International Journal of Engineering Research and Modern Education (IJERME)
Impact Factor: 7.018, ISSN (Online): 2455 - 4200
(www.rdmodernresearch.com) Volume 8, Issue 2, 2023

REVIEW OF DMAIC, SIX SIGMA, TQM AND COMPANY CULTURE

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Cite This Article: Rahul Kumar & Vineet Kumar, "Review of DMAIC, Six Sigma, TQM and Company Culture", International Journal of Engineering Research and Modern Education, Volume 8, Issue 2, July - December, Page Number 28-32, 2023.

Abstract:

The abstract provides an overview of the review focused on "DMAIC, Six Sigma, TQM, and Company Culture," offering insights into the collective impact of these methodologies and cultural factors on organizational quality and performance. The abstract highlights the interconnectedness of DMAIC, Six Sigma, and TQM in providing structured approaches to problem-solving, process optimization, and quality enhancement. Additionally, it underscores the role of company culture in shaping employee engagement, innovation, and the successful implementation of these methodologies. However, the abstract lacks specific details about the methodologies used for the review and the key findings derived from the analysis. Including a concise summary of the major findings and their implications would provide readers with a clearer understanding of the review's contributions to the understanding of how these elements intersect to drive organizational excellence.

Introduction:

The introduction of the review "DMAIC, Six Sigma, TQM, and Company Culture" lays the foundation for exploring the synergistic relationship between these methodologies and organizational culture in the pursuit of enhanced quality and performance. The introduction begins by emphasizing the contemporary business landscape's demand for continuous improvement and operational excellence. It highlights the significance of methodologies such as DMAIC, Six Sigma, and TQM in addressing process inefficiencies, minimizing defects, and optimizing operational processes.the introduction recognizes the critical role that organizational culture plays in shaping employee attitudes, behaviors, and the overall work environment. It emphasizes the influence of culture on employee engagement, innovation, and the successful adoption of process improvement methodologies. The introduction also identifies a research gap in the literature regarding the integrated impact of these methodologies and company culture.the introduction sets the stage for an in-depth exploration of how DMAIC, Six Sigma, TQM, and company culture interact to foster a holistic approach to organizational enhancement. It underscores the study's significance in contributing to a more comprehensive understanding of how these interconnected elements collectively drive quality and performance improvements.

Literature Surveyed:

Md. EnamulKabir (2022) Examine and research the procedures employed by the firm in question to determine how many sigmas the company now has, and then enhance the company's sigma level through productivity growth. In accordance with the objectives, the contemporary sigma level was computed and suggestions for improvement were provided. This was accomplished through the usage of a six-sigma DMAIC cycle. Many particular tools, such as 5s, grocery store lines, and line balancing tools, are utilised in the "enhance" phase of the DMAIC cycle. These have been utilised to enhance productiveness by reducing the number of errors produced. This work was completed by a fan-making company to demonstrate how Six-sigma may be used to enhance productivity and quality. This document isn't solely created by people who work for fan companies. It is also authored by people who work for any type of business. Six-sigma can help you discover a fair balance between cost, quality, manufacturing time, and control time. [13]

Deepak Mittal and Kiran Bala (2021) TQM was introduced to me (TQM). We also investigated how TQM practises in manufacturing organisations affected a variety of parameters. There are numerous vital parameters that must be met for TQM to work properly in the literature. Based on these factors, a questionnaire containing a variety of different types of questions, variable questions, and rating questions is created. A business choice is utilised depending on variables such as client focus, ongoing development, working as a team and as a group, top management's dedication and reputation, work and development, business communication, measurement, and feedback, among others. The industries that manufacture them are issued a total of 40 questionnaires. After that, respondents from relevant industries were requested to complete new questionnaires, and usable data was saved. The data is then examined using the MINITAB tool to determine how the factors have an impact. [14]

Vikas Tayal (2020) Use the DMAIC technique (define, measure, analyse, improve, and control). The DMAIC technique was utilised to control the injection moulding reduction parameters, reducing defects (Blush, Burn, cold flows, cold slugs, contamination, peeling, and gloss) as well as the time and money required to create

the components. This method could be quite beneficial for it to adopt in order to improve its procedures, goods, and services. This technique is used to keep the amount of defects in the company under control at all times in order to improve the company's products and services. [15]

Mohit Chhikara (2017) Up to this point in the study, a literature evaluation of prior work on the topic of Six Sigma Implementation by various writers was provided. Based on this work, more research in this sector might be conducted with the goal of building effective research procedures to satisfy the objectives I set for my research. [1]

Rajat Ajmera and Valase K.G. (2017) Examine how the six sigma DMAIC technique can be used to eliminate defects in the textile sector. This scientific technique for defect reduction consists of five steps: define, measure, analyse, improve, and control. In this procedure, the DMAIC technique is applied. At various levels, special six sigma equipment was deployed. A Pareto analysis was utilised to determine which types of defects were common and which were uncommon. To determine what caused the defects, cause and effect analysis was employed. Finally, a few effective approaches to dealing with those causes are suggested. The eventual result of implementing the solutions is enormous. Improvements in strategy quality result in cost savings as well as better service. The Sigma stage has been raised from 2.9 to 3.2 as the defect rate has lowered from 7.4 to 5.08 percent. [2]

Jitendra A Panchiwala (2015) Carry out the research that was done with the try of various researchers and a work to discover a technical solution to many casting faults and to improve the entire casting processThis study provides an overview of the research "Quality and Productivity Improvement in Small Scale Foundry Industry." The research focuses on ways to increase the quality and productivity of tiny foundries, which are critical in many sectors. The abstract describes the study's objectives, methodologies, and potential outcomes. [3]

C. Manohar and A. Balakrishna (2015) In the manufacturing business, fault analysis is used to improve quality and productivity. In a wheel manufacturing facility, it shows how to use the DMAIC process, which stands for "define-degree-analyze-improve-manipulate." To optimize the operation variables, increase and keep performance, such as process yield, this strategy is utilised with well-completed control plans to become aware of, quantify, and remove assets of variant in an operational system in question. [4]

Ghazi Abu Taher& Md. Jahangir Alam (2014) Shows how to increase the quality and productivity of a manufacturing line in a manufacturing business. The goal is to discover out what's going on in the company and come up with a better solution to improve the manufacturing line's performance. A variety of commercial engineering techniques and tools are employed in this investigation in order to identify and resolve the technique that occurs in production. However, the primary tools required to complete this task are seven excellent control tools. Records for the chosen assembly line manufacturing plant are obtained, reviewed, and analysed. Here's how it works: This step's primary goal will be to target illnesses that occur far more frequently than other ailments. The fault can be investigated for a variety of reasons, and there may be numerous solutions. A high-quality repair method might be chosen and recommended to the company. The corporation might then examine at earlier results or production. There are many factors that influence whether or not a corporation will adopt these problem-solving approaches. [5]

Darshan D. Patel (2014) The concept of "Productivity Improvement through Six Sigma and TQM in Manufacturing" highlights the integration of two powerful approaches, Six Sigma and Total Quality Management (TQM), to increase operational efficiency and product quality in the manufacturing industry. Manufacturing industries expect to achieve considerable gains by successfully combining Six Sigma's data-driven strategy with TQM's all-encompassing quality-centric principles. The comprehensive examination of processes to identify inefficiencies, flaws, and variances is part of the Six Sigma and TQM integration in manufacturing. Businesses can utilize Six Sigma's DMAIC (Define, [6]

S. Chandra (2014) According to the study's author, one of the most significant aspects for the effective adoption of Total Quality Management in a firm is continuous improvement. Continuous improvement entails the utilisation of people and a systematic approach to issue solving with exceptional products and services, as well as the systems that produce them. There are numerous approaches and procedures that can be employed to examine troubles in a systematic manner and arrive at a solution. This article discusses the low yield / high level of rejection in the Glass Neck (a portion of a picture Tube used in TV enterprises) forming process and how to improve output yield through systematic human group involvement and the Six-Sigma method. [7]

Pramod A. Deshmukh & A. B. Humbe (2014) The tool changing process at the grinding wheel station has been accelerated. Metrics were a significant assistance in this usage because they helped a lot. Why? Analysis and methods for determining the underlying cause of an analysis As a result of this work, many more people should be using Six Sigma. Tulja Engineering in Aurangabad, a medium-sized industrial plant in the city, is responsible for the work. [8]

S. Arun Vijay (2014) His research goal was to use the Six Sigma DMAIC approach to reduce the time it takes for patients to be discharged from a multifunctional hospital in India. He has worked all five levels of this version's Six Sigma DMAIC way. Some of the most cutting-edge tools and techniques were made use of by

him. The goal of this research was to find ways to reduce the amount of time it takes to get people out of the hospital. The time it takes to get patients out of the hospital was cut by 61% after the trial. [9]

Mohit Taneja, Arpan Manchanda (2013) Six sigma tools can be used to make the manufacturing business more productive. In his piece, he gives an overview of Six Sigma and then does a thorough study on how it works in small and medium-sized businesses as well as how it can be used in big industries. He has also done a study on the different sorts of Six Sigma quality tools that businesses use. Some examples are process capability analysis, Fishbone Diagrams, and two-pattern t-tests. [10]

Hemendra Nath Roy (2013) Has executed out efforts to disseminate the Six-Sigma philosophy throughout Bangladesh, particularly in the manufacturing sector. The major purpose of this paper is to demonstrate how this strategy may be applied in our enterprises to improve productivity and quality. Sigma level is computed as part of the framework, and aspects directly related to the method are considered below the computation. Of course, every step of the manufacturing procedure is scrutinised at the same time. We sought to optimise the entire manufacturing system by using and enforcing Six-Sigma tools. A fan-making company has relocated to our research facility, where it can be examined and used. DMAIC is a technical instrument for creating the procedure in great detail. Finally, as part of the DMAIC process, the traditional format was executed to a balanced format model, which resulted in significant improvements. [11]

Faisal Talib (2013) investigated the concept of TQM and how it could be applied in a service system. There's also a look at the literature on TQM in service agencies and why it didn't succeed. Finally, the study provides powerful implementation on how to successfully adopt TQM in service agencie. This work provides a thorough introduction to the main ideas and principles of Total Quality Management (TQM) as they apply to service organizations. TQM's emphasis on customer satisfaction, continuous improvement, and staff participation are highlighted in the overview. [12]

TQM - Background, Definitions and Ingredients:

Total Quality Management (TQM) originated as a response to the quality challenges faced by industries, particularly manufacturing, in the aftermath of World War II. It gained prominence through the efforts of quality pioneers like W. Edwards Deming, Joseph Juran, and Armand Feigenbaum, who advocated for a systematic approach to achieving superior quality. TQM's roots can be traced back to the mid-20th century, but its principles have since transcended industries and borders.

TQM is characterized by its core principles that guide its implementation. At its heart lies an unwavering dedication to customer satisfaction. TQM emphasizes the need to deeply understand and meet customer needs and expectations, driving organizations to prioritize their clientele. Furthermore, TQM embodies the philosophy of continuous improvement, encapsulated by the PDCA cycle (Plan-Do-Check-Act). This iterative cycle encourages organizations to plan improvements, implement them, assess their impact, and adjust strategies accordingly.

Employee involvement is another critical component of TQM. TQM-enabled organizations allow their employees to actively participate in decision-making processes and offer their thoughts. As a result of this involvement, the workforce develops a sense of ownership and dedication, which leads to creative solutions. TQM is also known for its data-driven approach, which involves making decisions based on facts and analysis rather than educated guesses. Organizations can identify patterns, areas for improvement, and potential bottlenecks by gathering, analyzing, and deciphering the data.

TQM underscores the significance of fostering strong relationships with suppliers, recognizing the integral role they play in the overall quality of products and services. Collaborative partnerships with suppliers enable a seamless flow of quality materials, contributing to the organization's overall success. Lastly, TQM relies on effective leadership that champions its principles and ensures their integration throughout the organization. When leadership is committed to TQM, it creates a culture that encourages continuous learning, improvement, and the pursuit of excellence.

Problem Statement:

In the dynamic landscape of manufacturing, the pursuit of heightened quality and performance stands as a constant challenge. This challenge is compounded by the intricate interplay of numerous factors, ranging from process intricacies to the prevailing company culture. The integration of methodologies like DMAIC (Define, Measure, Analyze, Improve, Control), Six Sigma, and Total Quality Management (TQM) offers a promising avenue for tackling this challenge. These approaches emphasize data-driven decision-making, process optimization, defect reduction, and continuous improvement. However, their effectiveness is often contingent on the alignment with the company's cultural fabric.

The culture of a company serves as the underlying foundation that either supports or obstructs the successful implementation of quality improvement techniques. A culture rooted in openness to change, employee empowerment, and a commitment to excellence can significantly increase the impact of approaches such as DMAIC, Six Sigma, and TQM. A culture that is resistant to change, on the other hand, may stifle progress and render these tactics ineffective.

TQM - Principal:

At its core, TQM is characterized by several key principles:

- Customer Focus: TQM places the customer at the center of all activities. Organizations identify and meet customer needs and expectations, striving to deliver products and services that consistently exceed these requirements.

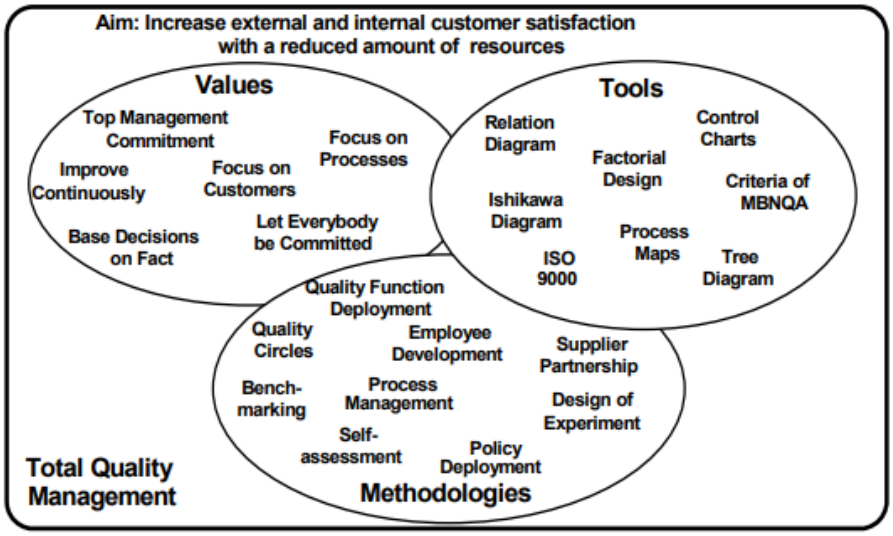

Figure 1: Total Quality Management (TQM)

- Continuous Improvement: Also known as Kaizen, this principle advocates for the ongoing enhancement of processes, products, and services. TQM encourages organizations to adopt a systematic approach to identifying and rectifying inefficiencies and defects.
- Employee Involvement: TQM recognizes employees as valuable assets in the pursuit of quality. Employee involvement is essential for generating innovative ideas, problem-solving, and implementing improvements at all levels of the organization.
- Process-Centric Approach: TQM highlights the need of having well-defined processes that are controlled, measured, and improved to ensure consistent quality outputs. This principle emphasizes fault prevention rather than just problem resolution.
- Data-Driven Decision Making: TQM promotes the use of data and statistical analysis to inform decision-making processes. Data provides insights into process performance, allowing decisions for continuing improvement to be made based on correct information.
- Supplier Relationships: It is critical to create partnerships with suppliers to ensure that the materials and parts utilized in the organization's processes are of good quality. TQM emphasizes working closely with suppliers to ensure that quality standards are met throughout the supply chain.
- Leadership Commitment: TQM implementation is dependent on good leadership. Leaders set the tone by demonstrating their concern for quality, providing the necessary tools, and promoting a culture of continuous improvement.

Conclusion:

The review underscores the interplay between DMAIC, Six Sigma, TQM, and company culture in shaping organizational excellence. The collective impact of these methodologies, when synergistically applied, amplifies quality improvements and operational efficiencies. A strong company culture enhances employee engagement, facilitating the successful adoption of these methodologies. The review acknowledges the need for further empirical studies to validate the proposed connections and outcomes. Emphasizing the symbiotic relationship between structured methodologies and a conducive culture, the review highlights the potential for organizations to achieve sustained quality enhancement and superior performance by harnessing the combined power of DMAIC, Six Sigma, TQM, and an enriched company culture. The insights presented underscore the significance of holistic approaches in modern organizational management.

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