

MAPPING IDEA & LITERATURE FORMAT | RESEARCH ARTICLES

Total Quality Management and Operational Performance

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ABSTRACT

This study examines the effect of Total Quality Management (TQM) practices on operational performance at PT So Good Food. The study employed a quantitative survey design involving 30 employees selected through purposive sampling. The respondents were employees who had worked at the company for at least one year and were considered to have sufficient experience and understanding of the company's quality-management practices and operational processes. TQM was represented by customer satisfaction, employee empowerment, continuous quality improvement, and fact-based management, while operational performance served as the dependent variable. Data were collected using a structured questionnaire with a five-point Likert scale and analyzed using validity and reliability tests, classical assumption tests, multiple linear regression, partial t-tests, and a simultaneous F-test. The findings indicate that the TQM dimensions simultaneously have a significant effect on operational performance. Partially, employee empowerment, continuous quality improvement, and fact-based management have positive and significant effects on operational performance, whereas customer satisfaction does not have a significant partial effect. These findings suggest that internal quality-management practices, particularly employee involvement, continuous process improvement, and data-based decision-making, play an important role in supporting operational effectiveness. The study is limited to a small sample from a single organization; therefore, the findings should be interpreted and generalized cautiously.

Keywords: Total Quality Management, Operational Performance, Customer Satisfaction, Employee Empowerment, Continuous Quality Improvement.

I. Introduction

The development of the global business environment requires companies to adapt to rapid changes and increasingly intense competition. Under these conditions, companies must develop competitive advantages to maintain their existence and sustainability in the market. One strategic approach that can be implemented to strengthen organizational competitiveness is Total Quality Management (TQM). Total Quality Management is a management approach oriented toward comprehensive quality improvement through the involvement of all organizational elements. TQM emphasizes customer satisfaction, continuous improvement, employee empowerment, and data-based decision-making. According to Tjiptono and Diana (2001), TQM is an approach to managing a business that aims to maximize organizational competitiveness through

continuous improvement in products, services, people, processes, and the organizational environment. The implementation of TQM is expected to improve organizational operational efficiency because quality management does not focus solely on the final product but also on the effectiveness of the processes that support organizational activities. Operational performance is associated with a company's ability to manage production and operational processes effectively and efficiently. Handoko (2010) stated that operational performance involves managerial activities related to the selection, design, operation, and control of production systems. Therefore, the implementation of TQM is relevant to operational performance because its principles can support process improvement, reduce operational errors, strengthen employee involvement, and improve the consistency of organizational activities.

PT So Good Food is a company operating in the food-processing industry and continuously seeks to improve product quality and its operational processes. In the increasingly competitive food industry, the company must ensure that its quality-management system is implemented effectively to support operational performance. The food-processing industry requires consistent product quality, reliable production processes, efficient resource utilization, and appropriate responses to operational problems. Consequently, the implementation of TQM is important because the effectiveness of quality-management practices may influence the company's ability to maintain operational consistency and improve its overall performance. Previous studies have indicated that the implementation of TQM is associated with improved organizational performance. Widjaya and Suryawan (2014) found that TQM has a positive effect on company performance. Similarly, Munizu et al. (2012) reported that effective TQM practices can improve quality culture, competitiveness, and the performance of manufacturing companies. These findings indicate that TQM can contribute to organizational performance through the integration of quality-oriented practices into managerial and operational activities.

However, previous findings do not necessarily imply that every dimension of TQM has the same effect in every organizational context. The contribution of each TQM dimension may differ depending on the characteristics of the company, the involvement of employees, the implementation of quality-improvement practices, and the use of information in managerial decision-making. Therefore, examining TQM only as a single management approach may provide limited information regarding the specific practices that contribute to operational performance. This study addresses this issue by examining four dimensions of TQM, namely customer satisfaction, employee empowerment, continuous quality improvement, and fact-based management. The selection of these dimensions is based on their relevance to the implementation of quality management within organizational operations. Customer satisfaction reflects the company's orientation toward meeting customer needs and expectations. Employee empowerment represents the involvement and participation of employees in organizational decision-making and problem-solving. Continuous quality improvement emphasizes ongoing efforts to improve products, processes, and organizational systems. Fact-based management refers to the use of accurate data and information as the basis for evaluating performance and making managerial decisions. These dimensions are expected to support operational performance through improved process quality, employee participation, organizational learning, and more objective decision-making.

Accordingly, the central research problem of this study is whether the implementation of the selected TQM dimensions contributes to operational performance at PT So Good Food. The urgency of this study lies in the need to identify which quality-management practices are most closely associated with operational performance in the context of a food-processing company. The findings are expected to provide empirical evidence regarding the partial and simultaneous effects of customer satisfaction, employee empowerment, continuous quality improvement, and fact-based management on operational performance. Based on the preceding discussion, this study aims to analyze the effect of Total Quality Management on operational performance at PT So Good Food, both partially and simultaneously. The study is expected to contribute to the development of knowledge regarding the relationship between TQM and operational performance and to provide practical insights for management in strengthening quality-management practices that support organizational operational effectiveness.

II. Literature Review and Hypothesis Development

2.1. Total Quality Management and Operational Performance

Total Quality Management (TQM) is a management approach that emphasizes comprehensive quality improvement through the involvement of all organizational members. TQM does not focus solely on the quality of final products but also addresses the quality of processes, human resources, managerial practices, and organizational systems. According to Tjiptono and Diana (2001), TQM is an approach to managing a business that aims to enhance organizational competitiveness through continuous improvement in products, services, people, processes, and the organizational environment. The implementation of TQM places quality as a strategic foundation for improving customer satisfaction and organizational effectiveness. Hensler and Brunell, as cited in Tjiptono and Diana (2001), identified four important pillars of TQM: customer satisfaction, employee empowerment, continuous quality improvement, and fact-based management. These dimensions represent complementary aspects of quality management. Customer satisfaction provides an external orientation toward customer needs and expectations, employee empowerment strengthens participation and responsibility in operational activities, continuous quality improvement supports systematic process enhancement, and fact-based management encourages the use of reliable information in organizational decision-making.

The relationship between TQM and operational performance can be explained through the role of quality-management practices in improving process consistency and organizational effectiveness. When customer requirements are incorporated into organizational activities, employees are actively involved in problem-solving, operational processes are continuously evaluated, and managerial decisions are supported by accurate information, organizations are expected to improve productivity, reduce operational errors, strengthen process quality, and increase the reliability of their operations. Therefore, the implementation of TQM should be understood as an integrated management system in which the individual dimensions may contribute differently to operational performance. Recent research also emphasizes that TQM should be implemented as an integrated management system rather than as a collection of separate quality-control activities. Alam et al. (2024) explained that the integration of TQM with strategic, operational, and human resource management can improve operational efficiency, strengthen employee engagement, and enhance organizational performance. This finding indicates that the effectiveness of TQM depends on the alignment of quality-management practices with operational processes and employee involvement. Therefore, TQM is expected to support operational performance by improving process coordination, encouraging organizational learning, and strengthening the organization's ability to achieve consistent quality outcomes.

Recent studies also demonstrate that the effects of TQM practices may differ across organizational contexts. Wibowo et al. (2023) found that several soft-TQM dimensions, including customer focus, top-management commitment, and supplier relationships, had significant relationships with operational performance. Similarly, Bytyçi et al. (2023) reported that different TQM components had different levels of influence on the operational performance of manufacturing enterprises. These findings indicate that TQM should be examined not only as a general management philosophy but also through its individual dimensions because each practice may contribute differently to operational outcomes.

2.2. Customer Satisfaction and Operational Performance

Customer satisfaction refers to the condition in which the products or services received by customers meet or exceed their expectations. Within the TQM framework, customers are considered an important focus because organizational success is closely related to the ability of a company to understand and respond to customer needs. According to Kotler (1994), companies that understand customer needs and respond effectively to customer complaints have greater opportunities to improve service quality and strengthen their competitiveness. Customer information can provide feedback regarding product quality, service

performance, and customer expectations. Such feedback may assist companies in identifying quality gaps and determining priorities for operational improvement.

The relationship between customer satisfaction and operational performance is expected to occur through the alignment of operational processes with customer requirements. When a company consistently evaluates customer feedback and uses the information to improve products and services, the organization may enhance product quality, reduce customer complaints, and improve the effectiveness of operational activities. In this context, customer satisfaction is not only an outcome of organizational performance but can also function as an important source of information for improving operational processes. Widjaya and Suryawan (2014) found that customer-oriented TQM practices had a positive effect on company performance. This finding supports the argument that a strong customer orientation may encourage organizations to improve the quality and effectiveness of their internal activities. Recent evidence also indicates that customer-focused quality practices may contribute to operational performance, although their effects can differ across organizational settings. Wibowo et al. (2023) found that customer focus had a positive and significant relationship with operational performance. This finding supports the argument that customer information and customer-oriented practices can guide organizations in improving the quality and responsiveness of their operational processes.

Based on the preceding theoretical and empirical arguments, the following hypothesis is proposed:

H1: Customer satisfaction has a positive effect on operational performance.

2.3. Employee Empowerment and Operational Performance

Employee empowerment refers to the efforts of an organization to provide employees with authority, responsibility, information, and opportunities to participate in organizational decision-making. In the TQM framework, employee involvement is important because employees are directly engaged in operational activities and are often the first to identify process problems and opportunities for improvement. According to Noe et al. (1994), employee empowerment can strengthen employees' sense of ownership toward the organization and increase work motivation and productivity. Empowered employees are expected to participate more actively in providing ideas, identifying operational problems, implementing corrective actions, and improving the quality of their work. The relationship between employee empowerment and operational performance can be explained through increased employee participation and responsibility. When employees are given opportunities to contribute to decisions and problem-solving, operational problems may be identified and addressed more quickly. Employee empowerment may also improve communication between management and employees, encourage the exchange of improvement ideas, and support the implementation of quality-management practices at the operational level. These mechanisms may contribute to higher productivity, improved process effectiveness, and more consistent operational outcomes.

Prayhoego and Devie (2013) demonstrated that employee involvement and empowerment in the implementation of TQM had a significant effect on company performance. The findings indicate that employee participation is not merely an administrative practice but can serve as an operational mechanism that supports quality improvement and organizational performance. Recent studies also emphasize that the contribution of human-resource-related quality practices depends on the extent to which employees are actively involved in organizational improvement activities. Employee participation can facilitate problem identification, knowledge sharing, and the implementation of operational improvements. Therefore, employee empowerment is expected to support operational performance by strengthening employees' responsibility and capacity to respond to operational challenges.

Based on the preceding theoretical and empirical arguments, the following hypothesis is proposed:

H2: Employee empowerment has a positive effect on operational performance.

2.4. Continuous Quality Improvement and Operational Performance

Continuous quality improvement refers to an ongoing process of improving the quality of products, operational processes, and organizational systems. This principle is central to TQM because organizations are expected to conduct regular evaluations, identify opportunities for improvement, and implement corrective actions to achieve better performance over time. According to Tjiptono (2003), continuous improvement aims to increase organizational efficiency and effectiveness through the ongoing refinement of organizational processes. Continuous improvement therefore emphasizes that quality should not be treated as a one-time achievement. Instead, organizations should continuously monitor operational performance, identify process weaknesses, evaluate the causes of problems, and implement improvements based on the results of these evaluations. The relationship between continuous quality improvement and operational performance is expected to occur through the systematic reduction of process errors and inefficiencies. Organizations that continuously evaluate and improve their activities may reduce recurring production problems, improve the consistency of work procedures, strengthen process reliability, and enhance product quality. Continuous improvement may also support organizational learning because the results of previous evaluations can be used to improve future operational practices.

Munizu et al. (2012) found that TQM practices supported by continuous quality improvement could enhance competitiveness and the performance of manufacturing companies. This finding provides empirical support for the argument that ongoing quality improvement can contribute to better organizational outcomes by improving processes and strengthening the quality culture within the company. Kumar et al. (2021) demonstrated that process quality management is associated with operational performance and that organizational learning and development play an important role in strengthening this relationship. This finding supports the argument that continuous improvement contributes to operational performance not only through process refinement but also through the development of organizational knowledge and learning capabilities. Based on the preceding theoretical and empirical arguments, the following hypothesis is proposed:

H3: Continuous quality improvement has a positive effect on operational performance.

2.5. Fact-Based Management and Operational Performance

Fact-based management is an approach to organizational decision-making that relies on accurate, relevant, and reliable data rather than solely on intuition or assumptions. Within the TQM framework, the use of factual information is important because organizational decisions concerning quality improvement, operational control, and resource allocation should be supported by objective evidence. Hensler and Brunell, as cited in Scheuing and Christopher (1993), explained that companies implementing fact-based management are better able to identify operational problems and determine appropriate solutions. The use of operational data enables organizations to monitor performance, identify deviations from established standards, evaluate the effectiveness of corrective actions, and determine areas that require improvement.

The relationship between fact-based management and operational performance can be explained through the improvement of decision quality. When managers use accurate information to evaluate operational conditions, decisions can be made more objectively and operational resources can be directed toward the most relevant problems. Data-based management may also reduce uncertainty, minimize avoidable errors, and improve the effectiveness of operational control. Consequently, the organization may achieve more consistent processes and better operational outcomes. Ramlawati et al. (2008) found that the implementation of data-based TQM practices had a positive effect on improving the business performance of manufacturing companies. This finding supports the argument that the use of factual information is an important mechanism through which quality-management practices can contribute to organizational performance.

The importance of fact-based management is also supported by Junaidi (2022), who emphasized that integrated quality management includes customer orientation, employee involvement, process approaches, fact-based decision-making, and continuous improvement. The study further demonstrated that the implementation of integrated quality-management practices is associated with competitiveness and operational performance in manufacturing companies. These findings support the argument that the use of accurate and relevant information can improve the quality of managerial decisions, facilitate operational control, and assist organizations in identifying and addressing process-related problems. The increasing complexity of organizational operations makes reliable information essential for effective managerial decision-making. Fact-based management enables organizations to monitor operational conditions, evaluate performance, identify process deviations, and assess the effectiveness of corrective actions. Consequently, the use of accurate and timely information may improve the quality of operational decisions and support more consistent organizational performance. Based on the preceding theoretical and empirical arguments, the following hypothesis is proposed:

H4: Fact-based management has a positive effect on operational performance.

2.6. The Simultaneous Effect of Total Quality Management on Operational Performance

The implementation of TQM is expected to influence operational performance through the integration of its various dimensions. Customer satisfaction provides information regarding customer expectations and quality requirements. Employee empowerment supports participation, responsibility, and problem-solving at the operational level. Continuous quality improvement encourages organizations to evaluate and refine their processes on an ongoing basis. Fact-based management provides an objective basis for monitoring performance and making operational decisions. These dimensions are interconnected. Customer feedback can identify areas requiring improvement, empowered employees can contribute to the implementation of corrective actions, continuous improvement can institutionalize the learning process, and factual information can be used to evaluate the effectiveness of organizational interventions. Therefore, the simultaneous implementation of these TQM dimensions is expected to create a more integrated quality-management system and improve operational effectiveness.

Previous studies have shown that the implementation of TQM can contribute to improved company performance through improvements in quality, employee involvement, organizational competitiveness, and managerial effectiveness. The findings of Widjaya and Suryawan (2014) and Munizu et al. (2012) provide empirical support for the positive relationship between TQM practices and organizational performance. Nevertheless, the effects of individual TQM dimensions may vary across organizations because the implementation of quality-management practices is influenced by organizational characteristics and operational conditions. Recent empirical studies have also shown that the combined implementation of quality-management practices can contribute to operational performance. Bytyçi et al. (2023) found that several TQM components were associated with operational performance in manufacturing enterprises, although the magnitude of their effects differed across dimensions. Likewise, Wibowo et al. (2023) demonstrated that selected soft-TQM practices had significant effects on operational performance. These findings support the view that TQM should be implemented as an integrated system while recognizing that individual practices may contribute differently depending on the organizational context.

The simultaneous implementation of TQM practices is expected to create a stronger effect on operational performance because the dimensions of TQM complement one another. Customer orientation provides information regarding customer expectations, employee involvement supports the implementation of quality improvements, continuous improvement promotes systematic process development, and fact-based decision-making strengthens the objectivity of managerial actions. Junaidi (2022) found that integrated quality management was associated with competitiveness and operational performance in manufacturing companies. Similarly, Alam et al. (2024) demonstrated that the integration of TQM with strategic, operational,

and human resource management can enhance operational efficiency and organizational performance. These findings indicate that TQM practices are more likely to support operational performance when they are implemented as an integrated management system. Based on the preceding theoretical and empirical arguments, the following hypothesis is proposed:

H5: Customer satisfaction, employee empowerment, continuous quality improvement, and fact-based management simultaneously have a positive effect on operational performance.

III. Research Method

This study employed a quantitative survey design to examine the effect of Total Quality Management (TQM) on operational performance at PT So Good Food, Boyolali Regency. The study involved 30 employees selected through purposive sampling. Respondents were required to have worked at the company for at least one year to ensure that they had sufficient experience and understanding of the company's quality-management practices and operational activities. The limited sample size reflects the scope and availability of the research data; therefore, the findings should be interpreted cautiously and are limited to the context of the organization studied. Primary data were collected through an online questionnaire from March to May. The questionnaire used a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. The independent variables consisted of customer satisfaction (X1), employee empowerment (X2), continuous quality improvement (X3), and fact-based management (X4), while operational performance served as the dependent variable (Y). These dimensions were selected based on the TQM framework and were measured through indicators related to customer orientation, employee involvement, continuous process improvement, data-based decision-making, and operational effectiveness.

The data were processed using SPSS version 22.0. The analysis included validity and reliability tests, classical assumption tests, multiple linear regression, partial t-tests, simultaneous F-tests, and the coefficient of determination (R^2). The regression model was formulated as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

The t-test was used to examine the partial effect of each TQM dimension on operational performance, while the F-test was used to determine the simultaneous effect of all independent variables. The hypotheses were evaluated at a significance level of 0.05. The coefficient of determination was used to assess the proportion of variation in operational performance explained by the TQM dimensions included in the model.

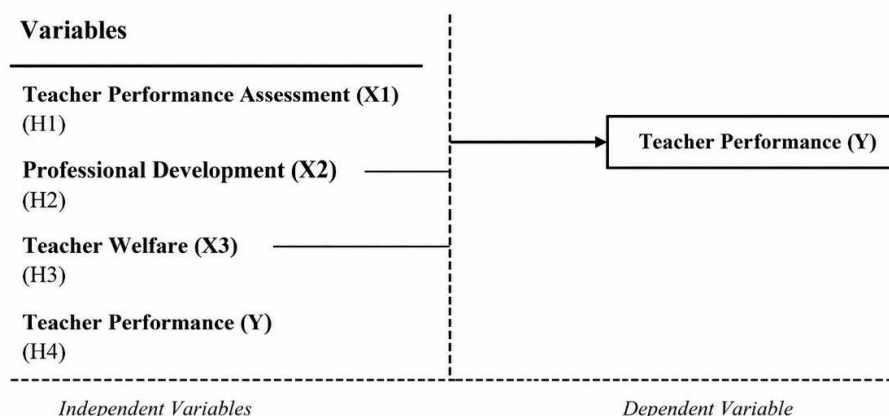


Figure 1. Conceptual Framework

IV. Results and Discussion

4.1. Respondent Characteristics

Table 1. Respondent Characteristics Based on Age

No.	Age	Frequency (f)	Percentage (%)
1	17-25 Years	5	17
2	26-35 Years	23	77
3	36-45 Years	1	3
4	45> Years	1	3
Amount		30	100

Table 2. Respondent Characteristics Based on Gender

No.	Gender	Frequency (f)	Percentage (%)
1	Man	12	40
2	Woman	18	60
Amount		30	100

Table 3. Respondent Characteristics Based on Last Education

No.	Last education	Frequency (f)	Percentage (%)
1	Senior High School	6	20
2	D3	3	10
3	S1	21	70
Amount		30	100

The majority of respondents were aged 26–35, representing 77%. Gender-wise, female respondents dominated at 60%, while male respondents made up 40%. In terms of education, the majority (70%) had a bachelor's degree.

4.2. Validity and Reliability Test

Table 4. Validity Test Results for All Variables

No	Variables	Item	r count	r table	Information
1	Customer satisfaction	TQM 1	0.458	0.361	Valid
2	Customer satisfaction	TQM 2	0.402	0.361	Valid
3	Customer satisfaction	TQM 3	0.421	0.361	Valid
4	Customer satisfaction	TQM 4	0.571	0.361	Valid
5	Customer satisfaction	TQM 5	0.635	0.361	Valid
6	Employee Empowerment	TQM 1	0.752	0.361	Valid
7	Employee Empowerment	TQM 2	0.669	0.361	Valid
8	Employee Empowerment	TQM 3	0.624	0.361	Valid
9	Employee Empowerment	TQM 4	0.459	0.361	Valid
10	Employee Empowerment	TQM 5	0.630	0.361	Valid
11	Continuous Quality Improvement	TQM 1	0.409	0.361	Valid
12	Continuous Quality Improvement	TQM 2	0.391	0.361	Valid
13	Continuous Quality Improvement	TQM 3	0.400	0.361	Valid
14	Continuous Quality Improvement	TQM 4	0.384	0.361	Valid
15	Continuous Quality Improvement	TQM 5	0.557	0.361	Valid
16	Fact-Based Management	TQM 1	0.544	0.361	Valid
17	Fact-Based Management	TQM 2	0.597	0.361	Valid
18	Fact-Based Management	TQM 3	0.565	0.361	Valid
19	Fact-Based Management	TQM 4	0.528	0.361	Valid

20	Fact-Based Management	TQM 5	0.476	0.361	Valid
21	Operational Performance	KO 1	0.651	0.361	Valid
22	Operational Performance	KO 2	0.561	0.361	Valid
23	Operational Performance	KO 3	0.579	0.361	Valid
24	Operational Performance	KO 4	0.415	0.361	Valid
25	Operational Performance	KO 5	0.678	0.361	Valid
26	Operational Performance	KO 6	0.475	0.361	Valid
27	Operational Performance	KO 7	0.656	0.361	Valid
28	Operational Performance	KO 8	0.566	0.361	Valid

The value obtained from the calculated r is the corrected item-total correlation, while the 5% r table value can be obtained through the Pearson product moment r table with df (degree of freedom) = $n - 2$, so $df = 30 - 2 = 28$, then r table = 0.361. Data is said to be valid if the calculated r value > r table. Based on the validity test results in the table above, all statement items in the variables Customer Satisfaction, Employee Empowerment, Continuous Quality Improvement, Fact-Based Management, and Operational Performance have a calculated r value greater than the table r of 0.361. Thus, all statement items in this study are declared valid and suitable for use as research instruments.

Table 5. Reliability Test Results

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.925	.927	28

The results showed that the data had a Cronbach's Alpha value of 0.925. This indicates reliability, as the Alpha value was greater than the r value at the 5% significance level, which is 0.361.

4.3. Classical Assumption Test

Table 6. Data Normality Test

Statistics	KP	PK	PMB	MBF	Operational Performance
N	150	150	150	150	240
Normal Parameters ^a	4.30	4.19	4.28	4.14	4.08
Normal Parameters ^a	0.642	0.692	0.614	0.769	0.704
Most Extreme Differences	0.286	0.257	0.309	0.261	0.295
Most Extreme Differences	0.286	0.257	0.309	0.232	0.280
Most Extreme Differences	-0.255	-0.231	-0.246	-0.261	-0.295
Kolmogorov-Smirnov Z	3.508	3.143	3.785	3.198	4.563
Asymp. Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000

Based on the Kolmogorov Smirnov test table above, it can be concluded:

X1 = 3.508 which means > 0.05 so the population is normally distributed

X2 = 3.143 which means > 0.05, so the population is normally distributed.

X3 = 3.785 which means > 0.05 so the population is normally distributed

X4 = 3.198 which means > 0.05 so the population is normally distributed

Y = 4.563 which means > 0.05, so the population is normally distributed

So it can be concluded that based on the normality test, all data is normally distributed.

Table 7. Results of Data Multicollinearity Test

Model	Variable	Tolerance	VIF
1	Constant	—	—
	KP	0.753	1.328
	PK	0.800	1.250
	PMB	0.830	1.204
	MBF	0.887	1.127

Based on the table above, the results of the Tolerance value calculation also show that there are no independent variables that have a Tolerance value of less than 0.10, namely for each variable. The results of the VIF calculation also show the same thing, namely that none of the independent variables have a VIF value of more than 10, namely the Customer Satisfaction variable 1.328, Employee Empowerment 1.250, Continuous Quality Improvement 1.204 and Fact-Based Management 1.127. From these results, it can be concluded that there is no multicollinearity between the independent variables in the regression model.

Table 8. Autocorrelation Test Results (Durbin-Watson)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin- Watson
1	.428 a	.183	.161	.60537	2,182

The autocorrelation test aims to test whether there is a correlation between the error term in the regression model in the previous period, which usually occurs because it uses time series data. The results of the autocorrelation test can be concluded that the model used in this study has a Durbin-Watson value of 2.182 with a DL (Durbin lower) of 1.142 and a DU (Durbin Upper) of 1.738. Based on these data, there is no positive autocorrelation in the data because $d > d_U$. While negative autocorrelation is also not found because $(4-d) > d_U$. So it can be concluded that in the regression analysis there is no positive autocorrelation and there is no negative autocorrelation so it can be concluded that there is no autocorrelation at all.

Scatterplot

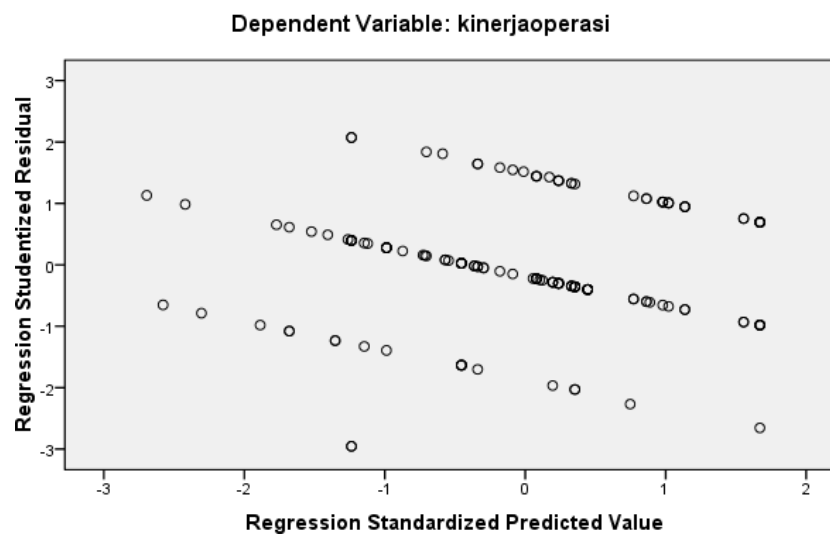


Figure 2. Heteroscedasticity Test Results

The heteroscedasticity test is used to determine whether or not there is a deviation from the classical assumption of heteroscedasticity, namely the unequal variance of the residuals for all observations in the

regression model. A good regression model is one that is homoscedastic, or does not exhibit heteroscedasticity (Ghozali, 2011). Heteroscedasticity testing uses a scatterplot graph. The following is a display of the scatterplot graph of the regression model in this study, presented in the graph above. Based on the Scatterplot graph above, it can be seen that the points are randomly distributed and spread both above and below the number 0 on the Y-axis and do not form a clear pattern. Therefore, it can be concluded that there is no heteroscedasticity problem in the regression model, so the regression model is suitable for predicting operational performance based on the variables of customer satisfaction, employee empowerment, continuous quality improvement and fact-based management.

4.4. Hypothesis Testing

Table 9. T-Test Results (partial test)

	Model	T	Sig.	Sig. In Percentage
1	(Constant)	3,366	.001	0%
	KP	.368	.713	71%
	PK	2,767	.006	1%
	PMB	2,210	.029	3%
	MBF	2,206	.029	3%

The results of the t-test of the variables Customer Satisfaction, Employee Empowerment, Continuous Quality Improvement and Fact-Based Management on Operational Performance from the data obtained show that:

- The Customer Satisfaction variable in the study showed a significance value of 0.713 or 71% in percentage. Because the significance value in the study of 0.713 or 71% is more than the significance level (α) of 0.05 or 5%, it can be concluded that H_0 is accepted and H_a is rejected, meaning the regression coefficient on the Customer Satisfaction variable is not significant. It can be concluded that the Customer Satisfaction variable partially (individually) has less influence on Operational Performance.
- The Employee Empowerment variable in the study showed a significance value of 0.006 or 1% in percentage. Because the significance value in the study of 0.006 or 1% is less than the significance level (α) of 0.05 or 5%, it can be concluded that H_0 is rejected and H_a is accepted, meaning the regression coefficient on the Employee Empowerment variable is significant. It can be concluded that the Employee Empowerment variable partially (individually) has an effect on Operational Performance.
- The Continuous Quality Improvement variable in the study shows a significance value of 0.029 or 3% in percentage. Because the significance value in the study of 0.029 or 3% is less than the significance level (α) of 0.05 or 5%, it can be concluded that H_0 is rejected and H_a is accepted, meaning the regression coefficient on the Continuous Quality Improvement variable is significant. It can be concluded that the Continuous Quality Improvement variable partially (individually) has an effect on Operational Performance.
- The Fact-Based Management variable in the study shows a significance value of 0.029 or 3% in percentage. Because the significance value in the study of 0.029 or 3% is less than the significance level (α) of 0.05 or 5%, it can be concluded that H_0 is rejected and H_a is accepted, meaning the regression coefficient on the Fact-Based Management variable is significant. It can be concluded that the Fact-Based Management variable partially (individually) influences Operational Performance.

Table 10. F-Test Results (Simultaneous Test)

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	11,935	4	2,984	8,142	.000 a
Residual	53,138	145	.366		
Total	65,073	149			

- Predictors: (Constant), MBF, PK, PMB, KP
- Dependent Variable: Operation Performance

Based on the table above, the calculated F value is 8.142 while the F table value is 2.76. It can be seen that the calculated F value of 8.142 is greater than the F value and the significant probability value is 0.000 or 0% smaller than 0.05 or 5%. then this regression model can be used for Operational Performance. In other words, it can be said that the variables Customer Satisfaction, Employee Empowerment, Continuous Quality Improvement and Fact-Based Management have a significant effect simultaneously on the Operational Performance variable.

4.5. Multiple Linear Regression Test

Table 11. Results of Regression Test of Factors Affecting Operational Performance.

Model	Variable	Unstandardized Coefficient (B)	B (%)	Std. Error	Standardized Coefficient (Beta)	t	Sig.
1	Constant	1.580	158%	0.469	—	3.366	0.001
	Customer Satisfaction (KP)	0.033	3%	0.089	0.032	0.368	0.713
	Employee Empowerment (PK)	0.222	22%	0.080	0.232	2.767	0.006
	Continuous Quality Improvement (PMB)	0.196	20%	0.089	0.182	2.210	0.029
	Fact-Based Management (MBF)	0.151	15%	0.068	0.176	2.206	0.029

From the table, a regression equation can be formulated to determine the influence of Customer Satisfaction, Employee Empowerment, Continuous Quality Improvement and Fact-Based Management on Operational Performance as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

$$Y = 1.580 + 0.033 X_1 + 0.222 X_2 + 0.196 X_3 + 0.151 X_4 + e$$

$$Y = 158\% + 3\% X_1 + 22\% X_2 + 20\% X_3 + 15\% X_4 + e$$

Information :

Y = Operational Performance
a = Constant
X₁ = Customer Satisfaction
X₂ = Employee Empowerment
X₃ = Continuous Quality Improvement
X₄ = Management Based on Facts

$\beta_1; \beta_2; \beta_3; \beta_4$ = Regression Coefficient of X₁; X₂; X₃; X₄ e = Standard error

- The constant of 1,580 in percent 158% states that if the independent variable is considered constant, then Operational Performance is 3,366 or in percent of 337%. The figure obtained is quite large, namely 337%. This indicates that the implementation of Operational Performance in the company PT. So good food has been implemented well before the influence of the implementation of Total Quality Management.
- The Customer Satisfaction variable has an influence on Operational Performance of 0.033 or 3% in percentage and has a significance level of 0.713 or 71% on the Operational Performance variable. Therefore, the Customer Satisfaction variable has an influence on Operational Performance but is not significant because it is more than the 5% significance level. When the Customer Satisfaction variable increases, Operational Performance also increases by 3%.
- Employee Empowerment variable has an influence on Operational Performance of 0.222 , or 22% in percentage, and has a significance level of 0.006, or 1% in percentage. Therefore, the Employee Empowerment variable has a significant influence on Operational Performance because it is less than

- the 5% significance level. When the Employee Empowerment variable increases, Operational Performance also increases by 22%.
- d. Continuous Quality Improvement variable has an influence on Operational Performance of 0.196 or 20% in percentage and has a significance level of 0.029 or 3% in percentage on the Operational Performance variable. Therefore, the Continuous Quality Improvement variable has a significant influence on Operational Performance because it is less than the 5% significance level. When the Continuous Quality Improvement variable increases, Operational Performance also increases by 20%.
 - e. The Fact-Based Management variable has an influence on Operational Performance of 0.151, or 15% in percentage, and has a significance level of 0.029, or 3% in percentage. Therefore, the Fact-Based Management variable has a significant influence on Operational Performance because it is less than the 5% significance level. When the Fact-Based Management variable increases, Operational Performance also increases by 15%.

4.6. Discussion

The results indicate that customer satisfaction does not have a significant partial effect on operational performance. This finding suggests that, within the context of PT So Good Food, customer satisfaction may function more as an outcome of operational performance than as a direct driver of internal operational activities. Customer expectations may also influence operational performance indirectly through product-quality improvement, complaint evaluation, and service-development processes. Therefore, improvements in customer satisfaction may not immediately produce measurable changes in operational performance. This result differs from the findings of Widjaya and Suryawan (2014), which demonstrated a positive relationship between TQM practices and company performance. The difference may be related to variations in organizational context, measurement indicators, and the role of customer-oriented practices in each company. Employee empowerment has a positive and significant effect on operational performance and provides the largest contribution among the TQM dimensions examined. This result indicates that employee involvement is an important factor in improving operational activities at PT So Good Food. Employees who are provided with opportunities to participate, contribute ideas, and take responsibility for work-related decisions may identify operational problems more quickly and support the implementation of appropriate improvements. This finding is consistent with Prayhoego and Devie (2013), who found that employee involvement in TQM implementation contributes to improved company performance. Practically, the company should strengthen employee participation through regular improvement meetings, opportunities to provide operational feedback, and greater involvement in problem-solving activities.

Continuous quality improvement has a positive and significant effect on operational performance. This result indicates that continuous evaluation and improvement of products, work procedures, and operational processes can support greater efficiency and consistency. Continuous improvement enables the company to identify recurring problems, reduce process errors, and improve the quality of operational outcomes. This finding supports the study of Munizu et al. (2012), which showed that effective TQM practices can strengthen quality culture, competitiveness, and company performance. Therefore, PT So Good Food should maintain regular process evaluations and use the results to develop corrective and preventive improvements. Fact-based management also has a positive and significant effect on operational performance. The result demonstrates the importance of using accurate and relevant information in evaluating operational conditions and making managerial decisions. Data-based decision-making can assist the company in identifying performance deviations, determining operational priorities, and evaluating the effectiveness of improvement actions. This finding is consistent with Ramlawati et al. (2008), who reported that data-based TQM practices contribute to improved business performance. Accordingly, PT So Good Food should strengthen the use of operational data and performance indicators in routine monitoring and decision-making.

The simultaneous F-test indicates that customer satisfaction, employee empowerment, continuous quality improvement, and fact-based management jointly have a significant effect on operational performance. This finding confirms that TQM should be implemented as an integrated management system because its dimensions complement one another. Customer orientation provides information regarding market expectations, employee empowerment supports the implementation of improvements, continuous quality improvement strengthens process development, and fact-based management provides an objective basis for operational decisions. The result supports the findings of Widjaya and Suryawan (2014) and Munizu et al. (2012), which showed that the implementation of TQM practices contributes to improved organizational performance. Overall, the findings indicate that the internal dimensions of TQM, particularly employee

empowerment, continuous quality improvement, and fact-based management, have a more direct relationship with operational performance at PT So Good Food than customer satisfaction. The practical implication is that management should prioritize employee involvement, continuous process evaluation

V. Conclusion

This study examined the effects of customer satisfaction, employee empowerment, continuous quality improvement, and fact-based management on operational performance at PT So Good Food. The findings indicate that employee empowerment, continuous quality improvement, and fact-based management have positive and significant effects on operational performance, whereas customer satisfaction does not have a significant partial effect. However, the simultaneous test demonstrates that the four dimensions of Total Quality Management (TQM) jointly have a significant effect on operational performance. These findings indicate that internal TQM practices, particularly employee involvement, continuous process improvement, and data-based decision-making, play an important role in supporting operational performance. Therefore, PT So Good Food should strengthen employee participation in operational problem-solving, conduct regular evaluations of work processes, and optimize the use of operational data in managerial decision-making. Customer feedback should also continue to be used as an important input for long-term quality improvement. This study is limited by the use of 30 respondents from a single company and the use of a cross-sectional survey design. Therefore, the findings should be interpreted cautiously and cannot be generalized broadly to other organizations or industries. Future studies should involve a larger and more diverse sample, include companies from different industries, and examine additional factors that may influence operational performance. Future research may also investigate the indirect effects of customer satisfaction or examine other organizational factors that could strengthen the relationship between TQM practices and operational performance.

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