

## The Effect Of TQM Practices On Operational Performance In Energy Sector Companies

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**Abstract**—This study aims to determine whether there is an influence of TQM Practice on operational performance in energy companies in Indonesia. The sample selection method in this study is Purposive Sampling in employees who work in the field of energy, Data collection using surveys in the form of questionnaires using SEM statistical analysis tools processed through AMOS 26 software. The results of hypothesis testing show that process management has a positive and significant effect on performance, while top management support, customer focus, employee empowerment and engagement, continuous improvement, education, and training have no significant effect.

**Keywords:** *TQM Practices; operational performance*

### INTRODUCTION

People are now smarter in choosing goods or services that have good quality. Therefore, many companies are trying to improve the quality of the goods or services they produce to maintain customer trust in the company. It is difficult for companies to survive unless they improve the quality of the company (Bajaj *et al*, 2018). Companies are encouraged to improve quality in terms of services, products and also processes of daily operations. As for research conducted by Herzallah *et al*, (2014) stated that quality is a very relevant concept and a strategic key factor that plays an important role in organizational success.

In improving the quality of the company, managers can be assisted by the concept of Total Quality Management (TQM). TQM is considered as a continuous process that leads to the overall development of the organization in terms of performance with the involvement of every individual associated with the organization (Bajaj *et al*, 2018). TQM has an important and beneficial influence for value development on employees and companies. By focusing employees on quality management and continuous improvement, companies can build and maintain values that drive long-term success for customers and companies (Hudnurkar *et al*, 2022). TQM focuses on identifying skills gaps in the workforce and providing the training, education, and mentoring needed to address those gaps (Hudnurkar *et al*, 2022). Based on the background described above, this study aims to see the influence of TQM Practices on Operational Performance in Energy Sector.

### LITERATURE REVIEW

#### *Total Quality Management (TQM)*

Concept of TQM first appeared in 1949 after World War II. At that time scientists, academics, and strategists from Japan worked together to develop a TQM process that could improve the quality of life in Japan (hudnurkar *et al*, 2022). According to Oakland (2014), TQM refers to "a set of systematic activities carried out by the entire organization effectively and efficiently to be able to achieve organizational goals in terms of providing products and services with a satisfactory level of quality to customers, at the right speed of time and price". TQM principles are daily practices taken with the aim that companies can meet and achieve quality management goals (Quang *et al.*, 2016). Sajan *et al.*, (2017)

also argue that the values, objectives, and objectives related to TQM are aimed at being able to achieve customer satisfaction. Taylor et al., (2020) added that maximizing profits, reducing operational costs, and increasing company productivity and efficiency are also the values and objectives of TQM. Total Quality Management or often abbreviated as TQM is a quality management system that focuses on Customers (Customer focused) by involving all employees in making continuous improvements or improvements. There are eight elements in TQM (Total Quality Management), namely: Customer Focused, Total Employee Involvement, Process-centered, Integrated System, Strategy and Systematic Approach, Continual Improvement, Fact-based decision making, and Communications.

### ***Operational Performance***

Operational performance can be said to be a vital aspect of the company, which can show how well the activity in carrying out a process or the results of a process are useful for achieving certain goals (Faeq et al., 2021). The purpose of operations is to minimize costs and increase efficiency in conducting the company's daily operations (Sharma and Modgil, 2019, Acquah et al, 2022). Operational performance relates to the measurement of process results within the company such as consistency, production time, and inventory turnover (Thoumy et al, 2022). According to Purbowo and Waluyowati (2022), quality is a demand for every company to compete well. In improving operational performance, companies need to pay attention to all aspects in the company. The company's performance can be measured by several aspects of assessment that in the future can enable the company to operate the business effectively and efficiently. In assessing operational performance, this study refers to research conducted previously by Nabass and Abdallah, (2018) by categorizing operational performance into 4 aspects, namely; quality, cost, delivery, flexibility. Previous research said that TQM allows companies to achieve better operational performance which can be measured in terms of quality, cost, productivity, flexibility, and delivery time (Adem and Viridi, 2019).

### **CONCEPTUAL FRAMEWORK**

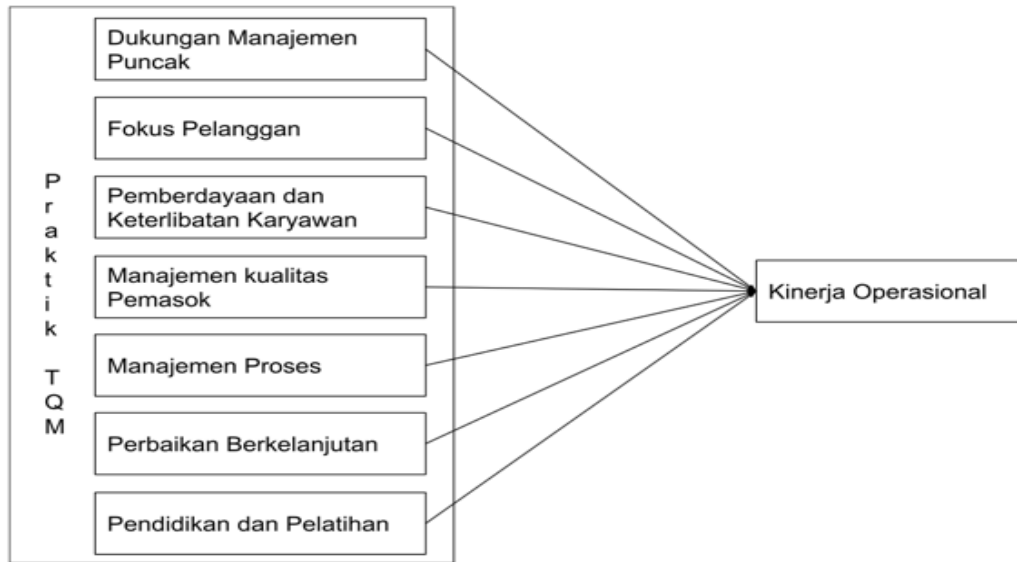
Based on the results of research conducted by Sadikoglu and Olcay (2014), establishing top management commitment and leader involvement as the most important factors in effectiveness in TQM practices. The success of TQM implementation lies largely in the support obtained from senior management in the organization (Purbowo and Waluyowati, 2022). Top management also needs to ensure that quality training is available for human resources in the company (Faeq et al., 2021). Based on previous studies, the following hypothesis was proposed. H1: Top Management Support has a positive and significant effect on Operational Performance.

Several studies have found that customer focus has a positive and significant effect on operational performance (Chauke et al., 2019). Customer focus can see the extent to which a company can meet customer needs and expectations, and find out whether these needs and expectations are met (Faeq et al., 2021). Based on previous studies, the following hypothesis was proposed. H2: Customer focus has a positive and significant effect on operational performance.

Adem and Viridi (2019) said that the key to operational performance in the company lies in the elements of human resource management which include employee engagement, empowerment, training and information sharing. Research conducted by Chauke et al. (2019) also found a significant and positive relationship between employee engagement and operational performance. Based on previous studies, the following hypothesis was

proposed. H3: Employee empowerment and engagement have a positive and significant effect on operational performance.

Several studies have also recognized the significant and positive relationship that supplier quality management has with operational performance (Chauke et al, 2019). Based on previous studies, the following hypothesis was proposed. H4: Supplier quality management has a positive and significant effect on operational performance.



**Figure 1.** Conceptual Design

Results Research conducted by Chauke et al., (2019) said that process management affects operational performance. Process management plays an important role in improving the efficiency, effectiveness, and flexibility of operations, as well as the quality of the final product (Nasution and Absah, 2022). Process management helps achieve quality improvement by adopting proactive and preventive mechanisms that ensure that production and operational processes with large quantities without errors or potential errors (Purbowo and Waluyowati, 2022). Based on previous studies, the following hypothesis was proposed. H5: Process management has a positive and significant effect on operational performance.

Kiprotich et al. (2018) argues that continuous improvement significantly affects every indicator of a company's operational performance and thus increases the company's competitiveness. Based on previous studies, the following hypothesis was proposed. H6: Continuous improvement has a positive and significant effect on operational performance.

Research conducted by Kiprotich et al. (2018); Demonstrate a significant and positive relationship between employee education and training and operational performance. In order to make a transition in improving the quality of products and processes, companies need human resources, commitment from management, and employee training to be able to adapt to changes (Niyi Anifowose et al., 2022). Based on previous studies, the following hypothesis was proposed. H7: Education and training have a positive and significant effect on operational performance.

## RESEARCH METHODS

The purpose of research is to test the hypothesis because the researcher wants to prove whether the hypothesis that has been compiled is accepted or rejected. Based on the level of involvement of researchers, this study is a study with minimal involvement, conducted at the energy sector company. The unit of analysis in this study is individual, namely Human Resources in the Company. The data period used cross section.

The population in this study is employees of Energy Sector Companies. Respondents to this questionnaire have criteria, namely employees who have worked for more than 2 years. With a research sample of 305 respondents. Sample selection techniques use certain considerations that are generally tailored to the purpose of the study. The sample selection method in this study is Purposive Sampling on employees who work in the field of Energy. Data collection using surveys in the form of questionnaires by sending *internet links*.

Researchers use Primary Data obtained directly from original sources which are then processed and presented by researchers. The data collection instrument is using questionnaires using online surveys by sending internet links. Questionnaire is an information collection technique that will be analyzed to study the attitudes, behaviors, and characteristics of several people in the company who can be affected by the existing system.

The statistical analysis tool used in this study uses SEM analysis processed through AMOS 26 software with the aim of seeing the relationship structure of a number of variables or knowing the arrangement of all variables studied. Based on validity and reliability tests on research instruments, it shows that all research variables are valid and reliable.

## RESULT AND DISCUSSION

### *Test Instruments*

The feasibility of data on test instruments is measured using validity and reliability. Validity tests are used to see if indicators are appropriate for measuring variables, and reliability tests are used to analyze whether there is consistency of intervals between indicators (Sekaran & Bougie, 2016)

### *Validity Test*

Validity test is the test of the extent to which variables in a study can be measured by statement indicators. The analytical tool used in the validity test is Confirmatory Factor Analysis (CFA) by looking at the loading factor in the Structural Equation Model (SEM) and the help of AMOS software. The level of the number of samples will affect the value of the loading factor. (Hair et al., 2019)

Based on the number of respondents in this study is 317 respondents, the loading factor used is 0.40 so that the indicator can be declared valid. The following provisions are based on the loading factor in the table above: If the Loading Factor  $\geq 0.40$ , then the statement item is valid; If the Loading Factor  $\leq 0.40$ , then the item declaration is invalid.

**Table 1.** Normality Test Results

Kurtosis	Critical Ratio skewness value
121,211	34,71

Source: Authors

Evaluation of data normality based on *critical ratio skewness value* criteria of  $\pm 2.58$ . While the *multivariate* normality test in this study showed a *critical ratio* value of 34.71, it can be concluded that the data in this study has not been normally distributed. This research uses *the Structural Equation Model (SEM)* analysis method using AMOS software. Before hypothesis analysis is carried out, it is necessary to evaluate the suitability of the model in research to ensure that the model can draw cause and effect. If one of the *goodness-of-fit* criteria has been met, it can be declared a viable model for use in future tests.

**Table 2.** Goodness of fit results

Goodness of fit index	Criteria (cut-off value)	Calculation Results	Conclusion
X <sup>2</sup> - Chi-square	Expected small (0-2)	5,319	Poor Fit
Significance probability	$\geq 0.05$	0,000	Poor Fit
RMSEA	$\leq 0.08$	0,117	Poor Fit
NFI	$\geq 0.90$	0,913	Goodness Of Fit
RFI	$\geq 0.90$	0,886	Marginal Fit
TLI	$\geq 0.90$	0,905	Goodness Of Fit
CFI	$\geq 0.90$	0,928	Goodness Of Fit
GFI	$\geq 0.90$	0,793	Poor Fit
AGFI	GFI $\leq$	0,701	Poor Fit

Source: Authors

These results show that the model used is acceptable because it shows the results of the goodness of fit test, it can be seen that the NFI, TLI, and CFI values are expressed *Goodness of fit*. Results from RFI are declared *Marginal* fit, while results from sig, RMSEA, GFI, and AGFI values are declared *Poor of fit*.

Based on the results above, it can be concluded that the model used in this study can meet the criteria of the model of fit. If one of the goodness of fit criteria has been met, then the model used can be accepted and the next test can be carried out, namely hypothesis testing, because there are 3 measurement models with *goodness of fit* values.

In this study there are 7 (seven) hypotheses that refer to previous research. Hypothesis testing aims to answer the problems posed in research by rejecting the null hypothesis (H<sub>0</sub>) so that the alternative hypothesis (H<sub>a</sub>) can be accepted. The following is a table 3 of hypothesis test results.

**Table 3.** Hypothesis Testing Results

Hypothesis	Estimate	P-value	Conclusion
H1	-0,140	0,383	Rejected
H2	0,024	0,885	Rejected
H3	0,031	0,937	Rejected
H4	0,302	0,032	Rejected
H5	0,428	0,005	Accepted
H6	0,176	0,533	Rejected
H7	0,313	0,059	Rejected

Source: Authors



The results show that process management and supplier quality management have a positive and significant effect on operational performance because it has a *p-value* of  $\leq 0.50$ , so the hypothesis is accepted. Results were not significant on top management support, customer focus, employee empowerment and engagement, continuous improvement, education and training on operational performance because it had a *p-value* of  $\geq 0.05$  so the hypothesis was rejected. These results are in line with previous results conducted by Sadikoglu & Olcay, (2014), Kebede Adem & Viridi, (2021), where not all TQM practices have significant results on operational performance.

## DISCUSSION

H1: Top Management Support for Operational Performance. The *p-value* result of 0.383 value is  $\geq 0.05$ , it shows that top management support does not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous research conducted by Sadikoglu & Olcay, (2014), Kebede Adem & Viridi, (2021) also found that there was no significant effect on top management support on operational performance. H2: Process Management of Operational Performance. The *p-value* result of 0.005 is  $\leq 0.05$ , it shows that process management has a significant effect on operational performance, so the hypothesis is accepted. This shows that the higher the process management, the higher the operational work. The results of this study are in accordance with the results of previous research conducted by Sadikoglu & Olcay, (2014), Kebede Adem & Viridi, (2021). H3: Supplier Quality Management of Operational Performance. The *p-value* result of 0.032 value is below  $\geq 0.05$ , It shows that quality management does not have a significant effect on operational performance, so the hypothesis is rejected. H4: Customer Focus on Operational Performance. The *p-value* result of 0.885 value is  $\geq 0.05$ , it shows that customer focus does not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance. H5: Employee Empowerment and Involvement in Operational Performance. The *p-value* result of 0.937 value is  $\geq 0.05$ , it shows that employee empowerment and involvement in operational performance then the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance. H6: Continuous Improvement of Operational Performance. The *p-value* result of 0.533 value is  $\geq 0.05$ , it shows that continuous improvement does not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance. H7: Education and Training on Operational Performance. The *p-value* result of 0.059 value is  $\geq 0.05$ , it shows that education and training do not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance.

## CONCLUSION

This study analyzes the effect of TQM practices on Operational Performance in energy sector companies using Structural Equation Modeling (SEM) using the help of AMOS software. Based on the results and discussion of research obtained from 317 respondents who are employees in the energy sector. The majority of respondents are male, the majority are aged 20-30 years, the majority of company employees are

undergraduate graduates, the majority of employees working in the company are over 9 years. Based on the results of hypothesis testing, there is 1 supported hypothesis and 6 unsupported hypotheses showing that not all TQM practices have a significant effect on operational performance. The results of hypothesis testing can be seen: 1) There is no positive effect of Top Management Support on Operational Performance; 2) There is no positive influence Customer focus on Operational Performance; 3) There is no positive influence of employee empowerment and engagement on Operational Performance; 4) There is no positive influence of supplier quality management on operational performance; 5) There is a positive influence of Process Management on Operational Performance; 6) There is no positive effect of continuous improvement on operational performance; and 7) There is no positive effect of Education and training on Operational Performance.

## IMPLICATION

This study found that process management has a significant effect on operational performance. These results are associated with key practices such as achieving process capabilities that meet production requirements, maintenance of production equipment according to maintenance plans, conducting regular assessments of production processes and prioritizing quality in developing new products. In short, controlling the production process periodically and monitoring quality data continuously will certainly help the organization to achieve better performance results in terms of operational criteria.

The findings in this study can help managers of energy sector in Indonesia to be able to understand the importance of supplier quality management for operational excellence. In addition, the fact that all TQM practices correlate with operational performance can assist managers in realizing important improvements. The increase is triggered by the relationship between TQM factors. In general, the results of this study will encourage managers of energy sector companies in Indonesia who seek to take advantage of the TQM approach.

## LIMITATIONS

In conducting this study, researchers have several limitations, including the research data was spread abnormally due to the presence of outliers and the object of research is only focused on 1 (one) company.

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