

CRITICAL TOTAL QUALITY MANAGEMENT IN MANUFACTURING COMPANIES: A CASE STUDY IN MAKASSAR

Musran Munizu

Hasanudin University

E-mail : m3.feunhas@yahoo.com; m3.feunhas@gmail.com

Jalan Perintis Kemerdekaan Km. 10, Makassar 90245 Sulawesi Selatan Indonesia

ABSTRACT

The aim of this study was to empirically investigate the effect of critical TQM practices on operational performance of medium and large manufacturing companies in Makassar. The critical total quality management (TQM) practices divided into three factors, i.e. strategic, tactical, and operational factors as predictors of operational performance. Total of population were 143 manufacturing companies. A questionnaire designed and distributed to all population, a total of 59 returned. It consists of both 29 medium companies and 30 large companies. Data analysis use both descriptive and multiple regression analysis (MRA). The empirical analysis demonstrates several key findings: data analysis reveals that there was a positive effect of critical TQM practices which consists of strategic, tactical, and operational factors on operational performance. Tactical factors were the strongest significant predictors of operational performance. Overall, the results showed the central role of the tactical factors as critical factors in improving the operational performance within medium and large companies in Makassar manufacturing industrial. There were some research limitations. For instance, the study is using perceptual data provided by production managers or quality managers which may not provide clear measures of performance.

Key words: *critical TQM practices, operational performance, manufacturing companies.*

INTRODUCTION

Manufacturing companies in the globalization era with increasingly competitive today want to win the competition in the market by giving full attention to the quality (Rahman, 2001). Attention to quality should give positive impact to the business performance through two ways, namely: (1) the impact on production costs and; (2) the impact on earnings. First, the impact on production costs going through the process of making products that have a high level of standards and degree of conformation that free from damage. Second, the impact on increasing revenues going through increased product sales (Gasperz, 2005).

In order still exist in the global environment, manufacturing firms should be able to compete in creating the conditions that would enable them to be competitive in the domestic and international markets. Accord-

ingly, all manufacturing firms seek to adopt and implement a set of operations management practices that have been successful elsewhere and that will help them to identify changes in their environment and to respond proactively through continuous improvement. There are many forms of best management practices in operation management area. They are Just In Time (JIT) systems, Material Requirement Planning (MRP), Six Sigma, Lean Manufacturing, Enterprises Resources Planning (ERP), Supply Chain Management (SCM), and Total Quality Management (TQM). One of the best forms of operations management practices is Total Quality Management (TQM) which has received great attention in the last two decades (Jung and Wang, 2006).

Manufacturing companies have central role in the national economy (e.g. employment absorption, reduce poverty, and

economic growth). Manufacturing enterprises especially large and medium scale have an important and strategic role to reduce unemployment. Small Medium Enterprises (SMEs) Statistical (2007) reports the absorption of labor at medium and large enterprises have a greater level of growth, i.e. (5.76%) and (5.49%) compared with micro and small enterprises (2.45%). This indicates that up to 2006 medium and large enterprises have increased contribution to absorption of labor. Data of the growth of employment absorption by enterprises scale was presented in the Table 1.

In general, Table 1 shows the role manufacturing companies to economic growth at national scale. Manufacturing firms also play important role to improve the economy growth in Makassar. Contribution of manufacturing sector to GDP (Gross Domestic Product) from 2003 to 2006 is 12% - 15% (Statistical Bureau Center of Makassar, 2008).

The success of industry in all sectors, including of small and medium enterprises (SMEs) have a direct impact on economic development in developing countries and emerging countries. Manufacturing companies have ability in creating jobs with minimum cost. They were play important role not only as pioneer in the innovation of the world, but also they have high flexibility which enable them to meet the customer needs (Brock and Evans, 1986; ACS and Audretsch, 1990).

Performance measurement is an important factor for effective management. In general, performance is defined as the extent to which an operation meets performance

goals, the major steps in order to meet customer needs (Slack et al., 2001). The fact is that without a measurement performed on the performance, every company will difficult to fix its performance. Therefore, improving of organizational performance needs to identify variables and measure them.

According to Demirbag et al. (2006) Operational performance measurement is very important for an organization, in order to achieve optimal efficiency and performance. Organizational performance can be measured in two dimensions i.e. (1) operational performance and (2) organizational performance. Operational performance reflects the company's internal operating performance in terms of cost and reducing waste, improving product quality, new product development, improves delivery performance, and increased productivity. These indicators and variables are considered as the main factor because they follow directly from the action taken in the company's operating activities. While the organizational performance measured by financial metrics like revenue growth, net income, Return on Investment (ROI), Return on Asset (ROA), and non-financial measures such as investment in Research and Development (RD), and the capacity for developing competitive profile of organization (Brah and Lim, 2006).

Empirical studies that link between TQM and performance have been widely used by researchers. For example, Samson and Terziovski (1999) examine the effect of total quality management practices on operational performance of a large number of manufacturing companies (1200 Australian

Table 1
Trend of Absorption of Labor by Enterprise Scale, 2005 – 2006

| No. | Enterprise Scale | Total (person) | | Growth | |
|-----|---------------------------|----------------|------------|-----------|------|
| | | 2006 | 2006 | Total | % |
| 1. | Micro & Small Enterprises | 78,994,872 | 80,993,354 | 1,938,512 | 2.45 |
| 2. | Medium Enterprises | 4,238,921 | 4,483,109 | 244,188 | 5.76 |
| 3. | Large Enterprises | 3,212,033 | 3,388,462 | 176,429 | 5.49 |
| | Total | 86,445,826 | 88,804,955 | 2,359,129 | 2.73 |

Source : SMEs Statistics (2007)

and New Zealand manufacturing organizations). The study reveals that the relationship between TQM practice and organizational performance is significant in a cross-sectional sense, but not all of the categories of TQM practice were particularly strong predictors of performance. The categories of leadership, management of people and customer focus were the strongest significant predictors of operational performance.

Rahman (2001) conducted a study on 53 SMEs in Australia and found that the critical success factors of implementing TQM is a leadership, strategy and planning, employee empowerment and employee involvement, employee training and development, information and analysis of customer management. Thus, Demirbag et al. (2006) conducted an empirical study to identify the factors critical to the success of TQM in SMEs in Turkey. They concluded that there are seven CSF (critical success factors) from the practice of TQM, namely data and reporting quality, the role of top management, employee relations, supplier quality management, training, quality policy and process management.

The other empirical studies that investigate the relationship between TQM practices and company performance (e.g. Ahire and Golhar, 1996; Brah and Lim, 2006; Sila, 2007). In general, many researchers find out a positive effect between TQM practices and performance.

Unlike some previous studies found in the literature, this study investigates the effect of critical TQM practices on organizational performance embedded to operational performance. Operational performance reflects the performance of internal operation of the company in terms of cost and waste reduction, improving the quality of products, improving flexibility, improving delivery performance; and productivity improvement. They are considered as primary measures because they follow directly from the actions taken during the implementation of TQM (Salaheldin, 2009).

This study explores critical TQM prac-

tices based on previous research into three levels i.e. strategic factors, tactical factors, and operational factors, and then attempts to investigate their effect on operational performance as direct result from critical TQM practices. Based on these descriptions, the aim of this study were: (1) to investigate the effect of strategic factors of TQM practices on operational performance; (2) to investigate the effect of tactical factors of TQM practices on operational performance; and (3) to investigate the effect of operational factors of TQM practices on operational performance.

THEORITICAL FRAMEWORK AND HYPOTHESIS

The conceptual model of the current study is drawn from two streams of research, namely total quality management (TQM) literature and organizational performance literature. The first survey study that attempted to identify the critical factors of TQM that must exist in a business unit to achieve effective quality management is that by Saraph et al. (1989). This study used organizational and managerial aspects of the works of a number of quality management practitioners such as Deming, Juran, and Crosby to organize and synthesize the critical factors identified by them. Saraph et al. (1989) also developed measures of each critical factor and overall organizational quality management. A similar study were conducted by another research (e.g. Black and Porter, 1996; Anderson and Sohal, 1999; Samson and Terziovski, 1999). The researchers have been developed critical TQM practices based on different objects, so that they generate the different factor for critical TQM practices (Demirbag et al., 2006).

Several empirical studies have been conducted to establish the link between TQM practices and organizational performance (e.g. Samson and Terziovski, 1999; Brah and Lim, 2006; Demirbag et al., 2006; Feng et al., 2006). The results of these studies indicated that there are various measures, i.e. organizational performance, corporate

performance, business performance, operational performance, financial and non-financial performance, innovation performance, and quality performance. There are various measures of organizational performance. Accordingly, this study focus on operational measurement to evaluate of organizational performance.

Based on the background of the problem, the purpose of the research, theoretical and empirical studies which have been described previously, conceptual model are presented in the Figure 1.

The scheme of conceptual model which shows above clearly link the critical TQM practices on operational performance. So that, research hypotheses could be formulated as follows:

Strategic factors of critical TQM practices have a positive and significant effect on operational performance (H1).

Tactical factors of critical TQM practices have a positive and significant effect on operational performance (H2).

Operational factors of critical TQM practices have a positive and significant effect on operational performance (H3).

RESEARCH METHOD

This research uses quantitative approach. The research design employed in the current study was a cross sectional study. Population

is the whole object that has the same basic characteristics or meet certain criteria for a research problem (Aaker et al., 2001). While sample is a sub group of the population selected to participate in order to fulfill the objectives of the study (Malhotra, 1996).

Our target population was 143 manufacturing companies. They consists of medium and large scale that obtained from listings provided by the Statistical Bureau Center of Makassar. The criteria of medium and large companies based on Statistical Bureau Center, because it is more relevance with the study. Large enterprises have a number of employees more than 100 persons. In contrast, the medium enterprises have a number of employees 20-99 persons.

Data collected through a questionnaire instrument. The questionnaires mailed by post in part, and the rest delivered directly by researchers at company sample. Target respondents both operational manager and quality manager. A total of 59 firms thus comprised the final sample which represents a (59/143) 41.2 percent response rate. It consists of 30 large firms, and 29 medium firms.

According to Hair et al. (1998), the number of samples always varied, a good sample should be able to represent the population characteristics. The data used consists of both primary data and secondary data. Secondary data obtained from Statistical

Figure 1
Conceptual Model of Research

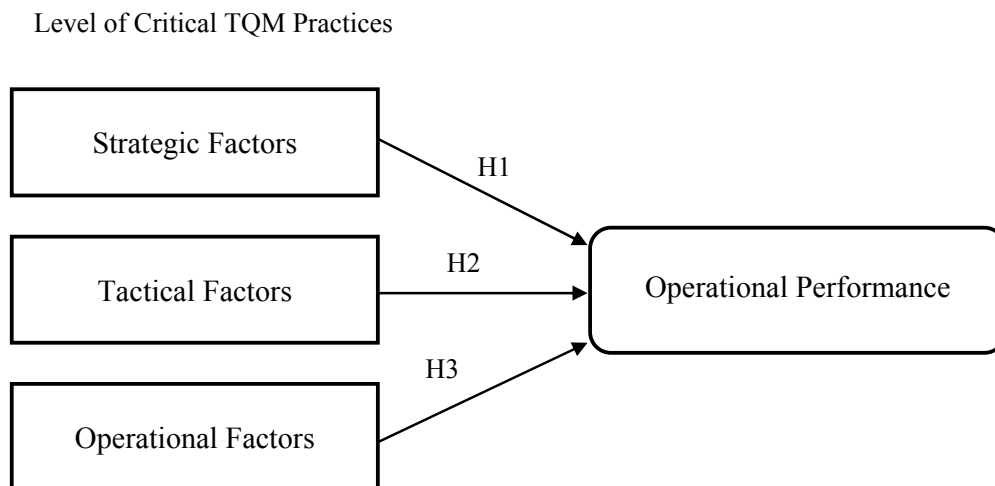


Table 2
The result of validity test of Critical TQM Practices

| No. | Variables/Indicators | Total Correlation | | Remark |
|-----|---|-------------------|--------|--------|
| | | Before | After | |
| 1. | Strategic factors (X1) | | | |
| | Leadership (x1.1) | 0.3730 | 0.7670 | Valid |
| | Organizational culture (x1.2) | 0.6222 | 0.6264 | Valid |
| | Top management support (x1.3) | 0.5122 | 0.6184 | Valid |
| | Continuous improvement (x1.4) | 0.4300 | 0.8437 | Valid |
| | Benchmarking (x1.5) | 0.4850 | 0.8763 | Valid |
| | Quality goals and policy (x1.6) | 0.5700 | 0.6342 | Valid |
| 2. | Tactical factors (X2) | | | |
| | Team building and problem solving (x2.1) | 0.4320 | 0.7156 | Valid |
| | Employee empowerment (x2.2) | 0.4466 | 0.6712 | Valid |
| | Employee involvement (x2.3) | 0.4045 | 0.5613 | Valid |
| | Employee training (x2.4) | 0.5300 | 0.6474 | Valid |
| | Use of information technology (x2.5) | 0.3245 | 0.7611 | Valid |
| | Supplier quality (x2.6) | 0.4665 | 0.8838 | Valid |
| | Supplier relationships (x2.7) | 0.5530 | 0.7000 | Valid |
| | Assessment of performance of suppliers (x2.8) | 0.5780 | 0.8372 | Valid |
| 3. | Operational factors (X3) | | | |
| | Product and service design (x3.1) | 0.4350 | 0.6552 | Valid |
| | Enterprise performance metrics for TQM (x3.2) | 0.6570 | 0.6733 | Valid |
| | Process control (x3.3) | 0.4800 | 0.6461 | Valid |
| | Customer orientation (x3.4) | 0.3230 | 0.8800 | Valid |
| | Management of customer relationships (x3.5) | 0.3550 | 0.7945 | Valid |
| | Resources value addition process (x3.6) | 0.3450 | 0.8544 | Valid |
| | Realistic TQM implementation schedule (x3.7) | 0.3333 | 0.7912 | Valid |
| | Customer and market knowledge (x3.8) | 0.5454 | 0.6776 | Valid |
| | Resources conservation and utilization (x3.9) | 0.5002 | 0.6263 | Valid |
| | Inspection and checking work (x3.10) | 0.6460 | 0.6297 | Valid |

Source : Primary data, processed (2009)

Bureau Center of Makassar and Department of Industry and Commerce in Makassar. While the primary data directly obtained from respondents through both direct interview and questionnaires.

There were two variables in this study which investigate their relationship. They were critical TQM practices as independent variable and operational performance as dependent variable. Critical TQM practices adopted from Salehaldin (2009) i.e. strategic factors, tactical factors, and operational factors. Strategic factors consists of 6 indicators, tactical factors consist of 8 indicators, and operational factors consists of 10 indica-

tors. Then, operational performance variable consists of 5 indicators which adopted from Saraph et al., (1989) and Brah and Lim (2006).

All indicators in the questionnaire measured by a five-point Likert Scale. The scale from very low (1) up to very high (5). For easier interpretation the results of the study, the scale changed into interval class as follows: (1) 1.00 to 1.80 = Very Low; (2) 1.81 to 2.60 = Low; (3) 2.61 to 3.40 = high enough, (4) 3.41 to 4.20 = High; and (5) 4.21 to 5.00 = Very High (Sugiyono, 2008).

The test of validity used to evaluate the accuracy and precision of a measuring

instrument in the measuring function. It would be analyzed by Pearson Product Moment Correlation method. An instrument can be said valid when the value of $r > 0.3$ (Cooper and Emory, 1999). Then, the test of reliability construct conducted to determine the reliability of an instrument. An instrument can be said reliable if the instrument produces consistent results (Cooper and Emory, 1999). Cronbach Alpha scores computed for each construct (strategic factors, tactical factors, operational factors, and operational performance) to measure the internal consistency and to indicate how different items can reliably measure the construct. Kline (1998) pointed out that a reliability coefficient of around 0.90 can be considered "excellent", values of around 0.80 as "very good," and values of around 0.70 as "adequate", depends on the questions. The results of validity and reliability test presented in table 2, 3, and 4. Based on the table, it can be concluded that the instrument used in this study were valid and reliable.

According to the research objectives, the data analysis uses both descriptive statistics and multiple regression analysis (MRA). The data have been collected, edited, and

tabulated would be analyzed by descriptively with average (mean), and percentage (%). Multiple regression analysis (MRA) used to test the effect independent variables to dependent variable (Hair, et.al, 1998). The model formulation is presented as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon, \quad (1)$$

where :

Y = Operational performance

α = Constant

$\beta_1, \beta_2, \beta_3$ = Regression coefficient

X_1 = Strategic factors

X_2 = Tactical factors

X_3 = Operational factors

ε = Error term

Thus, to test of hypotheses use level of significance at 5% or level of confidence at 95%. Data processing is performed by SPSS for Windows. Technically, the effect of variable of critical TQM practices partially on operational performance could be performed by comparing t-value with t-table or by comparing the significance calculated with $\alpha = 5\%$. If the t-value > 1.96 , it means that there is significant effect between variables or if the t-value < 1.96 , it means there was no significant effect among variables in the study.

Table 3
The result of validity test of Operational Performance

| No. | Variables/Indicators | Total Correlation | | Remark |
|-----|--|-------------------|--------|--------|
| | | Before | After | |
| 1. | Cost reduction (y1) | 0,4115 | 0,6618 | Valid |
| 2. | Waste reduction (y2) | 0,4450 | 0,7328 | Valid |
| 3. | Improving the quality of products (y3) | 0,5220 | 0,7313 | Valid |
| 4. | Improving delivery performance (y4) | 0,4100 | 0,6722 | Valid |
| 5. | Product/service development (y5) | 0,5480 | 0,5780 | Valid |

Source : Primary data, processed (2009)

Table 4
The result of Reliability test of Constructs

| Variables/Constructs | Alpha Cronbach (α) | Remark |
|--------------------------------|-----------------------------|----------|
| 1. Strategic factors (x1) | 0.7980 | Reliable |
| 2. Tactical factors (x2) | 0.7242 | Reliable |
| 3. Operational factors (x3) | 0.8155 | Reliable |
| 4. Operational Performance (Y) | 0.7555 | Reliable |

Source : Primary data, processed (2009)

DATA ANALYSIS AND DISCUSSION

Respondents of this study have quite different characteristics. Diversity can be seen from the personal data of respondents including gender, position, educational level, and duration of the implementation of TQM practices in the organization. General description of respondent characteristics could be seen in Table 5.

The table shows that respondents of this study were dominant male gender, i.e. 42 peoples (71.19%) and women 17 peoples (28.81%). Most respondents have position within the company as a production manager and operations, which is 29 persons (49.15%), and supervisor of 14 persons (23.73%). The rest were the chief executive officers (8.47%), and the quality manager (18.64%). Level of respondents education were the Bachelor degree (S1) (42.37%), Diploma level (32.2%), Senior High School (18.64%) and Master degree (S2) (6,78%). The duration of implementation of critical TQM practices in the organization was very

important, because it related to the degree of application each factor in organization. The firms have been implementing TQM practice over three years, namely 34 companies (57.66%), and 25 companies (42.34%) between 1-3 years.

Variable characteristics in this study described based on the average value (mean) of each indicator that forming the constructs or variables. The research variables tested in this study consists of three independent variables i.e. strategic factors, tactical factors, and operational factors. The dependent variable was operational performance.

The results of data processing indicates that the average value (mean) strategic factors were in good category (4.17) with the support of top management as the most powerful indicator (4.45). Tactical factors were in the very good category (4.58) with quality training for employees as the most powerful indicator (4.69). Operational factors were in good category (4.10) with the most powerful indicator was customer orien-

Table 5
Respondent Characteristics

| No. | Description | Frequency | Percentage (%) |
|-----|--------------------------------------|-----------|----------------|
| 1. | Sex : | | |
| | a. Male | 42 | 71.19 |
| | b. Female | 17 | 28.81 |
| | Total | 59 | 100.00 |
| 2. | Position : | | |
| | a. President Director (CEO) | 5 | 8.47 |
| | b. Production and Operations Manager | 29 | 49.15 |
| | c. Quality Manager | 11 | 18.64 |
| | d. Others : (Supervisor) | 14 | 23.73 |
| | Total | 59 | 100.00 |
| 3. | Education : | | |
| | a. Senior High School | 11 | 18.64 |
| | b. Diploma | 19 | 32.20 |
| | c. Bachelor (S1) | 25 | 42.37 |
| | d. Master (S2) | 4 | 6.78 |
| | Total | 59 | 100.00 |
| 4. | TQM Implementation : | | |
| | a. 1 – 3 years | 25 | 42.34 |
| | b. Above 3 years | 34 | 57.66 |
| | Total | 59 | 100.00 |

Source : Primary data, processed (2009)

tation (4.33). Then, the operational performance variable according to the perception of respondents were in the good category (4.05). The highest indicator value was the increase in delivery performance (4.17). In contrast, the lowest was the development of new products (3.56).

Delivery performance is a major strength for the manufacturing companies in a dynamic and fast competitive environment. Product development was relatively lower compared than other indicators. It reflects of products innovation in the manufacturing companies was not optimal yet. Nevertheless, some activities of innovation or product development has been done, for instance: food and beverage companies have focus on developed hygienic, economical, attractive, and durability packaging.

Thus, testing of research hypotheses use SPSS for Windows. The results completely presented in the Table 6.

Based on the summary of multiple regression analysis (MRA) results as presented in the table above, accordingly, the equation of multiple linear regression could be formulated as follows:

$$Y = 0.181 + 0.414 X_1 + 0.468 X_2 + 0.362 X_3$$

The equation shows that the critical of TQM practices which consists of strategic factors (X_1), tactical factors (X_2), and operational factors (X_3) have significant effect on operational performance. The value of determination coefficient (R Square) was 0.817. It means that 81.7 percent the variation of increasing and decreasing of the operational performance could be explained by

the variations of the critical TQM practices. While 18.3 percent could be explained by other variables which didn't test in this study.

Partially, the effect of critical TQM practices that consists of strategic factors (X_1), tactical factors (X_2), and operational factors (X_3) on operational performance described as follows:

The finding of this study was the strategic factors have significant effect on operational performance (H1 accepted). It could be seen at t-value greater than t-table ($4.811 > 2.0112$). The strategic factors such as leadership, organizational culture, top management support, quality improvement and quality goals and policy were good predictors on operational performance. The result of this study consistent with Samson and Terziovska (1999), Demirbag et al. (2006), Stevenson (2007) and Salehaldin (2009).

The finding of this study was the tactical factors have significant effect on operational performance (H2 accepted). It could be seen on t-value greater than t-table ($5.179 > 2.0112$). Company activities such as employee empowerment, employee training, employee involvement, team building, quality, and supplier relationships were the important factors to build the strength of the company's operating structure in maximizing the tactical factors effect of critical TQM practice on operational performance. This finding was consistent with previous studies (Ahmad and Schroeder, 2002; Demirbag et al., 2006, Sila, 2007, Salehaldin, 2009).

Table 6
The summary of Multiple Regression Analysis Results

| Variable/Construct | Regression Coefficients (β) | t-values | Sig. |
|-------------------------------|-------------------------------------|----------|-------|
| Constant = 0.181 | - | 1.023 | 0.309 |
| Strategic Factors (x_1) | 0.414 | 4.811 | 0.000 |
| Tactical Factors (x_2) | 0.468 | 5.179 | 0.000 |
| Operational Factors (x_3) | 0.362 | 3.150 | 0.001 |
| $F_{value} = 18.610$ | Sig. = 0.000 | n = 59 | |
| $F_{table} = 3.1455$ | R = 0.904 | | |
| $t_{tabel} = 2.0112$ | R Square = 0.817 | | |

Source : Primary data, processed (2009)

The Effect of Operational Factors on Operational Performance

The finding of this study was operational factors have a significant effect on operational performance (H3 accepted). It could be seen on t-value greater than t-table ($3.150 > 2.0112$). Operational activities in organization such as process control, customer orientation, TQM implementation schedule which realistic, and the inspection and work evaluation were important components in improving the operational performance. This finding consistent with Handfield et al., 1998, Anderson and Sohal, 1999, Samson and Terziovski, 1999; Demirbag et al., 2006; Sila, 2007; and Salehaldin, 2009.

CONCLUSIONS AND SUGGESSTION

Conclusions

The aim of this study was to empirically investigate the effect of critical TQM practices on operational performance of medium and large companies in Makassar manufacturing industrial. The critical Total Quality Management (TQM) practices divided into three factors, i.e. strategic, tactical, and operational factors as predictors of operational performance.

Simultaneously, the critical TQM practice which consists of strategic factors, tactical factors, and operational factors have positive and significant effect on operational performance. Partially, tactical factors have dominant effect on operational performance. Company's activities in the tactical factors, such as employee empowerment, employee training, employee involvement, team building, quality and building relationships with suppliers and have been done well, so its impact on operational performance of manufacturing firms was relatively more powerful than the strategic and operational factors.

Suggestions

From the managerial point of view, instruments which developed and used in this study would be very useful to policy makers within the enterprise as a tool for evaluating the effectiveness of their current TQM prac-

tices. In order to gain the full potential of TQM need to train everyone on all levels in order to create awareness of TQM as part of a cultural organization. Thus, management attention might be more useful if focused on developing appropriate training programs for implementation of TQM practices in organization

Overall, The results of this study can be used by managers to prioritize the implementation of TQM practices. For instance, those practices that are found to have a positive impact on operational performance can be recommended to managers so that they can allocate resources to improve these practices to get the best results

In the future study, this study could be developed to test the effect of critical TQM practices on organizational performance (financial and non financial measurement), where the operational performance variables were could be used as moderating variable. Thus, because of this study focused on manufacturing companies, accordingly, the next research could be carried forward with a focus on service companies in order to obtain more specific results.

REFERENCES

- Aaker, David, A., V. Kumar and George S. D 2001, *Marketing Research*, Seventh Edition, New York, John Wiley & Son, Inc.
- Acs, Z. and Audretsch, D 1990, *The Economics of Small Firms: A European Challenge*, Kluwer Academic Publishers, Norwall, MA.
- Ahmad, S. and Schroeder, R 2002, "The importance of recruitment and selection process for sustainability of total quality management", *International Journal of Quality & Reliability Management*, Vol. 19 No. 5, pp. 540-51.
- Anderson, M. and Sohal, A 1999, "A study of the relationship between quality management practices and performance in small businesses", *International Journal of Quality & Reliability Management*, Vol. 16 No. 9, pp. 859-77.

- Black, S. and Porter, L 1996, "Identification of critical factors of TQM", *Decision Sciences*, Vol. 27, pp. 1-21
- Brah, S. and Lim, H 2006, "The effects of technology and TQM on the performance of logistics companies", *International Journal of Physical Distribution & Logistics Management*, Vol. 36 No. 3, pp. 192-209.
- Brock, W. and Evans, D 1986, *The Economics of Small Business: Their Roles and Regulations in US Economy*, Holmes & Meier Publishers, Teaneck, NJ.
- Cooper, Donald R. Dan C. William Emory, 1999, *Business Research Methods*, Fifth Edition, Chicago : Richard D. Irwin Inc.
- Demirbag, M., Tatoglu, E., Tekinkus, M. and Zaim, S 2006, "An analysis of the relationship between TQM implementation and organizational performance: evidence from Turkish SMEs", *Journal of Manufacturing Technology Management*, Vol. 17 No. 6, pp. 829-47.
- Gaspersz, Vincent, 2005, *Total Quality Management*, Jakarta : PT. Gramedia Pustakan Utama Press.
- Hair Jr., Yoseph F., Rolph E. Anderson, Ronald L. Papham, William Black, 1998, *Multivariate Data Analysis*, 5th edition, Prentice-Hall, Inc., New Jersey
- Handfield, R., Ghosh, S. and Fawcett, S 1998, "Quality-driven change and its effects on financial performance", *Quality Management Journal*, Vol. 5 No. 3, pp. 13-30.
- Jung, J. and Wang, Y. (2006), "Relationship between total quality management (TQM) and continuous improvement of international project management (CIIPM)", *Technovation*, Vol. 26 Nos 5-6, pp. 716-22.
- Kline, R 1998, *Principles and Practice of Structural Equation Modeling*, Guilford Press, New York, NY.
- Malhorta, Naresh, K. (1996). *Marketing Research : An Applied orientation*, Second Edition, New Jersey, Prentice Hill.
- Rahman, S 2001, "A comparative study of TQM practice and organisational performance of SMEs with and without ISO 9000 certification", *International Journal of Quality & Reliability Journal*, Vol. 18 No. 1, pp. 35-49.
- Salaheldin Ismail Salaheldin, 2009, Critical success factors for TQM implementation and their impact on performance of SMEs, *International Journal of Productivity and Performance Management Vol. 58, No. 3, pp. 215-235*
- Saraph, V., Benson, G. and Schroeder, G 1989, "An instrument for measuring the critical factors of quality management", *Decision Sciences*, Vol. 20 No. 4, pp. 810-29.
- Sekaran, Uma, 2002, *Research Methods for Business*, Southern Illinois University, Carbondale.
- Sila, I 2007, "Examining the effects of contextual factors on TQM and performance through the lens of organizational theory: an empirical study", *Journal of Operations Management*, Vol. 25 No. 1, pp. 83-109.
- SMEs Statistical, No. 28/05/Th. XI, May 30, 2007.
- Statistical Bureau Center of Makassar, 2007, *Makassar in Figures*; Makassar Press
- Stevenson, W 2007, *Operations Management*, 9th ed., McGraw-Hill, Boston, MA.
- Sugiyono, 2008, *Statistical for Research*, Alfabeta Press, Bandung, Indonesia.
- Terziovski, M. and Samson, D 1999, The link between total quality management practice and organizational performance. *International Journal of Quality & Reliability Management*, Vol. 16 No. 3.