

# CHAPTER 4:

# RESEARCH RESULTS

#### **4.1 SUMMARY OF STATISTICS OF RESPONDENTS**

In this study, total of 248 questionnaires were distributed via e-mail and directly to the respondents. Out of total 248 questionnaires, 200 questionnaires were sent through e-mail and total of 47 completed questionnaires received. The response through e-mail was 23.5%.

In order to increase the response rate, an additional of 48 questionnaires distributed directly to the respondents where 100% response rate achieved. Therefore total of 95 questionnaires were collected through both email and directly from the respondents. The initial response rate was 38.4%

Further screening revealed that, 11 out of total 95 questionnaires were non usable and has to be removed. Therefore, total usable questionnaires were 84 and usable response rate is 33.9%.

#### **4.2 SURVEY FINDINGS**

This section contains the findings of the survey. It begins with a description of the general characteristics of the companies. This is followed by a discussion according to every section based on measured data.

### **4.3 RELIABILITY ANALYSIS**

As explained in the previous chapter, In order to find the consistency and stability of the measurement scales, the reliability test using Cronbach Coefficient Alpha was undertaken. Because this is an exploratory type of research the acceptable internal reliability coefficient or alpha is based on Nunnally's (1978 standard), that is 0.5 and above.

The final reliabilities for all scales were greater than 0.50 and the result of the reliability analysis can be seen in applicable table of this chapter.

## **SECTION 1: GENERAL INFORMATION OF THE ORGANIZATIONS**

### **CORE BUSINESS OF ORGANIZATIONS**

Out of total 84 responded organizations, 17% of them deal with food and beverages products, 12% fabricated metal products, 10% motor vehicles, semi trailers and trailer products, 8% chemical and chemical products and basic metal products, 7% radio, television and communication products, 6% electrical machinery and apparatus products and rubber and plastic products, 5% machinery and equipment products and furniture products, 4% paper, non metallic and publishing and printing products, 2% office accounting and medical and precision equipment products and 1% coke, refined petroleum products.

## **LENGTH OF BUSINESS**

In term of length of business, 47.6% (40) of the responded organizations have been in the business for more than 20 years, 36.9% (31) of them have been in the business between 10 to 20 years and meanwhile 15.5% (13) of them have been in the business for less than 10 years.

## **SIZE OF THE ORGANIZATIONS**

Based on annual sales turnover figure, 45.2% (38) responded organizations were large companies and the rest, 54.8% (46) of them were small and medium organizations.

## **SECTION 2: ADOPTION OF COQ REPORTING SYSTEM**

### **CERTIFICATION TO QUALITY MANAGEMENT SYSTEM**

In terms of certification, out of 84 respondents, 97.6 % of them (82 respondents) have been certified to any one of quality management certification.

### **ADOPTION OF COQ REPORTING SYSTEM**

In response to whether or not COQ reporting system adopted, out of 84 respondents, 39.3% (33 respondents) have adopted COQ reporting system.

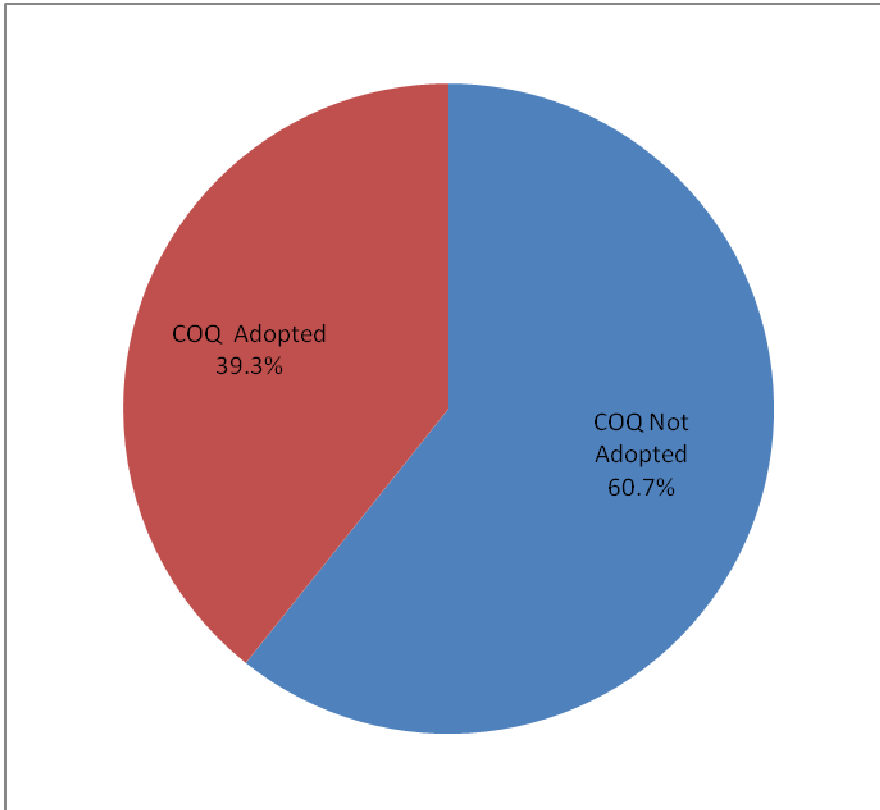


Figure 4.1: Adoption Rate of COQ Reporting

### **REASONS FOR NOT ADOPTING COQ REPORTING SYSTEM**

Of the 84 respondents, 51 organizations (60.7%) did not adopt COQ reporting system. The respondents were given a list of possible five reasons and were asked to rate the reasons according to their agreement. Table 4.1 summarized mean score of each reasons based on respondents' rating.

Table 4.1 Reasons for organizations not adopting COQ Reporting system

(Cronbach Alpha = 0.64)

| <b>Reasons</b>  | <b>N</b> | <b>Mean</b> | <b>Ranking</b> |
|---|----------|-------------|----------------|
| Lack of interest and understanding of quality costs concept within top management           | 33       | 2.47        | 2              |
| Our costing system is already capable of monitoring and providing accurate on quality costs | 33       | 2.90        | 3              |
| It is not important to deal with quality costs  | 33       | 3.94        | 5              |
| The return on investment (the significance of benefits) of COQ reporting system is low      | 33       | 3.20        | 4              |
| We have not yet been introduced to the principles and concept of quality costs              | 33       | 2.39        | 1              |

The means ranged from 2.39 - 3.90. Responded organizations which were not adopted to COQ reporting indicated that lack of awareness on principles and concept of quality costs (2.39) as main reason for adopting COQ reporting system. This was followed by lack of interest and understanding on quality costs concept within top management (2.47), availability of existing costing system in their organizations which able to measure and track quality related costs (2.90), perception that the return on investment of COQ reporting is low (3.20) and lastly, perceive that it is not important to deal with quality costs (3.94)

### **SECTION 3: OBJECTIVES OF COQ REPORTING SYSTEM**

In response to the objectives of adopting COQ reporting, the respondents were asked to rate the importance of implementing COQ reporting based on given possible eleven objectives.

The mean ranges from 1.30 – 2.15. According to responding organizations, main objective to adopt COQ reporting systems are to reduce company's failure rate (1.30) and to increase service/product quality (1.30). This is followed by the interest of responding organizations to achieve significant cost reductions (1.55), to enhance company competitiveness (1.58) and to promote product/service quality as a business parameter (1.67) through COQ reporting.

To prioritize improvement actions with the highest potential payoff (1.85) to create a new process performance measure in monetary terms (1.86), to set up a new budgeting tool (2.15) through COQ reporting were rated by respondents as last three reasons for adopting COQ reporting system. Table 4.2 shows complete set of objectives with mean as well as the ranking

Table 4.2 Objectives of organizations for adopting COQ reporting system(Cronbach Alpha = 0.842)

| <b>Objectives of COQ Reporting System</b>                           | <b>N</b> | <b>Mean</b> | <b>Ranking</b> |
|---|----------|-------------|----------------|
| To highlight the company's non-value added processes                | 33       | 1.85        | 7              |
| To reduce the company's failure rate                                | 33       | 1.30        | 1              |
| To increase product/service quality                                 | 33       | 1.30        | 1              |
| To achieve significant cost reductions                              | 33       | 1.55        | 2              |
| To create a new process performance measure in monetary terms       | 33       | 1.86        | 8              |
| To set up a new budgeting tool                                      | 33       | 2.15        | 9              |
| To prioritize improvement actions with the highest potential payoff | 33       | 1.85        | 7              |
| To create a more comprehensive quality system                       | 33       | 1.79        | 5              |
| To increase the company's competitiveness                           | 33       | 1.58        | 3              |
| To promote product/service quality as a business parameter          | 33       | 1.67        | 4              |
| To provide the means for planning and controlling costs             | 33       | 1.82        | 6              |



## **SECTION 4: DIFFICULTIES DURING IMPLEMENTATION OF COQ REPORTING SYSTEM**

In this section, the respondents were to rate the difficulties encountered during implementation of COQ reporting based on ten possible difficulties.

The mean ranges from 2.88 – 3.48. Responded organizations cited three areas where they encountered difficulty during implementation of COQ reporting which are lack of cooperation with other departments (2.88) as main difficult, followed by difficulties with getting financial data (2.91) and personalization of program (2.97).

The survey result shows that the responded organizations did not encounter in identifying quality related activities (3.39), analyzing data collected (3.48) and in identifying quality cost items (3.52). Table 4.3 summarized means and ranking for every difficulties given in survey

Table 4.3 Difficulties during Implementation of COQ Reporting System  
(Cronbach Alpha = 0.868)

| <b>Difficulties during Implementation of COQ Reporting System</b>               | <b>N</b> | <b>Mean</b> | <b>Ranking</b> |
|---|----------|-------------|----------------|
| Lack of top management support in the earlier stage                             | 33       | 3.18        | 6              |
| Lack of cooperation with other departments                                      | 33       | 2.88        | 1              |
| Personalization of the program (strong interest only from the few sponsors)     | 33       | 2.97        | 3              |
| Identification of activities that relate to quality                             | 33       | 3.39        | 8              |
| Identification of quality cost items  | 33       | 3.52        | 10             |
| Difficulties with getting access to particular financial data                   | 33       | 2.91        | 2              |
| Difficulties with standardizing a corporate quality costs system                | 33       | 3.06        | 4              |
| Difficulties with analyzing the data collected                                  | 33       | 3.48        | 9              |
| Difficulties with identifying new quality improvement opportunities             | 33       | 3.33        | 7              |
| Lack of benchmarking opportunities, literature sources and consultancy services | 33       | 3.09        | 5              |

## **SECTION 5: BENEFITS OF COQ REPORTING SYSTEM**

In this section, responding organizations were asked to rate benefits they have expected to achieve through COQ reporting (before implementation) and achieved benefits of COQ reporting (after implementation). There respondents were given a list of 13 benefits and asked to each benefits according to its impact.

For the expected benefits (before implementation of COQ reporting) as summarized in table 4.4, the mean ranges from 1.70 – 2.45. The result shows the responded organizations have expected that COQ reporting will have impact on all 13 identified areas (benefits). The highest impact through the implementation of COQ reporting was expected in increasing product/service quality (1.70) reducing product/service costs (1.70), reducing company's failure rate (1.73) and reducing process costs (1.85).

Table 4.4 shows the complete mean and ranking of each benefits expected by respondents through implementation of COQ reporting system.

Table 4.4 Expected Benefits of COQ Reporting System (before implementation)  
(Cronbach Alpha = 0.903)

| <b>Benefits of COQ Reporting System</b>   | <b>N</b> | <b>Mean</b> | <b>Ranking</b> |
|---|----------|-------------|----------------|
| Identify non-value added processes  | 33       | 2.06        | 5              |
| Reduce the company's failure rate   | 33       | 1.73        | 2              |
| Increase product/service quality  | 33       | 1.70        | 1              |
| Reduce process costs  | 33       | 1.85        | 3              |
| Reduce product/service costs  | 33       | 1.70        | 1              |
| Enable analysis regarding the impact of product/service quality on business such as sales turnover, profit and loss | 33       | 2.03        | 4              |
| Enable benchmarking with other division or companies  | 33       | 2.45        | 11             |
| Enable identification of quality related improvement actions and their payoff analysis                              | 33       | 2.15        | 7              |
| Provide accurate financial data on quality investments  | 33       | 2.21        | 8              |
| Introduce new process measures in monetary terms  | 33       | 2.39        | 10             |
| Establish new bases for budgets considering quality issues  | 33       | 2.30        | 9              |
| The existing quality management system will become more comprehensive   | 33       | 2.21        | 8              |
| Improve supplier's performance  | 33       | 2.09        | 6              |

For the achieved benefits (after implementation of COQ reporting) as summarized in table 4.5, the mean ranges from 1.64 – 2.21. Almost similar range of means for the expected and achieved benefits shows respondents have achieved the expected benefits through implementation of COQ reporting.

According to survey result, responded organizations had high impact through implementation of COQ reporting in increasing product/service quality (1.64), reduced company's failure rate (1.64), reduced product/service costs (1.67) and reduced process costs (1.70) as they had expected before COQ reporting implementation.

Table 4.5 Benefits of COQ Reporting System (after implementation)

(Cronbach Alpha = 0.911)

| <b>Benefits of COQ Reporting System</b>   | <b>N</b> | <b>Mean</b> | <b>Ranking</b> |
|---|----------|-------------|----------------|
| Identify non-value added processes  | 33       | 1.88        | 5              |
| Reduce the company's failure rate   | 33       | 1.64        | 1              |
| Increase product/service quality  | 33       | 1.64        | 1              |
| Reduce process costs  | 33       | 1.70        | 3              |
| Reduce product/service costs  | 33       | 1.67        | 2              |
| Enable analysis regarding the impact of product/service quality on business such as sales turnover, profit and loss | 33       | 1.91        | 6              |
| Enable benchmarking with other division or companies  | 33       | 2.18        | 9              |
| Enable identification of quality related improvement actions and their payoff analysis                              | 33       | 1.82        | 4              |
| Provide accurate financial data on quality investments  | 33       | 2.15        | 8              |
| Introduce new process measures in monetary terms  | 33       | 2.09        | 7              |
| Establish new bases for budgets considering quality issues  | 33       | 2.21        | 10             |
| The existing quality management system will become more comprehensive   | 33       | 1.82        | 4              |
| Improve supplier's performance  | 33       | 1.91        | 6              |

Independent T – Test analysis was further conducted to determine whether there is a significant difference exists between benefits expected by respondents and benefits achieved by respondents.

Prior to T – Test analysis, factor analysis was performed using SPSS to ensure internal consistency and that the scale in question is unidimensional. Then Cronbach Alpha was recalculated. Through factor analysis, data were initially analyzed using principal component analysis to assess the psychometric properties of the instrument. The primary concern was interpretability of the factors.

As the result of factor analysis, total of 13 was reduced to 7 items in both expected benefits and achieved benefits. All the items loaded appropriately only identified with factor loading of above 0.5 being accepted. The result of factor analysis is summarized in Table 4.6

Table 4.6: Summary of factor analysis and reliability analysis

| <b>Factor / Statement</b> | <b>Cronbach's Alpha</b> | <b>Statements</b>   | <b>Factor Loadings</b> |
|---------------------------|-------------------------|---|------------------------|
| Expected benefits         | 0.90                    | Reduce the company's failure rate   | 0.69                   |
|                           |                         | Increase product/service quality  | 0.77                   |
|                           |                         | Reduce process costs  | 0.59                   |
|                           |                         | Reduce product/process costs  | 0.67                   |
|                           |                         | Enable analysis regarding the impact of product/service quality on business such as sales turnover, profit and loss | 0.60                   |
|                           |                         | The existing quality management system will become more comprehensive   | 0.55                   |
|                           |                         | Introduce new process measures in monetary terms  | 0.51                   |
| Achieved benefits         | 0.84                    | Identify non value added processes  | 0.53                   |
|                           |                         | Reduce the company's failure rate   | 0.57                   |
|                           |                         | Increase product/service quality  | 0.55                   |
|                           |                         | Reduce process costs  | 0.63                   |
|                           |                         | Reduce product/process costs  | 0.62                   |
|                           |                         | Enable analysis regarding the impact of product/service quality on business such as sales turnover, profit and loss | 0.51                   |
|                           |                         | Introduce new process measures in monetary terms  | 0.54                   |



Then independent T-Test analysis performed using SPSS to test the significance of difference between benefits expected by respondent through COQ reporting system (before implementation) and benefits achieved by respondent through COQ reporting system (after implementation)

The independent T-Test analysis at significance level of 0.05, shows that no significance difference exists (between benefits expected and achieved by respondents since P value (0.225) not below than 0.05. The result of T-Test analysis summarized in Table 4.7

Table 4.7 Summary of T - Test

| Details | F-value | Sig   | t-value | Df | Sig.(2 tailed) |
|---------|---------|-------|---------|----|----------------|
| T –Test | 0.582   | 0.448 | 1.225   | 64 | 0.225          |

- Confidence level: 95%

Finally, in this section, respondents were asked to rate whether COQ reporting implementation has benefited their organization in overall and the mean was 1.52 which clearly shows respondents strongly has benefited from the implementation of COQ reporting. Total of 93.9 % of respondents have cited that COQ reporting has benefited their organization while another 6.1% remain neutral. Table 4.8 and table 4.9 summarized the result of overall benefits of COQ reporting system.

Table 4.8: Overall benefits of COQ reporting system

| <b>Overall benefit of COQ reporting</b> | <b>N</b> | <b>Mean</b> |
|---|----------|-------------|
| Benefit of COQ Reporting                | 33       | 1.52        |

Table 4.9: Summary of Rating of COQ reporting benefits

| <b>COQ reporting implementation benefited in overall</b> | <b>Strongly Agree</b> | <b>Agree</b> | <b>Neutral</b> | <b>Disagree</b> | <b>Strongly disagree</b> |
|--|-----------------------|--------------|----------------|-----------------|--------------------------|
| % of respondents   | 54.5%                 | 39.4%        | 6.1%           | 0%              | 0%                       |

### **4.3 SUMMARY OF RESEARCH RESULTS**

This study had the highest response rate from food and beverages industry (17%), second highest was from metal industry (12%) and the third from chemicals industry (10%). Majority of the responding organizations (47.6%), have been in their business for more than 20 years while only 15.5% of the responding firms has been operating their business for less than 10 years. In terms of size, about half of the responding organizations (45.2) were large organizations, 54.8% were small and medium organizations.

The characteristics of the organizations especially in terms of operating period shows majority of the responding firms shall have gained vast experience and exposed to various quality management approaches in the past decades. The size of the responding organizations shows, number of resources (workforce) would not be the obstacle to maintain the quality management system of the organizations.

In terms quality management certification, 97.6% of the responding organizations had been certified with quality management. This is significantly higher compared to recent study conducted by Arvaiova *et al.* (2009) where only 39% of organizations were certified with quality management system.

Indulging in business for more than two decades with sufficient workforce as well as certified with accredited quality management system, however contributed little in terms COQ adoption in Malaysia. The survey result of this study shows only 39.2% (33) of responding organizations had adopted COQ reporting system.

Compared with previous studies, the adoption rate was almost similar: Gupta and Campbell's study, 33-40% (as cited in Sower *et al.*, 2007), higher than: Oliver and Qu, (1999): 26%; Roche (1981) 39%; Duncalf and Dale (1985) 32% (as cited in Oliver & Qu, 1999) and lower than: Plunkett & Dale (1984) 50%; Ross (1993) 47.5% (as cited in Oliver & Qu, 1999).

The main two reasons for not adopting COQ reporting system as indicated by responding organizations were lack of awareness on principles and concept of quality costs and lack of interest and understanding on quality costs concept within top management. These two reasons are similar with Arvaiova *et al.* (2009); Sower *et al.* (2007) as well as Pursglove and Dale's finding (as cited in Sower *et al.*, 2007).

Other than that, availability of existing costing system which able to measure and track quality related costs were cited by respondents as one of the reasons for not adopting COQ reporting which is similar to Arvaiova *et al.*, (2009) finding.

Means score of more than 3 for reasons such as COQ reporting is not important and the return of investment from COQ reporting is low shows that even though COQ reporting had not been adopted, responding organizations had realized the importance of COQ reporting and perceive it is an important tool with various potential benefits.

The mean range of below 3 (1.30 – 2.15) for reasons of implementing COQ reporting shows, responding organizations had expected improvement in all eleven areas (table 4.2) through implementation of COQ reporting. This shows responding organizations had high confidence that COQ reporting will bring improvement in various areas.

To reduce failure rate, increase service/product quality, achieve significant cost reductions, enhance company competitiveness and promote product/service quality as a business parameter were the main five reasons cited by respondents for implementing COQ reporting and these are common reasons identified in previous studies as well: Arvaiova *et al.* (2009); Ramford and Land, (2006); Dale and Wan (2002) and Oliver and Qu, (1999).

In terms of difficulties encountered during implementation of COQ reporting, surprisingly organizations in Malaysia had identified lack cooperation of with other department as the main difficult encountered during implementing COQ reporting system. This is clearly contradicts with previous studies where lack of

cooperation from top management (Rodchua, 2009), identifying new quality improvement opportunities (Arvaiova *et al.* (2009), and difficulty in getting COQ information (Ramford and Land, 2006) were the common difficulties encountered by organization.

However the second most difficult encountered was the common one with previous studies which is difficulties in getting access to particular financial data or generally difficulties in getting COQ information data as cited in other studies as well: Ramford and Land (2006).

This study has an interesting finding where responding organizations cited that they did not have any difficulties in getting top management support during implementation of COQ reporting. The mean score of close to 3 shows responding organization prefer not to give any opinion when come to top management issues unlike other previous studies which has been conducted in western countries: Rodchua, (2009).

This could be explained by Hofstede's (2001) differences in cultural dimensions between Western and Asia countries where according to Hofstede's (2001) cultural dimensions for various countries shows power distance within organization high in Asia countries compared to western countries where power distance is none existent or very low (Jessup & Valaciah, 2008).

In terms of benefits, overall mean score of below 3 for expected benefits (before COQ reporting implementation) shows that responding organizations had expected COQ reporting to have impact on all areas (Table 4.4) and eventually to lead to improvement in overall performance since all the identified areas have integrated the whole supply chain management of the organizations right from supplier to customer.

The same overall mean score of below 3 for achieved benefits (after COQ reporting implementation) in this study shows that, without doubt COQ reporting had benefited the whole supply chain of responding organizations which would have improved the overall performance as well.

According to responding organizations, the implementation of COQ reporting had increased product/service quality, reduced product/service costs, reduced company's failure rate and achieved cost saving. These are the main benefits expected and achieved as well by responding organizations through COQ reporting.

Independent T-Test analysis has shown clearly that no significant mean differences exist between expected and achieved benefits by responding organizations. This further confirmed that responding organizations had achieved all their expected benefits through COQ reporting. Therefore this finding supports the first hypotheses (H1) of this study.

The finding of this study also supported COQ reporting benefits identified previous studies: Kiani *et al.* (2009); Kim and Nakhai, (2008); Ramudhin *et al.* (2008); C.C. Yang, (2008); Sower *et al.* (2007); Ramdeen *et al.* (2007).

Total of 93.9% of responding organizations had confirmed that they were benefited in overall through COQ reporting system. The mean score was 1.52. The result without any doubt confirmed that COQ reporting had improved overall performance of responding organizations which had adopted COQ reporting system and this supports the second (H2) and last hypotheses of this study.