

## Review Article

### THE INFLUENCES OF MANAGEMENT ACCOUNTING SYSTEM AND PROCESS QUALITY MANAGEMENT TO PRODUCT QUALITY PERFORMANCE (CASE STUDY ON MANUFACTURE COMPANIES IN INDONESIA)

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#### ABSTRACT

The purpose of this study is to empirically examine the influences of Management Accounting System (dimensions of Quality Objectives/QO, Quality Feedbacks/QF, and Quality Incentives/QI) and Process Quality Management (PQM) to Products Quality Performance/PQP (Internal Quality and External Quality) using regression analysis. This research was conducted at the manufacture companies listed in Indonesia Stock Exchange with the analysis unit employees who work associated with the production process. Simultaneously, the results of statistical tests indicate that the Management Accounting System (MAS) and PQM positive and significant influence on PQP in both Internal and External Quality. It can be used as a reference of the manufacturing companies in running the management accounting systems in order to improve the quality of their products so the products can be well accepted by customers and exceeding customer expectations. The results indicate that the MAS-(QO and QI) and PQM significant positive influences on the Internal Product Quality. However, MAS-(QF) not significant and negative influences on the Internal Product Quality. The results also indicate that the MAS-(QI) and PQM significant positive influences on External Products Quality. However, MAS-(QO and QF) not significant and negative influence on the External Product Quality.

## INTRODUCTION

The level of competition in today's business world is getting higher in the presence of a free trade agreement by APEC (Asia Pacific Economic Cooperation), which is a cooperation forum in the Asia-Pacific countries to promote economic growth, trade, and investment among member countries, AFTA (Asean Free Trade Area), which is an agreement between countries of ASEAN cooperation aimed at creating a free trade area in the entire ASEAN region and will end with the formation of the ASEAN Economic Community (AEC) by 2015, ACFTA (ASEAN-China Free Trade Area), which is a free trade cooperation between ASEAN countries and China, and so on. The agreement essentially aims to enhance the competitive advantage in regional or interstate related measures reduce/eliminate import tariffs.

This makes the company must have the right strategy in order to be able to produce products or services that compete at the regional level/world. Therefore required high productivity to obtain high quality products/services. The quality of goods/services is a powerful strategic tool to compete in the market and will also be able to meet the needs/desires are expected consumer/customer. Quality is always a revelation that may change by the consumers/customers to a product or services that meet or even exceed customer expectations. Phenomena that occur in the business world today is how the quality of products or services produced meet or exceed customer expectations. Obviously this is very related to the process of creating a product or service. Therefore, it is necessary to process quality management. Some of the phenomena that occur in the business world can be described as follows:

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- Endang Gumira Said (2012), professor of Industrial Technology of Agriculture, IPB, Bogor – Indonesia said that the quality of eggs flour that produced in Indonesia is

not good. Required construction of a eggs flour mill to produce flour with good quality. Construction of a eggs flour mill should be in the center of a national egg production. So there is a guaranteed supply of raw materials.

- Edy Putra Irawady (2011), Deputy Coordinating Minister for Economic Affairs Industry and Trade said that Indonesian cosmetics industry is still using the standard minimum BPOM (Drug and Food Agency of Republic of Indonesia) not use the standard ASEAN.
- Karen Agustiawan (2010), President Director of PT Pertamina (Persero), said that Pertamina continues to improve its quality products and quality of care.
- Dedy Rochimat (2012), President Director of PT Gema Graha Sarana Tbk said that to achieve vision, GGS will continue to build a world-class business organization that continues to grow based on employee competencies that gets updated, to innovate and to realize the quality of products and services according to the customer's criteria in the comfort, health (ergonomic), and environmentally friendly. In order to integrate all business processes in order to improve the effectiveness and efficiency of the company's performance, GGS implement SAP Business All-in-One software solution integrated ERP (Enterprise Resource Planning).
- Budiyanto Halim (2012), Chairman of Development Partners Member Pearl Farming Association said that the quality of Indonesian pearls are still inferior compared to other producing countries. The low quality triggered by the lack of proper location, severe environmental pollution, quality bloodstocks and bad seed pearl shell, and the technicians have not been adequate.

Of phenomena that occur as described above, that the process quality management is critical in creating a product or providing services that can meet or exceed the expectations of consumers/customers. Control over the processes which take place really should be done continuously by management so that any problems can be done corrective action. The impact of products or services produced will be in accordance with established standards and have added value.

From the above description of the phenomena associated with product quality performance it can be concluded that the quality of the product should be in accordance with established standards and performing well, with the sense that the resulting product is defective minimal, reworked (rework), trace, and minimal complaints or even the claims of customers.

### Literature Review

Product quality Performance (Ahire and Dreyfus: 2000) which consists of an internal quality and external quality is that it can be influenced so the quality of the product/service depends on the variables that influence it. Process quality management have components that can affect the performance of the quality of products, among others, identifying the essential elements in the process. In this case it can be said that the process quality management is a series of processes in producing a quality product. According Maiga (2008) the results of previous studies that claimed different results, the process quality management does not affect in producing products quality performance, due to the lack of involvement of management accounting systems in the link between process quality

management and product quality performance. However, research related to management accounting system which addresses the relationship between process quality management with the quality of the product is still lacking. Drake *et al.* (1999) suggest that accounting and control systems that still seems to be a broad discussion for subsequent research and to contribute to alternative management options for the things that have not been well understood.

Management accounting system is often regarded as an important tool to provide information for decision makers, create and develop some kind of coaching in the company (Axelsson *et al.* 2002). This means that the management accounting system plays an important role in organizations and organizational behavior at large. Wruck and Jensen (1994) suggest to employees that will achieve quality performance products, such as management accounting system goals, feedback, and incentives should be used as a mechanism to motivate and influence behavior in getting the maximum welfare for both the organization and employees. Therefore, employees should know what they are doing (feedback for learning) and they should know what they should be doing (goal directing information), and they should get a prize/reward for what they have achieved (Baker, 1988). Thus, management accounting is a very valuable tool for decision making and control in general. So it is clear that the interactive effect between process quality management and management accounting systems on the quality of the product can be justified. Maiga and Jacob (2005) stated that the control system will affect the direction and level of effort shown by individuals or groups. It is expected to improve the performance quality of the product.

In this study wanted to know the effect of management accounting systems and process quality management affect product quality performance. Management accounting system has three functions of management, including planning, coordination, and control. Maiga (2008) states that there are three components in the control of management accounting systems, namely quality of goals, quality of feedback, and quality-related incentives that are expected to create the conditions that can motivate employees to achieve outcomes. It can be said that this study is a replication of the study Maiga (2008), but the object of research is a manufacturing company in Indonesia, which is listed in the Indonesia Stock Exchange.

Some of the literature related to the strategy of manufacturing companies showed that the quality of the product as one of the main priorities of competition to gain competitive advantage (Hill, 1997). While Young and Selto (1991) states that companies in the United States respond to the competition by adopting a strategy that can produce a high quality product and make the product quality as the main objective. Research conducted Flynn (1995) and Ahire (2000) about the influence of the process quality management on the performance quality of the product to a different outcome. The reason is the involvement of contextual variables that vary in application of the system in their respective companies. It is based on a contingency approach stating that the management accounting is based on the assumption that there is no proper accounting system that can be universally used by all organizations in a variety of circumstances. Proper accounting system depends on the specific circumstances in which the

organization is located. Therefore, contingency theory must identify specific aspects of the company's accounting system in which the state can be defined with certainty and the system can be tested properly.

## Definitions

### Management Accounting System

Anthony and Govindarajan (2009) says that a system is a certain way to carry out an activity or series. The system used by management to control the activities of an organization called the management control system. Management control is the process in which a manager influences other members of the organization to implement the organization's strategy. Management control is facilitated by a formal system which is a repeated cycle of activity. Management Control System includes financial and nonfinancial performance measures.

Atkinson *et al.* (2012) said "A Management Accounting and Control Systems (MACS) generates and uses information that helps decision makers assess whether an organization is achieving its objectives. The term control in management accounting and control refers to the set of procedures, tools, performance measures, systems, and incentives that organizations use to guide and motivate all employees to achieve organizational objectives. A system is in control if it is on the path to achieving its strategic objectives, and deemed out of control otherwise."

In this study, there are three components of the control of management accounting systems, namely quality goals, quality of feedback, and quality incentives (Maiga, 2008). All three are expected to create conditions that can motivate employees to achieve the intended purpose. The goal can be seen as a target level of performance for individuals or organizations to achieve (Locke *et al.* 1981). Feedback is thought to fulfill several functions and usually refers to information regarding the level of performance and or the manner and efficiency/performance efficiency of the process that has been decided (Kluger and DeNisi, 1996). For example, 1). Directive, to provide explanations about the behavior to be performed, 2). Motivational, as stimuli for better business, 3). Error-correcting, providing information about the level of errors made (Cooper *et al.*, 1994). Incentive is defined as a system of recognition and awards/rewards to recognize quality improvement/progress of the group or individual (Spreitzer and Mishra, 1999; Ittner and Larcker, 1995).

### Process Quality Management

Ahire (1996) says that the process quality management is one of the functions of the Total Quality Management (TQM). Process quality management is also a series of processes to produce high quality products. Excess organizations that have implemented a process quality management is able to develop the concept of quality with a comprehensive approach (holistic). In the concept of Total Quality Management, customers not just as a buyer but are intended as a further process that specify requirements and expects satisfaction. TQM emphasizes the operational aspects and social behavior on quality improvement. In TQM, there are five main programs are interrelated, namely 1). Focus on the customer, 2). Continuous improvement, 3). The development of the system, 4). Full participation, and 5). Performance measurement.

Ahire and Rana, 1984, says "Total quality management (TQM) has been perceived as a competitive strategy to continually improve the quality of products and processes. However, the initial stages of TQM implementation may encounter major problems owing to misplaced efforts. The extent to the which TQM is successful in an organization is determined by the initial impact of TQM efforts. Experts like Juran have suggested an incremental approach to the introduction of TQM, stressing pilot projects in some business units/areas of an organization.

### Product Quality Performance

Hall (2007) said that two basic reasons why the quality is important for manufacturers worldwide. First, poor quality very expensive for the company. Secondly, the quality is world-class manufacturer of basic competition. Quality is no longer a charge neutralizer. Customers want quality and are looking for quality products at the lowest price. One way companies can increase quality is to place control points along the production process for identifying operations that are "out of control" when the operation occurred. The alternative is the final quality control procedures that traditional process. In this approach, the product will be studied after completion.

Thus it can be said that quality from the perspective of the consumer/customer (external quality) is a reference/standard availability, characteristic, maintainability, reliability, and performance can be measured. While from the point of view of the manufacturer, the quality of the product is in compliance with established specifications (internal quality). Ahire and Dreyfus (2000) states that an internal quality assessment of the quality of the final product before delivering it to consumers/customers and their accompanying processes. While external quality is a quality product that is assessed from the point of view of the consumer for the purpose or benefit of such products.

## Framework

### Relations Process Quality Management, Management Accounting Systems and Product Quality Performance

Process quality management is the process of monitoring performed by management to ensure that the products are processed produce a quality product and in accordance with the standards or criteria/specifications that have been established. Quality has a very broad sense, not only from the point of view of the customer or the company, but can also be seen from the comparison of products, value, and interest rate. The elements which express the quality is the fulfillment or exceed customer expectations, including products, services, people, processes, and environment, and the quality is a condition that can always change with the times.

In addition it is also an effective quality management requires the suppliers to deliver products to the specifications/standards that have been agreed upon. The process quality management seeks to avoid any product defect/damage resulting from the operation of the company and will not continue to process the products are defective/damaged *let alone* to pass on to customers.

It required monitoring/control over the quality of the process effective and efficient. Thus the process quality management have an influence or effect on the product quality performance. Three control components or subsystems of Management Accounting System, the quality goals, quality of feedback, and quality incentives are expected to increase worker motivation to achieve the result (outcomes) that have been established organization. This is in accordance with the opinion Flamholtz (1996) and Maiga and Jacob (2005) which states that the control system will affect the direction and level of effort shown by the individual. The product quality can be tested through the customer experience using the product organization (Ahire and Dreyfus, 2000). Thus, this test is done through internal reliability test is an assessment of the quality of the final product before it is sent to the consumer along with the quality of the process through. As for the performance of the products or called external quality will be assessed from the viewpoint of customers who use these products.

### **The influence of quality goals and process quality management on product quality**

Based on the theory of goal-setting, goals will be effective for these goals indicates an acceptable level of performance (Locke and Latham, 1990). In experimental studies conducted Tuttle and Harrell (2001), using which students act as workers, workers in the rules, shows that the priority objectives to employees communicate can affect workers priority in achieving these goals. Taylor (2004) said that a set of business objectives are clearly an important need in the process of rectifying the measurement of product performance with business objectives. The goals runs as a regulator of human action by motivating the project development team (Linderman *et al.*, 2006). With specific goals needed to straighten the performance measurement strategy, the quality goals set in the process quality management will have an impact on the quality of the product.

### **The influence of quality feedbacks and process quality management on product quality**

The results of the study Renn and Fedor (2001) states that employees receive and use feedback as the subject of the inspection and control of current. While the results of research Kluger and DeNisi (1996), in relation to influencing the behavior of employees, motivation force feedback gain almost exclusively from the information provided about the employee's performance, which in turn increases the clarity of the task to be performed. Sarkar (1997) showed that the improvement/process improvement in quality will be increased when the recommended information dissemination in the work location. Nagappan *et al.* (2005). The result indicate that a test quality feedback provide meaningful feedback on the quality of the testing effort and for added confidence that product quality will be high.

### **The influence of quality incentives and process quality management on product quality**

Sprinkle (2000) found that reliance on incentive-based compensation schemes improve the performance of individuals to motivate them to improve both the duration and intensity of effort.

He found also that the incentives not only motivate people to work longer, but also improves the quality of individual attention to devote to the task. Meanwhile Chong and Eggleton (2007) suggested that the fundamental purpose of incentive-based compensation schemes is to motivate individuals to strive to improve its performance.

Prize/Reward System binding process quality management that can be used as a mechanism to motivate employees, which should lead to higher operational performance. MacDuffie (1995), said further "Multiple skills and conceptual knowledge developed by the work force under the flexible production are of little use unless workers are motivated to Contribute mental as well as physical effort". Employees will only contribute to the effort to solve the problem if they believe that the interests of individuals and organizations aligned with the interests of the organization will invest in a mutual desire of the individual. In the absence of an equitable compensation system, employee morale can be decreased and the performance becomes "dangerous"/"be compromised". Thus, it is expected that the quality management process when combined with performance incentives should encourage higher quality.

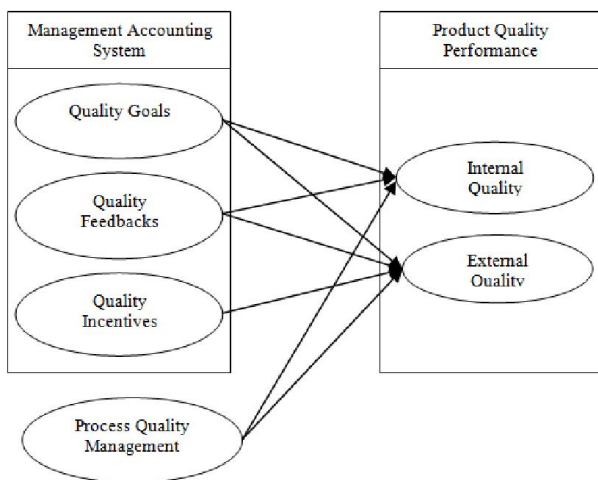
### **Hypotheses**

From the description above formulation of the problem the authors are interested to find out in this study, which essentially can be formulated as follows:

- H1:** Quality Goals and Process Quality Management is positive influence on the Internal Quality;
- H2:** Quality Feedback and Process Quality Management is positive influence on the Internal Quality;
- H3:** Quality Incentives and Process Quality Management is positive influence on the Internal Quality;
- H4:** Quality Goals and Process Quality Management is positive influence on the External Quality;
- H5:** Quality Feedbacks and Process Quality Management is positive influence on the External Quality;
- H6:** Quality Incentives and Process Quality Management is positive influence on the External Quality;
- H7:** Quality Goals, Quality Feedback, Quality Incentives, and Process Quality Management is simultaneously positive influence on the Internal Quality;
- H8:** Quality Goals, Quality Feedback, Quality Incentives, and Process Quality Management is simultaneously positive influence on the External Quality.

### **Measures**

The following figure illustrates the theoretical relationship between the independent variables and the dependent variable. In considering suitable/feasible "fit" of the Process Quality Management and Management Accounting System, the process of identification with Milgrom and Roberts (1995) are used. It is expected that Process Quality Management and Management Accounting System has an influence on quality performance products for every hypothesis that has been presented above. This study aims to obtain empirical evidence about the effect of the interaction of the Process Quality Management and Management Accounting System to the Product Quality Performance at the manufacturing companies listed in Indonesia Stock Exchange.



**Figure 1. Theoretical Relations between Independent and Dependent Variables**

The method used in this research is descriptive research. This descriptive study include the collection of data to test hypotheses or answer questions about the current status of research subjects. The purpose of descriptive studies is to give researchers a history or to describe relevant aspects of the phenomenon of someone's attention, organization, industry orientation, or other (Sekaran, 2009). The unit of analysis in this study is the individual, the Director of Manufacturing, Head of the Department/Division of Manufacturing, Manufacturing Manager, and Senior Manufacturing Staff at a manufacturing company/industry listed in the Indonesia Stock Exchange.

### Operationalisation of Variables

#### Management Accounting System

Is a way to implement something or a series of activities through the three components of the control of management accounting systems, namely quality objectives, quality of feedback, and quality incentives. All three are expected to create conditions that can motivate employees to achieve organizational goals that have been set. Feedback is thought to fulfill several functions and usually refers to information regarding the level of performance or efficiency in the performance of which has been decided upon, such as the directive, motivational, and error-correcting. Incentive is defined as a system of recognition and rewards to recognize quality improvement/progress of the group or individual. Operationalisation of the variable Management Accounting System are as follows: a.) Management Accounting System – Quality Goals is a level of performance that must be achieved by an individual or organization. b.) Management Accounting System – Quality Feedbacks is information that is used to evaluate the steps undertaken to implement a plan. c.) Management Accounting System – Quality Incentives is a system of recognition and reward system to recognize the improvement of the quality of an individual or group.

#### Process Quality Management

Is a set of processes to produce high quality products. Process Quality Management as a function of the Total Quality Management (TQM). Excess organizations that have implemented a process quality management is able to develop the concept of quality with a comprehensive approach (holistic).

### Product Quality Performance

Quality from the perspective of the consumer/customer (external quality) is a reference/standard availability, characteristics, maintenance, reliability, and performance can be measured. While from the point of view of the manufacturer, the quality product means the product has been in accordance with predetermined specifications (internal quality). Internal quality is the rating of the quality of the final product before delivering it to consumers/customers and their accompanying processes. While external quality is a quality product that is assessed from the point of view of the consumer for the purpose or benefit of such products.

Sources of data used in this study is primary data. Primary data refers to information obtained from the first hand by researchers associated with the variable of interest for the specific purpose of study (Sekaran, 2009). The data source of this study is manufacturing companies listed in Indonesia Stock Exchange with the unit of analysis individuals working in production unit/production ranging from Production Director, Head of Department/Division of Production, Production Manager, and Production Supervisor, and Production Staff.

### Data Collection Method

Primary data were obtained from the respondents as unit analysis (Director of Manufacturing, Head of Department/Fabrication Division, and Manager of Manufacturing companies listed in Indonesia Stock Exchange) with the following data collection techniques:

- The questionnaire, which is a structured list of questions addressed to them.
- Interview, the questioning and asked questions directly to them. Interviews were conducted to complete a questionnaire relating to the process quality management, management accounting systems, and product quality performance.

### Population and Sample

The population in this study are all companies listed on the Indonesia Stock Exchange. In March 2014 the number of companies listed on the Indonesia Stock Exchange is 492 issuers/companies, including 138 manufacturing companies as a sample. While the unit of analysis in this study is that individuals who work in the production ranging from Production Director, Head of Department/Division of Production, Production Manager, Production Supervisors, and Production Staff.

### Method of Testing Data

Primary data were collected through questionnaires need to be tested first, to see the seriousness of the respondents in answering the questions in the questionnaire. There are two kinds of tests were performed, namely test of validity and test of reliability. In this study to measure the degree of validity by means of the correlation between the scores of the questions with a total score of constructs or variables. Significance test is done by comparing the value of  $r$  count  $r$  table for degree of freedom ( $df$ ) =  $n-2$ , where  $n$  is the number of samples.

See the display output in the column Cronbach Alpha correlated item - total correlation, compare values correlated item - total correlation with the calculated r table, if r is bigger than r table and a positive value then the item or statement is declared invalid or indicator (Ghozali 2011). Reliability is a tool to measure a questionnaire which is an indicator of the variables or constructs. A questionnaire said to be reliable or reliable if someone answers the statements are consistent or stable over time (Ghozali, 2011). In this study approach was used to test the reliability of one-shot or one-time measurement. The measurement only once and then the results were compared with another question or measure the correlation between the answers to questions. Analysis tools provide the facility to measure the statistical reliability with Cronbach Alpha test. A construct or variable said to be reliable if the Cronbach Alpha value  $> 0.70$  (Nunnally in Ghozali, 2011). In addition to the validity test and reliability test, normality test (by looking at the histogram graph), heteroscedasticity test (by looking at the graph plots between the predicted value of the dependent variable), and multicollinearity test (test whether the regression model found a correlation between the independent variables) are also conducted in this study.

### Data analysis

To analyze the data in this study used a descriptive statistical analysis. This analysis was conducted to get an overview of respondents' answers regarding the variables used in this study. Descriptive statistics provide a picture or description of the data that is seen from the mean, standard deviation, variance, maximum, minimum, sum, range, kurtosis, and skewness (Ghozali, 2011). In this study there are two steps are carried out to analyze the data that is statistical regression analysis. Regression analysis is the study of the dependence of the dependent variable with one or more independent variables, with the aim to estimate or predict the population average or mean value of the dependent variable based on the value of the independent variables are known (Gujarati, 2003). To analyze the data in this study used regression analysis. Regression analysis is the study of the dependence of the dependent variable with one or more independent variables, with the aim to estimate or predict the population average or mean value of the dependent variable based on the value of the independent variables are known (Gujarati, 2003).

### Assessing Goodness of Fit of a Regression Model

In regression analysis, in addition to measuring the strength of the relationship between the two variables or more, also shows the direction of the relationship between the dependent variable and the independent variables, where the dependent variable is assumed to be random/stochastic, which means it has a probabilistic distribution and independent variables assumed to have a fixed value (in repeated sampling). The way used to see the goal is to see the value of  $R^2$  essentially measures how far the model's ability to explain variation in the dependent variable. The coefficient of determination is between zero and 1. In this study to evaluate the use of regression models adjusted  $R^2$  values, Simultaneous Significance Testing (Test Statistic F), and Significant parameters Individual Test (Test Statistic t).

## RESULTS AND DISCUSSION

The number of companies or issuers listed on the Indonesia Stock Exchange in July 2013 totaled 478 companies include 138 companies are manufacturing companies. The manufacturing companies is compose of: Basic Industry and Chemical Sector, Various Industry Sectors, and Consumer Goods Industry Sector.

In this research, questionnaires through visits to the companies and also via email through the corporate secretary. Each company was given five sets of questionnaires filled in by the hopes of five people who work associated with the production process such as Production Director, Head of Production, Production Manager, Production Supervisor, and Production Staff. Used in this research the validity test, reliability test, normality test, heteroscedasticity test, multicollinearity test, and descriptive test. From the descriptive test it can be seen descriptions of each of the variables studied, which consists of a Management Accounting System (Quality Goals, Quality Feedbacks, and Quality Incentives), Process Quality Management and Products Quality Performance (Quality Internal and External Quality). From these results it can be said that respondents to the variable Management Accounting System (Quality Goals, Quality Feedbacks, and Quality Incentives) have been good. This suggests that the Management Accounting System are established manufacturing company and both responded positively by respondents.

From all respondents from manufacture companies listed in Indonesia Stock Exchange (138 companies), 18 companies responded to the number of respondents were 110 people who filled out questionnaires and were accepted. Results of statistical analysis showed that the processing of the frequency distribution of respondents for each variable, namely the variable of Management Accounting System consisting of Quality Goals, Quality Feedback, and Quality Incentives, Process Quality Management and Products Quality Performance consisting of Quality Internal and External Quality indicates whether a variable is important. The test results showed the frequency distribution of scores produce a minimum score of 84%, which indicates that the respondents in manufacturing firms understand how important variables Management Accounting System, Process Quality Management, and Products Quality Performance as a whole to be implemented in the company.

### Hypothesis Testing

The first hypothesis stated interaction Management Accounting System - Quality Goals and Process Quality Management has influence on Product Quality Performance - Internal Quality. The results of the regression test was performed using statistical analysis software obtained the following results: The results of the statistical analysis of output shows the value of the adjusted  $R^2$  of 0.417. This means that 41.7 % variable Products Quality Performance can be explained by the variables Management Accounting System - Quality Objectives, while the remaining (100 % - 41.7 % = 58.3 %) is explained by cause other reasons outside the model.

Seen that the variable has a MAS - Quality Goals t value of 4.977, meaning more than 2 and a significance probability of 0.000. This suggests that H<sub>1</sub> is supported/received, i.e. MAS - Quality Goals partially affect Product Quality Performance - Internal Quality. Also evident is that the Process Quality Management variable has a t value of 3.843, meaning more than 2 and a significance probability of 0.000. This suggests that Process Quality Management partially affect Product Quality Performance - Internal Quality. The results of the F test (ANOVA) calculated F value obtained at 40.038 with a probability of 0.000. Because the probability is much smaller than 0.05, then the regression model can be used to predict the Product Quality Performance - Quality Internal or it can be said that the MAS - Quality Goals and Process Quality Management jointly affect the Products Quality Performance - Internal Quality. The second hypothesis states interaction Management Accounting System - Quality Feedbacks and Process Quality Management has an influence on Products Quality Performance - Internal Quality. The results of the regression test was performed using statistical analysis software obtained the following results:

The results of the regression test was performed using statistical analysis software obtained the following results: The results of the statistical analysis of output shows the value of the adjusted R<sub>2</sub> of 0.416. This means that 41.6 % variable Products Quality Performance - Internal Quality variables can be explained by the Management Accounting System - Quality Incentives, while the remaining (100 % - 41.6 % = 58.4 %) explained by other causes outside the model. Seen that the variable has a MAS - Quality Incentives t value of 4.942, meaning more than 2 and a significance probability of 0.000. This suggests that H<sub>3</sub> is supported, i.e. MAS - Quality Incentives partially affect Product Quality Performance - Internal Quality. Also evident is that the Process Quality Management variable has a t value of 2.241, meaning more than 2 and a significance probability of 0.027. This suggests that Process Quality Management partially affect Product Quality Performance - Internal Quality. The results of the F test (ANOVA) calculated F value obtained at 39.789 with a probability of 0.000.

**Table 1. Coefficients<sup>a</sup> MAS-QG and PQM to PQP**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	9,891	2,435		4,063	,000		
	qgoals	,578	,116	,424	4,977	,000	,738	1,354
	pqm	,341	,089	,327	3,843	,000	,738	1,354

a. Dependent Variable: qualinter

**Table 2. Coefficients<sup>a</sup> MAS-QF and PQM to PQP**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	13,693	2,693		5,084	,000		
	qfeedb	-,040	,124	-,030	-,319	,750	,763	1,311
	pqm	,581	,097	,558	6,010	,000	,763	1,311

a. Dependent Variable: qualinter

The results of the statistical analysis of output shows the value of the adjusted R<sub>2</sub> of 0.283. This means that 28.3 % variable Products Quality Performance can be explained by the variables Management Accounting System - Quality Feedbacks, while the remaining (100 % - 28.3 % = 71.7 %) is explained by other causes outside the model. Seen that the variable MAS - Quality Feedbacks has t value of - 0.319, meaning less than 2 and the probability of significance 0.750. This suggests that H<sub>2</sub> is refused/rejected, i.e. MAS - Quality Feedbacks partially not affect the Products Quality Performance - Internal Quality. Also evident is that the Process Quality Management variable has a t value of 6.010, meaning more than 2 and a significance probability of 0.000. This suggests that Process Quality Management partially affect Product Quality Performance - Internal Quality. The results of the F test (ANOVA) calculated F value obtained at 22.524 with a probability of 0.000. Because the probability is much smaller than 0.05, then the regression model can be used to predict the Product Quality Performance - Quality Internal or it can be said that the MAS - Quality Feedbacks and Process Quality Management jointly affect the Products Quality Performance - Internal Quality. The third hypothesis, stating interactions Management Accounting System - Quality Incentives and Quality Management Process has an influence on Product Quality Performance - Internal Quality.

Because the probability is much smaller than 0.05, then the regression model can be used to predict the Product Quality Performance – Quality Internal or it can be said that the MAS - Quality Incentives and Process Quality Management jointly affect the Products Quality Performance - Internal Quality.

The fourth hypothesis stated interaction Management Accounting System - Quality Goals and Process Quality Management has an influence on Product Quality Performance - External Quality. The results of the regression test was performed using statistical analysis software obtained the following results:

The results of the statistical analysis of output above shows the value of the adjusted R<sup>2</sup> of 0.299. This means that 29.9% of the variable Product Quality Performance - External Quality can be explained by the variable Management Accounting System - Quality Goals, while the remaining (100 % - 29.9 % = 70.1 %) is explained by causes others outside the model. Seen that the variable has a SAM - Quality Goals t value of 2.986, meaning more than 2 and a significance probability of 0.004. This suggests that H<sub>4</sub> is supported/received, i.e. MAS - Quality Goals partially affect the Products Quality Performance - External Quality. Also evident is that the Process Quality Management variable has a t value of 3.877, meaning more than 2 and a significance probability of 0.000.

Table 3. Coefficients<sup>a</sup> MAS-QI & PQM to QI

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	7,842	2,592		3,026	,003		
	qinsen	,843	,171	,485	4,942	,000	,556	1,800
	pqm	,229	,102	,220	2,241	,027	,556	1,800

a. Dependent Variable: qualinter

Table 4. Coefficients<sup>a</sup> MAS-QG and PQM to EQ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	13,173	3,414		3,859	,000		
	qgoals	,486	,163	,279	2,986	,004	,738	1,354
	pqm	,482	,124	,362	3,877	,000	,738	1,354

a Dependent Variable: qualekst

This suggests that namely Quality Management Process partially affect the Quality Performance Products - External Quality. The results of the F test (ANOVA) calculated F value obtained at 24.243 with a probability of 0.000. Because the probability is much smaller than 0.05, then the regression model can be used to predict the Products Quality Performance - External Quality or it can be said that the MAS - Quality Goals and Process Quality Management jointly affect the Products Quality Performance - External Quality. The fifth hypothesis states interaction Management Accounting System - Quality Feedbacks and Process Quality Management has an influence on Products Quality Performance. The results of the regression test was performed using statistical analysis software obtained the following results:

Because the probability is much smaller than 0.05, then the regression model can be used to predict the Products Quality Performance - External Quality or it can be said that the MAS - Quality Feedbacks and Process Quality Management jointly affect the Products Quality Performance - External Quality.

The sixth hypothesis stated interaction Management Accounting System - Quality Incentives and Process Quality Management has an influence on Product Quality Performance - External Quality. The results of the regression test was performed using statistical analysis software obtained the following results:

Table 5. Coefficients<sup>a</sup> MAS-QF & PQM to EQ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	17,577	3,511		5,006	,000		
	qfeedb	-,228	,162	-,134	-1,411	,161	,763	1,311
	pqm	,758	,126	,570	6,014	,000	,763	1,311

a. Dependent Variable: qualekst

Table 6. Coefficients<sup>a</sup> MAS-QI & PQM to EQ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	9,181	3,448		2,663	,009		
	qinsen	1,051	,227	,473	4,628	,000	,556	1,800
	pqm	,252	,136	,189	1,850	,067	,556	1,800

a. Dependent Variable: qualekst

The results of the statistical analysis of output above shows the value of the adjusted R<sup>2</sup> of 0.254. This means that 25.4 % variable Product Quality Performance - External Quality can be explained by variables Management Accounting System - Quality Feedbacks, while the remaining (100 % - 25.4 % = 74.6 %) is explained by other causes outside the model. Seen that the variable SAM-Quality Feedback has t value of -1.411, meaning less than 2 and the probability of significance 0.161. This suggests that H<sub>5</sub> is refused/rejected, i.e. MAS - Quality Feedbacks partially not affect the Products Quality Performance - External Quality. Also evident is that the Process Quality Management variable has a t value of 6.014, meaning more than 2 and a significance probability of 0.000. This suggests that Quality Management Process partially affect the Products Quality Performance - External Quality. The results of the F test (ANOVA) calculated F value obtained at 19.599 with a probability of 0.000.

The results of the statistical analysis of output above shows the value of the adjusted R<sup>2</sup> of 0.367. This means that 36.7 % variable Product Quality Performance - External Quality can be explained by variables Management Accounting System - Quality Incentives, while the remaining (100 % - 36.7 % = 63.3 %) is explained by cause other reasons outside the model. Seen that the variable has a MAS - Quality Incentives t value of 4.628, meaning more than 2 and a significance probability of 0.000. This suggests that H<sub>6</sub> is supported, i.e. MAS - Quality Incentives partially affect the Products Quality Performance - External Quality. Also evident is that the Process Quality Management variable has a t value of 1.850, meaning less than 2 and a significance probability of 0.067. This suggests that Process Quality Management is partially not affect the Products Quality Performance - External Quality. The results of the F test (ANOVA) calculated F value obtained at 32.629 with a probability of 0.000.



Because the probability is much smaller than 0.05, then the regression model can be used to predict the Product Quality Performance - Quality Internal or it can be said that the MAS - Quality Incentives and Process Quality Management jointly affect the Products Quality Performance - External Quality.

The seventh hypothesis stated interaction Management Accounting System - Quality Goals, Quality Feedbacks, and Quality Incentives and Process Quality Management has an influence on Product Quality Performance - Quality internal. The results of the regression test was performed using statistical analysis software obtained the following results:

**Table 7. Model Summary<sup>b</sup> Quality Internal**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,688 <sup>a</sup>	,474	,454	2,65155

a. Predictors: (Constant), pqm, qgoals, qfeedb, qinsen

b. Dependent Variable: qualinter

The results of the statistical analysis of output above shows the value of the adjusted R<sup>2</sup> of 0.454 . This means that 45.4 % variable Products Quality Performance – Internal Quality can be explained by variable of Management Accounting System (SAM) – Quality Goals, Quality Feedback, and Quality Incentives, and Process Quality Management, while the rest (100 % - 45.4 % = 54.6 %) is explained by other causes outside the model.

Seen that the variable has a MAS - Quality Goals t value of 3.032, MAS - Quality Feedback has t value of - 0.777, SAM - Quality Incentives have t value of 2.907, meaning to MAS - Quality Goals and Quality Incentives more than 2 and the probability of significance 0.003 and 0.004. This suggests that H<sub>1</sub> and H<sub>3</sub> is supported, i.e. SAM - Quality Goals and Quality Incentives each partial effect on Product Quality Performance - Internal Quality. But MAS - Quality Feedback has a t value of - .777 , meaning specific to the MAS - Quality Feedback is less than 2 and the probability of significance 0.439. This suggests that H<sub>2</sub> is refused, i.e. MAS - Quality Feedback partially not affect the Products Quality Performance - Internal Quality.

**Table 8. Model Summary<sup>b</sup> Quality External**

R	R Square	Adjusted R Square	Std. Error of the Estimate
,634 <sup>a</sup>	,402	,379	3,61413

a. Predictors: (Constant), pqm, qgoals, qfeedb, qinsen

b. Dependent Variable: qualekst

**Table 9. Coefficients<sup>a</sup> MAS and PQM to QE**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	10,483	3,528		2,972	,004		
	qgoals	,197	,178	,113	1,107	,271	,547	1,827
	qfeedb	-,262	,148	-,154	-1,771	,079	,756	1,323
	qinsen	,917	,260	,413	3,524	,001	,415	2,409
	pqm	,328	,146	,246	2,254	,026	,476	2,099

a. Dependent Variable: qualekst

The results of the F test (ANOVA) calculated F value obtained at 23.645 with a probability of 0.000. Because the probability is much smaller than 0.05, then the regression model can be used to predict the Product Quality Performance – Internal Quality or it can be said that the Management Accounting System (Quality Goals, Quality Feedbacks, Quality Incentives) and Process Quality Management together influential the

Product Quality Performance - Internal Quality. This suggests that H<sub>7</sub> is supported, i.e. MAS and Process Quality Management together affect the Products Quality Performance – Internal Quality. The eighth hypothesis states interaction Management Accounting System – (Quality Goals, Quality Feedbacks, and Quality Incentives) and Process Quality Management has an influence on Product Quality Performance - Quality external. The results of the regression test was performed using statistical analysis software obtained the following results:

The results of the statistical analysis of output above shows the value of the adjusted R<sup>2</sup> of 0.379. This means that 37.9% variable Products Quality Performance - External Quality can be explained by variables Management Accounting System (MAS) - Quality Goals, Quality Feedbacks, and Quality Incentives, while the remaining (100%-37,9%=62.1%) is explained by other causes outside the model. Seen that the variable has a MAS-Quality Goals t value of 1.107, MAS-Quality Feedbacks has t value of - 1.771, MAS-Quality Incentives have t value of 3.524, meaning to MAS-Quality Incentives over 2 and a significance probability of 0.001. This suggests that H<sub>6</sub> is supported i.e. MAS-Quality Incentives partially affect the Products Quality Performance - External Quality.

But MAS - Quality Goals and Quality Feedbacks having t values respectively 1.107 and - 1.771, mean for the MAS - Quality Goals and Quality Feedback less than 2 and significance probability 0.271 and 0.079. This suggests that H<sub>4</sub> and H<sub>5</sub> is refused, i.e. MAS - Quality Goals and Quality Feedback respective partial no effect on Products Quality Performance - External Quality. The results of the F test (ANOVA) calculated F value obtained for 17,638 with a probability of 0.000 . The probability is much smaller than 0.05, then the regression model can be used to predict the Products Quality Performance - External Quality or it can be said that the Management Accounting System and Process Quality Management together influential against the Products Quality Performance - External Quality.

This suggests that H<sub>8</sub> is supported, i.e. MAS and Process Quality Management together affect/influential the Products Quality Performance – External Quality.

**Conclusion**

- Management information presented on the level of performance (quality goals) to be achieved in relation to the

rest of the target cost (scrap), rework, and the maximum number of product defects that interacts with the Process Quality Management, which is set of processes produce high quality products, showed positive results and significant interaction on Products Quality Performance - Internal Quality. These findings are consistent with the research Maiga (2008) based on cost of scrap, reworking, and product defect with variable results are positively associated with Product Quality Performance – Internal Quality and statistically significant. Thus, in this case, the company should communicate more frequently on targets that must be achieved so that employees have a clear purpose and can reduce the cost of waste, reduce rework, reduce product defects, and are expected to increase productivity/ performance.

- Frequency occurs at the level of quality of feedback which is information for evaluating screening measures, improvement, and learning, which interacts with the Process Quality Management, which is a set of processes produce high quality products, shows the result of interaction positive and significant on Products Quality Performance - Internal Quality. Result of simultan test showed that the MAS - Quality Feedback and Process Quality Management jointly affect the Product Quality Performance - Internal Quality. These findings are not consistent with the results of research Maiga (2008) which is based on quality assessment, ongoing analysis, and data quality and application in the work plan. Quality Feedback dimension is partially related to the negative direction of the Product Quality Performance –Internal Quality and not statistically significant. Based on these findings the company should pay more attention to the quality of feedback as learning, the use of an assessment of the quality of the product, and the data can be analyzed continuously in the process of creating a quality product and in accordance with established specifications. Thus, the quality of feedback can be beneficial to the employees and management of the rest of the company to reduce costs , reduce rework , and reduce product defect which in turn will increase productivity and product quality.
- The test results of the Quality Incentive in relation to the provision of related awards and recognition of performance that interact with the Process Quality Management, which is a set of processes produce high quality products, showed positive results and significant interaction with the Products Quality Performance - Internal Quality. Result of simultan test showed that the MAS - Quality Incentives and Process Quality Management jointly affect the Product Quality Performance - Internal Quality. So it is that the Quality Incentives dimension partially related to the positive direction of the Product Quality Performance - Internal Quality and statistically significant. This means that the company further improve the quality of these incentives can inspire employees to be more productive and improve the quality of work that can produce high quality products as well, reducing the cost of waste, reducing the amount of rework, and reduce the number of defect products. These findings are not consistent with the results of research Maiga (2008 ) which is based on the awards and recognition from management related to product performance results of these variables interact negatively with Product Quality Performance - Internal Quality and not statistically significant.
- Result of simultan test showed that positif and significant. It could be argued that the MAS - Quality Goals and Process Quality Management jointly affect the Product Quality Performance External Quality. These findings are consistent with the research Maiga (2008) based on cost of scrap, reworking , and product defect with variable results are positively associated with Product Quality Performance – External Quality and statistically significant. Thus, in this case, the company should communicate more frequently on targets that must be achieved so that employees have a clear view of the purpose of the company and can reduce the cost of scrap, reduce rework, reduce defective products. Hopefully, by the interaction of these two variables (MAS - Quality Goals) and Process Quality Management can reduce the number of warranty claims, litigation claims lowering products, and decrease the number of complaints from customers. Further impact is a reduction in the cost of manufacturing and process engineering costs over the product failed, and lower engineering costs related to marketing the product failed.
- The findings in this study indicate that the variable Quality Feedback is partially related to the negative direction of the Product Quality Performance – External Quality and not statistically significant. These findings are not consistent with the results of research Maiga (2008) which is based on the quality assessment feedback (consisting of indicators: quality assessment, ongoing analysis, and data quality and application in the work plan) with the result of the interaction between the MAS and Process Quality Management is significant and positive. Looking at the results above, based on these findings the company should pay more attention to the quality of feedback as learning, the use of an assessment of the quality of the product, and the data can be analyzed continuously in the process of creating a quality product and in accordance with established specifications. Thus, the quality of feedback can be beneficial to the employees and management company to reduce costs of scrap, reduce rework, and reduce product defects which in turn will increase productivity and product quality.
- The result of MAS-Quality Incentive and Process Quality Management simultan test showed that positif and significant. So it can be said that the SAM - Quality Incentives and Process Quality Management jointly affect the Product Quality Performance - External Quality. So the variable Quality Incentives partially related to the positive direction of the Product Quality Performance - External Quality and statistically significant. That is , the company should also improve the quality of these incentives can inspire employees to be more productive and improve the quality of work that can produce high quality products, reducing the number of warranty claims, reduce litigation products, reducing the number of customer complaints, reducing the number of product returns, and finally can reduce the cost of manufacturing and engineering processes related to product failure and reduce engineering costs related to marketing the product failed. These findings are not consistent with the results of research Maiga (2008), which produces test results MAS - Quality Incentive

interaction with Process Quality Management showed no statistically significant results against Products Quality Performance - External Quality. Therefore it is important for manufacturing companies in Indonesia to always keep the awards and recognition for employees who certainly linked to performance and also maintain interaction with good process management product that will have an impact on decreasing the number of warranty claims, claims litigation decline in the number of products, number of subscribers the complaint and any further reduction in the cost of failure is the product of the cost of engineering and engineering product marketing.

- Based on the results of hypothesis testing concluded that the interaction of Management Accounting Systems and Process Quality Management simultaneously (overall) significantly affects Products Quality Performance - Internal Quality on manufactur companies listed in Indonesia Stock Exchange. This suggests a role of Management Accounting System (related Quality Goals, Quality Feedback, and Quality Incentives) and Process Quality Management is very significant in influencing on the Product Quality performance – Internal Quality. These results are consistent with research Milgrom and Roberts (1995) and Maiga (2008). It is important for the company in the production process to produce the highest quality products, and implement corrective actions for any product problem, using statistical analysis or value analysis in the process, develop better processes, and also to establish good communication between management and employees in resolving problems quality of the process/product. Communication between management and employees is critical in troubleshooting process/product. This is consistent with the results obtained by questionnaire respondents occupy the highest score in terms of the process quality management. This interaction with management accounting systems have an impact on the quality/reliability of the good products from the standpoint of the company's internal quality before the product is shipped to the customer. This is evident from respondents who stated that the performance of the product or product reliability is critical (occupying the highest score). Overall the results of this study have clear implications. The application of Management Accounting System which consists of the dimensions of Quality Goals, Quality Feedbacks and Quality Incentives interacting with Quality Management Process is crucial in producing quality products from the standpoint of Internal Quality.
- Based on the results of hypothesis testing concluded that the Management Accounting System and Process Quality Management simultaneously (overall) significantly affects Quality Performance Products - External Quality on companies listed in Indonesia Stock Exchange. This suggests a role of Management Accounting System related quality goals, quality feedback, and quality incentives is very significant in influencing the Product Quality Performance – External Quality.

These results are consistent with research Milgrom and Roberts (1995) and Maiga (2008). It is important for the company in the production process to produce the highest quality products, and implement corrective actions for any product problem,

using statistical analysis or value analysis in the process, develop better processes, and also to establish good communication between management and employees in resolving problems quality of the process/product. Preventive efforts better done before the product is finished, but if there is defect product, it is must to be reworking. Moreover, if the product has been used by the customer and then be disappointed because the quality of the product is not as expected customers. Communication between management and employees is critical in troubleshooting process / product. This is consistent with the results obtained by a questionnaire that occupy the highest score in terms of the quality management process.

This interaction with management accounting systems have an impact on customer satisfaction / users of the products produced by the company (from the point of view of an external quality). This is evident from respondents who stated that the decrease in the cost of manufacturing, process engineering, marketing and engineering associated with the failure of the product is very important (occupying the highest score). The results of this study support the research, among others, Mia (1993), Milgrom and Robert (1995), Ittner and Larcker (1995), Chenhall (2003), Maiga (2008), Mokhtar and Yusof (2010), and Corredor and Goni (2010). This previous research related to quality processes and a significant positive effect on product performance.

Overall the results of this study have clear implications are that the application of Management Accounting System which consists of the dimensions of Quality Goals, Quality Feedback, and Quality Incentives interacting with Process Quality Management is crucial in producing quality products from the standpoint of the External Quality. Definition of External Quality is that the company created a quality product that can reduce the cost incurred, inter alia due to warranty claims, product litigation claims , customer complaints , product recall. In addition, the company also can reduce the cost of manufacturing, process engineering costs, marketing and engineering costs associated with product failure. In the end, the expected impact on performance of the company as a whole, the company's products more reliable and of course the company expected profit is increasing.

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