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EFFECT OF SUPPLY CHAIN QUALITY MANAGEMENT PRACTICES ON QUALITY PERFORMANCE: THE CASE OF SADARA CHEMICAL COMPANY

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ABSTRACT

Quality management practices in the supply chain have changed the whole aspect of business and the changes are reflected in the different departments. The quality practices of the supply chain focus on the products that are purchased by the customers. The integration of the supply chain by improving the procedures adopted promotes the quality of the company's performance. Thus, in this work, the impact of Supply Chain Quality Management (SCQM) practices on the organization has been scrutinized. This work utilized quantitative research methods. Four hypotheses were analyzed in this work which are H1: there are positive effects of customer focus on quality performance, H2: there are positive effects of supplier focus on quality performance, H3: there are positive effects of supply chain integration on quality performance, and H4: there are positive effects of quality leadership on quality performance. The sample population are employees from Sadara Chemical Company. The sample size is 31. The analysis was performed using a correlation analysis. The key findings have shown that all of the hypotheses are partially acceptable because they have a good relationship in correlation and the result of the regression is close to 0.60.

CCS Concepts

• Information systems → Database management system engines • Computing methodologies → Massively parallel and high-performance simulations.

INTRODUCTION

Quality management in the supply chain encourages relatively constant prices of goods and services, depending on demand and supply [1]. When a company

adapts to changes in market dynamics, it can anticipate demand and supply on the basis of the data collected. During peak times, the production company will increase to meet the demands of consumers, and supply will also be regulated during off-peak periods [2]. These measures minimize the amount of waste that can lead to losses in business [2]. As a result, prices of products and services will be relatively constant, as there are already anticipated changes in the market [3]. Constant prices are desirable for customers promoting market demand for products and services [3]. The company may avoid losses or possible collapse if the supply chain measures are adopted and applied in the various operations of the company.

The supply chain of organizations determines the flow of activities to the organization as well as outside the company [4]. The supply chain department plays a significant role because it indicates how goods flow into and out of the company [5]. It is essential for the management of the organization to ensure that there is systems in place that increase the efficiency of the supply chain [6]. In this way, they will be in a position to identify deficiencies that may limit the organization from achieving its objectives. Increased efficiency promotes transparency and increases public confidence [7]. It is therefore evident that, when the quality of the supply chain is improved, the firm experiences significant benefits. As a result, the departmental leadership approach will determine the need to improve the quality of the supply chain due to the increased benefits to the organization [8].

Quality management in the supply chain is an aspect of leadership and the objective of implementing the practices are to promote the wellbeing of the organization [8]. Leaders have a responsibility to engage departmental staff to provide information that will help to address issues affecting the supply chain [9]. Supply Chain Quality Management (SCQM) refers to the need for trust in buyer-supplier relationships that serve as a basic condition for quality performance across SCQM [9]. With lack of trust and collaboration, nothing can be achieved and this will have an impact on the overall performance of the company, which means that the company will lose and fail [9].

Fernandes et al. [10] investigated the impact of the interoperability of supply chain management (SCM) and quality management (QM). The results have shown that the assimilation of SCM and QM has benefited the company substantially. Vanichchinchai [11] analyzed the supply chain management (SCM) and quality management (QM) structures and found that both SCM and QM have similar concepts and that their implementation in the organization will improve the overall performance of the company. Quang et al. [12] examined the Supply Chain Quality Management (SCQM) model and found that SCQM can be implemented by an organization with a reasonable conceptual framework in order to reap the full benefits of the organization. Truong et al. [13] analyzed the link between the implementation of Supply Chain Management (SCM) and Operational Performance (OP). The findings have shown that there is a strong and positive association between SCM and OP, both of which need to be implemented accordingly in order to improve the performance of the company.

Many SCQM-related studies suggest that each company should have SCQM or some SCQM practice [14]. Companies that lack these practices should consider adding them to the company in order to achieve excellent results in the company and in terms of quality performance. This study was therefore done to analyze the quality performance management practices of the supply chain. The impact of Supply Chain Quality Management (SCQM) practices on the organization has been scrutinized.

METHODOLOGY

For this work, quantitative research methodology was utilized. Figure 1 shows the adopted research model and hypotheses. As depicted in Figure 1, four supply chain quality management (SCQM) practices are considered for the purpose of the current study. These four categories are based on the work of Soares et al. [3]. SCQM for this study is customer focus, supplier focus, supply chain integration and quality leadership. The hypothesis of this study is H1: there are positive effects of customer focus on quality performance, H2: there are positive effects of supplier focus on quality performance, H3: there are positive effects of supply chain integration on quality performance, and H4: there are positive effects of quality leadership on quality performance.

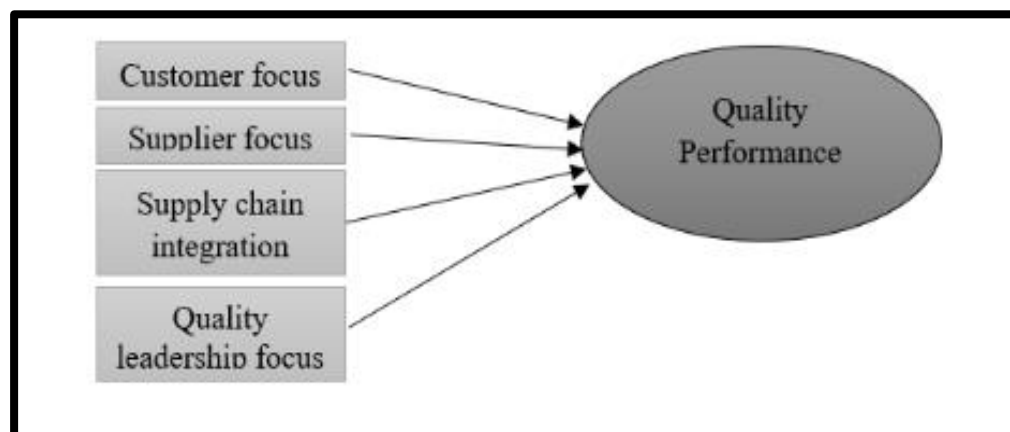


Figure 1. Research Model

In this study, the sample population is employees from Sadara Chemical Company. The sample size is 31. The research hypothesis were tested using correlation analysis.

RESULT AND DISCUSSION

Reliability analysis

Table 1 shows the reliability test for supply chain integration, customer focus, supplier focus, quality leadership and quality performance. Based on Table 1, the result showed that supply chain integration has exhibited Cronbach's alpha value of 0.859, customer focus has exhibited Cronbach's alpha value of 0.751, supplier focus attained value of 0.675, quality leadership exhibited value of 0.729, and quality performance exhibited value of 0.692. Thus, for all the variables, the value of Cronbach's alpha were more than 0.65. Thus, all the variable have acceptable reliability coefficient.

Table 1. Cronbach's Alpha

Variable	Cronbach's Alpha
Supply chain integration	0.859
Customer focus	0.751
Supplier focus	0.675
Quality leadership	0.729
Quality performance	0.692

Correlation matrix

Table 2 shows the results for the correlation matrix. Results presented in Table 2 identify that the correlation between the variables. The first variable is supply chain integration, where there is a good relationship between customer focus (CF), supplier focus (SF) and quality management (QL) and quality performance (QP) with values of 0.713, 0.527, 0.341 and 0.389. On the basis of Table 2, the relationship between supply chain integration (SCI), supplier focus (SF), quality leadership (QL) and quality performance (QP) with values of 0.713, 0.457, 0.463 and 0.517 is observed for the customer focus variable. In addition, the supplier's focus (SF) variable are related to supply chain integration (SCI), customer focus (CF), quality leadership (QL) and quality performance (QP), with values of 0.527, 0.457, 0.511 and 0.430, respectively. Furthermore, quality management (QL) has a relationship with customer focus (CF), supplier focus (SF) and quality performance (QP) values of 0.715, 0.430, 0.477, but QL does not have a good relationship with supply chain integration (SCI) as it has a value of 0.341. Moreover, quality performance (QP) has a good relationship with supply chain integration (SCI), customer focus (CF), supplier focus (SF) and quality leadership (QL) values of 0.389, 0.463, 0.511 and 1 respectively.

Table 2. Correlation Matrix

Variable	Element	SC I-Avg	CF-Avg	SF-Avg	QL -Avg	Q P-Avg
AVREG SCI	Pearson Correlation	1	0.713*	0.527*	0.341	0.389*
	Sig. (2-tailed)		0.000	0.002	0.060	0.031
	N	31	31	31	31	31
AVREGE CF	Pearson Correlation	0.713*	1	0.457*	0.463*	0.517*
	Sig. (2-	0.000		0.002	0.060	0.031

	tailed)	00		10	09	00 3
	N	31	31	31	31	31
AVREGE SF	Pearson Correlat ion	0.5 27* *	0.4 57* *	1	0.5 11* *	.4 30 *
	Sig. (2- tailed)	0.0 02	0.0 10		0.0 03	0. 01 6
	N	31	31	31	31	31
AVREGE QL	Pearson Correlat ion	0.3 41	0.5 17* *	0.4 30*	0.4 77* *	1
	Sig. (2- tailed)	0.0 60	0.0 03	0.0 16	0.0 07	
	N	31	31	31	31	31
AVREGE QP	Pearson Correlat ion	0.3 89* *	0.4 63* *	0.5 11* *	1	0. 47 7* *
	Sig. (2- tailed)	0.0 31	0.0 09	0.0 03		0. 00 7
	N	31	31	31	31	31

Regression Analysis

Table 3 shows the results of simple linear analysis for supply chain integration on quality performance. Based on Table 3, the result has shown that the simple linear model rejects the for supply chain integration as an independent variable and the quality performance as a dependent variable. The model coefficient of determination (Adjusted R Square) was found to be equal to 0.486, which means that the model explains 48 % of the variance in quality performance. Thus, the data analysis is rejected and the model and hypotheses should be improved.

Table 3. Simple Liner Regression (Supply Chain Integration)

Model Summary			
Variable	R square	Adjusted R Square	Std. Error of the Estimate
SCI	0.499	0.486	0.953

Table 4 shows the results of simple linear analysis for customer focus on quality performance. Based on Table 4, the result has shown that the simple linear model rejects the customer focus as an independent variable and the quality performance as a dependent variable. The model coefficient of determination (Adjusted R Square) was found to be equal to 0.57, which means that the model explains 57% of the variance in quality performance.

Thus, the data analysis is rejected and the model and hypotheses should be improved.

Table 4. Simple Liner Regression (Customer Focus)

Model Summary			
Variable	R square	Adjusted R Square	Std. Error of the Estimate
CF	0.581	0.573	0.8891

Table 5 shows the results of simple linear analysis for supplier focus on quality performance. Based on Table 5, the result has shown that the simple linear model rejects the supplier's focus as an independent variable and the quality performance as a dependent variable. The model coefficient of determination (Adjusted R Square) was found to be equal to 0.45, which means that the model explains 45 % of the variance in quality performance. Thus, the data analysis is rejected and the model and hypotheses should be improved.

Table 5. Simple Liner Regression (Supplier Focus)

Model Summary			
Variable	R square	Adjusted R Square	Std. Error of the Estimate
SF	0.447	0.427	0.577

Table 6 shows the results of simple linear analysis for quality leadership on quality performance. Based on Table 6, the result has shown that the simple linear model rejects quality leadership as an independent variable and quality performance as a dependent variable. The model coefficient of determination (Adjusted R Square) was found to be equal to 0.55, which means that the model explains 55 % of the variance in quality performance. Thus, the data analysis is rejected and the model and hypotheses should be improved.

OVERALL DISCUSSION

In general, the findings reveal that distinctive SCQM practices have an overall impact on item quality and that the impact of each SCQM practice on item quality measures varies. A summary of the main findings is described in detail as follows. The findings do not support the results of this research are that all hypotheses (H1) integration of the supply chain, (H2) customer focus, (H3) supplier focus, (H4) quality leadership have a good relationship and are all acceptable. However, the regression analysis hypotheses are rejected because they are all less than 0.60. So in the current work, it can be said that the hypotheses are partially acceptable because they have a good relationship in correlation and the result of the regression is close to 0.60.

According to Bastas and Liyanage [15], a SCQM or end-to-end approach to quality management is even more crucial to the entire supply chain network than simply paying for the quality service of each individual company. This finding not only confirms the main significance of all SCQM practices is in the improvement of item quality, but also shows that part of SCQM practices is the strong empowering influence of item quality improvement over the entire supply chain network. Furthermore, Nguyen et al. [16] confirmed that supply chain approach to quality management not only demonstrates a proven way to improve product quality performance, but also, and more importantly, emphasizes the need to improve the entire supply chain network and associated processes that need to work together to ensure high quality products.

CONCLUSION

This study contributes to the supply chain and QM literature by examining the interlinking of the two perspectives and the resulting combined effects (i.e. SCQM) on product quality outcomes. The aim of this study was to test the impact of supply chain quality management practices on quality performance and the practices of supply chain integration, customer focus and supplier focus and quality leadership. Key findings of this work have shown that H1 customer focus, H2 supplier focus, H3 supply chain integration and H4 quality leadership are partially acceptable. For future work, the authors recommend improving the model and assumptions in the future and applying them to a number of industries for better data analysis and understanding on SCQM.

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