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Effect of Quality Management Practices on Operational Performance, Customer Satisfaction and Business Performance of Manufacturing Companies of Industrial Area in Makassar-Indonesia

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ABSTRACT

This study aim is to determine effect of TQM quality management on business performance improvement based on management practices, infrastructure practice, core facility practice, operational performance and customer satisfaction. This study involved 108 respondents of 40 manufacturing companies in Makassar-Indonesia. Test results with Path Analysis of latent variable find about how management practices, infrastructure practice and core facilities practice as components of TQM that carried out simultaneously, systematic and sustainable can improve business performance. It provides practical implications for TQM implementation at manufacturing companies in Indonesia. It is time evaluate and emphasis on quality management practices. A limitation of this study is only use manufacturing companies in Makassar-Indonesia, and therefore can not be generalized to other companies. Therefore, further studies are needed to fill this gap, as well as other aspects of TQM.

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INTRODUCTION

In industrialization era that more competitive, every business wants to win competition. One main focus is competition quality. Quality is totality of shape and characteristics of goods or services that demonstrate the ability to satisfy real or hidden needs (Jay and Barry, 2004). Therefore, continuous improvement in business activity and overall organization must be carried out with an emphasis on level of flexibility and quality. Attention to quality will have a positive effect on business in two ways, the effect on production costs and effect on income (Olson, 1997). Global competition drives companies and organizations to implement total quality management (TQM) as a strategy to meet customer needs. TQM as a management philosophy can help companies to achieve excellence in all aspects of business through continuous improvement in overall organization. It is believed that TQM can contribute to organizational competitiveness (Knod and Schonberger, 2001; Chase *et al*, 2006). This is supported by Krajewski *et al*. (2003) that TQM as a new paradigm to business seeks to maximize the organization competitiveness through a focus on customer satisfaction, all employees' involvement, and continuous improvement of products quality, services, people, process and environmental organizations.

Raph *et al* (1989) proposes to measure and evaluate quality management directly in manufacturing company through the top management role, quality policy, training, products/services, supply management quality, management procedures, data quality reporting, and employee relations. According Demirbag *et al* (2006), performance measurement is an important factor for effective management process. Performance improvement of organization needs to identify the affecting variables and measure it accurately. Performance measurement of operation or quality is very important for an organization, in order to achieve efficiency and optimal business performance. Sarah and Lim (2006) state that organizational performance can be measured by two dimensions of operational and organizational performance. Operation performance reflects the operation company performance's internal cost and waste reduction, product quality improvement, new product development, delivery performance improvement and higher productivity. Ahire *et al*. (1996) found significant relationship between

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management practices and management practices infrastructure. In addition, many researchers investigate the effects of TQM quality management practice on organizational performance. Generally, they argue that quality management practices has positive relationship with organizational performance (Anderson et.al (1995); Flynn et.al (1995); Terziovski and Samson (1999); Douglas and Judge (2001). However, these studies do not consider the possibility of a causal relationship to quality management practices. TQM concept is a system consists of several quality management practices and collective interwoven with one another (interlinked) that has a relationship with organization's performance (Gao 1991; Dean and Bowen, 1994; Dean and Evans, 1994; Hackman and Wageman, 1995; Honey *et al*., 1995). Research results of Cua *et al* (2001); Sousa and Voss (2002); Kaynak (2003); Charline, *et al* (2006) have emphasized the importance to understand the causal relationship between the quality management practice. Success of quality management practices in a company can be determined by measuring the whole company performance. Size of company performance in quality management practices can be measured by three performance measures namely financial performance, product quality, operational performance (Charline *et al*., 2006). Therefore, with reference to some research findings and descriptions of above phenomenon, this study intends to follow up these results by considering causality of quality management practices (through proxy management practices, infrastructure practice, core facility practice) on operational performance and satisfaction consumers. This study aims are:

1. explaining the structural relationships between latent variables (construct), effect of quality management practices on operational performance, customer satisfaction and business performance
2. to understand TQM quality management practices, especially at manufacturing companies in Makassar-Indonesia to make their business performance more productive.

Theoretical overview:

Quality management can be seen as a principles set to support each other. Each part is supported by a set of techniques and implementation processes to improve company performance. Almost all researchers have found similarity that quality management has a significant effect on performance. Philip *et al*. (1983) describes the performance as a form of "zero defects (without disabilities)." This view is also assumed as a method to increase gradually (incremental) or through breakthroughs. When improvements have been achieved, then a standard mechanism process, control and monitoring should be built. They are intended to increase quality stability of process/product/service. TQM has role as a unity of all management functions in all parts of organization into a holistic philosophy based on concept of quality, teamwork, productivity, customer satisfaction and continuous improvement (Ishikawa, 1985). On other hand, Oakland (1995) looks TQM approach to improve competitiveness, efficiency, flexibility and compactness of organization. This opinion indicates a need for other variables in TQM implementation process to improve performance. This opinion is supported by Wruck and Jensen (1994) which states that practice of effective quality management requirements are associated with major changes in organization's infrastructure, such as correct decisions of allocation system, performance measurement system, and rewards and punishment system. Ittner and Larcker's (1995) expand the TQM practice to include performance measurement and non-financial incentives, such as operational performance and customer satisfaction. Operational performance is appropriateness of process and internal operations of business to meet the requirements in terms of cost, customer service, and delivery of goods to customers, flexibility and product/services quality (Sarah and Lim, 2006). While customer satisfaction is a measure on how products and services provided by company can meet or even exceed customer expectations. Oliver (1997) states that customer satisfaction is a response to fulfillment of their needs. This means that an assessment of privileges of a product or service itself provide a level of comfort related to needs fulfillment, including needs or expectations of fulfillment is satisfied above customer expectations. Man and Candice (1994) state that customer satisfaction is all characteristics of products and services that can provide more value to customers. A product should be created by performing various calculations and analysis with appropriate listening requests from customers.

The research hypothesis:

Analysis approach the effect of quality management practices on operational performance, customer satisfaction and business performance of manufacturing companies in Makassar is based on real condition and a real effort of company to face free market competition. One important trigger of company transformation is application of TQM principles. Generally, corporate leaders believe that these principles can improve a company's ability to compete in global markets with emphasis on products and services aspects. TQM success implementation in continuous quality improvement framework will increase the company's profitability and, in turn, will ensure company sustainability (Bill god, in Murdifin 2004, 2006). Quality management practices has three constructs of management practices (with indicators the support and commitment of top managers), infrastructure practice (by organizing quality indicator, employee training, employee participation, supplier quality

management, customer focus, ongoing support), as well as core facilities practice (with indicators of quality (Charline *et al*., 2006). Furthermore Lau and Idris (2001) also found that TQM has contribution to various tangible factors, such as the return on investments (ROI). TQM implementation success will contribute to fulfillment of demands of customers, increasing competitiveness, increasing income, and increasing market share.

Relationship between management practices and infrastructure practice:

A management practice is the most urgent in management science. It relates with artifact made by management to be able to adjust with organization mission and goals (and Lillrank Kujala, 2004). Management practice is proxied by support and commitment of top management that supported by good infrastructure practice. Pannirselvan and Ferguson (2001) states that infrastructure practice is a system that consists of a process that is tailored to requirements and objectives of company's performance. Furthermore, Charline et.al (2006) infrastructure practice is proxied by indicators of organizational quality, employee training, employee involvement/participation, suppliers, quality management, customer focus, continuous support or sustainable. Commitment and support of top management is needed for quality improvement at all levels in company. Top management will decide the infrastructure practice that adapted to companies conditions. It can be concluded that higher support and commitment of top management to quality, as a proxy of management practices, will improve the infrastructure practice. In other words, support and commitment of top management relates to quality management will improve performance and management at all company levels.

Relations between infrastructure practice and core facility practice, operational performance and performance:

Evaluation or measurement of each product quality can be done if there is a good and competent of core facility practice. Hackman and Wageman (1995) states that core facility is a tool framework to identify and understand the desire and wishes of customer related to products quality that can provide testing to consider and evaluate the change process in company. Charline *et al*. (2006) states that core facility consists of system quality improvement, information and analysis, and statistical quality techniques usage. Practical skills in infrastructure companies will increase the accuracy of methods used in core facilities. Logically, infrastructure practice is very close with human resources as a tool for users to evaluate the product quality. If human resources (infrastructure practice) are better, it will increase the accuracy to select and to use core facility to measure quality produced by company. Infrastructure practice is also believed to improve the company operational performance. This is based on findings and Terziovski Samson (1999) that infrastructure practice that focuses on customer satisfaction is directly related to operation performance. Dow et.al (1999) also indicates that infrastructure practice can be combined to improve management performance. Operational performance is intended to suitability and performance evaluation process in terms of company internal operations to meet the cost requirements, customer service, goods delivery to customers, quality processes, flexibility and quality of products/services (Sarah and Lim, 2006). Effect of infrastructure practice on financial performance is intended as operations that will lead to logical consequence of fundamental operations of better company's business (Kaplan and Norton, 1992). In this case, Charline *et al*. (2006) identify three business performance indicators related to quality management namely return on investment (ROI), return on assets (ROA) and sales growth.

Relations between core facility practice on operational performance, customer satisfaction and business performance:

Core facility practice is proxied by an increase in system quality, quality information usage, and statistical techniques usage to identify and solve the problems faced by customers such as the high price of company products (costly), delivery and flexibility quality. These two problems are to measure the dimensions of operational performance (Sarah and Lim, 2006). It can be concluded that if the company chooses right core facility practice to assess and evaluate the performance then company will able to further improve the company's operational performance. Flynn *et al*. (1995) found that core facility practice difference can affect the company operation success related to quality. In other words, that company with core facility practice different will makes different results obtained by company related to operational performance. In addition, company's ability to capture and to solve the customers problems will be able to makes positive effect on company's financial performance. Financial performance is result of intended operations and financial operations success that led better company fundamental operations, or also known as business performance (Kaplan and Norton, 1992). Sun (2000) found that items available of TQM (leadership qualities, development of human resources, quality information, etc.) will able to improve business performance. Conceptually, suitability of product specifications to meet customer needs in accordance with request contained in product characteristics can provide a better value to customers. Company's ability to capture the customers needs signal makes management should have core facility practice and appropriate. Core facility practice will be able to promote customer satisfaction. Customer satisfaction

can not be achieved if the product planned is not accepted by customer.

Relations with operational business performance performance:

Operation performance that proxied by cost, delivery and flexibility quality are indicators of customer's problems to improve business performance. This is possible if company can choose the exact process to be used to evaluate quality and performance to increases business performance. Buzzell and Gale (1987) shows that there is a strong relationship between the quality of products or services and financial indicators. Curkovic *et al* (2000) also found that quality has a positive effect on financial and market performance as market share, ROI and ROA.

Relationship between customer satisfaction and business performance:

Most previous studies have examined the relationship between financial performance and market performance with customer satisfaction as the primary measure of customer's performance. According to Please (2007), several studies such as Crosby and Johnson (2002) and Wright and Snell 6.

(2002) argues that not only customer satisfaction that could increase positive financial effect but also company retention can generate positive financial effect. The reason is that customer satisfaction will create customer loyalty and company retention, and this will make customers repeat the purchases. It create sales growth, lower operation costs and higher profit (Das et.al, 2000; Yeung and Ennew, 2001 in Sila, 2007). Man *et al* (2007), also found that there is a positive relationship between customer satisfaction and business performance.

Based on description above, hypothesis and conceptual framework are formulated as follows:

1. Management practice has positive effect on infrastructure practice.
2. Infrastructure practice has positive effect on core facilities practice, operational performance and business performance
3. Core facility practice has positive effect on operation performance, business performance and customer satisfaction
4. Operational performance has positive effect on business performance.
5. Customer satisfaction has positive effect on business performance.

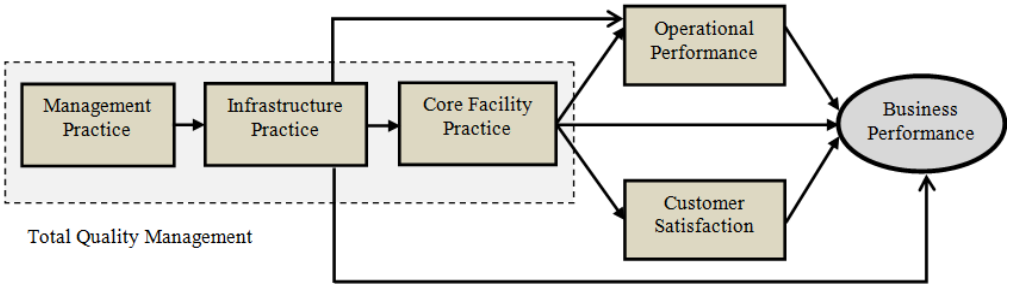

Fig. 1: Conceptual Model.

Table 1: Technical characteristics of respondents.

Manufacturing industry characteristic at research location	Samples	Manufacturing industry characteristic at research location	Samples
Food, beverages and tobacco	22	Basic metal	1
Textiles, apparel and leather products	5	Mines, non petroleum and coal	1
Wood and wood products, including wood home appliances wooden	5	Chemicals, Chemical, petroleum, coal, rubber and plastic goods	2
Paper and paper products, printing and publishing	2	Metal goods, machinery and equipment	1
Other processing	1		

Methodology:

Data:

Data is collected randomly by questionnaires to 120 managers and employees of 40 manufacturing companies in Makassar - Indonesia. Samples demographic characteristics are not different fore any particular group. There are total of 108 valid questionnaires for further analysis. Data collection is done by visits and direct delivery by post from September 2013 to December 2013. This study used confirmatory factor analysis to measure the effect of management practices, infrastructure practice, core facility practice, operational performance, customer satisfaction and business performance simultaneously. Technical characteristics of respondents are described as follows:

Measurement instruments:

Indicators are measured by Likert scale five point (Likert, 1961), from "1" means "strongly disagree" and "5" means "strongly agree". Indicator measurement was developed by adopting the

research results and relevant references. Before data collection, pre-test was conducted to obtain feedback on content, format, comprehensibility and accuracy of measurement instruments. Therefore, instrument can still be considered as proposal for a new measurement instrument even adopted from much previous reference. Technical specifications of instrument measurements are shown in Table 2.

Validation and reliability of measurement:

Figure 1 show two variables that will be analyzed. Path analysis is used to examine the relationship between variables in model. The effect can be explained by direct and indirect of variables causal (exogenous variables) and result variables (endogenous variable). There are several assumptions underlying the analysis path, they are the relationship between variables is linear, causal and additives, as well as the measuring instrument should be valid and reliable. Validity test is measured by Pearson Product Moment correlation > 0.4 (Lester, 2000). While the reliability of measurement is measured by Cronbach's alpha> 0.6 with SPSS version 16.0. Table 3 showing the instrument measurements are valid and reliable because it exceeds cutoff value.

Table 2: Instrument Measurement (main characteristics).

Measurement	Indicators	Concepts	Adapted from
Management Practice (X1)	Commitments (X1.1) Leadership (X1.2)	Determination to explain the quality increase. Top managers effort to encourage quality improvement behavioral	Lakhal et.al (2006), Han et.al (2007) Adam, 1997
Infrastructure Practice (X2)	Organization quality (X2.1) Employee training (X2.2) Employee involvement (X2.3) Supplier quality management (X2.4). Customer focus (x2.5) Continuous improvement (X2.6)	Comprehensive approach to design quality into product. Quality training for all employees Employee commitment to participate in quality improvement. Company's ability to choose a supplier that is able to respond to needs on time. Ability to achieve good quality based on customer needs. Continue management support at all levels of employees through reward	Dewhurst (2003), Angel Rafael Martines Lorente (2003) Sanchez Rodrigues 2003
Core facility practice (X3)	Quality improvement system (X3.1) Quality information usage (X3.2) Statistical techniques usage (X3.3)	Implementation of quality management in accordance with organizational structure, procedures, processes and resources need Company's ability to analyze and use information to control control in production process. Use statistics to measure and detect quality problems of company products	Zhang, et.al (2000); Ahire, et.al (1996);
Operational performance (Y1)	Cost (Y1.1) Quality (Y1.2) Flexibility (Y1.3) Speed of delivery (Y1.4)	Cost of product distribution to customers, and company's ability to distribute products to customers in accordance with time when customer needed.	Anderson, et.al (1999); Brah and Lim (2006);
Customer satisfaction (Y2)	Customer complaints (Y2.1) Purchase repetition (Y2.2) Companies retention (Y2.3)	Quality product compared with other products Ability to immediately repair or mitigate rightly Affordability of products than other brand products	Han et.al (2007)
Business performance (Z)	Investment turnover - ROI (Z1.1) Assets turnover - ROA (Z1.2) Sales growth (Z1.3) Market share (Z1.4)	Ability to earn a return on investment made. The ability to get return on total assets held and used for operation. Sales growth of products from year to year Mastery of market	Lakhaal, et.al (2006); Sila (2007); Han et.al (2003)

Confirmatory factor analysis:

Model fit is tested by Structural Equation Modeling (SEM) and statistical software AMOS 16 and applying the maximum likelihood method (Anderson and Gerbing, 1988) to test fitness of data model, particularly related to psychometric properties of instruments such as reliability, dimensional, convergent and discriminant validity. Analysis results show very fit criteria: Chi-square = 2.243; p = 0,327; Cmin/df = 1,120; RMSEA = 0.035; GFI = 0.989; AGFI = 0.946; TLI = 0.994; CFI = 0.997. Construct validity indicators test is done to see if study is a part or be able to explain construct. As shown in Table 3, most of factor loadings above 0.70. These results provide support for the dimensional, convergent and discriminant validity (Anderson and Gerbing, 1988). In addition, if the variance extracted > 0.5, it means that there is close relationship between constructs.

Table 3: Validity, reliability and fitness test of model (n = 108 data).

Estimator								Description
Management Practice (X1)	Indicator	X1.1	X1.2					
	Loading factor	0.785	0.822					*Valid*
	Reliability	0.917	0.891					*Reliable*
	λ	0.785	0.822					*Significant*
	Probability (p)	0.000	0.000					
Infrastructure Practice (X2)	Indicator	X2.1	X2.2	X2.3	X2.4	X2.5	X2.6	
	Loading factor	0.644	0.573	0.779	0.790	0.777	0.877	*Valid*
	Reliability	0.721	0.644	0.819	0.829	0.815	0.888	*Reliable*
	λ	0.644	0.573	0.779	0.790	0.777	0.877	*Significant*
	Probability (p)	0.000	0.000	0.000	0.000	0.000	0.000	
Core facility practice (X3)	Indicator	X3.1	X3.2	X3.3				
	Loading factor	0.707	0.702	0.908				*Valid*
	Reliability	0.825	0.904	0.828				*Reliable*
	λ	0.706	0.702	0.908				*Significant*
	Probability (p)	0.000	0.000	0.000				
Operational performance (Y1)	Indicator	Y1.1	Y1.2	Y1.3	Y1.4			
	Loading factor	0.809	0.611	0.679	0.808			*Valid*
	Reliability	0.828	0.758	0.811	0.814			*Reliable*
	λ	0.809	0.611	0.679	0.808			*Significant*
	Probability (p)	0.000	0.000	0.000	0.000			
Customer satisfaction (Y2)	Indicator	Y2.1	Y2.2	Y2.3				
	Loading factor	0.629	0.621	0.782				*Valid*
	Reliability	0.825	0.758	0.805				*Reliable*
	λ	0.629	0.621	0.784				*Significant*
	Probability (p)	0.000	0.000	0.000				
Business performance (Z)	Indicator	Z1.1	Z1.2	Z1.3	Z1.4			
	Loading factor	0.738	0.811	0.846	0.825			*Valid*
	Reliability	0.842	0.879	0.858	0.850			*Reliable*
	λ	0.738	0.811	0.848	0.823			*Significant*
	Probability (p)	0.000	0.000	0.000	0.000			

Research results/findings:

AMOS 16 is used to tests hypothesis. Table 4 and Figure 2 shows that hypothesis test results are significant at 95 percent confidence level, unless the infrastructure practice (X2) and operational performance (Y1) on business performance (Z). Data show that, as set out in model, management practices (X1) has significant effect on infrastructure practice (X2) with p = 0.000. While relations of infrastructure practice (X2), core facility practice (X3) and operation performance (Y1) is very strong with p = 0.000 and p = 0.014, but no significant effect on business performance (Z) on value of p = 0.735. The core facility practice (X3) has very significant on operational performance (Y1) p = 0.000, customer satisfaction (Y2) p = 0.017 and business performance (Z) with p = 0.001. Customer satisfaction has significant effect on business performance, but empirical evidence shows operational performance does not affect the business performance. Table 5 show structural equations in associated with increased business performance to reveals that almost 95 percent of variance can be explained by management practices, infrastructure practice, core practice facilities and customer satisfaction on business performance. It is reinforce the conceptual model of research (figure 1). Effect of operational performance is indirect effect as intervening variables of core facility practices.

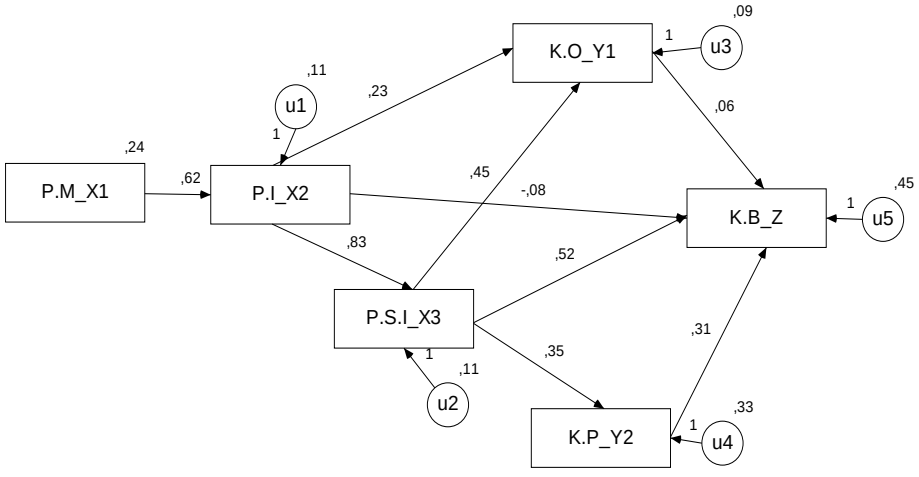

Fig. 2: Model overalls.

Table 4: Significance test the relationship between variables (hypothesis test).

Independent variables	Dependent variables	Direct effect		Description
		Standardize	P-value	
Management practice (X1)	Infrastructure practice (X2)	0.669	0.000	Significant
Infrastructure practice (X2)	Core facility practice (X3)	0.748	0.000	Significant
Infrastructure practice (X2)	Operational performance (Y1)	0.245	0.014	Significant
Infrastructure practice (X2)	Business performance (Z)	0.045	0.735	Significant
Core facility practice (X3)	Operational performance (Y1)	0.530	0.000	Significant
Core facility practice (X3)	Business performance (Z)	0.346	0.017	Significant
Core facility practice (X3)	Customer satisfaction (Y2)	0.296	0.001	Significant
Operational performance (Y1)	Business performance (Z)	0.035	0.783	Insignificant
Customer satisfaction (Y2)	Business performance (Z)	0.244	0.008	Significant

Table 5: Standardized direct effects, standardized indirect effects and standardized variables total .

Independent variables	Dependent variables	Effect coefficient		
		Direct	Indirect	Total
Management practice (X1)	Infrastructure practice (X2)	0.669		0.669
Infrastructure practice (X2)	Core facility practice (X3)	0.748		0.748
Infrastructure practice (X2)	Operational performance (Y1)	0.245		0.245
Infrastructure practice (X2)	Business performance (Z)	0.045	0.022	0.023
Core facility practice (X3)	Operational performance (Y1)	0.530		0.530
Core facility practice (X3)	Business performance (Z)	0.346	0.259	0.605
Core facility practice (X3)	Customer satisfaction (Y2)	0.296		0.296
Operational performance (Y1)	Business performance (Z)	0.035		0.035
Customer satisfaction (Y2)	Business performance (Z)	0.244		0.244

RESULTS AND DISCUSSIONS

Charline et.al, (2006) state that company's performance in quality management practices can be measured by financial performance, product quality, and operational performance. This study results can be considered to strengthen the findings. It is apparent from the test results of factor analysis of 22 indicators related to management practices; infrastructure practice, core facility practice, operational performance; customer satisfaction and business performance are significant. Core facility practice through indicators of quality improvement systems (X3.1) has a loading factor of 0.707, information quality usage (X3.2) has loading factor 0.702 and statistical techniques usage (X3.3) has loading factor of 0.908. This indicates the need for quality management implementation in according to organizational structure, procedures, processes and resources needed. Companies also need to analyze and use information and statistical techniques to measure, detect and control the quality problems in company products. This process will increase customer satisfaction that shown by indicators customer complaints (Y2.1) with loading factor 0.629, repeated purchases (Y2.2) with loading factor 0.621, retention companies (Y2.3) with loading factor 0.782. In other words, management ability to improve or overcome problems with product, good quality problems compared with other quality products and affordability of product compared to other products can improve customer satisfaction. It is believed that business performance improvement can be done through indicators of turnaround investment - ROI (Z1.1) with loading factor 0.738, asset turnover - ROA (Z1.2) with loading factor 0.811, sales growth (Z1.3) with loading factor 0.846, as well as market share (Z1.4) with loading factor 0.825. Turnover and investment property are ability to earn a return on investment and total assets held and used for operation. While the sales growth and market share growth rate of product sales from year to year can be improved through mastery of market.

Ability to practice core facility practice to improve operational performance, customer satisfaction and business performance needs infrastructure practice support and management practices. Test results show that infrastructure practice affect on core facility practice with coefficient of 0.748. While management practices affect on infrastructure practice with coefficient of 0.669. Based on Figure 1, it can be interpreted that implementation process of TQM quality management system simultaneously, structured and systematic can improve business performance. This is consistent with opinion of Hendricks and Singhal (1996) that TQM focus is to improve company's competitiveness.

Conclusions:

This study contributes to literature on how management practices, infrastructure practice, core facility practice as components of TQM that carried out simultaneously, systematic and sustainable can improve business performance. It provides practical implications for the implementation of TQM at manufacturing companies in Indonesia to evaluate time and emphasis on quality management practices. This study limitation is only a sample of manufacturing companies in Makassar, Indonesia, and therefore can not be generalized to other companies. Therefore, further studies are needed to fill this gap, as well as other aspects of TQM,

including comparisons with other companies to add more insight.

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