

Critical Success Factors of Total Quality Management and Their Impact on Performance in the Indonesian Public Service Sector

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Abstract—The paper seeks to empirically investigate the relationships among Critical Success Factors (CSF) of TQM and performance outcomes within one Public Service Sector in Indonesia by drawing on employee and management perceptions. Twenty-four hypotheses regarding the relations of CSF of TQM and performance outcomes have been developed through literature review and the research model was tested using Structural Equation Modeling (SEM) technique. The study utilized survey data obtained from 310 respondent (employee and managers). The results indicate that leadership is a key factor that can drive performance improvement. The other critical success factors that drive services quality are continuous improvement, customer focus, and operational performance. Researchers could use the results of this study to explore variously related hypothesis in more detail. Managers in public organizations must realize that it is imperative for them to enhance their leadership as is it essential for effective quality improvement.

Index Terms—total quality management (TQM), service quality, public sector organization, Indonesia

I. INTRODUCTION

In managing overall service quality, one effective approach is through the application of the Total Quality Management (TQM) method. TQM in Dean and Helms is an organizational strategy to continuously develop its products, processes and services to achieve sustainable quality [1]. Quality gurus suggest that quality management is the key to the improvement of performance [2]. Research has shown that quality schemes in the public sector have been found to improve facility management, reducing cost, staff motivation, moral and satisfaction [3], citizen satisfaction and overall organizational performance [4]. Although there is considerable research material and knowledge concerning the adoption of TQM in manufacturing environment, relatively few TQM studies in the service sector, and more specifically in the public service sector [7]. Some literature has noted that there is still no appropriate framework for applying TQM especially in the public sector [5], [6]. Based on this gap literature, researchers suggest that future research should focus on TQM implementation across service organizations investigating the the factors that are critical for the successful implementation of TQM and the respective outcome [7]. Investigating critical factors that determine the

success of TQM implementations is particularly important [8]. Measuring and evaluating the critical success factors (CSFs) of TQM is an important prerequisite to be able to control the implementation process and to increase the chances of success so that it can produce quality performance and also the quality of the organization's products/services.

Therefore, the present study focused on TQM implementation in the public sector, and more specifically, in one of government institution of Indonesia. Few studies of aspects of quality management have been conducted in Indonesia, especially in public services or government agencies and even fewer have used structural equations as a statistical tool to investigate the direct and indirect effects of quality management practices on performance. Hence, it is important to extend the studies on the effects of quality management practices in the context of Indonesia government agency.

The purpose of this study is to empirically investigate the relationships among quality management practices (CSFs of TQM) and performance outcomes, to find which factors that have a significant impact on overall performance, and especially service quality. This research proceed with: the study of these potential relationships; the identification of relationships supported by previous empirical research, and ; the use of research instruments previously developed by Grandzol and Gershon with modifications to the relationships between variables [9]; test the relationships with appropriate sample; the application of statistical technique to consider multiple relationships simultaneously in order to maximize the modeling of reality. The study intends to answer the following research questions:

- 1) Which quality management practices are the most critical?
- 2) What is the nature of the relationship between TQM CSFs and performance?

II. LITERATURE REVIEW

A. Total Quality Management

Quality gurus suggest that quality management is the key to the improvement of performance [2]. Over the past several

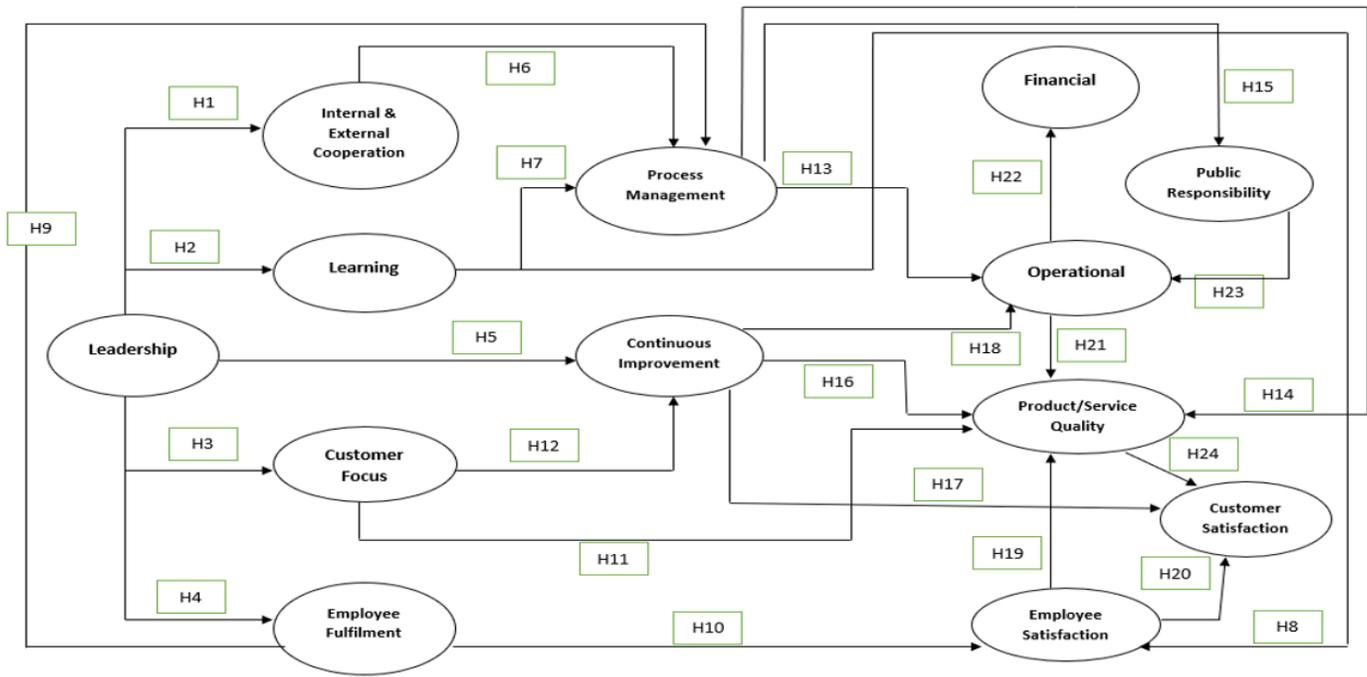


Fig. 1. Proposed conceptual model.

decades, quality management researchers have expanded the concept of quality throughout the organization and made each individual in the organization responsible for quality. Quality management evolved from result-oriented quality control to an integrated overall company/organization approach [8]. Researchers refer to the approach as Total Quality Management (TQM). The TQM concept consists of three components, namely: first, the “total” term assumes that all individuals associated with the organization contribute to quality management (employees, customers and suppliers). Second, “quality” is an integral part of the company’s philosophy. Third, the term “management” refers to executive responsibility and managerial commitment [10].

According to the Department of Defense TQM Masterplan (1988) in Ireland (1991) defines TQM as an integrated regulatory technique for the complex processes and activities of organizational work activities to achieve continuous improvement in work processes, products and service organizations. In its development, various studies have been conducted to identify elements for successful quality management, from three different fields, namely: contributions from teachers/quality experts (Deming, Juran, Crosby), formal model evaluation, and empirical research. And managers in a company/organization must know which aspects they should consider in developing TQM successfully in their company/organization. Several empirical studies in developed and developing countries conclude that quality management is the key for performance improvement, finding a positive relationship between quality management and performance ([11]; Powell, 1995; [12], [13]; Sila (2007)).

B. The Term Critical Success Factor (CSFs)

In order to benefit from TQM effectively, organisations require certain preconditions. These CSFs are best practices, enablers or keys, which drive a company’s success [8], [14]. In this study, CSFs are conceptualised as initial inputs, which affect the adoption of quality management practices in a critical way [8]. A multitude of different CSFs exist. These CSFs influence the success or failure of TQM implementation (Salaheldin 2009). From a number of studies that examine the relationship of the CSF of TQM to the output/performance of the organization, in this study researchers will use the results of the study that are variables and operationalization of variables similar to the research of Grandzol and Gershon [9]. The selection of this instrument is based on the consideration that Grandzol and Gershon’s research can be applied in the service and public sectors, and the latent variables that will be examined in the instrument are quite comprehensive in terms of both the latent variables associated with TQM practices (key TQM factors) and in terms of variables related with performance outcomes (quality performance produced). These latent variables in this study include: leadership, continuous improvement, employee fulfillment, learning, process management, internal and external cooperation, customer focus, product/service quality, operational, financial, public responsibility, customer satisfaction, employee satisfaction.

III. CONCEPTUAL MODEL AND HYPOTHESES

A. Conceptual Model and Hypotheses

Figure 1 shows a model of relations between TQM CSFs and performance measures. This model uses all construct that

were proposed by Grandzol and Gershon [9] and combines with other management literature to find the relationship of the variables.

B. Hypotheses

As documented by quality gurus and the previous studies, management leadership is an important factor in TQM implementation because it improves performance by influencing other TQM practices [15]. Leadership has a very significant and positive relationship and has a direct influence on Internal and External Cooperation [15] and Learning [15], [16]. Managers should demonstrate more leadership than traditional manager behaviors to increase employee's awareness of quality activities in TQM adoption and practices (Goetsch and Davis (2010)). Previous studies have found that leadership improves employee performance [17] and continuous improvement [18]. In addition, Mayer, et al. concluded that the increase in employee performance refers to the increase in customer focus, where this occurs in conditions when employees perceive leadership well in their organization [19]. Hence the following hypotheses can be proposed:

H1: Leadership has a positive direct effect on Internal and External Cooperation

H2: Leadership has a positive direct effect on Learning

H3: Leadership has a positive direct effect on Customer Focus

H4: Leadership has a positive direct effect on Employee Fulfilment

H5: Leadership has a positive direct effect on Continuous Improvement

Research conducted by Anderson, et al., resulted in a relationship and significant influence between internal and external cooperation on process management [15]. Thus, leads to the following hypothesis:

H6: Internal/external cooperation has a positive direct effect on process management

Employee training (learning) is clearly identified as a critical component of workforce management when implementing significant changes in an organization [20]. If it is to be effective, i.e. transform employees into creative problem solvers, training in quality-related issues should emphasize problem solving in small groups, effective communication, and statistical process control [11]. Previous studies also confirmed the relationship between learning and employee satisfaction. Employee development (learning) can be a determinant of satisfaction and result in an increase in work productivity [21]. Gazioglu and Tansel (2006) state that employees who receive job training have higher satisfaction compared to employees who do not have training opportunities. Thus, the conclusion leads to the following hypotheses:

H7: Learning has a positive direct effect on process management

H8: Learning has a positive direct effect on employee satisfaction

Research by Ho, et al., found that supportive TQM factors included employee fulfilment was stated to have a positive in-

fluence on core TQM factor, namely process management [10]. In addition, Bounds states that employee fulfilment through empowering employees leads them to be more innovative in implementing solutions to problem solving and directing the need for cooperation, communication and teamwork [22]. The practices of fulfilling and empowering employees in TQM are confirmed to have a positive influence on employee satisfaction [23]. Based on those literatures, the proposed hypotheses are:

H9: Employee fulfilment has a positive direct effect on process management

H10: Employee fulfilment has a positive direct effect on employee satisfaction

Singh and Smith (2006) states that customer opinion can help organizations improve product quality and service quality, and therefore it should be taken into consideration in every stage of the product development process. In addition, Jha, et al. stated that customer focus is the main element of continuous improvement.

H11: Customer focus has a positive direct effect on product/service quality

H12: Customer focus has a positive direct effect on continuous improvement

Forza and Flipini found that process management has a direct positive influence on product quality [24]. Similarly, Flynn, et al. found that effective process management results in increases in the percentage of goods passing final inspections with no rework required [11]. Meanwhile, in his research Kaynak found that process management has a direct influence on operational performance [12]. Quality and ethics have the same meaning, "doing the right thing in the right way". The relationship of process management and public responsibility based on Tari is that companies must manage their work processes to reduce variations, imperfect products/services and company activities that they carry out on a daily basis, with a process approach that directs the evaluation of risks, consequences and impact analysis on the activities carried out [25]. These activities are a way to improve quality, because in this management process can increase efficiency. Based on those literature, the proposed hypotheses are:

H13: Process management has a positive direct effect on operational performance

H14: Process management has a positive direct effect on product/service quality

H15: Process management has a positive direct effect on public responsibility

Feigenbaum states that to produce a quality product requires continuous improvement. Continuous improvement is an integral component of the quality program [26]. Flynn, Schroeder, and Sakakibara [11]; Rungtusanatham (1998) show that continuous improvement has a positive influence on customer satisfaction [27]. Bhuiyan and Bagehel conducted a history of continuous improvement definition and defined that continuous improvement is a culture of continuous improvement that targets the elimination of waste in all work systems and processes within an organization [28]. This definition is in line with the definition of the Institute of Quality Assurance that

continuous improvement focuses on increasing the effectiveness and efficiency of an organization to meet its policies and objectives, which means that there is a very close relationship between continuous improvement to operational performance. Hence the following hypotheses can be proposed:

H16: Continuous Improvement has a positive direct effect on product/service quality

H17: Continuous Improvement has a positive direct effect on customer satisfaction

H18: Continuous Improvement has a positive direct effect on operational performance

Schneider and Bowen formulated a conclusion that employees would treat their customers well only if the organization/company treated these employees well too [29]. He found that employee behavior towards organizations that employ them significantly correlated with customer perceptions of the company's service quality. Therefore it is important for organizations to pay attention to employee satisfaction to ensure that employees always show and serve with positive attitudes and behavior to produce quality service. He found that employee behavior towards organizations that employ them significantly correlated with customer perceptions of the company's service quality. Therefore it is important for organizations to pay attention to employee satisfaction to ensure that employees always show and serve with positive attitudes and behavior to produce quality service. Zahari, et al. (2010) and Stershic [30] stated that employee satisfaction is very important in realizing better service quality and customer satisfaction. Based on those literature, the proposed hypotheses are:

H19: Employee satisfaction has a positive direct effect on product/service quality

H20: Employee satisfaction has a positive direct effect on customer satisfaction

The research of Grandzol and Gershon [9] and Kaynak [12] resulted in the finding that there was a positive effect of operational performance on financial performance (market performance). The relationship of operational performance with product/service quality is supported by Krajewski and Ritzman which states that companies that implement TQM will be experienced in facing inventory turnover and situations related to scheduling and production problems, and will make improvements continuously on the process and the quality of its products, thereby leading to improved quality performance [31]. Based on those literature, the proposed hypotheses are:

H21: Operational performance has a positive direct effect on product/service quality

H22: Operational performance has positive direct effect on financial

The positive influence of public responsibility on operational performance is proven by several studies including Kim and Thapa which prove the direct and significant influence of the two variables [32]. Hence the following hypothesis can be proposed:

H23: Public Responsibility has positive direct effect on operational performance

Forza and Flippini research found that there was a significant effect on product/service quality (quality performance) on customer satisfaction [24]. From the literature, the hypothesis proposed, namely:

H24: Product/service quality have positive direct effect on customer satisfaction

C. Measurement Instrument

The questions in the questionnaire were tailored from Grandzol and Gershon to identify management and employee perceptions of quality management practices and performance outcomes within Indonesian Public Service Sector [9]. The questionnaire was designed in Indonesian Language, and consists of 62 questions. Respondents rated each statements on a six-point Likert-type scale from 1 for strongly disagree, 2 for disagree, 3 for somewhat disagree, 4 for somewhat agree, 5 for agree, or 6 for strongly agree. The pre-test was conducted for 45 respondents. Based on the measurement of validity and reliability test using SPSS V.23, results show that almost all indicators on the variable research have met the criteria of the analysis factor. However, there is one indicator from financial variable that do not meet the requirements of Component Matrix, because the value is below 0.5. In addition, the public responsibility variable also has Bartlett's Test of Sphericity value with a significance of 0.268 which means it exceeds the required limit, which is exceeding 0.05. Associated with the results of the pre-test validity test above the researcher still used the invalid statement item in the study, because there is a possibility that these invalid values will change using the number of respondents in accordance with the rule of thumb ($5 \times 62 = 310$ samples).

To test for reliability, each measure was tested using Cronbach's Alpha. The results show that from thirteen constructs, there were 11 constructs have met the reliability criteria, except for public responsibility and financial. For financial variables, this is influenced by the presence of items that have low validity but have not been eliminated. While for the public responsibility variable, the Alpha results with similar relative values are also indicated by reference journals [9]. It was stated in the reference journal, on the basis that the selection of the public responsibility variable was based on the study of literature and the underlying theory and was part of the research model, therefore the variable public responsibility was not omitted in the study and still be used as a measuring tool.

D. Research Sample

The focus of the present research is on a public sector department in one Indonesia's Government Institution (in order to keep the anonymity of the study we will not be able to disclose the name of the department or the Ministry). This institution has the task of carrying out cyber-security effectively and efficiently by utilizing, developing, and consolidating all elements related to cyber-security. Before distribution of questionnaires, a letter was forwarded to main secretary of this institution to gain approval and support this study. Once

TABLE I
RESULTS OF RELIABILITY AND VALIDITY TEST

Variables	Validity	Reliability
Leadership	Good Validity	Good Reliability
	Each indicators (LD1, LD2, LD3, LD5) have met the standardized loading factor ≥ 0.50	CR = 0.79 VE = 0.505
Continuous Improvement	Good Validity	Good Reliability
	Each indicators (CI1, CI3, CI4) have met the standardized loading factor ≥ 0.50	CR = 0.79 VE = 0.57
Employee Fulfilment	Good Validity	Good Reliability
	Each indicators (EF2, EF3, EF4, EF5) have met the standardized loading factor ≥ 0.50	CR = 0.808 VE = 0.52
Learning	Good Validity	Good Reliability
	Each indicators (LR1, LR2, LR3, LR4) have met the standardized loading factor ≥ 0.50	CR = 0.81 VE = 0.52
Process Management	Good Validity	Good Reliability
	Each indicators (PM1, PM2, PM3, PM4, PM7) have met the standardized loading factor ≥ 0.50	CR = 0.85 VE = 0.53
Internal and External Cooperation	Good Validity	Good Reliability
	Each indicators (CO2, CO3, CO5, CO6) have met the standardized loading factor ≥ 0.50	CR = 0.80 VE = 0.55
Customer Focus	Good Validity	Good Reliability
	Each indicators (CF1, CF2, CF3) have met the standardized loading factor ≥ 0.50	CR = 0.87 VE = 0.69
Product/Service Quality	Good Validity	Good Reliability
	Each indicators (PSQ1, PSQ2, PSQ3) have met the standardized loading factor ≥ 0.50	CR = 0.76 VE = 0.53
Financial	Good Validity	Good Reliability
	Each indicators (FIN1, FIN2, FIN3) have met the standardized loading factor ≥ 0.50	CR = 0.95 VE = 0.86
Operational	Good Validity	Good Reliability
	Each indicators (OP1, OP2, OP3) have met the standardized loading factor ≥ 0.50	CR = 0.79 VE = 0.57
Public Responsibility	Only 1 indicators met the standardized loading factor ≥ 0.50	Reliability test can't be done using calculation of CR and VE.
Customer Satisfaction	Good Validity	Good Reliability
	Each indicators (SAT1, SAT2, SAT3) have met the standardized loading factor ≥ 0.50	CR = 0.84 VE = 0.65
Employee Satisfaction	Good Validity	Good Reliability
	Each indicators (ES2, ES4, ES5, ES6) have met the standardized loading factor ≥ 0.50	CR = 0.84 VE = 0.58

this procedure was approved, surveys were distributed to 335 employee and managers. A total of 310 respondents completed the surveys, which represents a 92 percent response rate. In the case of the questionnaire data collection model, this study used personally administered questionnaires.

IV. RESULT

A. Scale Reliability and Validity

At this stage, the validity testing is done again through the Confirmatory Factor Analysis (CFA) method using Structural Equation Modeling (SEM). The SEM method was chosen because this method has the ability to make measurement models as well as structural models together. Measurement with the SEM method was done using the LISREL 8.8 full version application with diagonally weighted least square (DWLS) estimator. Validity test was conducted involving 310 respondents. Evaluation of validity is determined based on factor loadings, namely the provisions of standardized loadings factor ≥ 0.50 (Igbaria, Zinatelli, Cragg, and Cavaye, (1997)). While the reliability test was carried out using composite

reliability measure or CR and variance extracted (VE). Evaluation of reliability is the value of construct reliability greater than 0.70 ($CR \geq 0.70$), and the extracted variance value is greater than 0.50 ($VE \geq 0.50$). The table below shows the measurement results based on the standardized solution of each variable and the calculation results of CR and VE.

As indicated in Table I above, the result of validity using CFA showed that 12 variables have met the standardized loadings factor ≥ 0.50 , and can be concluded that these 12 variables have good validity. Similarly, the calculation result of CR and VE value showed the value of $CR \geq 0.70$, and $VE \geq 0.50$. But there is one variable, namely public responsibility that has an indicator with an SLF value of less than 0.5, so that the process of calculating CR and VE cannot be done.

B. Analysis of the Structural Model

Table II below shows the goodness-of-fit indices for the research model. The GFI value is 0,96 and indicates a good model fit. The RMSEA value is 0,0 and indicates a close-fitting model. The overall fit statistic in Table II reveals that the proposed model fits the data from the employee and the

TABLE II
RESULTS OF THE OVERALL STRUCTURAL MODEL FIT

Fit Measures	Recommended Value	Research Model	Description
Non Centrality Parameter (NCP)	the smaller the value the better	0.0	<i>Good fit</i>
Chi-Square	the smaller the value the better P > 0.05	5932.6 P=0.00	<i>Poor fit</i>
Root Mean Square Error of Approximation (RMSEA)	RMSEA ≤ 0.08 <i>good fit</i> ; RMSEA < 0.05 <i>close fit</i>	0.0	<i>Close fit</i>
P-Value Close Fit	P ≥ 0.50	P= 1,00	<i>Close fit</i>
Root Mean Square Residual (RMR)	RMR ≤ 0.05 <i>good fit</i>	0.12	<i>Poor Fit</i>
Normed Fit Index (NFI)	NFI ≥ 0.90 <i>good fit</i> ; 0.80 ≤ NFI < 0.90 <i>marginal fit</i>	1,00	<i>Good fit</i>
Non-Normed Fit Index (NNFI)	NNFI ≥ 0.90 <i>good fit</i> ; 0.80 ≤ NNFI < 0.90 <i>marginal fit</i>	1,03	<i>Good Fit</i>
Incremental Fit Index (IFI)	IFI ≥ 0.90 <i>good fit</i> ; 0.80 ≤ IFI < 0.90 <i>marginal fit</i>	1,03	<i>Good fit</i>
Comparative Fit Index (CFI)	CFI ≥ 0.90 <i>good fit</i> 0.80 ≤ CFI < 0.90 <i>marginal fit</i>	1,00	<i>Good fit</i>
Relative Fit Index (RFI)	RFI ≥ 0.90 <i>good fit</i>	1,00	<i>Good Fit</i>
Goodness-of-Fit Index (GFI)	GFI ≥ 0.90 <i>good fit</i> ; 0.80 ≤ GFI < 0.90 <i>marginal fit</i>	0.96	<i>Good fit</i>
Adjusted Goodness of Fit Index (AGFI)	AGFI ≥ 0.90 <i>good fit</i>	0,95	<i>Good Fit</i>

manager reasonably well. First, the Chi-square statistic, χ^2 associated with the null hypothesis that the proposed model can effectively reproduce the observed covariance is 5932.6 with 841 degree of freedom. Second, Table II shows that the various measures of relative and absolute fit index (ranging from 0 to 1, with 0 implying poor fit and 1 indicating perfect fit), including the GFI, AGFI, the comparative fit (CFI), and the normed fit (NFI) indices, Non-Normed Fit Index (NNFI), Incremental Fit Index (IFI) exceed 0.90, without any exceptions. Third, Table II. below also shows that the difference between reproduced and observed covariances are small as indicated by RMSEA of 0.0.

Thus, by looking at the results of the overall suitability of the model based on the Table II above, it can be said that this structural model has a good match, and the proposed model is an acceptable portrayal of the data and serves as a sound basis for interpreting the specific hypotheses and influence pathways in the study.

C. The Result of Hypothesis Testing

Based on the results of the analysis of the calculation of the structural equation model (SEM) of the thirteen research variables, the following is a result of the testing of the hypothesis proposed in the study, as follows:

Figure 2 depicts the SEM results of the relationship between TQM practices and factors of performance measures. Each path in the figure indicates the associated hypotheses and t-values. The figure above shows that leadership has a positive direct effect on internal and external cooperation, learning, customer focus, employee fulfillment, and continuous improvement. Internal and external cooperation also has a positive direct effect on process management. However, learning has no positive direct effect on both process management and employee satisfaction. Though employee fulfillment does not have a positive direct effect on process management, it has a positive direct effect on employee satisfaction. Customer focus

has a positive direct effect on both product/service quality and continuous improvement. Other than that, process management has a positive direct effect on operational performance and public responsibility, but it does not have a positive direct effect on product/service quality. Continuous improvement only has a positive direct effect on product/service quality, but it does not have a positive direct effect on operational performance and customer satisfaction. Employee satisfaction does not have a positive direct effect on product/service quality, but it has a positive direct effect on customer satisfaction. Operational performance has a positive direct effect on both product/service quality and financial performance. Public responsibility have positive direct effect on operational performance. And, product/service quality has a positive direct effect on customer satisfaction.

V. DISCUSSION AND CONCLUSION

The result shows that the sample data is a good fit for the proposed model and thus support the relationships between TQM factors and performance outcome. The paper empirically test the structural model using SEM on the data gathered from a sample of 310 respondents from one public service organization in Indonesia. The results support the seventeen hypotheses. As for the existence of a number of hypotheses regarding the relationship between TQM variables which, in the previous study, was declared to have an influence, but this study shows different results or absence of influence relations, as noted by Sila and Ebrahimpour [14]. It could be caused by differences in the types of organizations used as survey objects, the industrial environment, size of organization/company and the country of origin of the company.

The study has shown that the most influential factor capable of increasing other factors is the leadership factor. While, two other main factors that have the greatest impact on overall performance are customer focus and internal and external cooperation. In terms of improving the quality of

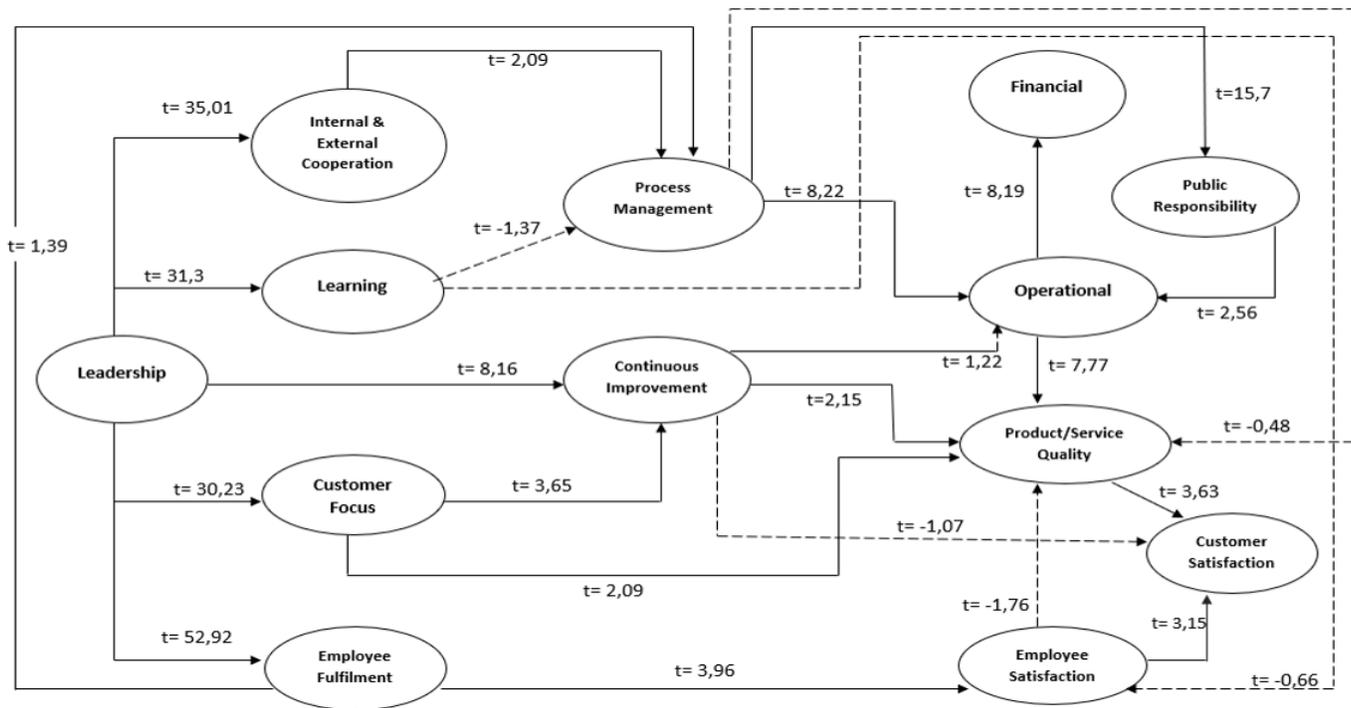


Fig. 2. Structural modeling of the relationship between TQM practices and performance measures.

product/services, the three main factors that have the greatest impact are continuous improvement, customer focus dan operational performance. Thus, the manager should consider the improvement in those factors would support the performance outcomes and the quality of its services. Managers should understand that the implementation of critical success factors of TQM will improve performance (product/service quality, financial, operational, public responsibility, customer satisfaction, and employee satisfaction). Therefore, managers and decision-makers need to upgrade their quality practices by increasing the resources and attention devoted to them. All quality management factors are necessary and managers should provide resources to support leadership capacity development by creating a leadership development program, and create generations of transformational leaders in the organization.

VI. LIMITATIONS AND FUTURE RESEARCH

This study has a number of limitations. The first limitation of this study asks perceptions about TQM practices and the performance measures, but respondents may give answers as they want, which makes their organization look good. Second, because this research focused on a public service sector in Indonesia, the results of this study are best applied to the case study object itself, and limit the ability to generalize the result of this study to the industry in general. Future research should therefore examine other industry.

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