NOVATEUR PUBLICATIONS
INTERNATIONAL JOURNAL OF INNOVATIONS IN ENGINEERING RESEARCH AND TECHNOLOGY
[IJIERT] ISSN: 2394-3696 Website: ijiert.org
VOLUME 10, ISSUE 7, July -2023

TOTAL QUALITY MANAGEMENT IN MECHANICAL INDUSTRY

Sibete Godfrey Ayeabu[1],
Waratimi Emomotimi Obonika[2],
Worgu Fortune Osaruchi[3].
[1]Department of Mechanical Engineering, Niger Delta University, Wilberforce Island, Bayelsa state, Nigeria.
[2]Nigerian Maritime Administration and Safety Agency Office: NIMASA CENTRAL ZONAL OFFICE, Warri, Delta State, Nigeria.
[3]Department of Mechanical Engineering, Rivers State University, Rivers States, Nigeria.
Corresponding Author: Sibete Godfrey Ayeabu

Abstract
Total Quality Management is a management idea and organization's operations aimed at harnessing human and material resources of the firm in the best effective way to actualize the goals of the company. It enlightened the origin and content of TQM approaches to TQM, areas /elements of Total Quality Management. The paper also encapsulates the importance of TQM in the Mechanical Industry. Thus, it is concluded that TQM includes ten core values and ideas critical to formulate organization's vision of quality top management support, planning and organizing of the effort and careful accomplishment and regulation of the process. The researchers therefore recommended that the primary focus of all TQM strategy satisfy the customer's needs at least and match their expectations as well as continuous improvement, quick response, public responsibility etc.

Keywords: Quality, Management, Quality management, TQM, Continuous improvement.

Introduction

Total Quality Management is the act of applying qualitative and quantitative techniques and human resources management to improve all procedures within an organization so as to surpass customer wants for the present and the future. The purpose of TQM is to give out quality product to customers, that will in turn, maximize productivity and reduce cost (Baster field et al, 2003).

Conceptually, TQM is an idea and series of guiding rules that depicts the basis of an uninterrupted improvement of the organization. As the name implies, the emphasis of TQM is to define what constitutes quality in an organization's functions and activities. Focusing on quality is considered a way of gaining competitive advantage, hence the advocates of TQM argued that if quality is improved, cost will drop and organization will respond more quickly and effectively to customer requests.

Thus, TQM should be planned, time quantified and executed and all personnel in the organization need to be involved. Other experts believe that TQM is a customer focused performance enhancing tool which can be applied to any type of organization. It balances the diverse elements of business enterprise through leadership, strategic planning; financial management, management information system, human resources development, work process management and marketing by aligning them to achieve results. TQM can be summed up as "do the right things right at the first time and always.

By British Standard (BS 4788) TQM is a management idea and firm's operation that focuses to support the human and material resources of the firm in the best efficient way to accomplish the goals of the firm. In total Quality Management Programme, voluntary participation of work people is sought for the quality of

the task. In a total quality management concept, the world quality has under meaning, it means quality of output of every department and by every employee of every organization.

Conceptual Background

The study principally aimed at discovering the facts and various conceptualizations of various writers, authors and the scholars about Total Quality Management in production organizations. MacDonald (2002) sees Total Quality Management as a process, used to manage the change in environment that will ensure that company reaches the goal of total continuous improvement. Aswathappa (2003) sees Total Quality Management as a process whereby managers seek to improve the total quality of their products because customers usually prefer a product of higher quality to a lower quality, higher quality product in seven tools as useful in the identification of problem and establishment of measures for improvement, these tools are scatter diagram, check sheet, graph and charts, histograms, control chart, pareto diagram.

Ravishakar (2005) sees Total Quality Management as a management path to organization as a complete commitment to quality in all spheres of the organization. According to him, TQM is centred on quality based upon involving every member and targets at a long-term victory through customer satisfaction and benefits to the members of organization and society. Gareth Jones (2005) also posited Total Quality Management as a management technique that focuses on quality improvement of an organization products and services and emphases that all of an organizations functional operation should be focused towards this goal. A total quality oriented organization must have at least the following principal objectives as stated clearly by Sharma (2003) including customer focus-customer delight, continuous improvement as a culture of the organization, which must be the way of life, focused, continuous and relentless cost reduction, to create all organization whereby everyone is working towards making their organization the best in its business and to capitalize on the sense of achievement and working in a world class organization.

Origin and Content of Total Quality Management

TQM has its beginning from Japanese and American Organizations. Joseph Juran, Edward Dening. To be precise it was inspired by a small group of quality experts, the most prominent among an American name W. Edwards Dening. It was in 1950, Dening went to Japan and advised many top Japanese. Philip Crusby and Kaonu Ishikawa are associated with the development of the concepts of TQM. The Japanese firms used the idea of TQM to sell goods and services to Europe and America at lesser prices than the European and American goods and services.

Total Quality Management is a people oriented management that aims at continuous increases in the customer service of continuous lower real costs. These are three ways in which this is typically done. One way is by finding output what customers really want and designing goods and services to meet these needs. A second way is by learning how to provide this output as efficiently as possible by eliminating both time and cost. A third way is by continuing to improve the process by looking for improvements.

The content of Total Quality Management includes ten core importance and ideas (a) customer driven quality (b) leadership (c) continuous improvement (d) Full participation (e) rapid response (f) Prevention, not detection (g) long-range outlook (h) management by fact (i) partnership development and (j) public responsibility. Other steps that are critical to TQM include formation of organization's vision of quality, top management support, planning and organizing of the effort and careful accomplishment and regulation of the process.

Principles of Total Quality Management in Manufacturing (Mechanical Industries)

The concept "Total Quality Management" became popular in Nigerian business Lexicon in the 1990 but it may not be surprising to know the principles which are not new. Managers on how to improve their production effectively and efficiently as Dening developed a fourteen (14) points programme which are popularly called principles for transforming organizations including mechanical industries. They are as follows:

1) Plan for the long-term future, not for the next month or next year.
2) Do not ever be unconcerned with the quality of your product
3) Create statistical regulation upon your processes of production and expect your suppliers to do well.
4) Handle the smallest number of suppliers, the best ones of course.
5) Investigate if your problems are restricted to particular parts of production process or stem from overall process.
6) Train workers for job that you are asking them to perform.
7) Raise your line of supervisor quality.
8) Drive out fear
9) Urge the departments to closely work together instead of focus on departmental or divisional distinctions,
10) Require your workers to do quality work; not just to be at their station from 9:00am to 5:00pm
11) Train your employees to understand statistical methods
12) Train your employees in new skills as the need arises
13) Take routine checks on the production processes at regular intervals
14) Make top managers responsible for implementing these principles.

While the programme was designed primarily for manufacturing enterprises, (ie companies). It is clear that its success has created opportunities for benchmarking for public sector.

Approaches To and Gains of Total Quality Management.

Approaches to TQM varies from one organization to another. Approaches include.

* Find out what customers want
* Design a product that will meet (or exceed) what customers want.
* Propose a production process which makes easy the technique of performing the job accurately the first time
* Keep record of results and use these to guide improvements in the system. Do not stop making effort to improve.
* Advance these ideas to suppliers and distribution

While the gains of Total Quality Management include:

* **Effectiveness:** the goal of TQM system is to improve the effectiveness of the organization in achieving targets and to continuously improve the quality of production and client satisfaction.
* **Efficiency:** The TQM makes sure that high efficiency is achieved by upgrading the quality the of resources, training inputs and outputs without maximizing capital volume.

* **Quality chains:** Each member of staff is part of quality chain ie – supplier of products /services to customers. One unit of a firm is an input (raw materials) to another unit. Thus, every staff in the quality chains should know his/her customer and supplier and expectations.
* **Quality costs**: These costs are indication of success if they are low. Poor quality costs money.

Implementing Total Quality Management in Mechanical Industries

The enforcement of TQM requires the following:

a) **Top management commitment:** TQM is a strategic planning principle of improving and maintaining a strategic apt between the firm and its varying market opportunities. The top management's commitment to the principles and implementation of TQM determining its success.

The attainment of goals of TQM depends on the vision of leaders (top management). The way that top management leads is essential in helping other staff become motivated and productive towards quality improvement. Thus, top management must be committed to TQM and must be prepared to lead it.

(b) **Need for change**- any quality product or service can be improved upon. Thus, it is better to target at perfection and miss than to target at imperfection and hit. The need for a change in quality of productions is due also to high cost of production, absence of quality orientation, customer dissatisfaction, low productivity.

(c) Staff Motivation: Quality improvement demand extra commitment of all employees in organizations. Their duties and responsibilities are enriched and enhanced. To actuate and encourage additional commitments, staff should be motivated through various procedures: incentive payment, recognition, letter of commendation, promotion, training/retraining to enhance performance.

Relevance of TQM In The Mechanical Industry

The industry entails the exploitation, exploration, technology (innovation and creativity) production, transportation, distribution and marketing of mechanical products. The products designs are relatively stable over time and thus they are produced into inventories.

Two important elements of TQM are very crucial to the activities of mechanical industry include:

* Concepts of TQM including tools techniques, system standards and procedures
* Culture of TQM which are created from leadership, facilitation, teamwork get setting etc.

The concepts will only work effectively and efficiently when the culture is right. To achieve TQM a structured process in the mechanical industry is used to ensure that all associated activities are correctly performed and come right to that the output (Mechanical Products) meet the customers' requirements first time every time.

Conclusion

Total Quality Management (TQM) programme is the strategy usually placed on work simplification and codification which is intended to create a simple work flow that carefully specifies work activities. TQM

programmes, therefore typically go with quality information and training for employees in addition to the chance they have to monitor quality of their work.

TQM includes ten core values and ideas critical to formulate organization's vision of quality top management support, planning and organizing of the effort and careful accomplishment and regulation of the process. TQM constitutes quality in mechanical's functions and activities. Focusing on quality is considered a way of gaining competitive advantage, hence the advocates of TQM contend that it is a quality improvement strategy in all manufacturing industries that will respond more quickly and effectively to customer's request. Great emphasis is placed on including customers' reactions perceived as the most appropriate degree of quality.

Recommendations

Striving for continuous total quality management in mechanical industry, then the following recommendations are proffered as solutions including;

* A well structured process in mechanical industries that TQM strategy should satisfy the customers' needs at least match their expectations as well as continuous improvement, quick response, public responsibility.
* That the top management should ensure that all associated activities in mechanical industries are correctly performed and come right so that output (mechanical outputs) meet the customer's requirement first time every time.
* The mechanical industries management should always ensure that money, time, and energy are not expended on correcting errors, scrapping output or reworks for maintaining quality improvement at alltime, right on products produced.
* Organizations that achieve excellence using TQM continuously strive for product/service improvement to obtain quality excellence as core value for industrial operations.
* Manufacturing organizations should establish a culture of TQM ie the need for continuity in quality improvement, quality improvement should be proactive and not reactive management.
* Finally, the management of such mechanical industries should know that there is a need the produce consumers requires in terms of quality improvement is indictable

Acknowledgments

I give all the glory to the Almighty God, who has been my strength throughout the research work. My special thanks go to Prof J.I Achebo, for his encouragement, and efforts towards the success of this study. I also want to thank Prof J.O Osarenmwinda and Prof F.F.O Orumwense for their support. Finally, I thank my beloved wife Mrs Braiye Sibete and my lovely children Master Peres Sibete, Miss Doye Sibete, Master Ebisele Sibete, Master Layefa Sibete and my mother Mrs Maria Sibete. May the good lord bless you all in Jesus name Amen.

References

1. Aswathappa, K. (2003) Organizational Behaviour (3rd ed.) New Delhi-Himalaya Publishing House.
2. Besterfield, D.H, Besterfield, C, Besterfield, G.H,
3. Besterfield, S. (2003) Total Quality Management, Delhi, Saurabh
4. BS4778, Quality Vocabulary, Part 1, 1987 British Terms (ISO 8402-1986 British Standard Institution, London.

5. Crosby, P.B (1979) Quality is free, New York: McGraw. Hill Ltd.
6. Egboh, S.H. O (2009) Entrepreneurship Development for Employment and Wealth Generation-Career opportunities / investment opportunities, Agbo: Ehis Print.
7. Gareth, R. Jones (2005) Contemporary Management (2nd ed.), USA: McGraw Hill Ltd.
8. Juran, J.M (1974) Quality control handbook, New York: McGraw Hill Ltd.
9. Ravi Sharkar (2005) Industrial Management (5th ed.) New Delhi-Galgotia Publications Press Ltd.
10. Sharma, S. C (2003) Materials Management (3rd ed.) New Delhi: Khara Publishers.