innovation and how the manufacturing in the United States failed to adapt to the new innovations. In the last chapters we will take a look at foresight methods and how the future technological innovations will affect the environment and society. The environment and society will then be reflected by the quality management systems all over the world.

### Quality

There are a wide variety of definitions to quality. Walter Shewhart defined quality as the goodness of product. Later this definition has been broadened to suit better both products and services. A query was conducted for numerous of manager in the United States to state their definition of quality. The following nine definitions were the most popular;

- Perfection
- Consistency
- Eliminating waste
- Speed of delivery
- Compliance with policies and procedures

- Providing a good, usable product
- Doing it right the first time
- Delighting or pleasing customers
- Total customer service and satisfaction

American Society for Quality defines quality in its glossary as follows: “A subjective term for which each person or sector has its own definition. In technical usage, quality can have two meanings: (1) The characteristics of a product or service that bear on its ability to satisfy stated or implied need; (2) A product or service free of deficiencies”. Several quality gurus have also their own definitions of quality. For example Dr. Joseph Juran defines quality as “fitness for use” and Philip Crosby explains quality as “conformance to requirements”. Quality is usually divided to product quality and service quality. The products have physical dimensions that reflect the overall quality perceived by the customer. Service quality on the other hand is based on the experience that manifests while the service is being produced. A customer sitting in the barber’s chair evaluates the received service constantly as barbed is cutting his or her hair.

## **II. Quality Management System**

Quality management system (QMS) is a formal that includes documenting the structure, responsibilities and processes required to achieve effective quality management. In addition, quality management is defined by American Society for Quality as follows: “*The application of a quality management system in managing a process to achieve maximum customer satisfaction at the lowest overall cost to the organization while continuing to improve the process*” (ASQ, 2013a).

Although there are no requirements for establishing a quality management system, a study conducted by Hendricks and Singhal’s (1997, pp. 1258-1247) evidently shows the advantages of systematic quality management. The findings include the following when comparing companies with quality management system with companies without quality management system.

	<b>With quality management system</b>	<b>Without quality management system</b>
Increase in sales	69%	32%
Gain in operating revenue	91%	43%
Growth in number of employees	23%	7%
Increase in return on sales	8%	Not at all

All the statistics show clearly that the companies with quality management system are more profitable and growing in faster pace than companies without quality management system.

## **III. Material And Methods**

For more than two decades “quality” and “quality management systems” have been leading buzzwords in the business world. Numerous consultants have build their careers around these topics, and quality issues in business have been responsible for the development of new organizations and even industries, for instance, the American Society for Quality and Six Sigma consulting.

The notion of quality in business focuses on the savings and additional revenue that organizations can realize if they eliminate errors throughout their operations and produce products and services at the optimal level of quality desired by their customers. Errors can take almost any from-for example, producing the wrong number of parts, sending bank statements to customers who have already closed their accounts or sending an incorrect bill to a client. All of these errors are very common, and costs incurred see minimal. But over time when mistakes are repeated the costs add up to a significant amount, so eliminating errors can result in significant increases to the bottom line of a business.

### **Quality Is**

According to the American Society for Quality, “quality” can be defined in the following ways:

- ❖ Based on customer’s perceptions of a product/service’s design and how well the design matches the original specifications.
- ❖ The ability of a product/service to satisfy stated or implied needs.
- ❖ Achieved by conforming to established requirements within an organization.

### **Quality Management System**

A quality management system is a management technique used to communicate to employees what is required to produce the desired quality of products and services and to influence employee actions to complete tasks according to the quality specifications.

### **Purpose of a Quality Management System**

- ❖ Established a vision for the employees.
- ❖ Sets standards for employees.
- ❖ Builds motivation within the company.
- ❖ Sets goals for employees.
- ❖ Helps fight the resistance to change within organizations.
- ❖ Helps direct the corporate culture.

### **Quality Management Important**

Business success may simply be the extent to which your organization can produce a higher-quality product or service than your competitors are able to do at a competitive price. When quality is the key to a company's success, quality management systems allow organizations to keep up with and meet correct quality levels, meet the consumer's requirement for quality, retain employees through competitive compensation programs, and keep up with the latest technology.

### **History of the Quality Movement**

As early as the 1950s, Japanese companies began to see the benefits of emphasizing quality throughout their organizations and enlisted help of an American, W. Edwards Deming, who is credited with giving Japanese companies a massive head start in the quality movement. His methods include statistical process control (SPC) and problem-solving techniques that were effective in gaining the necessary momentum to change the mentality of organizations needing to produce high-quality products and services. Deming developed his 14 points (Appendix 14.1) to communicate how to increase quality within an organization.

Deming believed that 85 percent of all quality problems were the fault of management. In order to improve, management had to take the lead and put in place the necessary resources and systems. For example, consistent quality in incoming materials could not be expected when buyers were not given the necessary tools to understand quality requirements of those products and services. Buyers needed to fully understand how to assess the quality of all incoming products and services, understand the quality requirements, as well as be able to communicate these requirements to vendors. In a well-managed quality, buyers should also be allowed to work closely with vendors and help them meet or exceed the required quality requirements.

According to Deming, there were two different concepts of process improvement that quality systems needed to address: (1) common (systematic) causes of error, and (2) special causes of error. Systematic causes are shared by numerous personnel, machines, or products; and special causes are associated with individual employees or equipment. Systematic causes of error include poor product/service design, materials not suited for their use, improper bills of lading, and poor physical conditions. Special causes of error include lack of training or skill, a poor lot of incoming materials, or equipment out of order.

Another influential individual in the development of quality control was Joseph M. Juran, who, like Deming, made a name for himself working in Japan. He founded the Juran Institute in 1979; its goals and objectives were centered on helping organizations improve the quality of their products and services.

Juran defined quality as "fitness for use," meaning that the users of products or services should be able to rely on that product or service 100 percent of the time without any worry of defects. If this was true the product could be classified as fit for use.

*Quality of design* could be described as what distinguishes a Yugo from a Mercedes-Benz and involves the design concept and specification. The quality of a product or service is only as good as its design and intention. Thus, it is important to include quality issues in the design process, as well as to have in mind during the design phase the difficulties one might have in replicating the product or service with the intended quality.

*Quality of conformance* is reflected in the ability to replicate each aspect of a product or service with the same quality level as that intended in the design. This responsibility is held by individuals to develop the processes for replication, the workforce and their training, supervision, and adherence to test programs.

*Availability* refers to freedom from disruptive problems throughout the process and is measured by the frequency or probability of defects—for example, if a process does not have a steady flow of electricity and this causes defective parts, or when an employee must complete two jobs at once and is therefore forced to make concessions on the quality of both products or services.

*Safety* is described by Juran as calculating the risk of injury due to product hazards. For example, even if the product or service meets or exceeds all quality standards and expectations, but there is a possibility that if it is not used properly it could injure someone, the product will not be considered high-quality.

Field use refers to the ability of the product to reach the end user with the desired level of quality. This involves packaging, transportation, storage and field service competence, and promptness.

Juran also developed a comprehensive approach to quality that spanned a product or service's entire life cycle, from design to customer relation and all the steps in between. Juran preached that an organization

should dissect all processes and procedures from a quality perspective and analyze for a “fitness for use,” Once this is completed the organization can begin to make changes based on the “fitness for use” model.

### **The Quality Revolution**

The push for increased quality began in American manufacturing companies in the 1980s, following in the footsteps of Japanese manufactures. Japanese companies found themselves with a distinct competitive advantage over American companies with their ability to produce much higher quality products with fewer defects.

The Ford Motor company was the first to invite Deming to help the company transform itself into a quality-oriented organization. As a result, Ford was able to achieve higher quality standards than any growth American automotive manufacturer and substantial sales growth in the late 1980s even when the rest of the U.S automotive take the Honda Accord in annual sales to the high quality standards set by the company.

The U.S Congress, seeing the need for American companies to strive for increased quality, established the Malcolm Baldrige National Quality Award, modeled after Japan’s Deming Prize. This spawned a substantial increase in the resources American businesses allocated for quality improvement, and within 10 years an American organization, Florida Power and Light, was able to capture Japan’s Deming Prize for quality.

Since the early 1980s and on into the twenty-first century, quality issues have surfaced in every industry and almost every organization in the United States. The quality movement started in manufacturing and then moved to service industries. Initially service organizations did not feel quality systems would transfer very easily from manufacturing, but today service companies are reaping substantial rewards from implementing quality programs.

### **Standardized Quality Management System**

ISO 9000 is a series of quality management systems (QMS) standards created by the International Organization for Standardization, a federation of 132 national standards bodies. The ISO 9000 QMS standards are not specific to products or services, but apply to the processes that create them. The standards are generic in nature so that they can be used by manufacturing and service industries anywhere in the world.

Any organization that would like to have ISO certification needs to meet all the criteria stated in the ISO standards and pass a detailed audit performed by an ISO auditor. In some industries ISO certification all suppliers to be ISO certified. While ISO certification is highly respected, if it is not a trend in your specific industry, the additional cost of certification is a deterrent to most managers. It is very possible to reach the desired quality level within an organization with a well planned quality system and without going through all the additional steps for ISO certification.

QS-9000, released in 1994, is the ISO 9000 derivative for suppliers to all the automotive Big Three: Daimler Chrysler, Ford, and General Motors. This quality management system standard contains all of ISO 9001: 1994, along with automotive sector-specific, Big Three and other original equipment manufacturer (OEM) customer specific requirements.

### **Total Quality Management (TQM)**

TQM is a management approach in which quality is emphasized in every aspect of the business and organization. Its goals are aimed at long-term development of quality products and services. TQM breaks down every process or activity and emphasizes that each contributes or detracts from the quality and productivity of the organization as a whole.

Management’s role in TQM is to develop a quality strategy that is flexible enough to be adapted to every department, aligned with the organizational business objectives, and based on customer and stake-holder needs. Once the strategy is defined, it must be the motivating force to be deployed and communicated for it to be effective at all levels of the organization.

Some degree of employee empowerment is also encompassed in the TQM strategy and usually involves both departmental and cross functional terms to develop strategies to solve quality problems and make suggestions for improvement.

### **Continuous Quality Improvement (CQI)**

Continuous quality improvement came into existence in manufacturing as a different approach to quality and quality systems. It does not focus as much on creating a corporate quality culture, but more on the process of quality improvement by the development of teams of groups who are rewarded when goals and quality levels are reached. CQI allows individuals involved in the day-to-day operations to change and improve process and work flows as they see fit.

CQI implementation attempts to develop a quality system that is never satisfied; it strives for constant innovation to improve work processes and systems by reducing time-consuming, low value-added activities. The time and resource saving can now be devoted to planning and coordination.

CQI has been adapted in several different industries. For example, in health care and other service sectors, it has taken on the acronym FOCUS-PDCA work.

#### **IV. Result & Disctions**

##### **Future of Quality Management Systems**

Based on the current quality management systems and the available history, one can only present an obscure estimate of the future of quality management systems. The main three quality management systems (ISO 9000, Six Sigma and Lean) will most likely keep developing in a sustaining way. As history of ISO 9000 quality management standards has shown, more industries will get their Sigma and Lean manufacturing have been developed in the same way. One of the emerging trends is to merge the different quality management systems in order to achieve the benefits from the each system (standardization from ISO, reducing Lean manufacturing). The experts agree that new industries will be covered by the quality movement in the future. Health care is one of the newest additions and arguably the most important industry at the moment. Numerous of countries are struggling with the rising health care costs. It has been mentioned that the quality management in government might be the next point of interest. The other major development in the society has been the structural change. Before the Industrial Revolution, farmers and producers exchanged goods and services. The Industrial Revolution changed the way the world did business. The years from 1900 to 1970 were the golden years of production. The latest development towards service-based society has been manifesting and due to the more and more computerized societies, the next develop might be towards the Information Technology society. The quality requirements and quality expectations of the Information Technology society will be drastically different that the ones in the early 2010s.

#### **V. Conclusion**

Quality movement started as early as in the ancient Egyptian era and it has evolved ever since. The most profound idea behind quality management is that is always reflects the surrounding society and environment. Changes in those factors develop the business world as well as quality management. From the beginning of the 20<sup>th</sup> century experts can identify seven different technological innovations in quality management. The seven monumental innovations of quality management have been disruptive since organizations who failed to adopt the new technology suffered. One of the most remarkable examples is the manufacturing in the United States of American in the 1970s and 1980s. The leading nation in production failed to foresight the future trends the new customers desired. Instead of responding to the treat the Japanese manufacturing imposed, the American manufacturing continued to concentrate on the quality instead of quality. The failure of the technological leader is the same Clayton Christensen presented in his book “the Innovator’s Dilemma”. The innovator’s dilemma can be seen everywhere in business world and in every aspect of life. While ISO 9000, Six Sigma and Lean manufacturing are the current dominating quality management systems, it remains to be seen how the quality management will evolve and develop in the future.

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