

Factors determining total quality management in the manufacturing industries: An empirical study

BIJAYA LAXMI THAPLIYAL

Department of Commerce, Graphic Era Hill University,
Dehradun, Uttarakhand, India 248002

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Abstract:

Total quality management (TQM) is a critical component of the manufacturing industry that aims to provide the highest level of customer satisfaction by continuously improving all processes. The goal of this paper is to identify the critical factors influencing TQM implementation in manufacturing industries. A literature review of various research papers, journals, and books on TQM in manufacturing industries was conducted as part of the study. According to the research findings, various factors such as “leadership commitment, employee involvement, customer focus, continuous improvement, and supplier involvement” influence TQM implementation in manufacturing industries. The study also revealed that the effective integration of these factors into the manufacturing process is critical to the success of TQM implementation. Furthermore, the research findings suggest that implementing TQM can result in a variety of benefits for manufacturing industries, such as increased customer satisfaction, improved product quality, and higher profitability. However, several obstacles, such as resistance to change, a lack of resources, and insufficient training, may impede TQM implementation in manufacturing industries. To summarize, implementing TQM in manufacturing industries necessitates a thorough understanding of the critical success factors. Manufacturing industries can achieve continuous improvement in all processes and provide high-quality products and services by addressing challenges and effectively integrating critical factors.

Keywords: Total Quality Management, Organization, Business, Manufacturing Industries, Employee

Introduction:

“Total quality management (TQM) is a management philosophy that emphasizes meeting customer requirements and continuously improving business processes”. Due to increased competition and the need to provide high-quality products that meet customers' expectations, it has become an essential component of modern manufacturing industries. The success of TQM implementation in manufacturing industries is dependent on a number of factors that impact overall product and service quality.

The “*leadership style of top management*” is one of the critical factors determining the success of TQM in manufacturing industries. Leaders are critical in promoting TQM principles, setting goals, and creating a quality culture. They are in charge of providing employees with the necessary resources, training, and support, as well as creating an environment that encourages continuous improvement.

Another factor influencing TQM implementation is “*workforce quality*”. Employees are the driving force behind TQM, and their dedication to quality is critical to success. TQM implementation is more likely to be successful in organizations that value their employees and invest in their development and training.

Another critical factor in TQM implementation is the “*use of technology*”. Manufacturing industries rely on advanced technology to improve product and service quality, reduce waste, and increase efficiency. Adoption of technology can aid in the automation of processes, the elimination of errors, and the provision of real-time feedback, all of which can aid in continuous improvement.

“*Supplier relationships*” are also important in TQM implementation. Manufacturers rely on suppliers for raw materials, parts, and components, and the quality of these components can have a direct impact on the final product's quality. Building strong supplier relationships and collaborating with them can thus help ensure that the supply chain is robust and product quality is consistent.

Finally, “*data and metrics*” are critical in TQM implementation. Data-driven decisions can be made by organizations that collect and analyze data on their processes, products, and services. Metrics can help track progress and ensure that quality standards are met on a consistent basis.

To summarize, the success of TQM implementation in manufacturing industries is dependent on a variety of factors, “including leadership style, employee quality, technology, supplier relationships, and data and metrics used”. A comprehensive approach that takes into account all of these factors can assist organizations in meeting their quality goals and gaining a competitive advantage in the marketplace.

Literature Review:

“Total quality management (TQM) is widely acknowledged as a critical business practice in the manufacturing industry”. Many researchers have investigated the factors that influence TQM implementation success in manufacturing industries.

According to **Yusuf et al. (2007)**, leadership is critical in TQM implementation. Effective leadership is critical in fostering a culture of continuous improvement, establishing a vision for the organization, and motivating employees to embrace TQM. Similarly, Ho et al. (2011) discovered that top management support is critical for successful TQM implementation. This assistance provides a clear path for TQM implementation and encourages employees to embrace the change.

Employee involvement is also essential in TQM implementation. Employee participation, according to **Dervitsiotis (1994)**, is critical for continuous improvement and innovation in manufacturing industries. Employee participation in TQM implementation can be achieved through training, empowerment, and decision-making processes.

Another critical factor is the incorporation of TQM into an organization's culture and processes. TQM implementation is more successful, according to **Ahmed et al. (2006)**, when it is integrated into the organization's culture and processes. This integration necessitates the establishment of a quality culture that promotes continuous improvement, communication, and collaboration.

Another important aspect of TQM implementation is continuous improvement. According to **Ahmad et al. (2011)**, continuous improvement is the foundation of TQM and entails identifying and eliminating waste, defects, and inefficiencies. Continuous improvement necessitates the use of quality tools and techniques such as statistical process control, total productive maintenance, and lean manufacturing.

TQM implementation also requires high-quality data and analysis. Quality data and analysis, according to **Shuaib and Alshawhi (2014)**, provide a foundation for decision-making and improvement. Data of high quality should be accurate, dependable, and timely, and it should be analyzed using appropriate statistical techniques.

Deming (1986) identified several critical factors that contribute to TQM implementation success, including top management commitment, employee involvement, continuous improvement, and customer focus. TQM implementation, according to Deming, necessitates a long-term commitment from top management as well as a focus on continuous improvement through employee involvement and customer feedback.

Leadership commitment is one of the most important factors determining TQM success. Top management support for TQM, according to **Jha and Shankar (2013)**, is critical for its successful implementation. Similarly, **Al-Swidi and Mahmood (2012)** discovered that the most significant barrier to implementing TQM in the manufacturing industry was a lack of top management support.

Juran (1992) also emphasized the significance of employee participation in TQM implementation. He suggested that TQM implementation necessitates a cultural shift within the organization in which employees are empowered to take ownership of their work and contribute to the process of continuous improvement. Additionally, according to **Rahman et al. (2014)**, employee participation and involvement are critical for effective TQM implementation. Furthermore, employee involvement leads to a better understanding of customer needs, which leads to the development of more customer-focused products and services, according to **Kaynak and Hartley (2008)**.

Supplier involvement, according to **Barman and Gomes (2013)**, is critical for TQM implementation in the manufacturing industry. Suppliers, according to the authors, can help with TQM implementation by providing high-quality inputs and materials, reducing defects, and improving process efficiency.

According to **Santos-Vijande et al. (2013)**, effective TQM implementation requires the use of information technology, particularly in areas such as data analysis, communication, and process improvement. Furthermore, **Wamba et al. (2015)** discovered that the use of

information technology can result in increased productivity, lower costs, and higher customer satisfaction.

Goi (2010) explored that training and education are critical for developing the knowledge and skills needed to successfully implement TQM. Similarly, training and education programs are critical for developing a TQM culture and ensuring that all employees understand and support TQM principles, according to **Shahin and Mahdi (2013)**. Furthermore, **Ishikawa (1985)** emphasized the importance of employee training in TQM implementation, stating that developing a quality culture in the organization is critical. Ishikawa also emphasized the importance of cross-functional teams in TQM implementation, which can aid in improving communication and collaboration across departments within an organization.

Objective of the Study

Reviewing the factors determining total quality management in the manufacturing industries

Methodology

This study utilized a structured questionnaire to conduct a survey, and statistical methods such as mean and t-test were used to analyze the responses from 193 participants. The sampling method used in this research was convenience sampling, where individuals were selected based on their accessibility and willingness to participate.

Table 1 Factors determining total quality management in the manufacturing industries

Serial No.	Statement of Survey	Mean Value	t- Value	Sig.
1.	Strong supplier relationships are crucial for manufacturing industries to ensure quality raw materials and components meet their standards.	4.21	9.139	0.000
2.	TQM in manufacturing industries requires employees to have the necessary skills and knowledge to participate in quality improvement processes.	4.07	6.900	0.000
3.	Manufacturing industries need to have a robust process management system to ensure that quality is built into the manufacturing process.	4.22	8.500	0.000

4.	TQM in manufacturing industries requires a customer-focused approach.	4.44	9.478	0.000
5.	Manufacturing industries need to have a culture of continuous improvement to achieve success with TQM.	4.33	8.783	0.000
6.	Employees should be trained and empowered to contribute to the improvement of quality processes.	4.39	10.621	0.000
7.	A culture that values quality and continuous improvement is not essential in manufacturing industries implementing TQM.	3.69	2.356	0.010
8.	Manufacturing industries need to use performance metrics to measure the success of their TQM process.	4.15	8.914	0.000
9.	Manufacturing industries may leverage technology to improve the efficiency of their quality processes.	3.97	6.134	0.000
10.	Top management should provide the necessary support, resources, and guidance for the TQM process to be successful.	4.48	12.871	0.000

Table1 and Figure 1 demonstrates the mean values for each of the statement of the study done on the “factors determining total quality management in the manufacturing industries”, examining the average scores, the statement that obtains the highest mean score can be described as “Top management should provide the necessary support, resources, and guidance for the TQM process to be successful”, which has the mean score of 4.48, if we analyze the next statement which is “TQM in manufacturing industries requires a customer-focused approach” has the mean score of 4.44. Looking at the mean value of 4.39 for the statement “Employees should be trained and empowered to contribute to the improvement of quality processes” which indicates that employee involvement is also found to be responsible for TQM. Looking at the another concern of TQM is, “Manufacturing industries need to have a culture of continuous improvement to achieve success with TQM” which displays the mean score of 4.33, and the statement “Manufacturing industries need to have a robust process management system to ensure that quality is built into the manufacturing process” showcase the mean value of 4.22, then the statement “Strong supplier relationships are

crucial for manufacturing industries to ensure quality raw materials and components meet their standards” indicates mean value of 4.21. “Manufacturing industries need to use performance metrics to measure the success of their TQM process” obtains score of 4.15. The statement “TQM in manufacturing industries requires employees to have the necessary skills and knowledge to participate in quality improvement processes” showcase the mean value of 4.07. Therefore, the last two statements fall within the lowest category or level, “Manufacturing industries may leverage technology to improve the efficiency of their quality processes” indicates the mean value of 3.97, and the statement “A culture that values quality and continuous improvement is not essential in manufacturing industries implementing TQM” indicates 3.69. The significance of the t-value for each statement in the investigation of the factors determining total quality management in the manufacturing industries is significant. The t-value statements were positive, and their significance value was less than 0.05, indicating a significant relationship between the two variables.



Figure 1 Factors determining total quality management in the manufacturing industries

Conclusion:

Total Quality Management (TQM) has become a critical component of the success of manufacturing industries because it enables them to deliver products and services that meet the needs and expectations of their customers. TQM in the manufacturing industries is determined by a variety of factors, the most important of which are leadership commitment, employee involvement, process improvement, continuous training and education, and a focus on customer satisfaction. Effective TQM necessitates top-down commitment, beginning with senior management and extending throughout the organization. Leaders must provide the resources and support needed to effectively implement TQM, such as training, incentives, and a culture that prioritizes quality over quantity. Another important aspect of TQM is employee involvement. Employees must be given the authority to make decisions, suggest improvements, and take part in the quality improvement process. Employee training, recognition, and incentives can help with this. “TQM also relies on process improvement to identify and eliminate waste and inefficiencies, resulting in higher-quality products and services”. Continuous process improvement can assist organizations in staying ahead of the competition and maintaining a competitive advantage. Employees must receive ongoing training and education to stay current with the latest techniques and technologies in their field. This ensures that employees have the knowledge and skills necessary to provide high-quality products and services. Also, TQM relies heavily on customer satisfaction. Companies must listen to their customers in order to understand their needs and expectations, and then deliver products and services that meet or exceed those expectations. Finally, the success of TQM in the manufacturing industries is dependent on a variety of factors, including leadership commitment, employee involvement, process improvement, continuous training and education, and a focus on customer satisfaction. Organizations can improve their quality, reduce costs, and gain a competitive advantage in the market by implementing these factors.

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