

# The Relationship Between Total Quality Management and Customer Satisfaction Through the Mediation of Employee Performance

Mario Parhan \*, Arfan Bakhtiar

<sup>a</sup> Department of Industrial Engineering, Diponegoro University, Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia

\* Corresponding author: [marioparhan18@gmail.com](mailto:marioparhan18@gmail.com)

## ARTICLE INFO

### Article history

Received, October 20, 2023

Revised, April 9, 2024

Accepted, July 31, 2024

Available Online, August 31, 2024

### Keywords

Total Quality Management

Employee Performance

Performance

Customer Satisfaction

ISO 9001:2015

## ABSTRACT

The increasing competition in the global market, driven by globalization and technological advancements, has caused many companies to face challenges in maintaining their market position. As a result, effective quality management systems are essential to enhancing employee performance and delivering high-quality products and services to satisfy customers. This study aims to analyze the effect of Total Quality Management (TQM) implementation on employee performance, the influence of employee performance on customer satisfaction, and the mediating role of employee performance between TQM and customer satisfaction. The research was conducted on companies certified with ISO 9001:2015, using questionnaires filled out by 80 respondents. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicate that TQM significantly improves employee performance, positively affecting customer satisfaction. Additionally, TQM directly enhanced customer satisfaction, with employee performance as an effective mediator in this relationship. These findings suggest that improving TQM practices and employee performance can substantially increase customer satisfaction. The study provides recommendations for companies in Indonesia to optimize TQM implementation, aiming to enhance both employee performance and customer satisfaction.



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## 1. Introduction

Customer satisfaction is a critical factor in determining a company's success [1],[2],[3]. Consumers' emotional value from products and services largely influences their satisfaction, primarily driven by product quality [4]. Ensuring customer satisfaction yields numerous benefits, such as fostering a harmonious relationship between the company and its customers, which can lead to repeat purchases and customer loyalty. Loyal customers will likely share positive word-of-mouth recommendations, ultimately supporting business growth. Satisfied customers also contribute to increased sales, offering companies a competitive advantage in the market [5]. In the context of today's increasingly competitive



<https://doi.org/10.22219/JTIUMM.Vol25.No2.161-172>



<http://ejournal.umm.ac.id/index.php/industri>



[ti.jurnal@umm.ac.id](mailto:ti.jurnal@umm.ac.id)

Please cite this article as: Parhan, M., & Bakhtiar, A. (2024). The Relationship Between Total Quality Management and Customer Satisfaction Through the Mediation of Employee Performance . Jurnal Teknik Industri, 25(2), 161–172. <https://doi.org/10.22219/JTIUMM.Vol25.No2.161-172>

global market, driven by the rapid pace of globalization and technological advancements, consumers have become more discerning in their purchasing decisions [6]. As a result, companies must consistently focus on meeting and exceeding consumer expectations by delivering superior product quality to stay ahead of their competitors [7]. In addition to product quality, Human Resources (HR) enhancement plays a pivotal role in achieving organizational success. High-quality HR is a critical competitive asset, often outweighing the importance of abundant natural resources [8]. A notable example is Japan, a country with limited natural resources yet capable of competing on a global scale due to its highly skilled workforce [9]. Thus, improving the quality of HR is essential for companies aiming to thrive in the global economy.

In Indonesia, human resources (HR) quality remains relatively low compared to other countries. The Human Development Index (HDI) serves as a measure of a nation's human resource development. In 2022, Indonesia's HDI was recorded at 72.91%, placing it in the "high" category. However, Indonesia ranks below 100 out of 189 countries, reflecting its workforce's lower quality and performance compared to other nations. This gap in HR quality poses a significant challenge for Indonesia in terms of competing within the global economy. To overcome this issue, companies in Indonesia must adopt modern and integrated quality management systems to remain competitive globally. One of the most widely adopted systems is Total Quality Management (TQM), designed to achieve long-term success by focusing on customer satisfaction [10]. For sustainable success, companies need to adapt to evolving customer continuously demands in the global market [11]. TQM emphasizes active participation from employees in enhancing processes, products, services, and organizational culture to deliver high-quality outputs consistently and meet customer satisfaction goals [12]. This makes TQM a vital strategy for companies aiming to strengthen their position in the competitive global landscape.

Previous research has consistently demonstrated a strong correlation between implementing Total Quality Management (TQM) and improving customer satisfaction across various industries. [Nguyen and Nagase \[13\]](#) found that TQM significantly enhanced customer satisfaction within healthcare facilities, highlighting the system's impact on service quality in that sector. Similarly, [Ohipeni \[14\]](#) reported that the successful application of TQM profoundly and positively influenced customer satisfaction in the downstream petroleum industry. In the telecommunications sector, [Owusu-Kyei, et al. \[15\]](#) also confirmed that TQM implementation leads to notable improvements in customer satisfaction. These studies prove that TQM is critical in enhancing customer satisfaction, regardless of the industry, and underscore the importance of quality management systems in maintaining competitive advantage.

Despite substantial research on Total Quality Management (TQM) and customer satisfaction, most previous studies have focused on specific companies rather than examining the broader national context, particularly in Indonesia. Additionally, while several studies have explored the direct impact of TQM on customer satisfaction, they have largely overlooked the mediating role of employee performance, which is a critical link between these two variables. This represents a significant gap in the literature, as employee performance plays a vital role in translating TQM practices into improved customer outcomes. This study aims to fill this research gap by developing a comprehensive structural model that simultaneously examines the relationships between TQM, employee performance, and customer satisfaction. Specifically, this study aims to determine the effect of TQM implementation on employee performance, the influence of employee performance on customer satisfaction, and the mediating role of employee performance in the relationship between TQM and customer satisfaction. The findings from this study will provide valuable insights and practical recommendations for

companies in Indonesia seeking to enhance customer satisfaction through improved TQM practices and employee performance.

## 2. Methods

This study employed a quantitative analytic design using multivariate analysis. Quantitative data were collected through questionnaires, supplemented by a review of previous studies to inform the method and hypotheses.

### 2.1 Conceptual Model

The conceptual model in this study consists of three variables: the independent variable (X), Total Quality Management (TQM); the mediation variable (Z), employee performance; and the dependent variable (Y), customer satisfaction. These relationships are illustrated in [Figure 1](#).

To assess TQM performance, we used four main elements and 24 sub-elements, which included: (1) Focus on customers, (2) Education and Training, (3) Continuous Quality Improvement, and (4) Employee Empowerment. These sub-elements were derived from previous research. Employee performance was measured using five indicators: Amount of work (RZ1), Quality of work (RZ2), Timeliness (RZ3), Presence at work (RZ4), and Teamwork ability (RZ5) [16]. Customer satisfaction was measured using five indicators: Price (RY1), Quality of Service (RY2), Product Quality (RY3), Emotional factors (RY4), and Efficiency (RY5) [17]. The variables and their respective indicators are outlined in [Table 1](#).

Based on the conceptual model, there are some research hypotheses to be tested, as follows:

H1: TQM positively affects employee performance

H2: Employee performance positively affects customer satisfaction

H3: TQM positively affects customer satisfaction

H4: TQM indirectly affects customer satisfaction through employee performance.

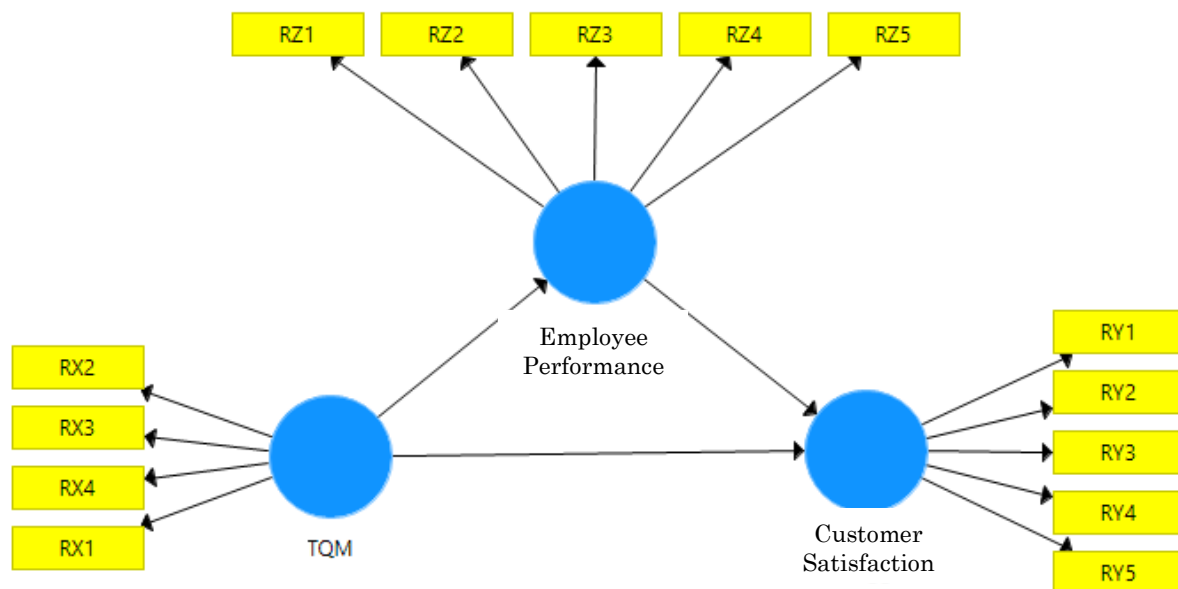


Figure 1. Measurement and Structural Model Path Diagram

Table 1. Research Variables & Indicators

Research variable	Indicator	References
Customer Satisfaction (Y)	1) Price (RY1)	[16]
	2) Quality of Service (RY2)	
	3) Product Quality (RY3)	
	4) Emotional factors (RY4)	
	5) Efficiency (RY5)	
Employee Performance (Z)	1) Amount of work (RZ1)	[17]
	2) Quality of work (RZ2)	
	3) Timeliness (RZ3)	
	4) Presence at work (RZ4)	
	5) Teamwork ability (RZ5)	
TQM Sub-Elements	Indicator	
Focus on customers (RX1)	1. Vision, commitment, and climate	[18]
	2. Alignment with customer	
	3. Willingness to identify flaws	
	4. Customer's information utilization	
	5. Respond to customer	
	6. Competence, capability, and authority delegation	
	7. Continuous product and process improvement.	
Education & Training (RX2)	1. Training needs	[19]
	2. Training participants	
	3. Training location	
	4. Training modules and content	
	5. Training provision	
	6. Evaluation post-training	
Continuous Quality Improvement (RX3)	1. Communication	[19]
	2. Problem Solving	
	3. Looking upstream	
	4. Progress documentation	
	5. Monitor changes	
Employee Empowerment (RX4)	1. Desire	[20]
	2. Trust	
	3. Confidence	
	4. Credibility	
	5. Accountability	
	6. Communication	

## 2.2 Data Collection

Data were gathered using close-ended questionnaires. The questionnaire was divided into two sections: respondent identification and evaluation of research variables. Questionnaires were distributed to companies via email, WhatsApp, and other online

platforms. The companies selected had implemented TQM, as indicated by their ISO 9001:2015 certification.

Responses were measured using a Likert scale, with options ranging from 1 (strongly disagree) to 5 (strongly agree). The study employed purposive sampling, selecting samples based on predefined criteria [20]. Eighty respondents representing various companies participated in the study. PLS-SEM analysis was applied, allowing hypothesis testing even with smaller sample sizes (minimum of 30 respondents) [21]. The percentage distribution of companies across industrial sectors is illustrated in Figure 2.

### 2.3 Data Processing

Data was analyzed using Partial Least Squares (PLS) through the SmartPLS 3.0 software to test the hypotheses. PLS is a multivariate statistical method that allows comparisons between multiple dependent and independent variables [22]. Validity and reliability were assessed through the outer model, while hypothesis testing was conducted using the inner model [23].

The outer model evaluates the relationship between indicators and constructs [24], and its validity and reliability were tested through four stages: internal consistency, indicator reliability, convergent validity, and discriminant validity [25].

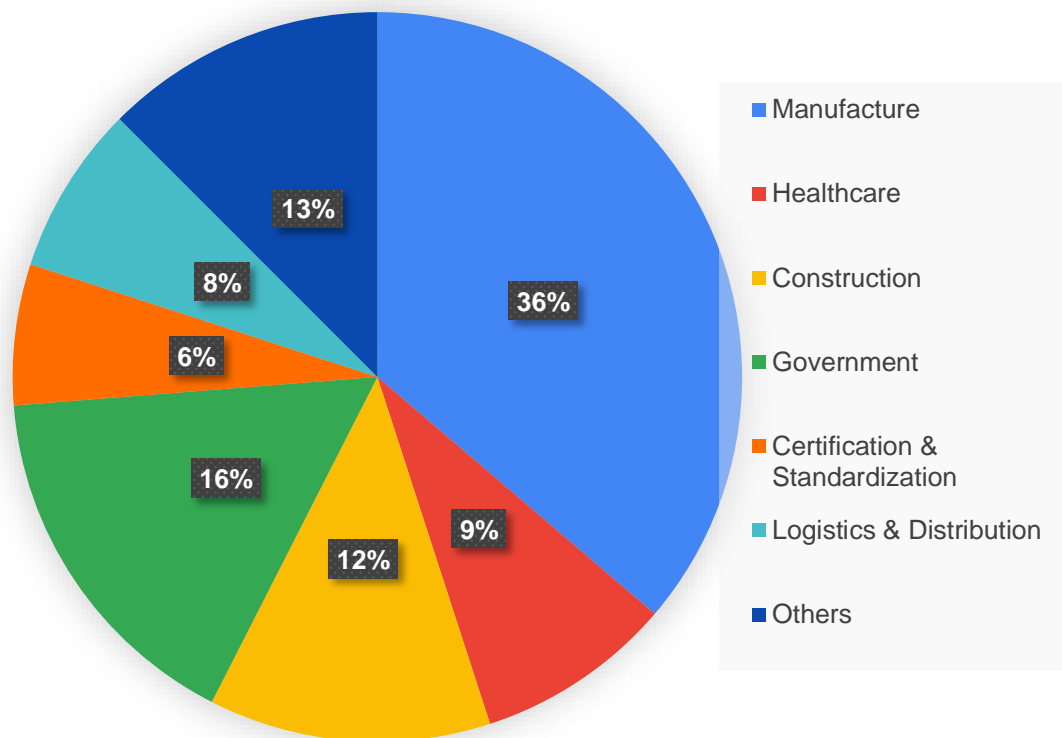


Figure 2. Company (Samples) Category Percentage Chart

The inner or structural model assesses the relationship between latent variables. This analysis ensures that the structural model is robust and accurately explains the relationships between the latent variables [26]. For reflective models, the measurement testing included internal consistency evaluation, indicator reliability, convergent validity, and discriminant validity [27].



### 3. Results and Discussion

#### 3.1 Outer Model Test

The validity and reliability tests were conducted using the outer model in PLS-SEM, as shown in Table 2. The initial test results indicated that one of the 14 indicators (RY2) had an outer loading value below 0.5, which led to its removal from the model. After excluding this indicator, the outer model test was repeated, and the results demonstrated that all remaining indicators had outer loading values of 0.7 or higher. In addition, the reliability test showed that all constructs had a Cronbach's Alpha value exceeding 0.5. Therefore, after the second iteration of testing, it was confirmed that all constructs and indicators were valid and reliable, making them suitable for further data analysis.

#### 3.2 Inner Model Test

The Inner Model test was conducted to evaluate the study's hypotheses. Hypotheses were accepted if the t-statistic was more significant than 1.96 and the p-value was less than 0.05 [28]. The results of the path coefficient calculations are presented in Table 3. Based on the model test, it was determined that TQM has a significant positive effect on employee performance, as indicated by the t-statistic for H1 (12.812), which exceeds 1.96, and the p-value, which is below 0.05. This finding aligns with the study by Ming [29], which also demonstrated that TQM positively and significantly influences employee performance.

Table 2. Outer Model Test

Construct	Indicator	Outer Loading (>0.7 = Reliable)	Cronbach's Alpha	Composite Reliability	AVE (>0,5 = Valid)
TQM	RX1	0,869	0,875	0,914	0,728
	RX2	0,807			
	RX3	0,897			
	RX4	0,837			
Employee Performance	RZ2	0,827	0,857	0,903	0,699
	RZ3	0,816			
	RZ4	0,868			
	RZ5	0,832			
Customer Satisfaction	RY1	0,806	0,889	0,923	0,751
	RY3	0,907			
	RY4	0,864			
	RY5	0,885			

Table 3. Hypothesis Tests

Hypothesis	Path Coefficient	T-statistics	P-value	Conclusion
H1: X → Z	0.715	12.812	0.000	Hypothesis Accepted
H2: Z → Y	0.657	7.007	0.000	Hypothesis Accepted
H3: X → Y	0.241	2.239	0.026	Hypothesis Accepted
H4: X → Z → Y	0.470	6.703	0.000	Hypothesis Accepted



Table 3 also demonstrates that employee performance positively affects customer satisfaction. The t-statistic for Hypothesis 2 (7.007) exceeds the threshold of 1.96, and the p-value is below 0.05, confirming that employee performance significantly positively affects customer satisfaction. This finding is consistent with a study by Sari and Fatmayoni [30], which also concluded that employee performance significantly influences customer satisfaction. For Hypothesis 3, the t-statistic (2.239) is more significant than 1.96, and the p-value is below 0.05, indicating that Total Quality Management (TQM) directly and positively affects customer satisfaction. This result aligns with previous research by Nguyen and Nagase [13], Ohipeni [14], and Owusu-Kyei, et al. [15], all of whom found that TQM implementation has a positive impact on customer satisfaction.

Hypothesis 4 is also supported, as the t-statistic (6.703) exceeds 1.96, and the p-value is less than 0.05. Therefore, it can be concluded that TQM indirectly significantly positively affects customer satisfaction by mediating employee performance. Moreover, the results in Table 3 indicate that the relationship between TQM and customer satisfaction is stronger when mediated by employee performance. It suggests that enhancing employee performance can further amplify the positive impact of TQM on customer satisfaction.

### 3.3 Research Implications

Implementing Total Quality Management (TQM) significantly positively affects employee performance. It means that better implementation of TQM leads to enhanced employee performance. This finding aligns with Ming's study [29], which showed that TQM positively impacts employee performance outcomes. Therefore, improving TQM practices is essential for enhancing employee performance within organizations. Additionally, employee performance significantly and positively influences customer satisfaction. This finding is consistent with the study by Sari and Fatmayoni [30], which demonstrated that improved employee performance has a notable and positive effect on customer satisfaction. Hence, enhancing employee performance is a key strategy for increasing customer satisfaction.

The direct positive effect of TQM on customer satisfaction is also confirmed, as supported by studies from Nguyen and Nagase [13], Ohipeni [14], and Owusu-Kyei, et al. [15]. These studies highlighted the critical role of TQM in increasing customer satisfaction. Thus, customer satisfaction can be effectively improved by properly implementing TQM. Moreover, the results show that TQM also indirectly enhances customer satisfaction through the mediation of employee performance. The relationship between TQM and customer satisfaction is stronger when employee performance serves as a mediator, indicating that improving employee performance alongside TQM implementation further boosts customer satisfaction. This highlights that TQM is not only a tool for improving operational processes but also a solution for enhancing employee performance, which in turn positively affects customer satisfaction.

### 3.4 TQM Implementation Recommendations

Total Quality Management (TQM) and employee performance significantly impact customer satisfaction. Several strategies are recommended to optimize the implementation of TQM and improve employee performance based on studies from various industrial sectors. These strategies aim to enhance both employee performance and customer satisfaction. In the construction industry, the following steps can be adopted to improve TQM implementation [31]: (1) Secure the client's commitment to quality; (2) Build awareness, educate, and shift staff attitudes; (3) Develop a process-oriented approach to

TQM; (4) Prepare detailed project quality plans at all levels; (5) Initiate continuous improvement processes; (6) Encourage staff participation and contribution through quality control circles (QCC) and motivation programs; and (7) Regularly review quality plans and measure performance. Clients should avoid awarding contracts based solely on the lowest bid and prioritize quality when selecting designers and suppliers. Organizations should also establish partnerships with suppliers that prioritize quality over cost.

In the logistics industry, a well-functioning Quality Management System (QMS) is essential for the successful implementation of TQM. A 10-step approach to implementing a QMS includes [32]: (1) Management commitment, (2) Establishment of a Quality Improvement Team (QIT), (3) Setting quality standards, (4) Raising quality awareness, (5) Training managers and supervisors, (6) Setting goals, (7) Identifying and eliminating error causes, (8) Taking corrective actions, (9) Providing recognition and rewards, and (10) Ensuring continuous improvement.

Several methods can be applied for manufacturing companies to enhance the role of TQM enablers [33]. First, understanding customer needs is essential to continuously improving business operations and efficiency, and second, fostering teamwork by involving cross-functional members, implementing appropriate communication systems, and empowering employees. Third, providing targeted training programs to address quality issues is critical for successful TQM implementation. Fourth, recognizing and rewarding employees for their contributions helps maintain the momentum of TQM implementation.

Lastly, the "three-step managerial action plan" offers a structured approach to improve TQM performance, ultimately enhancing customer satisfaction [34]. The first step involves developing specific skills in the workforce to understand customer needs at critical contact points. The second step is providing multicultural training to help employees better understand global customers and competition. The third step focuses on training relevant personnel to promptly assess customer experience and satisfaction levels at critical touchpoints.

#### 4. Conclusion

The findings of this research indicate that the implementation of Total Quality Management (TQM) plays a crucial role in enhancing employee performance, leading to increased customer satisfaction. Companies that adopt and implement TQM practices will not only see improvements in their operational processes but also experience a positive impact on customer satisfaction. Furthermore, the research shows that the benefits of TQM can be maximized when employee performance is improved in parallel with TQM implementation. The strategies proposed in this study focus on two main areas: optimizing TQM performance and enhancing employee performance, both of which are essential for achieving higher levels of customer satisfaction.

Despite these valuable insights, the study has certain limitations. The sample was limited to companies with ISO 9001:2015 certification, which may not fully represent the broader range of industries. Additionally, the scope of TQM elements assessed in this study was limited, and a more comprehensive evaluation could provide deeper insights. Future research should include additional elements of TQM and expand the sample size to cover more industries and sectors. Incorporating expert opinions and perspectives from various stakeholders would enrich the analysis and enhance the study's relevance. By addressing these areas, future research can provide a more holistic understanding of the relationship between TQM, employee performance, and customer satisfaction.



## Declarations

**Author contribution:** All authors contributed to this paper.

**Funding statement:** No funding was received for this work.

**Conflict of interest:** The authors declare no conflict of interest.

**Additional information:** No additional information is available for this paper.

## Acknowledgments

Thanks are conveyed to all companies, who were willing to be respondents, for their participations in filling out the questionnaires.

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