ISO IS NOT INFERIOR TO OTHER QUALITY MANAGEMENT TOOLS

Category: Perspective

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Abstract

The purpose of this paper is to compare and discuss the similar principles in various quality management tools like Six Sigma, Lean which already exist in International Organization for Standardization (ISO) certification. With increasing competition and costs companies have been implementing various quality management systems and tools to reduce the costs and improve their markets. Many quality management tools like ISO, Lean, Six Sigma etc. have been successfully implemented by many companies. If we can dig down to the nomenclature of the various quality management approaches, it can be found that the basic quality tools, methods and approaches have been there for decades and some of the statistical tools are being implemented from centuries. By studying the process and steps in various tools like Six Sigma, lean and ISO, it can be found that the same principles are being applied in all the quality management tools but a different approach is carried out in implementing them. A study has been done to explain the similar principles followed by various quality tools.

Key words: Six, Sigma, ISO, 9001:2008, Lean, Quality.

INTRODUCTION

Quality management has grown from a stage of mere inspection to branded tools like six sigma, lean management which became the backbone for a company's success. Joseph Juran one of the prominent figures in the area of quality is the first one to teach the Japanese about quality management. It has taken decades of research and planning to reach a stage where we use quality tools today. Though the movement of quality management started in early 1920's the quality initiatives can be dated back to 13th century. During the period in 13th century craftsmen formed themselves into groups called guilds. Guilds developed strict rules for products and services and made a special mark on goods that are flawless. Craftsmen themselves created a mark or symbol on the product to track the origin of the product. This form of inspection by both craftsmen and the inspector served as proof of quality for customers. This form of quality inspection was followed until the industrial revolution in 19th century. In mid-1750s Great Britain

emphasized on product inspection and this later led to industrial revolution. United States started following the craftsmanship model being followed by European countries. Then later came the factory system which made the craftsmen into factory workers and audits, inspections were introduced to ensure quality of the products. In the late 19th century USA adopted a new management approach called "Scientific Management" developed by Frederick W. Taylor to increase productivity. Though the system was successful it had few drawbacks which the emphasis on productivity had a negative impact on quality. In mid-1920's Walter Shewhart introduced statistical quality control (SQC) and emphasized on processes in quality management. Shewhart stressed that quality is not just relevant to the finished product but also for the process that created it. During the Second World War quality became critical component of the war effort for the USA. The supplier's quality was improved by using Walter Shewhart's SQC techniques. This was a response to the quality revolution in Japan following World War II. Japanese invited Edwards Deming and Joseph Juran and welcomed their inputs. Instead of relying on just product inspection Japan's strategy included a total quality approach. U.S again started implementing the strategies of Japan and was later became known as Total Quality Management (TQM). By the end of 20th century TQM faded out and new quality systems have evolved moving beyond manufacturing to services, healthcare and educational sectors. In 1987 International Organization for Standardization (ISO) implemented ISO 9000 Series which consists of international standards for quality management. The ISO 9000 series is continuously revised by advisory groups and standing technical committees. In 1987 U.S has introduced Malcolm Baldrige National Quality Award (MBNQA) to raise the awareness of quality management. In late 1980's Motorola introduced the concept of Six Sigma to reduce the process variation in its electronic division. Toyota Motor Corporation which is derived from Toyota Production System (TPS) (Ohno, 1988) is another tool introduced to eliminate waste by examining the processes. It is also refereed as Lean manufacturing as it is originated from production and operations management (Shingo, 1981; Ohno, 1988). In the recent years six sigma and lean six sigma has gained more momentum than ISO 9001. But when implemented perfectly both six sigma, lean and ISO standards can have a great impact on an organization. While ISO 9001:2000 focuses on customer requirements and is a basic QMS, ISO 9004:2000 enhances the basic QMS with continuous improvement.

While many companies touted Six Sigma and Lean are better than ISO certifications, it is also proved that ISO has helped in increasing efficiency and quality of the product. Proponents of ISO 9000 certification (Quazi et al. 2002) believed that the certification can help in increasing efficiency and quality of the product and also increased sales and reduced the costs. It has been also proved by a study by Chow-Chua, Goh and Wan (2003) that companies have experienced an increase in sales after the certification process. Six Sigma methodology or

lean may not be a revolutionary way of thinking, but an evolutionary development in the science of continuous improvement that includes best elements from many previous quality initiatives. The Six Sigma and lean philosophies have already existed before 50 years in one form or the other. We explained how ISO also explained the philosophies included in Six Sigma and Lean methodologies.

Six Sigma was coined by Bill Smith of Motorola in 1986 and was effectively implemented by many major companies like GE, LG etc. Six Sigma can be defined in many ways. It is a philosophy, a set of statistical tools, a methodology and a metric. The six sigma philosophy states that work is a process that can be defined, measured, analyzed, improved and controlled. The philosophy says it as a $y=f(x)$ concept, as the output of the process depends on the input. Some of statistical tools in Six Sigma include Statistical Process Control (SPC), Process Mappings, Control Charts, Pareto Charts, Cause and Effect Diagrams etc. DMAIC (Define, Measure, Analyse, Implement/Improve and Control), the basic sigma strategy says that the problem must be identified and a long lasting solution must be implemented.

The heart of the six sigma methodology is the DMAIC methodology and the process management which also exists in the ISO 9001:2000 quality systems. The clauses 4.1 and 8.2.3 in the ISO 9001:2000 explains about the process management to be followed by a company. Clause 4.1 states that an organization should identify the process needed for QMS and its application to the organization. Clause 8.2.3 states that an organization will employ suitable monitoring and measurement techniques needed to measure the QMS and to demonstrate its ability to achieve planned results. The DMAIC methodology is also explained in the ISO system. Section 8 of ISO 9001:2000 states Measurement, Analysis and Improvement. This is same as MAI explained in Six Sigma. Section 8.1 of ISO 9001:2000 states that a measurement system must be identified and implemented to monitor and measure the organization's processes. Section 8.2 explains steps to measure the customer satisfaction, QMS processes and product characteristics. The next section 8.3 explains to establish, implement and maintain a procedure for nonconforming or defective products. Section 8.4 states to collect and analyze the measured data. Section 8.5 suggests making improvements and preventing the occurrence of the defects by establishing a preventive action. Section 8.5.1 of ISO 9001:2008 specifies to continually improve the effectiveness of the QMS. This is also referred as 4th step as Improvement stage in Six Sigma. Section 8.5.4 of ISO 9004:2000 also mentions Continual Improvement of the Organization and refers the reader to the Annex B which is entitled as Process for Continual Improvement. The control step of Six Sigma is explained in the referred in many clauses of ISO 9001 and ISO 9000. Section 4.2.3 of IS 9000 states to control the organizations' QMS documents. Section 7.2 refers to controlling the customer related processes. Section 7.5

explains about controlling the production process and 7.6 explains controlling the monitoring and measuring equipment. The Define step in Six Sigma is the least explained in ISO 9000. Section 5.5.1 defines the responsibilities of authorities and section 7.3.2 explains product design and development inputs. The brief comparison of ISO and Six Sigma is put in the Table 1.

Table 1: Comparison of Six Sigma steps with steps in ISO 9001:2008

	Six Sigma	ISO 9001:2008
Step 1	Define	Clause 5.5.1: Define responsibilities. Clause: 7.3.2: Define design and inputs.
Step 2	Measure	Clause 8.1: Measurement system must be identified and implemented. Clause 8.2: Measure the customer satisfaction Clause 8.2.3: Employ suitable monitoring and measurement techniques.
Step 3	Analyse	Clause 8.4: Collect and analyze the data.
Step 4	Implement/ Improve	Clause 8.5.1: Continually improve the effectiveness of the QMS. Clause 8.5.4: Continual Improvement of the Organization.
Step 5	Control	Clause 7.5: Control the process. Clause 7.6: Control the monitoring and measuring system/equipment. Clause 8.5: Make improvements and preventing the occurrence of the defects.

Source: Kubiak and Benbow (2009)

The other quality management tool Lean is also being implemented by many companies and some of the companies have formulated lean Six Sigma successfully. Lean management mainly stresses on 7 elements. These 7 elements are waiting period, Over Production, Rework/Rejects, Motion, Processing (over processing), Inventory and Transport which are popularly called as WORMPIT. The main aim of Lean is to reduce and eliminate non-value-adding activities and waste from the processes which helps in gaining competitive advantage by lowering operating costs and improving productivity.

ISO has also addressed the Lean management technique in some of its sections increase efficiency of the quality system. Section 7.5.1 of ISO 9001:2000 explains the need for reducing the wastage. Section 7.5.4 states the need for management to involve suppliers and partners in implementing effective and efficient processes to protect purchased material. The section 8.3 which refers to Control of Nonconforming Product in ISO 9001 is same as mentioned as Rejects/Rework in Lean management. ISO considers rejects, rework, repair, regrade and release as non confirmation to customer specifications. The rejection can occur

even due to over processing or less processing of the product. The processing aspect is also mentioned in Lean which states that excess processing can lead to rejects. ISO has also mentioned the need of infrastructure (mentioned as transport in Lean) in Section 6.3 (C). It states that the organization has to provide the supporting services (such as transport, communication or information systems) required to achieve conformity to product requirements. Section 6.4 explains the need for resources in work environment required to achieve conformity to product requirements. This work environment also refers to the conditions under which the work is performed including physical, environmental and other factors (such as noise, temperature, and humidity, lighting or weather). In this step ISO states to reduce the movement, motion of people, material which can cause physical stress. The same is mentioned in lean management to reduce the motion or movement of equipment, material and people.

Another quality management tool being widely implemented by both service and manufacturing organizations is Kaizen. Kaizen is a Japanese word which means continuous improvement or good change. Kaizen needs to be implemented on a daily basis and should go beyond simply improving productivity and adding a human element to the workplace and remove excessive hard work. Right from the floor worker to the CEO of the company, everyone can participate in improving the process or the system. Kaizen Blitz (kaizen Event), a subtype of kaizen is implemented to check if something is wrong and fix it as soon as possible. The Kaizen Blitz s concentrated in a short time period to achieve significant results very quickly.

ISO also stresses the importance of continuous improvement throughout the organization. The clause 5.1 states to support the efforts to continuously improve the effectiveness of the organization. Clause 5.3 states to ensure that the quality policy of the company is committed to continually improve the effectiveness of the QMS. Clause 5.3.4 states to make plans to continually improve the QMS. Section 8.5 of ISO states to improve the effectiveness of the QMS. Clause 8.5.1 points to continually improve the effectiveness of the QMS and use information to improve the effectiveness of QMS. Clause 5.6.1 states to evaluate improvement opportunities.

On the digging down to the nomenclature of the various quality management approaches, it can be found that the basic quality tools, methods and approaches have been there for decades and some of the statistical tools are being implemented from centuries. All the quality management tools use the same basics to increase the productivity and quality but in a different way. Many of the elements in these QMS are apparent. It is up to the organization to implement the tools depending on their output, but no quality management tool is inferior to other. Each QMS have its own positive and negative impacts on the organization depending on the implementation process.

CONCLUSION

Selecting the right quality management tool is a complicated, arduous process. Organizations must determine the readiness for change for any process improvement and understand the potential of the company's quality system. Any improvement program requires more will power than branded tools like lean, Six Sigma or ISO. Until the company's quality and customers' satisfaction are not increasing certifications does not matter and guarantee a success. Quality is not just related to product or services, it is also applicable to people, processes and organizations associated with it. Six Sigma training and ISO certification may fade away, but basic things like customer focus, data driven analysis, statistically based decisions process oriented thinking and process control to maintain improvements will always be necessary elements for the success of the business. It is up to the company to understand its quality system and implement the quality management tool according to that. Ahmed et al. (2005) concluded that the success of any quality management system depends greatly on the strong commitment of top management and how customers are valued.

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