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# THE NEXUS BETWEEN SUPPLIER QUALITY MANAGEMENT AND ORGANIZATION'S COMPETITIVE ADVANTAGE: AN EMPIRICAL EVIDENCE

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**ABSTRACT**. **Background:** Due to the increasing demand on product quality and operation efficiency, supplier quality management has become increasingly important in supporting organizations to achieve the desired excellence. With the rapid globalization happening in these few decades, the business world is experiencing a higher complexity phase. However, there are only a limited number of studies that has been conducted on supplier quality management (SQM) and organization's competitive advantage (OCA) in the context of multinational corporations (MNC). The purpose of this study is to identify critical elements in supplier quality management as well as testing the significance of supplier quality management in affecting organization's competitive advantage.

**Methods:** This study employed self-administered questionnaire that has been distributed to 355 respondents and the data is analyzed using Statistical Program for the Social Science (SPSS) software version 23. The population of study is concentrated on multinational corporations in Malaysia.

**Results:** The results revealed that 5 elements have been identified as critical elements for supplier quality management namely Tracking of Cost of Supplier Quality, Supplier Audit, Supplier Scorecard, Close Loop Corrective Action and Engagement of Suppliers in Quality System.

**Conclusions:** The findings of the study show that supplier quality management is found to be significantly affecting organization's competitive advantage in positive direction. The managerial implications of this study have been discussed as well.

Key words: Quality management, Supplier, Operation, Efficiency, Competitive advantage.

#### INTRODUCTION

Supplier quality management (SQM) is a set of activities initiated by the organization especially by the management in order to improve organizational performance. SQM normally involves activities such as measuring and tracking the cost of supplier quality, using performance based score cards to measure supplier performance, conducting supplier effective audits and establishing communication channels with suppliers among many more, with an aim of achieving customer satisfaction [Sharma, Modgil 2019, Carr, Pearson 1999]. Suppliers can be one of the

sources of additional cost incurred if they are not performing well. Supplier's poor quality could possibly contribute to part of the production or service yield loss either directly or indirectly [Hong et al. 2019, Al-Shboul, Garza-Reves, Kumar, 2018]. No doubt, organizations spend a substantial portion of their capital for the purchasing of raw materials, components, and services. In fact, 60% of cost goods sold is consisted of purchased goods [Dale 2002]. Thus, supplier quality is playing a vital role in controlling product or service cost as it can substantially give an impactful effect. Along with the increase of globalization in business world, supplier chain for organization is becoming

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increasingly long and complicated, especially more and more organizations are outsourcing part of their production to strategic partners. In addition, many manufacturers are trying to streamline their production and practising lean inventory. Thus, they tend to face stock-out problem easily if suppliers are having quality trouble, which causing delay in delivery. Many scholars have stressed on the importance of supplier management. In fact, Supplier Chain Management (SCM) has come into the picture in early 1980s to suggest a series of activities to be coordinated by an organization as to procure and manage suppliers effectively [Oliver, Webber 1982]. In recent decades, competition in business world is becoming stronger and stronger with a big amount of suppliers competing with each other not only in term of cost, but also quality and delivery performance. Organizations understood a fact that the lowest acquisition cost does not necessarily result in the lowest product or service cost, as poor supplier quality may lead to higher product or service cost finally [Lo et al. 2018]. This is because poor supplier quality is potentially increases internal or external failure costs, which might provoke customer dissatisfaction as well as result an increment of customer complaint or warranty issue [Hong et al. 2019].

SCM is becoming an important element in determining sustainability of an organization. For a company to continue survive, it has to consider SCM that engage everyone within its organization as well as its supplier in sharing the same vision on the product, production and quality improvement. SCM is not only a sole procurement activity but it should rather be considered as a strategy with the purpose of achieving enduring beneficial buyer-supplier relationships [Carr, Pearson 1999]. Quality collaboration and reconciliation capacity is characterized as a company's coordination capacity to accomplish intuitive quality participation among its supply chain partners [Wu et al. 2006].

As part of SCM, SQM is considerably an important factor that an organization should be focusing to avoid potential damages that could bring down the organization's performance [Mandeep, Kanwarpreet, Doordarshi 2019]. Suppliers' non-conformance could invite serious fatal to an organization such as huge loss cost, product recall, tarnish of organization image or most serious loss of life. A good example that we can see, the massive recall involving 100 million vehicles worldwide by major car manufacturers such as Honda, Toyota, Ford, Mazda, BMW and so on due to the problematic airbags supplied by Takata, world largest airbag supplier [David 2016]. This failure has caused huge recall and replacement cost especially to Takata's major customer, Honda and most importantly, this problematic product has caused 11 death and 150 injuries, with some cases under review [David 2016]. Thus, this is why SQM is important for a reputable organization.

Similar to SCM, SQM is viewed as an integration of activities stretching across interorganizational boundaries in order to achieve customer satisfaction [Yu, Huo 2018]. SQM is a managerial effort to create an operating environment in which organization is trying to integrate its suppliers' capability into its operational processes. The activities integrated are involving management responsibility, selection of supplier, supplier development, supplier quality measurement, supplier integration and supplier audits.

# PROBLEM STATEMENTS

Although there are empirical studies discussed the impact of SQM to procurement performance [Famiyeh, Kwarteng 2018]. However, there are only a limited number of studies that has been conducted on supplier quality management and organization's competitive advantage in the context of multinational corporations in Malaysia [Ismail, Yunan 2016, Punnakitikashem et al. 2010]. To what extent SQM affects organization's competitive advantage; it is yet to be identified. Therefore, this study is to fill up the gap by identifying the effect of SQM on organization's competitive advantage especially in the context of multinational corporations (MNC) in Malaysia. Majority of the companies in Malaysia is concentrated in Klang Valley, thus the outcome of this research is expected to be able to be generalized as the current condition happening in the MNC in Malaysia.

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#### Research Objectives

The objectives of this research are to identify the critical elements that result toward effective supplier quality management and to examine the impact of supplier quality management on organization's competitive advantage.

#### Research Questions

Based on objectives mentioned above, the research questions will be addressed on answering, what are the critical elements in Supplier Quality Management(SQM) for Multi National Cooperations (MNC) in Malaysia? Furthermore, does SQM give significant impact to organization's competitive advantage for MNC in Malaysia?

### **CONCEPTUAL FRAMEWORK**

This research paper explores the relationships between supplier quality management and organization's competitive advantage in the context of multinational corporations in Malaysia. The modified model shown in Figure 1 below is established based on related factors and outcomes identified particularly related to supplier quality management the aspect. In proposed "Supplier conceptual framework, Ouality Management" defined by 5 sub-dimensions is the independent variable identified, the dependent variable is Organization's Competitive Advantage.



Fig. 1. Airports' strategic groups according to type and number of passengers

The sub-dimensions established for supplier quality management are actually based on the review of literature and theoretical background research done earlier [Projogo, McDermott, Goh, 2008, Rahman, 2006, Punnakitikashem et al. 2010, Dellana, Kros, 2014, Switala, Niestroj, Hanus, 2018, Ferdousi et al. 2018, Hong et al. 2019]. Those dimensions are identified to be related to practices that are applied for the purpose of supplier quality management. The five sub-dimensions have been established to define supplier quality management:

- 1. Tracking of Cost of Supplier Quality is about tracing and recording of loss or failure cost incurred due to problem originated by supplier.
- 2. Supplier Audit is a practice that is used to check and validate supplier's operation is in accordance to the requirements specified.
- 3. Supplier Scorecard is about measurement of supplier's performance based on key areas that define supplier's performance.
- 4. Close Loop Corrective Action is a PDCA (Plan-Do-Check-Action) based action used to manage supplier's counter measure against issues that arise.
- 5. Engagement of Supplier in Quality System is about involvement of supplier as part of the participant in the organization's quality management system so that organization's requirements and expectations can be communicated either directly or indirectly to supplier in a more effective way.

#### HYPOTHESIS

In order to obtain better understanding on the relationships between supplier quality management and organizational competitive advantage, these hypotheses are to be tested:

- H1: Tracking of Cost of Supplier Quality is positively related to Organization's Competitive Advantage.
- H2: Supplier Audit is positively related to Organization's Competitive Advantage.
- H3: Supplier Scorecard is positively related to Organization's Competitive Advantage.

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- H4: Close Loop Corrective Action is positively related to Organization's Competitive Advantage.
- H5: Engagement of Supplier in Quality System is positively related to Organization's Competitive Advantage.

#### METHODOLOGY

As the previous section has explained about the review of literature, related theoretical background and proposed conceptual framework with hypotheses intended to be tested. This part will explain the methodology used for this research including development of measurement for variables, sample and data collection as well as the data analysis method.

#### Development of Measurement For Variables

Definition of Variables - To achieve the objectives of this research, all the variables or

dimensions proposed in conceptual framework need to be tested. A measurement scale would need to be developed to define the variables, so that the variables can be measured tangibly. From the review of relevant literatures and theories, the measurement items have been established to define each sub-dimension of independent variable (Supplier Ouality Management) and dependent variable (Organization's Competitive Advantage).

Construction of Questionnaire and Pretesting - A structured questionnaire has been developed as an instrument for data collection. The self-administered questionnaire consists of 3 parts namely the organization's demographics, the general questions and research questions that developed from items defined in Table 1. Research questions are measured using seven-point Likert-type scale (ranging from 1= strongly disagree to 7= strongly agree).

~		Table 1. List of constructs and measurement items	
Construct	Indicator	Details	
	COQ1	Calculate and trace cost of poor quality	
Tracking of Cost of Supplier Quality	COQ2	Monitor disruption caused by supplier quality problems	
	COQ3	Additional freight cost for shipment expedition	
	COQ4	Accountability of supplier for cost of poor quality	
	COQ5	Cost of poor quality in supplier's assessment	
	SA1	Major suppliers are audited periodically	
Supplier Audit	SA2	Qualification audit is compulsory for new supplier	
	SA3	Standard criteria for supplier audit	
	SA4	Follow-up of suppliers in ranking	
	SA5	Effectiveness of supplier audit	
	SSC1	Systemized scorecard procedure	
Supplier Scorecard	SSC2	Suppliers are ranked	
	SSC3	Concern of suppliers in ranking	
	SSC4	Supplier scorecard role for procurement negotiation	
	SSC5	Supplier scorecard stimulates supplier's improvement	
	CA1	Supplier's problem root cause investigation	
Closed Loop Corrective Action	CA2	Reporting of corrective and preventive actions	
	CA3	Review of supplier's report	
	CA4	Tracing of actions implementations	
	CA5	Effectiveness of close loop corrective action	
	SE1	Supplier as part of quality system (QS)	
Engagement of Supplier in Quality	SE2	QS information is provided to supplier	
System	SE3	Suppliers are required to be accredited	
	SE4	Develop supplier to comply with QS requirement	
	SE5	Suppliers competency in fulfilling QS requirement	
	CADV1	Product cost	
Organisation's Competitive	CADV2	Competitive pricing	
Advantage	CADV3	Competitive quality	
-	CADV4	Brand identity	
	CADV5	Customer's perception	

Table 1. List of constructs and measurement items

#### SAMPLE AND DATA COLLECTION

#### The Population and Sampling

The population of this research consists of multinational corporations in Malaysia. According to Suruhanjaya Syarikat Malaysia (2018)6, there are total 4,727 multinational corporations registered in Malaysia as of 31st December 2017. Majority of businesses in Malaysia are concentrated in Peninsular Malaysia, thus, estimated population size for this research would be approximately 4,700 companies. So based on Krejcie and Morgan (1970) table, the sample size should be n =355.

#### Data Collection

Self-administered structured questionnaire is used for data collection. In total 362 responses received in return, 38 responded in printed copies (10.5% response rate), the rest are collected through electronic media (Google Form is used in this case). Overall response rate is unable to be calculated as the impact of social media spreading unable to be estimated. From all the 362 responses obtained, 7 were voided due to incompletion or inappropriateness in answering the questions. Finally, a total number of 355 responses were utilized for data analysis.

#### **DATA ANALYSIS METHOD**

After reviewed all data collected, the data from all the 355 valid responses were key-in into SPSS software for data analysis purpose. Meantime, the demographics and practices for quality management of respondents are being analyzed as well. All the statistical analysis was performed based on 95% confidence level. Two main analyses were employed in analyzing all data obtained: Descriptive Analysis for discrete measures by using one way ANOVA test and inferential analysis to examine the relationship suggested in proposed conceptual framework using regression.

#### **RESULTS AND DISCUSSION**

The significance of the relationship of supplier quality management (SQM) is tested using multiple regression (linear regression) ran on all the sub-dimensions defining SQM against organization's competitive advantage. Independent variables are Tracking of Cost of Supplier Quality (COQ), Supplier Audit (SA), Supplier Scorecard (SSC), Close Loop Corrective Action (CA) and Engagement of Supplier in Quality System (SE), while dependent variable is Organization's Competitive Advantage (CADV). Table 2 and Table 3 show the SPSS output of the mentioned regression.

	Table 2. SPSS output on regression of SQM versus organization's competitive advantage, ANOVA           Model         Sum of squares         df         Mean square         F         Sig.					IOVA	
Ν	Iodel	Sum of squares		Mean square	F	Sig.	
	Regression	27.519	5	5.504	30.537	.000	

350

355

.180

Total 90.599 a. Dependent Variable: MEAN\_CADV

Residual

b. Predictors: (Constant), MEAN\_SE, MEAN\_SA, MEAN\_COQ, MEAN\_CA, MEAN\_SSC

63.080

Table 3. SPSS output on regression of each sub-dimension versus organization's competitive advantage

Unstandardized Coefficie		zed Coefficients	Standardized Coefficients			
Mode	el	В	Std. Error	Beta	t	Sig.
1	(Constant)	1.363	.310		4.393	.000
	MEAN_COQ	.106	.049	.132	2.192	.029
	MEAN_SA	.116	.049	.125	2.357	.019
	MEAN_SSC	.202	.062	.198	3.267	.001
	MEAN_CA	.170	.065	.153	2.602	.010
	MEAN_SE	.112	.049	.117	2.311	.021

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The relationship between variables is judged as significant if the significance value, p < 0.05. From Table 2, we may conclude from the regression result that SQM is having significant impact organization's on competitive advantage and the overall significance value, p is approximately 0 (p < 0.05). Further showed in Table 3, the significance value of each sub-dimension on organization's competitive advantage is showing value of p < 0.05 as well (ranging from 0.001 to 0.029). Thus, each subdimension defining SQM is having significant impact on organization's competitive advantage.

# SUMMARY OF INFERENTIAL ANALYSIS

The purpose of the statistical analysis performed is to test the suggested hypotheses. The outcome of the analysis is summarized in Table 4.

	10010	1. Summary of h	nerennar i marj
Hypothesis	Correlation, R	Significant, p	Decision
H1: Tracking of Cost of Supplier Quality is positively related to	+ 0.434	0.029	Accept
Organization's Competitive Advantage.			
H2: Supplier Audit is positively related to Organization's	+ 0.381	0.019	Accept
Competitive Advantage.			
H3: Supplier Scorecard is positively related to Organization's	+ 0.463	0.001	Accept
Competitive Advantage.			
H4: Close Loop Corrective Action is positively related to	+ 0.437	0.010	Accept
Organization's Competitive Advantage.			-
H5: Engagement of Supplier in Quality System is positively related to	+ 0.345	0.021	Accept
Organization's Competitive Advantage.			-

Note: Relationship is significant p < 0.05

#### DISCUSSION

The objectives of this study were to answer two research questions stated earlier. Based on the data analysis, the outcomes would to be discussed to examine if the questions are able to be answered.

The first research question, what are the elements supplier critical in quality management (SQM) for MNC in Malaysia? SQM is actually a broad subject to be studied. There are many researches done by researchers intended to define the best practices for SQM [Al-Shboul, Garza-Reyes, Kumar, 2018] . As manv organizations have realized the importance of supplier's quality in affecting the organizations' day to day operations, the necessity to manage supplier's quality is no longer an option but a must [Ferdousi et al. 2018]. SQM is about the act overseeing all suppliers' activities to ensure supplied parts achieve certain level of desired excellence. This would involve tracing and monitoring of

suppliers' quality performance, checking and controlling their operations and finally developing them towards excellence. To define SQM practices, 5 sub-dimensions have been proposed to cater the three acts:

1. Tracking of Cost of Supplier Quality (COQ) – Tracing & monitoring

2. Supplier Audit (SA) – Checking & controlling

3. Supplier Scorecard (SSC) – Tracing and monitoring

4. Close Loop Corrective Action (CA) – Checking and controlling

5. Engagement of Suppliers in Quality System (SE) – Developing

From the result, it has proved that all the five sub-dimensions were significant, and they have positive relationship with organisational competitive advantage. As SQM is normally part of the requirement for quality standards, Ali K.A.M., 2020. The nexus between supplier quality management and organization's competitive advantage: an empirical evidence. LogForum 16 (1), 161-170. <u>http://doi.org/10.17270/J.LOG.2020.389</u>

thus, the outcome is in line with the expectation. The result supported that the dimensions above are part of critical elements in SQM.

The second research question, does SQM give significant impact to organizational competitive advantage for MNC in Malaysia? Based from the result, it is observed that all the 5 dimensions (Tracking of Cost of Supplier Ouality (COO), Supplier Audit (SA), Supplier Scorecard (SSC), Close Loop Corrective Action (CA), and Engagement of Suppliers in Quality System) used to define SQM are significantly affecting organization's competitive advantage in positive direction. This indicates that the higher strength of SOM of an organization the more likely the organization to hold a higher competitive position and vice-versa. Consequently, the outcome of the data analysis proved to us that significant impact SQM gives on organization's competitive advantage with all the hypotheses tested are being supported. Thus, SQM does give a significant impact to organizational competitive advantage in the context of MNC in Malaysia.

# CONCLUSION

Due to the increasing complexity in global business nowadays, SQM has become an important element that every organization should not neglect. The main elements that are identified as part of critical elements in SOM that will affect the strength of an organization's competitive advantage are: Tracking of Cost of Supplier Quality (COQ), Supplier Audit (SA), Supplier Scorecard (SSC), Close Loop Corrective Action (CA) Engagement of Suppliers in Quality and System (SE). The relationships between SQM with organization's competitive advantage are concluded to be significantly positive. All the hypotheses suggested are accepted through the statistical analysis conducted.

# MANAGERIAL IMPLICATIONS

It is obvious that the findings of this study are important to help the managerial decision making processes. This study supports the importance of SQM practices to maintain a competitive position in the industry. Consequently it has a great impact on the organizational performance. The management of any organizations should be aware of this reality and emphasize on SQM as part of an important element of total quality management initiative in order to ensure the organizations' sustainability. The outcome of this study has provided a comprehensive model to the organization especially in the context of MNC in Malaysia on how to conduct SQM effectively by applying the correct practices. The model can be referred to as a constructive input for strategic planning towards achieving the targeted goals. Another implication is the benefit provided indirectly to all the organizations in any industry, whereby, the outcome of this study reveals the expectation SQM. customers on It conveys of a comprehensive input to organizations playing supplier's role on what are the intended practices by their customers and how they can perform better in meeting their customers' needs and requirements in order to attain higher customer satisfaction.

# LIMITATIONS OF THE STUDY

There are several limitations identified for this study. Among those are, first, the outcome of the study can only be generalized in the context of MNC in Malavsia as the population of this study is concentrated on MNC in peninsular Malaysia. The outcome might be different with condition happening in all organizations across Malaysia as MNC and domestic organizations might have different concept and practices in SOM. Secondly, as SQM is a broad subject, the study is only conducted based on 5 sub dimensions in defining SQM. There could have more factors in SQM and probably more critical that the 5 factors identified. Thirdly, the samples selected for data collection consisted of MNC from all industries regardless their specialization. As the nature of industry may affect the SQM concepts and practices applied by an organization, which may result different outcome as compare to this study. However, this is unable to be identified in this study.

#### **RECOMMENDATIONS FOR FUTURE RESEARCH**

In view of the issues highlighted as limitations in this study, there are several recommendations to be taken as a measure of improvement in future research. First, the population of the study can be extended to a larger population, for example organizations in Malaysia, Southeast Asia or even Asia. So that it would provide more constructive and useful input for a broader scope of population. Second, more elements in SQM should be tested so that the beneficiaries may gain a better understanding on SQM. The more elements covered in SQM, the more effective SQM is likely to be for an organization. Lastly, studies specializing in particular industry can be conducted to provide a better insight on SQM particularly for specific industry. The outcome should be able to provide a more accurate, reliable and valid information to related industry.

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# ZALEŻNOŚĆ POMIĘDZY ZARZĄDZANIEM JAKOŚCIĄ DOSTAWCY A PRZEWAGA KONKURENCYJNĄ ORGANIZACJI: PRZYKŁAD EMPIRYCZNY

**STRESZCZENIE**. **Wstęp:** Ze względu na wzrastające wymagania odnośnie jakości wyrobów oraz efektywności operacji, zarządzanie jakością dostawcy staje się coraz istotniejszym elementem wspomagającym uzyskanie przez organizację pożądanej skuteczności. Wraz z gwałtownym wzrostem globalizacji na przestrzeni ostatnich kilku dziesięcioleci, wzrasta również stopień kompleksowości operacji biznesowych. Mimo to istnienie niezbyt duża liczba badań poświęconych zarządzaniu jakością dostawcy (SQM) oraz przewagą konkurencyjną organizacji (OCA) w kontekście międzynarodowych korporacji (MNC). Celem tej pracy jest zidentyfikowanie elementów krytycznych w zarządzaniu jakością dostawcy jak również przetestowanie istotności wpływu zarządzania jakością dostawcy na przewagę konkurencyjną organizacji.

**Metody:** W pracy wykorzystano specjalnie do tego celu przygotowaną ankietę, na którą zebrane odpowiedzi od 355 ankietowanych. Uzyskane w ten sposób dane poddano analizie statycznej przy pomocy programu statystycznego Social Science (SPSS) wersja 23. Populacja poddana badaniom była skoncentrowana w międzynarodowych korporacjach w Malezji.

**Wyniki:** Na podstawie uzyskanych danych zidentyfikowano 5 elementów jako elementy krytyczne dla zarządzania jakości dostawcy: śledzenie kosztu jakości dostawcy, audyt dostawcy, ocena dostawcy, działania korygujące oraz zaangażowanie dostawców w system jakości.

Wnioski: Uzyskane w pracy wyniki wskazują, że zarządzanie jakości dostawcy istotnie wpływa w sposób pozytywny na uzyskanie przez organizację przewagi konkurencyjnej.

Słowa kluczowe: zarządzanie jakością, dostawca, operacje, efektywność, przewaga konkurencyjna

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