

IDENTIFYING THE CRITICAL SUCCESS FACTORS OF TOTAL QUALITY MANAGEMENT IMPLEMENTATION IN THE MANUFACTURING INDUSTRY OF PAKISTAN: AN EXPLORATORY FACTOR ANALYSIS

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Abstract:

Total quality management (TQM) is a management philosophy that focuses on continuous quality improvement across all parts of a company. Its key goals are to satisfy customers and stay in business. As a result, it's critical to identify the elements that lead to successful TQM implementation. This study also proposed a framework that helps organizations in their success. To achieve this goal, various critical success factors (CSFs) that contribute to organizational growth success were identified. The major purpose of this research is to identify critical success factors for TQM implementation in the manufacturing industry. For this aim, the study was deployed from an extensive literature review, and the questionnaire was used as a research instrument to specify the essential CSFs in different manufacturing industries. Around 300 questionnaires were issued to top management of manufacturing enterprises in Sindh Pakistan (both public and commercial sectors). The structured survey received 82 valid responses, which were then analyzed by using factor analysis. Finally, the study's findings highlighted the five CSFs (customer satisfaction, employee involvement, training and education, continuous improvement, employee encouragement, and service quality) as the most important aspects in building an effective framework for successful TQM adoption in manufacturing industries. The findings of this study will assist senior management in the implementation of a TQM program and resource allocation that will produce the greatest results in terms of increased returns and stakeholder value.

Keywords: total quality management; TQM implementation; manufacturing; critical factors.

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1. Introduction

Today, quality management has become one of the most essential factors leading to organizational growth and performance in global markets (Van Trang & Do, 2020). To be successful in the marketplace, every department inside the company must work together to achieve the same objectives. Organizations are looking for a better degree of effectiveness across all activities and processes to improve competitiveness, and TQM is being used as a strategy to stay in business (Rani, 2013). New challenges have arisen from the globalization of world economies, focusing on product quality, processes, and customer focus. These factors have become critical not only for organizational growth but also for survival. The concept of quality management success is determined by how well it is implemented in an organization (Rad, 2006). Therefore, determining the key factors that affect the success of TQM implementation is essential (Kulenović et al., 2021). Quality management (QM) has a long and complicated history. The quality concept has been interpreted in many ways over time, ranging from quality control to overall quality management and beyond. TQM is characterized as a "holistic management

concept that seeks continual improvement in all aspects of an organization's operations." Despite the current challenging of the business environment is now, every company wants to survive, succeed, expand, and thrive. This can be accomplished by proper preparation and high-quality administration of their products and services. This holds for both global markets. A key component of successful building project management is quality management (Gherbal et al., 2012). TQM is concerned with entire organizational performance and acknowledges the importance of processes as well as customer-supplier interfaces, both internally and externally (Seetharaman et al., 2006).

Measuring and evaluating TQM's critical success factors (CSFs) is a crucial prerequisite for being able to govern the implementation process and raise the chances of success so that it can deliver high-quality performance and products/services (Utami & Harahap, 2019a). Effective implementation of TQM Change in important organization rules related to performance, such as decision right allocation, performance evaluation, and reward. By

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examining and classifying their influence, critical success factors are the critical areas that an organization must address to achieve its objective (Uttarakhand, 2020).

The main purpose of this study is to identify TQM CSFs for Pakistan's manufacturing sector and to learn how different organizations are dealing with TQM implementation issues. This research examines the critical success factors (CSFs) for TQM implementation in several manufacturing industries. As a result, the manufacturing industry serves as the backbone of any country's economy and is critical to national infrastructure. Quality programs in the public and private sectors have been found to improve overall organizational performance, according to this study. This study proposes that firms should concentrate on TQM implementation across manufacturing organizations, focusing on the elements that are crucial to TQM implementation success and the results.

2. Literature Review

2.1. Quality Concept

The word quality comes from the Latin *qua litas*, which means "of what kind." The term is also frequently used in this context. The quality of fabric can be a statement about the type of material it is made of. Another way to think about quality is to think of it as 'good' rather than 'poor.' It has a wide range of meanings and indicates different things to different people. According to Idris-Ashar & Zairi (2004), quality is "a known degree of uniformity and dependability at a low cost that is marketable." Customers in general expect a product that meets their needs and continues to execute its functions according to established criteria (Zakuan et al., 2012).

2.2. Total Quality Management

"Total Quality Management" is a comprehensive method that integrates quantitative monitoring and customer, supplier, and employee collaboration to execute a continuous improvement process (Wang & Meckl, 2020). Total quality management gurus such as Deming, Juran, Crosby, Ishikawa, and Feigenbaum described the term in various ways, but the substance and essence of the concept remained the same. Over the last two decades, the role of quality management in commercial organizations has risen significantly. TQM has an impact on organizations at all levels, from national to worldwide, allowing them to compete internationally and gain a competitive advantage in the global market (Salleh et al., 2018). According to quality experts, quality management is the key to trying to better performance. The TQM idea is made up of three parts: first, the "total" phrase indicates that all people who work for the company contribute to quality management. Second, "quality" is an integral part of the company philosophy. Third, the term "management" indicates executive responsibility and commitment on the part of managers (Utami & Harahap, 2019b). The greatest level of quality management is Total Quality Management. To ensure the successful implementation of the TQM program and strategy, businesses must identify important variables that should be given specific attention (Van Trang & Do, 2020).

TQM involves the application of quality management principles to all areas of an organization, including customers and suppliers, as well as their integration with important business activities. It is a method that involves everyone in the organization working towards continuous improvement (Uttarakhand, 2020). Total quality management (TQM) is a strategy for increasing a company's overall effectiveness, efficiency, cohesiveness, adaptability, and competitiveness. TQM, as described by the British Standard Institution, is a "management philosophy and company practices that aim to utilize an organization's human and material resources in the most effective way to fulfill the organization's objectives" (Salleh et al., 2018). Nowadays, The success of the TQM philosophy in manufacturing industries has prompted to use of TQM to improve project quality and performance (Neyestani & Juanzon, 2016).

2.3. The Importance of TQM

TQM has been around for a long time, but it was only in the early 1990s that it became widely available and used in developed countries to improve organizational flexibility and competitive capabilities to meet customer needs (Tsou et al., 2021). Organizations are required to design and implement plans from a global perspective in today's competitive market. Total Quality Management (TQM) is a management concept and way of thinking that has assisted many organizations in achieving excellent organizational results. TQM contributes to the success and existence of a company by promoting a culture of trust, involvement, teamwork, quality-mindedness, desire for continuous improvement, and continuous learning. TQM has been widely recognized and successfully applied in many small and large enterprises, providing them with a competitive advantage in both worldwide and local markets by allowing them to produce high-quality products that meet customer expectations (Quazi & Padibjo, 1998). According to (Lakhali et al., 2006) organizations that implemented TQM systems continuously achieved industry standards in terms of return on investment. Meanwhile, (Saad & Patel, 2006) conclude that by applying TQM, organizations gained a thorough understanding of the major elements influencing quality supply chain performance in the Indian automobile industry. Furthermore, (Jun et al., 2006) claim that companies with human resources that are focused on TQM techniques can improve employee satisfaction (Zakuan et al., 2012).

2.4. Critical Success Factor

Critical Success Factors are "the limited group of areas in which satisfactory results would assure successful competitive performance for the organization; they are the critical key area where 'things must go right for the successful organization (Arshida & Agil, 2013). These CSFs are best practices, enablers, or keys to a business's success. The following main aspects contributed to the success of total quality management execution on project creation. customer orientation, leadership, quality planning, supplier management, information analysis, natural environment, staff management, process management, and community care are among the standard works on motivating successful TQM implementation in the literature (Milovanovic, 2014).

The primary practices investigated by the researchers are quality, process, strategies, satisfaction, and motivation (Busu & Nedelcu, 2017). Top management, process management, training, supplier quality, the responsibility of the quality department, product services design, quality data, and interaction were among the 78 elements forecasted (Ismail Salaheldin, 2009). To assess total quality management, benchmarking, information analysis, training and education, Strategic quality management, design quality, top management control, process quality management, and statistical process control were all explored (Qureshi & Sharif, 2012). In the same way, another study by Flynn et al. (Qureshi & Sharif, 2012), suggested seven (7) TQM practices i.e., product design, quality information, customer involvement, supplier involvement, top management support, process management, and workforce management. From the literature review, Powell (1995) identified twelve factors: committed leadership, zero effects mentality, benchmarking, process improvements, employment, employee empowerment, closer supplier relationship, open organization, adoption, communication of TQM, measurements, flexible manufacturing, learning.

From 1989 to 2000, Sila (2006) identified twenty-five components from three hundred forty-seven previous literature focused on total quality management (Hassan et al., 2012). Sharma (Qureshi & Sharif, 2012), investigated the 12 TQM variables. Another study used the thirteen quality administration practices to evaluate the viability of the board's value rehearsals. The authors (Sila & Ebrahimpour, 2003) identified five critical components for successful TQM implementation: customer focus, top management commitment, supplier management, information analysis, and leadership. Leadership, customer focus, and teamwork are all important and basic TQM characteristics, according to the literature. To categorize key factors, (Karuppusami & Gandhinathan, 2006) conducted reliability and validation tests to identify 37 empirical studies. Supplier quality management, customer focus, the role of management leadership, process management, training, and quality policy are the five most essential variables mentioned by the authors. According to studies (Hietschold et al., 2014), there are 11 critical elements, with the following five being the most important: process management, top management commitment and leadership, human resources management, customer satisfaction, recognition, supplier partnership, and customer focus are all topics that need to be considered. Babatunde (2021) conducted a similar study on identifying key factors for successful TQM implementation, and the five factors listed above were confirmed in their findings: training and education, supplier quality, customer satisfaction, top management role, customer satisfaction, leadership, data information and analysis, and measurement system. Another study provides insights attention to TQM approaches including training and education, employee empowerment, and supplier quality management. (Nielsen & Jørgensen, 2013) studied three hundred and seventy (370) firms and discovered that Service design, training and education, human resources management, process management, customer focus, and supplier quality are the most important aspects of TQM implementation.

(Lau & Idris, 2001b) conducted research and identify seven common TQM precarious success practices: supplier quality management, training and education, top management commitment, customer focus, recognition and rewards, employee involvement, and plan statement. according to this study. Joanna Hing Yee Tsang (2001) emphasized eleven (11) critical quality management factors: teamwork and involvement, supervisory leadership, supplier partnership, communication, top management commitment, cultural change, quality systems and policies, and recognition and feedback are among them. Mahapatra (2006) evaluated twenty (20) key components that contributed to the effective implementation of TQM in the service industry: employee appraisal, teamwork, product service design, quality culture, human resource management, benchmarking, quality system, continuous improvement, zero defect, training, reward and recognition, flexibility, impact on society, employee participation, leadership, policy and strategy, customer satisfaction, process management, customer focus, and quality assurance. Siddiqui & Rahman (2006) identify five key elements that are essential to ITIS enterprises. They are: benchmarking, the strength of the employee base, customer-centric advancements, and relentless improvements. Just-in-time, training, customer focus, competitive benchmarking, recognition and reward, continuous improvement, employee involvement, communication, and getting things right the first time are among the 12 CSFs identified by (Yusuf et al., 2007). Al-Marri et al. (2007) identify 16 TQM practices that are essential for successful TQM adoption in the banking services sector: Continuous improvement, quality department, human resources management, quality technology, customer focus, strategy, service design, social responsibility, quality technologies, recognition and rewards, quality system, top management support and benchmarking. According to a study by Youssef and Zairi (1995), Sha'ri Mohd Yusof and Aspinwall (1999), Tamimi (1998), Sohal and Terziovski (2000), Hasan and Kerr (2003), Simon A. Black (1996), Thiagarajan and Zairi (1997)

The following are essential success elements for TQM implementation cultural change, teamwork, supplier management, customer focus, recognition, measurement and feedback, taring and development, supplier partnership, top management commitment, quality and policies, communication, continuous improvement, and Supervisory. In this study twelve (12) TQM practices are highlighted in the above literature: customer focus, employee focus, training and education, continuous improvement, employee encouragement, service quality, leadership, compensation benchmarking, customer relations, employee encouragement, top management commitment, customer focus, and customer satisfaction.

2.5. Leadership

Leadership is the ability to inspire confidence and support among individuals required to achieve organizational goals. The ability of top management to set practices and a long-term vision for the organization in response to changing clients' needs is referred to as leadership (Gherbal et al., 2012). Leadership provides all of the essential components as well as all of the assets for

the organization's connection and monitoring activities. Leadership is the ability to change the environment such that everyone feels empowered to contribute creatively to solving problems. Leaders must understand the culture and recognize the aspects that cannot be changed (Chen et al., 2018). One of the most important factors in implementing TQM in the development business is leadership. The most persuasive TQM component was leadership. Leadership commitment to quality is required for successful quality performance. It must also take initiative and provide resources. It must allow for the development of creativity and plan the strategy accordingly (Rani, 2013).

2.6. Top Management Commitment

Top management refers to the highest ranking administrators (directors, managing directors, chairman, chief executive officer, president, executive directors, etc.) responsible for the entire enterprise. TQM must begin at the top, where a real infatuation with quality and commitment to leadership must be recognized (Van Trang & Do, 2020). Top management commitment has been identified as one of the most crucial elements influencing the effectiveness of TQM implementation in a firm. TQM implementation will be significantly more challenging if top management does not provide clear directions.

The term "top management commitment" refers to top-level management taking a direct interest in the organization's major activities. Designing and establishing policies to assure quality, serving on and establishing a quality board, and so on are all part of a quality administration strategy. In charge of the entire procedure, Providing resources and training occasions. According to the research, top management's leadership and commitment are one of the most critical components enabling TQM's success. Because TQM is a management concept, quality actions are started at the highest levels of management (Kulenović et al., 2021).

2.6.1. Customer focus

Customer focus is a critical factor in an organization's success. (Nenadál et al., 2013) argue that organizations cannot "survive" without their customers in the long run. Organizations must create an open relationship with customers to obtain knowledge about their preferences and comments on how to best meet their requirements. Organizations must create an open relationship with customers to obtain knowledge about their preferences and comments on how to best meet their requirements. Consumer feedback can help enhance the quality of products and services, thus it should be included at every level of the development process. Because TQM is defined as a customer-oriented activity, customer focus receives special attention as a CSF (Van Trang & Do, 2020).

Customer focus can be described as the extent to which a company consistently meets client needs, and a successful company will recognize the value of putting the customer first in every decision. In recent years, customer focus has become increasingly important (Van Trang & Do, 2020). Customer focus, including customer happiness

and orientation, is critical for efficient and beneficial businesses to succeed. Customers who understand what they want and supply a product or service that meets their needs might get a competitive advantage and profit (Talib & Rahman, 2010).

2.6.2. Customer Satisfaction

Customer satisfaction is the philosophy of TQM that is concerned with identifying and responding to existing and emerging client needs (Nair, 2006). Because client happiness is so important to a company's success or failure, it must be able to respond rapidly to changing consumer demands. Customer satisfaction is a measurement that evaluates how satisfied customers are with a business's products, services, and capabilities. Information about customer satisfaction, such as surveys and ratings, can aid a firm in determining how to enhance or adjust its products and services. The primary goal of any business should be to please its clients. This holds for manufacturing enterprises, retail and wholesale businesses, government agencies, service businesses, and nonprofit organizations.

2.6.3. Continuous Improvement

Continuous improvement is used in a wide range of industries and sizes around the world, from major manufacturers to government agencies (Hoang et al., 2010). Continuous improvement aims to improve both results and skills to attain even greater results in the future (Van Trang & Do, 2020). Continuous improvement is a methodical, incremental, and company-wide process of changing current processes in a planned, coordinated, and systematic manner to improve corporate performance (Aletaiby et al., 2017). Continuous improvement and innovation in service quality are two of the most important characteristics of the TQM implementation program. It assists in the reduction of delivery lead times, as well as rework, error, and excessive slack and unpredictability in processes, resulting in continuous improvement of overall business performance and the minimization of all non-value-adding operations (Talib & Rahman, 2010).

2.6.4. Compensation Benchmarking

It is the process of comparing internal sets of expectations to external jobs with similar responsibilities to determine the market rate for each position. Benchmarking is the process of analyzing business processes and performance measurements with industry intellectuals and top observers from various firms. Benchmarking is the study of leading competitors' quality standards in the same branch or organizations in other branches that use similar processes. Benchmarking allows businesses to improve their performance by gaining knowledge from outside sources (Hietschold et al., 2014). Organizations do not know their relative performance without benchmarking, and they are likely to fail to design procedures more effectively as a result.

Benchmarking is one of the most essential TQM methodologies, and many organizations employ it. The goal of benchmarking is to give a target for improving

an organization's performance to achieve market superiority. When benchmarking is focused on critical business processes, the organization can achieve world standards. Finding gaps, correcting problems, and adapting to change are all part of benchmarking. Benchmarking and TQM work together to improve performance based on best practices in the company, which should directly contribute to addressing customer needs (Talib & Rahman, 2010).

2.6.5. Customer Relations

When it comes to gaining an advantage, it's tempting to concentrate on developing new metrics or keeping an eye out for more notable records. In any case, treating your existing clients with respect, regardless of how small they are, is critical to the success of your business. Following up with the ultimate objective that has a strong impact on the client is the method to go about business.

2.6.6. Service Quality

In management, delivering high-quality service is a major success. While remaining financially focused, a company with high help quality will meet or exceed client expectations. Improved aid quality, according to evidence from observational studies, enhances long-term financial strength and profitability. Support quality may be improved by enhancing operational procedures, swiftly and effectively isolating troubles, building liberal and reliable help execution scales, and measuring purchaser certainty and other performance outcomes.

2.6.7. Training and Education

Because of the rapid rise of technological innovation and development, training and education have become a major challenge. Employee engagement and empowerment require training on quality principles and methods (Kanji & Asher, 1993). A key to the successful implementation of TQM along the dimensions of cost reduction and profit increase)" is TQM training (Van Trang & Do, 2020)". The importance of training and education in determining the effectiveness of total quality management cannot be overstated. Any successful quality management program must include training as a key component. Training programs must target all employees in the organization, as quality is the responsibility of everyone in the organization under total quality management (Gherbal et al., 2012). It's an important part of quality control. Because training and education are such an important part of TQM, the success of the execution is directly proportional to how well they are completed. Many studies have found that education and training are two of the most important components in putting all-out quality management into practice.

2.6.8. Employees Involvement

A committed and skilled employee that fully participates in the activities carried out to enhance quality is required for the successful implementation of a TQM environment or culture. At all levels of the organization,

all employees should be encouraged to take responsibility and communicate efficiently to improve quality at all stages of production (Gherbal et al., 2012). Employee engagement can help employees better understand company policies. It entails processes like lower-level decision-making, adoption of experience, information, and ideas for the organization's progress. Employees should be recognized for their contributions and suggestions (1992). It is a psychological process that encourages members of an organization to make decisions and solve problems with one another by building confidence in them. Employee involvement is a procedure that allows employees at all levels of the business to participate in managerial decision-making and improvement efforts (Zakuan et al., 2012). As a result, employee involvement is an important aspect of the TQM program that should not be disregarded, particularly in service sectors because services cannot be supplied to target customers without the cooperation of "all" employees of the organization (Talib & Rahman, 2010).

2.6.9. Employee Encouragement

Employee encouragement refers to the level of responsibility, importance, and inventiveness that employees bring to their jobs. Employee motivation is one of the pillars of a successful TQM program implementation. Employees should be rewarded for their hard work, effort, contributions, accomplishments, and suggestions with monetary and non-monetary incentives during special events so that they feel valued members of the organization (Talib & Rahman, 2010). Employee empowerment and involvement in the firm help to make TQM implementation a success. It also encourages employees to provide higher-quality work and contribute more to the new company process, making it a critical aspect (Aletaiby et al., 2017).

Table 1 shows the Critical factors of total quality management implementation thorough literature review is conducted. Based on a literature review and discussion, three main practices were and nine sub-factors were recognized.

2.7. TQM Key Factors For Successful Implementation

In recent decades, a lot of academics have looked into the implementation of TQM programs. Antony et al. (2002), Yusuf et al. (2007), Din & Daud (2014), Clement et al. (2010), Hansson & Hansson (2003), Jamali et al. (2010), Hietschold et al. (2014), Georgiev & Ohtaki (2020), Tobergte & Curtis (2013), Zakuan et al. (2012), Abusa (2011), Rad (2006), Ismail Salaheldin (2009) these authors looked at the challenges from many angles and explored various points of view among the findings. The critical success factors (CSFs) that are responsible for achieving effective results are commonly related to the successful implementation of total quality management (Talib & Rahman, 2010). "Critical areas of managerial planning and action that must be implemented to achieve effective quality management in business units," according to the critical success factors for TQM. "Critical areas of managerial planning and

Table 1: CFs of Total Quality Management (TQM) practices defined in Literature.

Practices	Authors
Top management commitment	Salleh et al. (2018); Irfan & Kee (2013); Wang & Meckl (2020); Low (2010); Raj Kumar et al. (2011); Hietschold et al. (2014); Dedy et al. (2016); Aletaiby et al. (2017); Zakuan et al. (2012); Babatunde (2021); George Benson, Jayant V. Saraph (1991); Antony et al. (2002); Aquilani et al. (2017a); Van Trang & Do (2020); Talib & Rahman (2010); Lau & Idris (2001a); Georgiev & Ohtaki (2020); Jamali et al. (2010); Rani (2013); Arshida & Agil (2013); Nitin et al. (2010); Motwani (2001); Matsoso & Benedict (2015).
Leadership	Al-Damen (2017); Sadikoglu & Olcay (2013); Ibrahim (2013); Tayeb (2008); Salaheldin (2009); Feng et al. (2006); Arshida & Agil (2013); Sila (2006); Ahmad (2014); Khoja (2016); Hietschold et al. (2014); Aquilani et al. (2017a); Irfan & Kee (2013); Wang & Meckl (2020); Aletaiby et al. (2017); Dedy et al. (2016); Neyestani & Juanzon (2016); Tari (2005); Lau & Idris (2001a); Georgiev & Ohtaki (2020); Talib & Rahman (2012); Matsoso & Benedict (2015).
Continuous improvement	Fish (2015); Akpan et al (2014); Ibrahim (2013); Lizarell (2016); Abu Saleh Md. Sohel-Uz-Zaman, (2016); Salaheldin (2009); Khoja (2016); Al-Damen (2017); Cetindere et al. (2015); Antony et al. (2002); Hietschold et al. (2014); Aquilani et al. (2017a); Van Trang & Do (2020); Salleh et al. (2018); Wang & Meckl (2020); Kumar et al. (2021); Gherbal et al. (2012); Aletaiby et al. (2017); Zakuan et al. (2012); Tari (2005); Talib & Rahman (2010); Lau & Idris (2001a); Georgiev & Ohtaki (2020); Matsoso & Benedict (2015).
Compensation Benchmarking	Behara, Ravi S (2001); Fish (2015); Sila (2006); Milovanović (2014); Elhuni & Ahmad (2014); Wanjiku (2015); Clement et al. (2010); Hietschold et al. (2014); Babatunde (2021); Talib & Rahman (2010); Nitin et al. (2010); Motwani (2001); Matsoso & Benedict (2015).
Customer Focus	Hietschold et al. (2014); Aquilani et al. (2017a); Irfan & Kee (2013); Wang & Meckl (2020); Yasamis et al. (2002); Dedy et al. (2016); Neyestani & Juanzon (2016); Aletaiby et al. (2017); Zakuan et al. (2012); Tari (2005); Babatunde (2021); Georgiev & Ohtaki (2020); Jamali et al. (2010); Arshida & Agil (2013); Talib & Rahman (2012).
Customer Satisfaction	Ibrahim (2013); Fish (2015); Sila (2006); Lau & Idris (2001); Al-Damen (2017); Zhang et al. (2000); Black & Porter (1996); Antony et al. (2002); Aquilani et al. (2017a); Salleh et al. (2018); Wang & Meckl (2020); Lewis et al. (2006); Kumar et al. (2009); Hietschold et al. (2014); Tari (2005); Lau & Idris (2001a); Rani (2013); Sha'ri Mohd Yusof & Aspinwall (2000); Motwani (2001).
Customer Relations	Saraph et al. (1989); Sila & Ebrahimpour (2002); Quazi et al. (1998); Zhang et al. (2000); Motwani (2001); Din & Daud (2014); Matsoso & Benedict (2015).
Service Quality	Nielsen & Jørgensen (2013); Ahmadabadi, et al. (2012); Georgiev & Ohtaki (2020); Jamali et al. (2010); Rani (2013); Arshida & Agil (2013); Sha'ri Mohd Yusof & Aspinwall (2000); Nitin et al. (2010); Motwani (2001); Irfan & Kee (2013); Talib & Rahman (2012); Matsoso & Benedict (2015).
Employee Focus	Aquilani et al. (2017a); Georgiev & Ohtaki (2020); Motwani (2001); Talib & Rahman (2012); Matsoso & Benedict (2015).
Training & Education	Oganga (2015); Khan et al. (2019), McLean (2015); Sila (2006); Milovanović (2014); Elhuni & Ahmad (2014); Idris (2011); George Benson, Jayant V. Saraph (1991); Hietschold et al. (2014); Aquilani et al. (2017a); Van Trang & Do (2020); Salleh et al. (2018); Gherbal et al. (2012); Hietschold et al. (2014); Dedy et al. (2016); Neyestani & Juanzon (2016); Aletaiby et al. (2017); Zakuan et al. (2012); Babatunde (2021); Talib & Rahman (2010); Lau & Idris (2001a); Georgiev & Ohtaki (2020); Jamali et al. (2010); Rani (2013); Arshida & Agil (2013); Nitin et al. (2010).
Employee involvement	Al-Damen (2017); McLean (2015); Hoang et al. (2010); Salaheldin (2009); Sila (2006); Milovanović (2014); Clement et al. (2010); Aquilani et al. (2017a); Salleh et al. (2018); Wang & Meckl (2020); Gherbal et al. (2012); Neyestani & Juanzon (2016); Zakuan et al. (2012); Babatunde (2021); Talib & Rahman (2010); Lau & Idris (2001a); Jamali et al. (2010); Rani (2013); Sha'ri Mohd Yusof & Aspinwall (2000); Nitin et al. (2010); Matsoso & Benedict (2015).
Employee Encourage	Wali et al. (2003); Talib and Rahman (2010), Salaheldin (2009); Idris (2011); Yusuf et al. (2007); Aletaiby et al. (2017); Babatunde (2021); Talib & Rahman (2010); Rani (2013); Arshida & Agil (2013); Nitin et al. (2010); Motwani (2001); Matsoso & Benedict (2015).

action that must be implemented to achieve effective quality management in business units,” according to the critical success factors for TQM. According to several studies, implementing TQM procedures in industrial firms is difficult due to a lack of standardization and multiple parties (Oludare & Oluseye, 2016). Thus, identifying “key elements” that contribute to the effectiveness of TQM implementation in organizations is crucial (Kulenović et al., 2021; Neyestani & Juanzon, 2016). Because business and behavior concerns are tightly tied to TQM CSFs, not the context of business and sector, some studies have shown that important variables of effective TQM adoption are the same in all sectors.

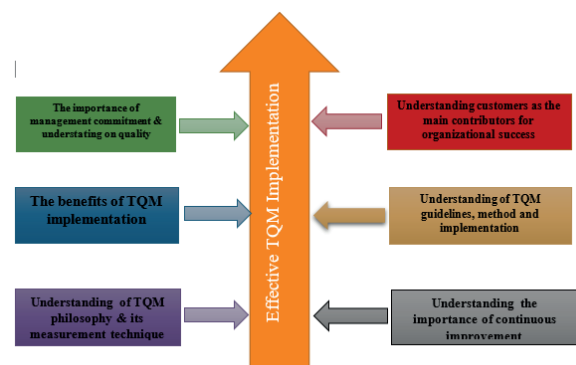


Figure 1: Factors of Effective TQM implementation.

3. Conceptual Model

This model shows the main practices of total quality management.



Figure 2: The conceptual frame of TQM work is developed.

4. Contribution of this study

By implementing this model of TQM practices in the manufacturing industries, this model provides the quality assurance that customers will get what they expect as well as process for managing unsatisfied customers and also reduces the waste and the time. This study is a innovative nature this model provides the contineous improvement of the organiasation. It will give a deeper understanding of TQM practices and issues identified by the arrangement of the organisation. Setting goals for enhancing the quality perfromance of firms will be made easier with the adoption of TQM methods in Pakistan’s industrial sector. The results show that TQM can improve firm performance depending on the level of implementation.

5. Research Methodology

This study’s design depicts a realistic image of quality in Karachi and Hyderabad’s manufacturing industry. Data for this study was gathered from several manufacturing industries.

5.1. Data Collection

Data collection was consisting of two phases. In the first phase, the main practices of TQM were found from the broad literature, and in the second phase was a questionnaire survey to find the successful practices of TQM review. The questionnaire was designed on google forms and distributed in several manufacturing industries.

A questionnaire survey based on the demographics portion and twelve practices in the survey were designed on a Likert scale. The questionnaire aimed to identify the major practices of TQM The questionnaire was filled by the top management of the organizations. Three hundred (300) questionnaires were sent to industries and a total of 100 responses were received among them 82 responses were valid and 2 percent were unfilled. This survey supports the findings and to have a better understanding of TQM’s critical success factors.

5.2. Data Analysis

The collected data was analyzed on SPSS (Statistical Package for Social Science) and MS Excel. Descriptive statistics and exploratory factor analysis (EFA) were used to find the validity and it shows accurately what was proposed to be measured. EFA was led by utilizing SPSS to distinguish the considered structure of the variable.

5.2.1. Normality of Data

Skewness and kurtosis are used for the normality of data. Skewness is an amount of symmetry and Kurtosis is a degree related to the normal distribution. The following table indicates the normality test of the data. The values range of Skewness and Kurtosis is between (=-1, -1 and +3, -3). The values and normality of variables are given in Table 2.

Table 2: Normality Test values of Data.

Variables	Skewness values	Kurtosis values
TQM	-0.063	-0.897

Results show the normal values of these variables which are related to skewness and kurtosis values (+1, -1 & +3, -3). These values show at the data is symmetric and data is normally distributed.

5.2.2. Data Screening of Data

Data screening ensures that your data is clean and ready to go before you conduct any more measurable experiments. Data must be reviewed to ensure that it is usable, dependable, and significant enough to test a causal hypothesis. Data correctness and missing values were checked on the sample. Table 3 shows the results of data screening.

5.2.3. Reliability of Data

Cronbach’s alpha values derived for the constructions ranged from 0.835 to 0.941. A reliability coefficient of 0.70 or higher is regarded as good in general. A substantial and reliable result as 0.80 or above; this showed that the instrument created for monitoring TQM adoption using key success factors was regarded as dependable. The Cronbach alpha for the entire study ranged from 0.835 to 0.966, indicating that the instrument is quite reliable.

Table 3: Data screening of TQM Practices.

Case Processing Summary						
	Cases					
	valid		Missing values		Total number	
	N	Percent	N	Percent	N	Percent
Ledership1	82	100.0%	0	0.0%	82	100.0%
Ledership2	82	100.0%	0	0.0%	82	100.0%
Ledership3	82	100.0%	0	0.0%	82	100.0%
Top mgmt. Commitment 1	82	100.0%	0	0.0%	82	100.0%
Top mgmt. Commitment 2	82	100.0%	0	0.0%	82	100.0%
Top mgmt. Commitment 3	82	100.0%	0	0.0%	82	100.0%
C. Improvement 1	82	100.0%	0	0.0%	82	100.0%
C. Improvement 2	82	100.0%	0	0.0%	82	100.0%
C. Improvement 3	82	100.0%	0	0.0%	82	100.0%
C. Benchmarking 1	82	100.0%	0	0.0%	82	100.0%
C. Benchmarking 2	82	100.0%	0	0.0%	82	100.0%
C. Benchmarking	82	100.0%	0	0.0%	82	100.0%
Customer Focus1	82	100.0%	0	0.0%	82	100.0%
Customer Focus2	82	100.0%	0	0.0%	82	100.0%
Customer Focus3	82	100.0%	0	0.0%	82	100.0%
Customer Satisfaction1	82	100.0%	0	0.0%	82	100.0%
Customer Satisfaction2	82	100.0%	0	0.0%	82	100.0%
Customer Satisfaction3	82	100.0%	0	0.0%	82	100.0%
Customer Relations1	82	100.0%	0	0.0%	82	100.0%
Customer Relations2	82	100.0%	0	0.0%	82	100.0%
Customer Relations3	82	100.0%	0	0.0%	82	100.0%
Service Quality1	82	100.0%	0	0.0%	82	100.0%
Service Quality 2	82	100.0%	0	0.0%	82	100.0%
Service Quality 3	82	100.0%	0	0.0%	82	100.0%
Employee Focus1	82	100.0%	0	0.0%	82	100.0%
Employee Focus1	82	100.0%	0	0.0%	82	100.0%
Employee Focus1	82	100.0%	0	0.0%	82	100.0%
Training & Education1	82	100.0%	0	0.0%	82	100.0%
Training & Education2	82	100.0%	0	0.0%	82	100.0%
Training & Education3	82	100.0%	0	0.0%	82	100.0%
Employee Involvement1	82	100.0%	0	0.0%	82	100.0%
Employee Involvement2	82	100.0%	0	0.0%	82	100.0%
Employee Involvement3	82	100.0%	0	0.0%	82	100.0%
Employee Encourage1	82	100.0%	0	0.0%	82	100.0%
Employee Encourage2	82	100.0%	0	0.0%	82	100.0%
Employee Encourage3	82	100.0%	0	0.0%	82	100.0%

Table 4: Reliability Values of Data.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
0.957	0.958	82

5.2.4. Cronbach's Alpha Statistic Test

It is used to determine the in constant's reliability, and its value ranges from 0-1. The closer the value gets to 1, the more remarkable the inner consistency of the variables becomes. Cronbach's Alpha standard values are often 0.9 wonderful, 0.8 good, 0.7 adequate, 0.6 doubtful, 0.5 terrible, and less than 0.5 unacceptable.

The results of TQM are shown in [Table 5](#). As a result, the mean values, variances, standard deviation, and Cronbach's Alpha value of variables are displayed in this

table. The alpha values of 0.7 are dependable, indicating that the data is reliable and acceptable.

5.2.5. KMO's Sample Adequacy Test of TQM

The data is valid if the results of TQM are shown in [Table 5](#). As a result, the mean values, variances, standard deviation, and Cronbach's Alpha value of variables are displayed in this table. The alpha values of 0.7 are dependable, indicating that the data is reliable and acceptable.

5.2.6. KMO's Sample Adequacy Test of TQM

The data is valid if the KMO value is larger than 0.7.

Table 5: Cronbach's Alpha values of Total Quality Management CF's.

TQM factors	Sub factors	Standard deviation	variance	Mean	Cronbach alpha
Top mgt commitment	Leadership	1.603	0.04	4.44	0.795
	C.I C. Benchmarking	1.738	3.020	4.23	0.828
		1.618	2.617	6.02	0.497
Customer focus	C. Satisfaction	2.581	6.660	5.21	0.682
	C. relations	2.252	5.071	6.12	0.668
	Service Quality	1.769	3.130	5.07	0.723
Employee focus	Training & E	1.537	2.363	4.70	0.693
	Employee Inv:	1.897	3.598	5.21	0.823
	E. encourage	1.493	2.229	0.472	0.738

Table 6: Values of Total quality management from KMO and Bartlett's Test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.806	
Bartlett's Test of Sphericity	Approx. Chi-Square	722.931
	df	210
	Sig.	0.000

Table 6 reveals that the value is 0.806, indicating that anything above 0.7 is valid.

5.2.7. Extraction of Eigenvalue of TQM

The extracted factors and the variation defined by those factors are shown in Table 6. The first component explains 18.025 percent of the variance, the second factor explains 13.358 percent, the third factor explains 10.073 percent, and the fourth factor explains 10.034 percent of the variance. These variables were discovered when the Eigenvalue was greater than one.

5.2.8. Screen plot of Total Quality Management Practices

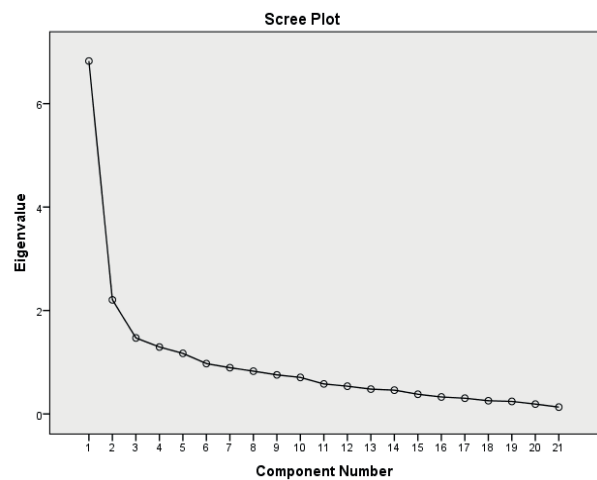


Figure 3: Screen plot of TQM practices.

Table 7: Extraction of variables based on Eigenvalue.

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.823	32.488	32.488	3.785	18.025	18.025
2	2.205	10.502	42.990	2.805	13.358	31.383
3	1.469	6.995	49.985	2.149	10.232	41.615
4	1.294	6.161	56.146	2.115	10.073	51.688
5	1.171	5.575	61.722	2.107	10.034	61.722
6	0.973	4.633	66.355			
7	0.894	4.257	70.612			
8	0.826	3.935	74.546			
9	0.755	3.596	78.142			
10	0.706	3.361	81.503			
11	0.580	2.761	84.264			
12	0.536	2.551	86.815			
13	0.479	2.283	89.098			
14	0.460	2.189	91.287			
15	0.381	1.812	93.099			
16	0.328	1.560	94.659			
17	0.304	1.445	96.104			
18	0.255	1.214	97.318			
19	0.242	1.150	98.469			
20	0.190	0.905	99.373			
21	0.132	0.627	100.000			

The screen plot of data for TQM, which specifies the Eigenvalues and component number of TQM, is shown in Fig. 3.

6. The Framework of Total Quality Management Practices

The final framework shows the critical success factors of total quality management which shows the high value and impact on the performance of an organization.



Figure 4: Final Framework of the study.

7. Results and Discussion

This paper shows the results of the study on the critical factors of total quality management and their implementation in manufacturing industries. The survey's validity and reliability have been examined, and it has been determined that the survey is fairly reliable and valid. The questionnaires address three critical factors with nine variables. The collected and analyzed data were analyzed for factor analysis (FA) to identify critical factors in the implementation of overall quality management. Reliability and validity were conducted in this study which was valid under the internal consistency by using reliability coefficient (α) which ranged from 0.835 to 0.966. This study indicates that factors are highly reliable at (0.957).

The main purpose of this paper has been to identify the most commonly used critical success factors in the TQM implementation. Analyzing previous research and conducting a literature review, we have identified twelve main critical success factors: leadership, service quality, employee involvement, customer focus, top management commitment, customer relations, continuous improvement, customer satisfaction, employee encouragement, training and education, compensation benchmarking and training and education. This research adds value to the existing literature as it focuses on critical factors of TQM implementation. The results also highlight the past studies (Din & Daud, 2014; Tari, 2005; Jun et al., 2006; Clement et al., 2010; Lau & Idris, 2001; Sha'ri Mohd Yusof & Aspinwall, 1999; Rani, 2013; Hietschold et al., 2014; Neyestani & Juanzon, 2016; Aletaiby et al., 2017; Antony

et al., 2002; Georgiev & Ohtaki, 2020; Zakuan et al., 2012; Awan et al., 2008). The adoption of the TQM philosophy will aid in improving the effectiveness and competitiveness of the organization. As a result, the findings of this study on the important success aspects of total quality management in Pakistan's manufacturing industries are presented in this paper. To implement TQM, industries that have already done so should learn a valuable lesson from their experience. Companies who are actively implementing TQM or preparing to implement TQM will have a better chance of success if they become more sensitive to the challenges. To improve the structure of the industries that are now using total quality management, these CFs must be understood and learned to identify the industries' strengths and weaknesses. These outcomes also support the past studies related to the implementation of total quality management i.e. (Sha'ri Mohd Yusof & Aspinwall, 1999; Hietschold et al., 2014; Yusuf et al., 2007; Abusa, 2011; Georgiev & Ohtaki, 2020; Zhang, 2000; Ozdal & Oyebamiji, 2018; Van Trang & Do, 2020; Salleh et al., 2018; Barker, 1990; Jamali et al., 2010). There is a considerable circumstantial sign on the extent to which Total quality management enhances the potential for firms to improve organizational performance (Tasie, 2016). The findings of this study identified five credible and effective TQM elements. The factors are training & education, service quality, improvement, employee involvement, customer satisfaction, and employee encouragement.

8. Conclusions

The findings of this study are critical for management in Karachi and Hyderabad's manufacturing industry. It advises supervisors on the best actual components the protective elements in a quality program and which programs they should execute because the cost of failing to implement quality curriculums is great and the cost of reestablishing quality curriculums is expensive (Herzallah et al., 2014). According to the findings, manufacturing organizations should pay more attention to TQM processes. The analysis was conducted using exploratory factor analysis. The findings highlight the significance of TQM and its application in industrial firms in Hyderabad and Karachi. If industries in Hyderabad and Karachi are to compete effectively in the market, they must enhance their quality standards. This research also establishes a framework that aids in the financial performance of industries. As a result, total quality management (TQM) (leadership, customer relation, customer satisfaction, training and education, and continuous improvement). The manufacturing industries of Hyderabad and Karachi will be more confident in implementing the TQM concept as a result of these findings. Hence, the findings of this investigation support our objectives. In conclusion, crucial success elements for TQM adoption are important for manufacturing industries since they will assist the business in improving performance measurement. Thus, the most significant critical success components of TQM adopted in the manufacturing industry are customer satisfaction, continuous improvement, customer relationship, training & education, and leadership. This research finds it important to determine the elements of TQM and key practices of sustainability that affect the performance and propose some managerial insights for improving sustainability and performance.

9. Limitations and Future Suggestions

One of the study's significant flaws is that it is limited to manufacturing companies in Karachi and Hyderabad. For this investigation, the sample size was limited to 82 people. This might lead to more investigation by doing comparative studies with a larger sample size to broaden the scope of the findings of this study. This survey produces better findings in the industries if the number of responses grows. This finding also points the way for future research. However, a similar study is being

conducted in the industries of Hyderabad and Karachi, and if this study is replicated in other Pakistani cities, it may yield useful results. Using exploratory factor analysis, this study investigates the main practices of total quality management. Furthermore, future research should concentrate on the examination of Structural Equation Modeling (SEM), which provides the organization with superior results. This research was limited to manufacturing enterprises in Hyderabad and Karachi. So, the next research also could be carried forward with a focus on service companies to get more definite results.

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