Toward Better Understanding of Total Quality Management (TQM)

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Abstract

The objective of this paper is to get better understanding of total quality management the (TQM) concept. It will highlight the beginnings of and improvements in the quality movement at the beginning of this century. The paper investigates the various definitions of TQM and its importance in the organization. The paper also explores the valuable contributions of quality gurus such as Deming, Crosby, and Juranto quality development. Finally, the paper discusses the factors that help to build a successful TQM organization and the barriers that may stand in the way of adopting TQM as well.

Introduction

In the last few decades, a philosophy of total quality management has been widely used. However, the concept of quality did not emerge recently; it has existed since ancient times. One example of a focus on quality in ancient times canbe found during the Code of Hammurabi's period in 2000 B.C.As reported by Gitlow, Oppenheim, Oppenheim and Levine (2005), item 229 of this code states that "if a builder has built a house for a man, and his work is not strong, and the house falls in and kills the householder, that builder shall be slain." However, to get a better understanding of the quality improvement in this century, it is important to start with the beginnings of modern quality improvement in the 1920s. In the 1920, Deming, an American statistician, worked to formulate his ideas for strategies for eliminating the sources of waste and variability from industrial operations. He was the first to begin developing quality management philosophy. Shewhiter, another American statistician working at Bell Laboratories at this time, developed methods to bring industrial operations into what was called Statistical Control. This is a number of procedures aimed at removing variability from industrial processes. They are also aimed at utilizing statistical control to remove waste. Deming worked to improve shewart’s techniques, creating what is known today as Statistical Process Control (SPC), the theoretical underpinnings of TQM (Sallis, 1993).

However, though the quality movement was originally developed in the United States after 1920 and the quality movement’s pioneers, including Deming, Crosby, and Juran, were American scientists, the first successes inthe quality movement were applied in Japan in 1950. After the Second World War, in the 1950, the Japanese Union of Engineers and Scientists (JUES) was concerned about rebuilding Japan. Also, the Japanese were facing some challenges, such as developing Japanese's reputation for producing low-quality goods and the need to improve global markets. The JUES invited Deming to lecture to Japan's leading industrialists, and he persuaded them that implementing his methods, the Japanese quality would-be the best. Deming informed them that instead of beginning with total quality, they should start with what their customers need. In addition, he suggested that they should create both their strategies of production and their products to the highest standards to meet customers' requirements (Sallis, 1993). Industrialists took his advice seriously and, after implementing his ideas, Japan’s industry’s productivity and quality improved enormously (Gitlow, Oppenheim, Oppenheim& Levine, 2005).The ideas of Crosby and Juran, who visited Japan at that time, were also put into practice by Japanese. The Japanese took Deming's and Juran's ideas and developed them into the concept of Total Quality Control (TQC) which was created first by Feigenbaum in the 1951. Feigenbaum defined TQC as cited by Ngambi and Nkemkiafu (2015) "an effective system for integrating the quality development, quality maintenance, and quality improvement efforts of the various groups in an organization’s. 70.

The primary goal of total quality control is to achieve the customers' satisfaction. Furthermore, from the TQC perspective, control begins with creating the product and finishes when the client obtains the product, with product satisfaction guaranteed. However, while Feigenbaum's view included the idea that all departments in the institution have some tasks to ensure quality, his approach toTQC did not involve other management concepts, including teamwork and provider improvement relationships. Those management concepts became elements of the Total Quality Management philosophy (Ngambi & Nkemkiafu, 2015).Ishikawa, one the most famous Japanese experts in quality, believed that the Japanese approach to TQC is quite different from Feigenbaum' approach and different from what is being practiced in the West as well (1985). Ishikawa argued that the total participation definition included only company leaders, middle managers, and employees. But total participation now extended to involve all divisions such as divisions of manufacturing, inspection, and marketing.

In the 1980s, Japan's successes in industry with the use of total quality management influenced other countries across the world, including the United States and United Kingdom, to adopt a quality management model (Ngambi & Nkemkiafu, 2015). For instance, in the United States several industries such as Texas Instruments, IBM, and Motorola successfully implemented the total quality management process. Those industries overcome challenges from international competition and other barriers are related to business environment (Lozier& Teeter, 1996).

Various Definitions of TQM

To get a better understanding of TQM, it is important to begin by defining the term "quality". Quality is a broad term, making it difficult to define (Sallis, 1993). Pfeffer and Coote (1991) also considered the quality concept to be a slippery concept because it has a wide range of meanings and can be used in different fields with different people. "Satisfying a customer beyond expectations" is Deming's definition of quality (1986). Juran (1986) defined quality as a systematic method that is looking for perfection. Also, the Quality is the eligibility for usage. According to Crosby (1979) the quality is "the quality is the eligibility for conditions and it is needed to abide by three basic stages such as perseverance, education and practice in orders to improve the quality" Peker, 1993). In the business arena, IBM gives a simple definition of quality; quality equals customer satisfaction (Unterberger, 1991).

However, as Sallis (1993) mentions, it is important to distinguish between the three ideas of quality: quality control, quality assurance, and total quality management. Sallis (1993) pointed out that Quality Control is an after the event process that is designed to remove and detect the final products' elements which do not meet standards. Ishikawa (1985) indicated that the quality control that focused on inspection was an old concept of quality control. He added that the organizational quality control succeeded when the customers could buy a company's new products with confidence that they were good products. Quality assurance is different from quality control and it is before and during the event process. Quality assurance refers to preventing mistakes from happening in the first phase (Sallis, 1993). Ishikawa (1985) states that quality assurance refers to the assurance of quality in a product which allows the client to buy the product with confidence and use it with satisfaction for a long time. Total quality management (TQM) integrates quality assurance and improves it.

TQM refers to building a quality culture in which every member of the organization seeks to delight customers. Hellsten and Klefsjo (2000) see TQM as a system of management that improves continuously and consists of methods, tools and values. Besterfield et al. (2008) define each term in TQM separately:"Total" meaning "whole";"Quality" referring to the extent of excellence of a product; and "Management" as the act, manner of dealing with and guide. Brun (2011) defines TQM as an integration process that involves all departments of an organization including finance, human resources, and manufacturing, working together to meet customers' needs and to achieve the organizational goals. Ngambi and Nkemkiafu (2015) provided another comprehensive definition of TQM, describing it as management strategies that are utilized to increase an institution's productivity and quality. They add that TQM is an inclusive management philosophy that includes all departments and employees and involves all suppliers and clients as well. According to Patyal and Madduley (2015), the purpose of TQM is to seek long-term success through the satisfaction of clients, benefitting the institution's members and the community in general. Also, the total quality management isa philosophy that seeks to meet customers' needs and develop organizational performance (Asif, Awan, Khan, & Ahman, 2013)

Two Concepts of Quality:

According to Sallis (1993), there are two aspects of qualities: procedural and transformational. The procedural aspect focuses on the definition of systems and procedures. This aspect of quality can be accomplished through setting the procedures and systems into process and assuring that those systems are working effectively. In addition, the procedural aspect is related to proving that activities conform to requirements. The other aspect of quality, Transformational Quality, is related to continuous development and institutional transformation. Transformational Quality refers to customer service and social responsibility. Transformational quality can be accomplished through the exercise of good management. The management's task includes designing a vision that translates into customer service, i.e., establishing an institutional culture that empowers staff to offer quality service. The procedural aspects related mainly to proving that quality is being offered while the transformational aspect emphasizes improving the quality being offered.

Significance of TQM:

Total quality management plays a significant role to improve institutional outcomes such as productivity and performance. As a tool that can make the difference between success and failure, it can contribute to help organizations to administrate change and to deal with external pressures quality (Sallis, 1993). There are a number of studies that clearly found that TQM is a strong predictor of improving organizational performance. Prajogo and Brown (2004) performed a study on Australian institutions to examine the correlation between TQM practices and quality performance. The findings of the study showed a positive correlation between those variables. Brah and Tee's (2002) study aimed to measure the quality performance of Singapore companies through examining the correlation between TQM practices and organizational performance. The study's results found a strong link between TQM and performance. Also, the results of Ngambi's and Nkemkiafu's study (2015) indicated that TQM can positively develop the organizational performance of manufacturing enterprises. In particular, they showed that TQM plays a pivotal role in financial performance. Demirbag, Tatoglu, Tekinkus, and Zaim(2006) exhibited that working on developing product quality and procedures contribute to increase revenues and minimize costs. Dale (1999) also confirmed that quality management is one of the appropriate strategies that organizations can use to survive in this competitive world.

Improving quality is a topic that has been given considerable attention from a number of countries, including Japan, US, and the European Union, which countries show recognition of and appreciation for institutions that show high levels of standards of quality in both process and product. For example, in the United States, the Baldridge Quality Award was designed by the US Department of Commerce to honor companies that meet high degrees of standards of quality (Osseo-Asare & Longbottom, 2002). In Japan, the Deming is offered as the highest award in Japan related to total quality (Ishikawa, 1985). The Deming Prize was established in 1951 by the Union of Japanese Scientists and Engineers (JUSE) and given to the institutions that have an impact, whether directly or indirectly, on improvement to quality control management (JUSE, 2016). The European Foundation for Quality Management (EFQM) established the European Quality Award called EFQM Excellence Award, which is given once year to Europe's best performing institutions, whether public or private, profit or non-profit (EFQM, 2016).

However, there are a number of standards that used in the TQM field and ISO 9000 seems to be one of the most common set of standards. The International Standards Organization states, "The ISO 9000 family addresses various aspects of quality management and contains some of ISO's best known standards. The standards provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved" (2015). TheISO9000 series quality standards to reinforce the activities within an institution and to governing quality management systems were established in 1987.The seven quality management principles include a focus on the customer (increased customer's value, satisfaction, and loyalty), leadership (enhance effectiveness and efficiency to meet institutional quality goals), engagement of people (increase the involvement of people and enhance trust and collaboration through the institution), process of approach improvement (increase the ability to focus effort on major processes and opportunities for development), evidence based decision making (develop decision-making processes, enhance the ability to demonstrate the effectiveness of past decisions),improvement (develop the using of learning for development, increase drive for innovation), and relationship management (increase performance of the institution (ISO, 2015).

Quality Gurus:

Showing the valuable efforts of experts in the total quality management field including Edward Deming, Joseph Juran, and Philip Crosby, is observable and it should be mentioned to get better understanding of TQM. They were most influential experts and writers in the quality field who offered the most powerful and appealing ideas and theories in the quality field. Therefore, other scholars' contributions such as Armand V. Feigenbaum and Kaoru Ishikawa cannot deniable who had great influence on improving quality concept.

Deming's 14 points:

Edward Deming was born in 1900 and died in 1993. In the 1920s Deming worked as member in the Inspection Engineering Department, at The Bell System and Western Electric. In 1946 the American Society of Quality Control (ASQC) was established and Deming was selected as its president. Deming (1986) reports that, customer satisfaction is the central focus in the quality management. Deming also considered the management, including their failure to plan for the future, to be the main cause of industrial quality issues. Deming explained that senior management has the resources that allow them to control the organization and they have a key influence on the organization's culture (citation). However, Deming (1986) developed his famous 14 points that offer a guide to how to lead for quality. Those 14 points, which include significant leadership principles and insights into workers' psychology, offer an outline to improve the culture of quality of an organization. They focus on prevention instead of cure, and they can be used at any organization as criteria to measure organizational performance (Deming, 1986; Evans and Lindsay, 2001). The Deming's 14 points management principles were:

Create constancy of purpose: for continuous improvement of service and product, create a constancy of purpose.
Adopt the new philosophy: involves creating a philosophy in a new economic age.
Cease dependence on inspection: includes establishing the quality into the product in the first place, eliminating the need for mass inspection.
End lowest tender's contracts: preventing of awarding business according on the price tag alone.
Develop every process: refers to develop every process of planning (e.g., production and service) constantly and forever.
Institute training on the job: involves instituting and adopting new ways of training on the work field.
Institute leadership: the goal of leadership should seek to assist people and machines to do a better job.
Drive out fear: includes encouraging the effectiveness that helps everyone to work effectively for an institution.
Break down barriers: refers to the breaking down the obstacles between staff and departments areas.
Eliminate exhortations: through removing the using of slogans, exhortations, and posters that ask for zero defects and productivity without offering methods.
Eliminate targets: includes using the work standards (e.g., measuring a day work) instead of using the job standards that prescribe numeral quotas for employees.
Permit pride of workmanship: refers to the management's role to prevent the obstacles that employees from finding joy in their work.
Institute a vigorous program of education: adopt a vigorous educational program and motivate self-development for every person.
Top management commitment: top management has to be committed to develop quality and increase productivity continuously.

System profound knowledge:

Deming (1994) developed a philosophy of management called "System of Profound Knowledge" which includes four points.
System appreciation: the institution should treat staff members and customers as significant components of the system.
Variation Knowledge: includes understanding the reasons for variation, which leads to identifying the appropriate procedures to improve product's quality.
Knowledge Theory: refers to importance of knowledge and it refers to the knowledge about knowledge and leading by knowledge.
Psychology Knowledge*:* involves the importance of staff's satisfaction, motivation, and delight to offer quality products.

Crosby's ideas:

Philip Crosby is another expert in the area of quality. He developed two well-known concepts: 1) Quality is free and 2) Zero defects. Quality is free focuses on the fact that the savings from quality development programs pay for themselves. Crosby (1979, 1984) believed that the quality is free but what costs money is "inequality things," where institutions do not do rights things right. In other words, not doing the things right the first time costs money. Crosby described the quality as "conformance to the requirements and quality is free". Crosby's concept of Zero Defects (1984, pp. 74) emphasizes developing the system of production to accomplish what he called "Zero Defects. Zero defects are about the commitment to success and the removal of failure. According to Crosby's view, failures and errors can be removed if the institution is willing to do so. Crosby also pointed out that seeking to achieve zero defects will enhance profits through saving costs. He believed in only one standard for quality: perfection (citation).

Crosby's improvement program:

Crosby's model is a practical model while Deming's model is more philosophical. Crosby provided fourteen steps for continuous enhancing quality. Crosby's (1979) improvement program includes: *Management commitment* (short and clear quality policy statement), *Quality improvement team* (everyone in the organization must be involved in the improvement efforts), *Quality measurement* (to offer a show of current nonconformance issues in a method that enables aim), *The costs of quality*(determining the costs of quality and to set a value on them), *Quality awareness* (increase the awareness among everyone in the organization),*Corrective action*(working with employees to eliminate poor quality), *Zero defects planning* (all members of organizations should sign a pledge to work to achieve zero defects), *Supervisor training*: (leaders should identify their roles in the development process and that can be done by training programs),*Zero Defects day* (a day-long event to create the approach of zero defects and tells staff that there will be a change), *Goal setting*: (includes putting specific and measurable goals),*Error-cause removal*(refers to the communication between staff and leadership in terms of cases that make something is difficult to apply),*Recognition* (staff needs recognition such as prizes or certificates, and it is not necessarily a monetary prize),*Quality councils*(involves bringing inequality professionals to investigate how issues can be addressed and solved),*Do it over again*: (the quality improvement never ends).

Juran's theory:

Juran developed his philosophy in quality during his work at Western Electric in the USA in the 1920s. Juran worked with Deming in the 1940s and delivered is experiences in the principles of quality to Japan in the 1950s along with Deming (Flood, 1993). Juran (1986) defined quality as "fitness for use." Also, Juran implemented two different meanings to quality which are freed from deficiencies and features. Juran offered a detailed plan for quality improvement called the "quality trilogy"(1988a, b). The quality trilogy consists of three main managerial processes: quality control, quality improvement, and quality planning (1988a, b). Quality control includes preventing quality problems and correcting defects to establish a product without deficiencies. Quality improvement means seeking for chances to improve quality before problems increase. Quality planning involves offering the operating forces with the means of producing products that satisfy customers' needs.

Juran's Road Map:

Juran (1989) agreed with Deming that most quality issues lead back to leadership decisions and that poor quality is often due to the poor of leadership. Juran developed a road map to build a quality program comprised of nine steps: identify the customers, determine the customers' needs, translate needs into our language, design a product that can meet these needs, optimize the product features so as to meet customers' needs and our needs as well, create a procedure that helps to produce a product, optimize the procedure, prove that the procedure can produce the product under operating conditions, transfer the procedure to operations.

TQM pyramid "Kanji's pyramid":

Kanji's pyramid consists of four principles: Delight the Customer: achieve high levels of customer satisfaction; Continuous Improvement: improve the organization continuously; Management by Fact: making decisions based on objective proofs; People-based management: involving all of the members at organization in quality improvement activities (Kanji, 1996).

Key aspects of implementing TQM:

To get a better understanding of the TQM concept, it is necessary to identify the critical principles to adopt TQM effectively. There are a wide range of factors that contribute for building a successful TQM organization such as leadership, empowering staff, and teamwork, initiating staff training, and changing culture (Sallis, 1993). Although some researchers believe that the process of implementing TQM differs from one organization to another, most agree that TQM can be adopted in all organizations uniformly (Juran, 1986, as cited in Sitkin, 1994).

Leadership commitment:

Both Deming and Juran agree that good leadership is considered one of the most important components to building an effective TQM organization (citation). Deming (1994) pointed out that failure to adopt quality programs usually is due to the management's poor decisions. Similarly, one of the Crosby's improvement programs for building effective quality program is leadership commitment. Vora(2000)indicated that, it is difficult to implement successful TQM at higher educational institutions without participation from higher educational leaders. Showing the importance of leadership's role leads to the question of what the leadership's role in TQM organizations is/should is.

Leadership empowerment:

One of the key roles of leadership is to provide empowerment for employees. Spanbauer (1992) provides a model of leadership for empowerment in the educational field. He points out that to empower staff, leaders should: involve all staff in problem-solving activities, utilizing the main scientific strategies and the principles of quality; involve staff through asking them how projects can be dealt with instead of informing them how projects will occur; ask staff what systems are preventing them from delivering quality to the customers (e.g., students/parents); offer education in quality terms including creating the team, management, and communication; model through walking around and listening to the customers and staff; try to be less a boss and more a coach; give autonomy; improve skills including those related to problem-solving, conflict resolution, and negotiations; work to balance paying considerable attention to internal customers' needs (staff, teachers) and confirming the quality provided to the external customers (students/parents)**.**

Teamwork:

Another a major aspect of building an effective TQM organization is teamwork. Crosby (1979) mentioned that being an effective member of a team is learned, not a natural human function. Sallis (1993) described the teamwork factor as an engine of quality development. Sallis added that teamwork can offer to each member of an institution an opportunity to express their opinions and make contributions to the quality development process. Crosby's improvement program includes quality improvement team as a significant phase to adopt quality program effectively. One of the five principles of exemplary leadership that Kouzes and Posner (2002) list is enabling others to perform "teamwork". Kouzes and Posner confirm that teamwork efforts have higher levels of achievement compared with individual efforts. Therefore, they pointed out that great dreams and aims usually are not achieved by a single person's efforts, but rather require cooperative effort. Tuckman(1965)suggests a four-stage model for teamwork improvement: forming, storming, forming, performing. *Forming***:** The stage involves everything about forming. At this stage, the group members are still individuals not a team who are coming for the goal of work but they do not have much knowledge about how to work together. The major discussions at forming stage will emphasize on the organizations' structures or the obstacles that may prevent to build a successful work environment. Also, senior leadership should share their vision with the staff and giving them clear directions. This stage is pertinent of two of the Deming's 14 points: drive out fear so everyone may work effectively, and break down barriers between departments**.**

Storming: the next stage is known as a storming stage. Storming is a stage that each member of group begins to understand more each other. Also, the team members at this stage will realize the scale of the job and the challenges that may face. This stage may include conflicts and personal hostilities and team leader should handle properly and control these conflicts through using firmness and resolve, and using patience and humor as well. Therefore, team's leader should seek to identify the origin of any conflicts and help team members to overcome these conflicts. This stage is closely related with two of Deming's 14 points: create constancy of purpose and adopt a new philosophy**.**

Norming: Norming is the Tuckman's third stage. Norming stage the decision that has been made by team members to improve own methods and rules at work and determining the team members' roles. In order to help members to work properly, the methods and rules should be clear and understood. *Performing*: Now at this stage, members should create their methods of working and the procedures that members intend to utilize them. It is a stage of performing so members should solve their differences and they should focus on more for developing procedures and solving problems. The five and seven of the Deming's 14 points are an example of performing stage: improve constantly and forever the system of production and service, and institute leadership.

Staff training:

Staff training can be the key of success for improving the quality culture. Motivational theorists assured that training is one of the most significant motivators in an institutional culture. Also, the role of training is an essential component in TQM practices and has a positive influence on operational performance (Parast & Adams & Jones, 2011).Deming pointed out that institute training on the job is a key component to create a TQM organization through adopting new methods of training on the work field. Crosby in his improvement program to build successful TQM involved the employee education. Employee education includes training employees in order to positively reinforce their function in the quality improvement process. Sallis (1993) believed that during the initial steps of applying, every member of organization has to train the principles of TQM. That includes increasing the awareness and knowledge of some the major approaches such as decision-making methods, assessment tools, teamwork, and problem solving. Besides that, visiting other institutions that implement TQM initiatives can be helpful. Also, it is important to remember that the lack of training and educating staff can be a major obstacle to adopt TQM program (Catalin & Bogdan & Dimitrie, 2014).

Changing culture:

Changing cultures is another fundamental component to create effective TQM organizations. The positive and supportive institutional cultures help to establish effective application of quality management process (Corbett & Rastrick, 2000). Sallis (1993) pointed out that changing cultures involves change of organizational leadership, working strategies, and attitudes. Therefore, Sallis confirmed that in order to produce quality, staff needs two important things. First, it is significant to offer an appropriate work environment that motivates staff to work. That includes working with easy and clear procedures and systems which assist staff to do their tasks. Second, to do greater success, staff demands a motivation and appreciation of their accomplishments and efforts. That comes from the leadership's role to recognize and appreciate the staff's achievements which ultimately contributes to greater productivity. Catalin, Bogdan, and Dimitrie (2014) agreed with the Sallis' view and they indicated that lack of motivation, satisfaction, recognition of success among employees were barriers of implementing TQM. Employees are the most critical elements of success in the organization. The quality expert Ishikawa (1985) stated that "in management, the first concern of the company is the happiness of people who connected with it. If the people do not feel happy and cannot be made happy, that company does not deserve to exist. The first order of business is to let the employees have adequate income. Their humanity must be respected and they must be given an opportunity to enjoy their work and lead a happy life" p. 97. However, besides the above critical principles, other significant principles of successful TQM practices include: benchmarking, employee focus, quality measurement, supplier relationship and customer focus (Saraph et al, 1989).

Barriers to Adopt TQM:

It is important to remember that implementing and developing TQM require more efforts and it may encounter some barriers. To get better understanding of TQM concept, is it necessary to realize the barriers that stand in the way of pursuing TQM in the organizations. Deming discussed that the barriers that face quality improvement and he called them seven deadly diseases. The Deming's seven deadly diseases include the lack of constancy of purpose, short-term thinking, and the assessment of employees' performance by annual review, job-hopping (e.g., turnover's issues), and the use of visible figures. Sebastianelli and Tamimi (2003) also identified five barriers that hinder of implementation of TQM: lack of practices for both management and development of human resources, poor planning, and the quality of planning is insufficient, lack of resources for TQM, inadequate of leadership to improve a quality culture, lack of customer orientation. Catalin et al.(2014) performed a study to investigate more deeply the barriers that prevent of implementing TQM and they grouped those barriers into five categories. The first is strategic barriers involved poor leadership, insufficiency of both government support and top leadership, unrealistic expectations are not realistic.

The second is structural barriers which include institutional structure is not appropriate, insufficient of information systems, and lack of financial aid. The third is human resources barriers poor of training staff, lack of encourage and satisfy staff members, lack of recognition and appreciation of staff's success. The fourth is contextual barriers contained lack of institutional culture, poor of innovation, lack of communication, inadequate of confidence of staff in the leadership. The last category is procedural barriers are lack of assessment and self-assessment, bureaucracy, lack of focus on customers, the efforts to develop quality are time consuming. Other obstacles that may stop organization from pursuing quality include lack of training and education, lack of management commitment, lack of financial and human resources (Gitlow, Oppenheim, Oppenheim& Levine, 2005).

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