The elements, benefits, and challenges of total quality management implementation

Okpala Charles C[1], Ezeanyim Okechukwu C[2], Aguh Patrick S[3]
[1-3] Department of Industrial/Production Engineering, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Abstract
Many manufacturing companies are bedeviled with the problem of satisfying their customers' needs and expectations, which bordered on quality and timely products delivery. However this can only be attained by continuous improvement of their manufacturing processes. This paper focuses on Total Quality Management (TQM), an extensive, structured and broad management approach that aims at world-class manufacturing, through continuous quality improvement of products and services by using continuous feedback. The eight accepted elements of TQM which were grouped into foundation, building bricks, biding mortar, and roof were discussed, before the benefits of successful implementation which include customer satisfaction and retention, improved staff morale and productivity, as well as enhanced process efficiency and profitability were listed. The paper also discussed the challenges of TQM implementation which include but not limited to lack of commitment by the top management and some workforce, organizational culture, and ineffective communication between the departments. For a maximum impact in TQM implementation, the study concluded that manufacturing companies must ensure quality improvement commitment from the entire staff, exceed the expectations of the customer rather than merely meeting up with their needs, and also institute continuous improvement processes in all procedures, strategies, and manufacturing activities.

Keywords: total quality management, manufacturing, quality, statistical process control, benchmarking, quality improvement teams, problem solving teams

1. Introduction
To remain viable in the competitive global market, it is pertinent for manufacturing companies to strive for continuous improvement which will enable them to keep on manufacturing high quality products for competitive advantage over their competitors, and also ensure customer satisfaction and continuous patronage. Hence, the need for a paradigm shift from the traditional manufacturing approach.

As a philosophy that is geared towards continuous improvement of manufacturing processes, Total Quality Management (TQM) is a lean business managerial approach that involves the entire workforce to aim at continuous improvement of all manufacturing processes in order to exceed the customers' requirements.

According to Napierala (2012) [8], TQM is a participative, systematic approach to planning and implementing a constant organizational improvement process, with its approach focused on exceeding customers' expectations, identifying problems, building commitment, and promoting open decision-making among workers. As an effective quality improvement and maintenance system, TQM ensures the participation and training of the entire company employees.

It is a blend of quality development and management tools targeted at enhancing business and manufacturing activities thereby leading to economical production of quality products that will lead to customer satisfaction. Quoting Mitreva (2005), Mitreva, Nikolov, and Nikolova (2016) [7], explained that TQM system is structured to meet the internal and external needs of customers and suppliers by integrating them with the company and improving the business climate, the opportunity for innovation and development, and improving business processes and organizational culture.

By identifying and reducing losses that arise from wastes and wasteful habits in manufacturing, TQM concentrates on performance and improvement of all production processes for enhanced productivity and profitability.

Shmula (2015) [12], noted that as a management philosophy that strives to achieve the best possible results by centering all business activities and processes on customer satisfaction, proper TQM implementation involves continual improvement as all members of a particular organization are expected to take part in the process. He concluded that the main idea behind this approach is that the best way to long-term success is through providing a high quality product or service that meets the needs and requirement of the customer, as everything in manufacturing approach is defined through the lens of customer satisfaction.

As the culture of TQM involves quality improvement in all manufacturing processes, with emphasis on reduction and possible elimination of all kinds of wastes inherent in production procedures, the following tools and techniques are employed to achieve the desired objectives: Failure analysis, Process management, Benchmarking, Statistical Process Control (SPC), Plan-do-check-act cycle and product design control.

2. The Elements of TQM
Although Chand (2017) [3], listed the following as the ten elements of TQM: "management's commitment to quality, customer satisfaction, preventing rather than detecting defects, measurement of quality, continuous improvement, corrective action for root cause, training, recognition of high quality, involvement of employees, and benchmarking." However, the generally accepted eight TQM major elements are grouped into four according to their functions and

described with building allegory.

As shown in Figure 1, the groups are:

A. Foundation – comprising of Integrity, Ethics, and Trust;
B. Building bricks – comprising of Leadership, Teamwork, and Training;
C. Binding Mortar – comprising of Communication;
D. Roof – comprising of Recognition.

Fig 1: The Main Elements of TQM

A. Foundation – Integrity, Ethics, and Trust

According to Padhi (2015) [11], TQM is built on a foundation of ethics, integrity and trust, which fosters openness, fairness and sincerity and allows involvement by everyone. He noted that this is the key to unlocking the ultimate potential of TQM, as the three elements move together, with each element offering something different to the TQM concept.

Integrity: As TQM cannot excel in an atmosphere of strife and acrimony, integrity which refers to honesty encourages fairness, morals, equity, and justice in the workplace, thereby promoting team members' collaboration and enabling strife-free environment that TQM requires to flourish.

Ethics: Ethics is the awareness and understanding of what is good or bad, and is applicable to both the company and the employees. By upholding rules and regulations, ethics enables the workers to imbibe an organization's code of conduct and also uphold a sociable environment in the workplace.

Trust: To successfully implement TQM, team members must cooperate and trust each other to foster team spirit and active participation. According to Educa (2016) [13], trust can evolve into a relationship between team members that can result in active decision making, thus, implementation can be successfully. He noted that it encourages commitment and also fosters individual risk-taking, as an individual would know that the team members have their back in important situations.

B. Building Bricks – Leadership, Teamwork, and Training

Standing on the stable foundation of integrity, ethics, and trust, the TQM building bricks support the entire structure and also advance to the rooftop of recognition. They entail:

Leadership: Bernal (2012) [2], noted that Leadership is "possibly the most important element in TQM as it requires the manager to provide an inspiring vision, make strategic directions that are understood by all and to instill values that guide subordinates." He explained that for TQM to be successful in a business, a supervisor who must understand

the quality concept, believe in it and then demonstrate his belief and commitment through daily practices must be committed in leading the employees.

Teamwork: TQM requires that workers should both work individually and also in teams as the culture of total quality is accomplished through the building of cooperative obligation which enhances sense of ownership, identify causes and sources of problems, promotes problem solving skills and communication, thereby leading to positive changes.

The three types of teams that companies that adopt TQM adopt are Quality Improvement Teams (QITs), Problem Solving Teams (PSTs), and Natural Work Teams (NWTs).

Training: in order to ensure enhanced productivity and improved levels of quality and efficiency in companies, TQM necessitates all employees to subject themselves to many specialized trainings which borders on performance analysis and improvement, problem solving techniques, involvement and participation in teams, technical skill, job management, and improved decision making.

C. Building Mortar – Communication

Effective communication which is the binding mortar of TQM plays a vital role in enhancing the employees' morale as well as in motivating them, as it is the important link between all the other elements of TQM. According to Dasari (2015) [4], communication which means a common understanding of ideas between the sender and the receiver binds everything together starting from the foundation to the roof of the TQM house. This is because ineffective communication between the supervisor, staff, and the departments lead to poor implementation of the entire quality process.

D. Roof – Recognition

The ability to identify and reward outstanding employees is the role of a good TQM supervisor, as it enhances staff morale, self-esteem, performance, as well as productivity. Also as employees are recognized, others are motivated to put in their best in order to attract recognitions for themselves and their teams, thereby enhancing productivity and overall improvements.

3. Benefits of TQM Implementation

According to Ngwenya, Sibanda, and Matunzeni (2016) [10], TQM is a philosophy for managing an organization in a way, which enables it to meet stakeholders' needs and expectations efficiently and effectively without compromising ethical values. They noted that it enables the management approach of an organization to be centered on quality, based on the participation of all its members and aiming at long term success, which is achieved through customer satisfaction and benefits to all members of the organization and to society.

When fully supported by the management and executed by staff teams, the implementation of TQM in a manufacturing company assists immensely in the streamlining of production processes, leading to continuous improvement of both the processes and products, as well as improved employees and machines efficiency thereby ensuring the manufacturing of high quality products.

Nayab (2011) [9], pointed out that the major thrust of TQM is to achieve productivity and process efficiency by identifying and eliminating problems in work processes and

systems, as it addresses key problem areas such as mistakes in work processes, redundant processes, unnecessary tasks, and duplicate efforts. He maintained that the TQM interventions also help with predicting and pre-empting such mistakes and unproductive activities, as improving process efficiency brings about many benefits to the organizations in terms of costs and time.

Some of the benefits of successful implementation of TQM program to the customer, a manufacturing company, and its employees are outlined in figure 2.
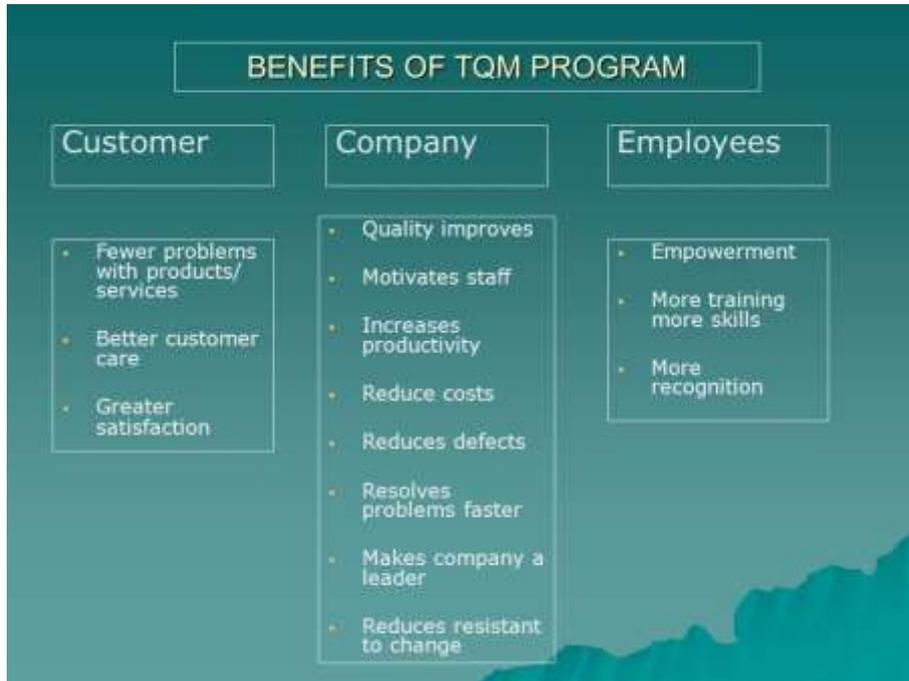

Fig 2: The Benefits of TQM Program

Other benefits of successful TQM implementation include but not limited to the following:

- Customer satisfaction and retention
- Scrap, defect, and waste reduction
- Cost reduction
- Improved staff morale and productivity
- Enhanced process efficiency and profitability
- Extension of products range
- Competitive advantage
- Boost in innovations
- Enhanced throughput

4. Challenges of TQM Implementation

Although there are numerous benefits of TQM implementation, visits to manufacturing companies that have introduced the manufacturing concept reveal high TQM failure rate which could be attributed to many factors. According to Kosgei (2014) [6], some of the challenges of TQM implementation include: lack of commitment by the top management and some workforce, organizational culture, ineffective communication between the departments, lack of training of staff members and poor documentation.

Management Commitment and Support

Lack of or inadequate top management commitment and support adversely affects successful TQM implementation, as it is the major cause of its failures in manufacturing companies. This is because the involvement and participation of a company's leadership in the improvement process is strategic to its success. According to Suleman and Gul (2015) [13], effective management is an important and indispensible factor for the successful implementation of TQM, as the commitment of top management assists the workforce to adopt a clear direction of functioning and working.

Experience has shown that workers are often resistant to change and also reluctant to adopt TQM at the onset, hence production firms that commence and maintain the commitment of its management will achieve very dramatic successes, as they can engage their workforce throughout and after the implementation stage in order to prove that TQM is not a ruse, but a set of on-going continuous improvement processes that will re-position an entire firm's value chain.

Organizational Culture

Organizational culture can be defined as the dominant beliefs of many people in a company which dictates the firm's approach to business, as well as their relationship to others. The implementation of TQM requires enormous changes both in terms of physical structures and working conditions. However, as human nature resists change, the employees overall performance are often hindered as a result of emotional resistance.

Also rational resistance most times inhibit the workers to perform at their optimum best which often results when they are not properly trained on the manufacturing approach. This is usually noticed in organisations whose entrenched culture is centred on mass production as the workers find it very difficult to understand the rationale behind the quality management.

Gherbal *et al*. (2012), noted that within the TQM culture, a co-operative and open culture has to be created by a firm's management in which all the employees have to be made to feel that all of them are responsible for satisfying the

organisation's customers. They noted that workers are going to feel and consider this only if they are involved in the development of the vision, plans and strategies of the organisation, as it is crucial for the organisation to achieve a successful implementation of TQM to encourage the employees to participate in all these activities. They pointed out that workers are unlikely to behave in an acceptable responsible way in the case where they see the management behaving irresponsibly and saying something or acting in opposition of it.

Ineffective Communication

It is very important to ensure that the entire staff of a manufacturing company understand the policies and concept of TQM, this will enable them to maintain accurate documentation and effective communication, in order to monitor and appraise the firm's performance. Effective communication and excellent feedback system are quite essential in providing the required information to the company leadership in order to adopt the required changes.
Direct communication between the employees has been advocated for the successful TQM implementation, as it leads to fear reduction and also binds the bricks of the quality improvement process.

Other Challenges

The other challenges of TQM implementation according to Ahmed and Hassan (2003) [1], include the following: the inability of industries to have a good quality conception; lack of clear vision, mission and concrete quality policy for the manufacturing companies; the companies' managements inability to comprehend the modern quality concept as well as their obligations; lack of proper observation, care and control of quality of industrial practices; inadequate implementation time and enabling resources; firms' preferment of short term to long term goals; complication of the process of achieving TQM that involves all staff; and inadequate time to change company's culture.

5. Conclusion

Due to its numerous benefits, TQM has within the past years evolved into a comprehensive quality improvement model that has made positive impacts in all aspects of manufacturing. For a maximum impact, manufacturing companies must ensure quality improvement commitment from the entire staff, exceed the expectations of the customer rather than merely meeting up with their needs, and also institute continuous improvement processes in all procedures, strategies, and manufacturing activities.

6. References

1. Ahmed S, Hassan M. Survey and Case Investigations on Application of Quality Management Tools and Techniques in SMIs", International Journal of Quality and Reliability Management. 2003; 20:7.
2. Bernal J. The 8 Elements of TQM" [Online]. Accessed on 2012-2019, from http://www.authorstream.com/Presentation/eito-649327-the-8-elements-of-tqm-1216606359668603/
3. Chand S. Ten Elements of Total Quality Management Explained [Online]. Accessed on 2017-2019, from http://www.yourarticlelibrary.com/total-quality-management/10-elements-of-total-quality-management-explained/26182
4. Dasari R. Elementsof TQM" [Online].]. Accessed on 2015-2019, from https://www.slideshare.net/Ravi Dasari09/elements-of-tqm
5. Ghebal N, Shibani A, Saidani M, Sagoo A. Critical Success Factors of Implementing Total Quality Management in Libyan Organisations" Proceedings of the 2012 International Conference on Industrial Engineering and Operations Management, Istanbul, Turkey, 2012.
6. Kosgei J. Challenges Facing the Implementation of Total Quality Management in Secondary Schools: A Case of Eldoret East District, Kenya" Global Journal of Human Resource Management. 2014; 3:1.
7. Mitreva E, Nikolov E, Nikolova B. Application of Total Quality Management (TQM) in the Macedonian Railways Transport in the Republic of Macedonia" Journal of Quality Management. 2016; 17:151.
8. Napierala B. Five Important Factors in Total Quality Management [Online]. Accessed on 28 March 2019, from, 2012, http://aboutthree.com/blog/five-important-factors-in-total-quality-management/
9. Nayab N. Looking at the Benefits of TQM" [Online]. Accessed on 2011-2019, from https://www.brighthubpm.com/monitoring-projects/70318-looking-at-the-benefits-of-tqm/
10. Ngwenya B, Sibanda V, Matunzeni T. Challenges and Benefits of Total Quality Management (TQM) Implementation in Manufacturing Companies: A Case Study of Delta Beverages, in Zimbabwe International Journal of Original Research. 2016; 2:6.
11. Padhi N. The Eight Elements of TQM" [Online]. Accessed on, 2015-2019, from https://www.isixsigma.com/methodology/total-quality-management-tqm/eight-elements-tqm/
12. Shmula. Understanding the Most Important Elements of Total Quality Management (TQM)" [Online]. Accessed on 2015-2019, from http://www.shmula.com/understanding-the-most-important-elements-of-total-quality-management-tqm/22125/
13. Suleman Q, Gul R. Challenges to Successful Total Quality Managemet Implementation in Public Secondary Schools: A Case Study of Kohat District, Pakistan" Journal of Education and Practice. 6. No.15