



# The Effect of Information Technology and Total Quality Management on Organizational Performance

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## ABSTRACT

This study discovers the effect of information technology (IT) and total quality management (TQM) on organizational performance. The unit of analysis is state-owned enterprises in Padang city, Indonesia. The study utilized primary data which is obtained through the questionnaire. Total sampling is used in this study. 90 questionnaires were returned as a final sample. Data were analyzed by multiple regression analysis performed by SPSS 25 software. The result shows that IT has a positive and significant effect on organizational performance. TQM has a positive and significant effect on organizational performance.

**Keywords:** Information Technology, Total Quality Management, Organizational Performance

**JEL Classifications:** D83, L86, M15

## 1. INTRODUCTION

As organizations today face increasingly complex, dynamic, and threatening environments, attention has been focused on both the running of day-to-day business affairs and the adaptation of the organization to changing environmental conditions (Al-Sarayrah et al., 2016). Organizations must be able to increase effectiveness and efficiency. Organizational performance is based on how effectively and efficiently managers utilize resource to achieve objective (Lussier, 2006). This can be achieved if the organization makes the right decision. information technology (IT) plays a role in the process of daily operational decision making (short-term planning) to long-term planning. Decision making is a process that involves several intertwined stages and is not a separate act. IT is expected to be able to provide good information for managers.

A business model describes how a company produces, delivers, and sells a product or service to create wealth (Laudon and Laudon, 2016). Companies must improve the performance of their company through IT. Currently, there is

a growing interdependence between a company's information system and its business capabilities. IT and systems are the main supporting tools to improve the quality of products or services, as well as a completely new business model. Therefore changes in hardware, software, databases and telecommunications are very important if companies want to change business strategies, rules and processes.

IT infrastructure is a set of hardware and software applications that are used together in a company. But IT infrastructure is also a set of firm wide services budgeted by management and comprising both human and technical capabilities (Laudon and Laudon, 2016). As companies grow, they often quickly surpass their infrastructure. When companies shrink, they can get stuck with the excessive infrastructure they have bought. If a company spends too much on technology infrastructure, it lies idle and constitutes a drag on firm financial performance. If it is spent too little, important business services cannot be carried out and the company's competitors (who spend the right amount) will win the competition. Some previous studies have found a relationship between IT and

organizational performance. Nikoloski (2014) found technological infrastructure affects the culture, efficiency, and relationship of a business. In this manner, IT enables businesses to operate efficiently and profitability.

The quality aspect has become one of the most important factors in today's global competition. The increasing demand by customers for better product quality in the market has driven many companies to provide quality products and services in order to compete successfully in the market. To meet the challenge of this global competition, many businessman adapting and implementing total quality management (TQM) practices in their operations. TQM is an integrated management philosophy and set of practices that emphasize, among other things, continuous improvement, meeting customer's requirements, reducing rework, long-range thinking, increased employee involvement and teamwork, process design, competitive benchmarking, team-based problem solving, constant measurement of results, and closer relationship (Ross, 1993). Some literature has shown the relationship between organizational performance and TQM. The result show TQM practice increase organizational performance, Chong and Rundus (2004); Cetindere et al. (2015).

The theoretical framework was determined by reviewing some literature. So model of Nikoloski (2014); Ross (1993); Paré et al. (2019) Mahadeen et al. (2016); Tajudeen et al. (2018) for IT and organizational performance. Model of Aslefallah and Badizadeh (2014); Munizu (2013); Taleghani et al. (2013) for TQM and organizational performance. According to previous research and the definitions presented above, the following conceptual models are presented to test the effect of IT and TQM on organizational performance, as described in Figure 1.

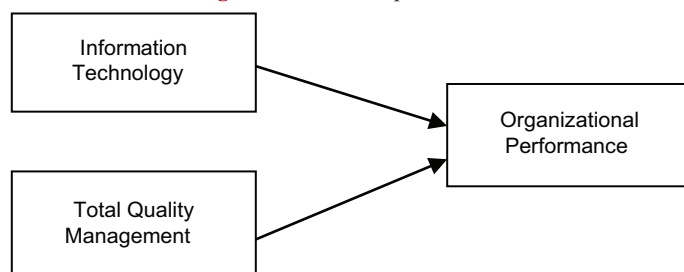
The conceptual model above generates two hypotheses will be tested in the study. Therefore, the hypotheses could be formulated as follows:

- H<sub>1</sub>: IT has significant effect on organizational performance  
H<sub>2</sub>: TQM has significant effect on organizational performance.

## 2. METHODS

This study uses quantitative approach. The quantitative approach is explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics) (Muijs, 2010). The quantitative approach is used when one begins with a theory (or hypothesis) and test for confirmation or disconfirmation of that hypothesis (Newman and Benz, 1998). The data used in this study were obtained from a questionnaire

Figure 1: The conceptual model



method. Respondents of this study all the managers of state-owned enterprises in Padang City. They are financial manager, operation manager, the human resource manager, and marketing manager. The information about companies was obtained from the Statistical Bureau Center of West Sumatera Province, Indonesia. The population of this study consisted of branch state-owned enterprise in Padang city. There were 30 state-owned enterprises. The population was selected to be sampled (total sampling). As many 30 units of state-owned enterprises were surveyed. A number of 90 questionnaires were collected from 120 distributed until the end of the survey.

At the present model, IT and TQM are endogenous variables. Organizational performance is endogenous variables. The major material to collect data is questionnaire based on which four dimensions for IT: IT infrastructure, organizational structure, strategic alignment, and individual learning Nikoloski (2014). TQM used twelve dimensions: executive commitment, adopting philosophy, closer to the customer, closer to supplier, benchmarking, training, open organization, employee empowerment, zero-defects mentality, flexible manufacturing, process improvement, and measurement Powell (1995). Seven dimensions were used to measure organizational performance: effectiveness, efficiency and utilization of resources, productivity, quality, quality of work-life, innovation, profitability and budget compliance (Cetindere et al., 2015).

In order to determine the degree with which participants agree with statements, a five answer Likert scale consisting of (5) Strongly agree (4) Agree (3) Neutral (2) Disagree (1) Strongly disagree were used in the answer section. The survey data was analyzed using SPSS software.

The validity instrument tested by Pearson product moment correlation. The instrument has high validity if the correlation value of each indicator to total correlation more than 0.30 or  $R > 0.30$  Cooper and Emory (2002). The instrument was tested for reliability with Cronbach's alpha. The reliability criteria if Cronbach's alpha  $> 0.6$  Hair et al. (1998).

The data analysis uses both descriptive statistics analysis and multiple regression analysis. The descriptive statistical analysis aims to describe respondent demographics i.e., age, sex, education, position, and salary. Multiple regression analysis used to predict the value of variables based on the value of two or more other variables.

## 3. RESULTS AND DISCUSSION

Respondents of this research have quite different characteristics. Diversity can be seen from the personal data of respondents including sex, education, position, and salary. The majority of respondent who participated in this study as male gender (66.67%), aged between 41 and 45 years (41.11%), having level education bachelor degree (75.56%), having position within company as a human resource manager (28.88%) and having salary IDR  $> 12,000,000$  (35.55%). Demographics of respondents in Table 1.

**Table 1: Demographics of respondents**

Characteristics	Numbers of respondents (NR)	Percentage
Sex		
Male	60	66.67
Female	30	33.33
Age		
<25	2	2.22
26≤30	6	6.67
31≤35	14	15.55
36≤40	25	27.77
41≤45	37	41.11
46≤50	2	2.22
51≤55	2	2.22
<55	2	2.22
Education		
High school or below	-	-
Junior college	-	-
Bachelor	68	75.56
Master or above	22	24.44
Position		
Financial manager	20	22.22
Operation manager	20	22.22
Human resource manager	26	28.88
Marketing manager	24	26.66
Salary		
<2,000,000	-	-
2,000,000-4,000,000	-	-
4,000,001-6,000,000	-	-
6,000,001-8,000,000	12	13.33
8,000,001-10,000,000	31	34.44
10,000,001-12,000,000	15	16.67
>12,000,000	32	35.55

Source: Primary data processed by the author

The research variables tested in this study consisted of three variables, IT, TQM, and organizational performance. Respondents answered each item on IT (X1), TQM (TQM) (X2), and organizational performance (Y) from strongly agree (scale 5) to strongly disagree (scale 1). The result of the mean value of the research variables/indicators in Table 2.

According to Table 2, it can reveal that average value (mean) of the IT variable was in high category (4.09), organizational structure as the highest indicator (4.17), information and technology infrastructure as the lowest indicator (4.00). TQM implementation variable was in high category (4.18), flexible manufacturing as the highest indicator (4.38), and closer to supplier as the lowest indicator (3.99). variable of organizational performances was in high category (4.15), quality as the highest indicator (4.29), and effectiveness as the lowest indicator (3.88).

The conceptual model illustrated in Figure 1 has two hypothesized relationship among the variables IT, TQM, and organizational performances. Tables 3 and 4 display resulting from the multiple regression analysis using SPSS for windows.

The results of testing the coefficient of determination show that organizational performance is influenced by IT variables and TQM variables by 34.5%. The rest is influenced by other variables outside the research framework.

**Table 2: Result of mean value of research variables/ indicators**

Variables/indicators	Mean	Description
Information technology (X1)	4.09	High
IT infrastructure	4.00	High
Organizational structure	4.17	High
Strategic alignment	4.11	High
Individual learning	4.07	High
Total quality management (X2)	4.18	High
Executive commitment	4.28	Very high
Adopting philosophy	4.17	High
Closer to customer	4.03	High
Closer to supplier	3.99	High
Benchmarking	4.12	High
Training	4.14	High
Open organization	4.16	High
Employee empowerment	4.26	Very high
Zero-defects mentality	4.24	High
Flexible manufacturing	4.38	Very high
Process improvement	4.23	High
Measurement	4.11	High
Organizational performance (Y)	4.15	High
Effectiveness	3.88	High
Efficiency and utilization	4.12	High
Productivity	4.26	Very high
Quality	4.29	Very high
Quality of work-life	4.26	Very high
Innovation	4.19	High
Profitability and budget compliance	4.04	High

Source: Primary data processed by the author

**Table 3: Coefficient of determination test result**

Model	Model summary			
	R	R square	Adjusted R square	Standard error of the estimate
1	0.600*	0.360	0.345	1.82128

\*Predictors: (Constant), TQM\_X2, IT\_X1. TQM: Total quality management

The results of the multiple regression analysis are also presented in Table 4 indicating support for all the hypotheses. Hypothesis 1 stated IT has significant effect toward organizational performance, which is statically significant at probability  $0.039 < 0.05$  (t-statistic = 2.093). The statistical significance of hypothesis 1 confirms the implementation of IT improves organizational performance. So, hypothesis 1 is confirmed. The results of this study are the same as previous studies by Nikoloski (2014) whatever the size of the company, whether large or small. Technology has tangible and intangible benefits that will help companies increase profits and produce products and services that customers want. Technology infrastructure has an impact on culture, efficiency and business relations. This also affects the security of confidential information and trade profits. Likewise, the internet and social media used by companies will increase revenue, improve relationships, and produce cost and time efficiencies Apigian et al. (2005).

Hypothesis 2 stated TQM have significant effect toward organizational performance, which is statically significant at probability  $0.039 < 0.05$  (t-statistic = 2.522). The statistical significance of hypothesis 2 confirms the implementation TQM improve organizational performance. So, hypothesis 2 is

**Table 4: Multiple regression test result**

Model		Coefficients <sup>a</sup>				t	Significant
		Unstandardized coefficients		Standardized coefficients			
		B	Standard error	Beta			
1	(Constant)	12.918	2.334			5.535	0.000
	IT_X1	0.418	0.200	0.288		2.093	0.039
	TQM_X2	0.185	0.073	0.347		2.522	0.013

<sup>a</sup>Dependent variable: OP\_Y. TOM: Total quality management

confirmed. The result of this study confirms previous studies conducted by Aslefallah and Badizadeh (2014); Munizu (2013); Taleghani et al. (2013). This can be interpreted if TQM practices are implemented properly, it will produce various benefits for the company, such as understanding customer needs, increasing customer satisfaction, improving internal communication, solving problems better, and fewer mistakes. If this has been achieved, then an increase in organizational performance will be realized. Individuals who are committed to implementing TQM will adopt the principles of TQM in their daily activities and are always responsible for successful performance.

#### 4. CONCLUSION

The aim of this research to discover the effect of IT and TQM on organizational performance at state-owned enterprises in Padang city, West Sumatra Province, Indonesia. IT and TQM have positive and significant effect toward organizational performance. Information technologies serve a variety of purposes throughout the organization in what are known as a functional business area - in-house services that support the organization's main business. Functional business areas include, but are not limited to, accounting, finance, marketing, and human resources which can then improve overall company performance. The practice of TQM will improve quality of business. Continuous quality improvement is based on increasing the knowledge and productivity of all employees in individual organizations, especially those responsible for productivity growth.

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