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AN EVALUATING OF BUSINESS PERFORMANCE THROUGH SCMIMPLEMENTATION

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ABSTRACT

In today competitive business, most of the firms increase their focus on creating and delivering value to the target customer. The center of business attention is providing products or services that are more valuable compared to its competitors. The main purpose of this research is evaluating the business performance through SCM implementation in Malaysia manufacturing industry. A total of 248 respondents were selected. The data were analyzed using mean, standard deviation and correlation between independent and dependent variables. The analyses involved statistical methods such as reliability and validity tests and multiple regressions. The research findings supported the hypotheses. Based on the findings, strategic recommendations are proposed to implement the SCM for the manufacturing industry in Malaysia.

Keywords: business implementation,manufacturing industry,supply chain management implementation

INTRODUCTION

Business today has become very sophisticated than it has been in the past. The process of modern business is characterized by such more interconnected and interdependent, short product life cycles, a new fast product introduction and complicated customer. Individual firm's future success depend greatly on the ability of managers to integrate the firm's network and relationships with other business partners. When a firm finds itself struggling to maintain profit margins, a strategy that focuses on the supply chain management implementation become more important (Sahay and Mohan, 2003). Towil and Christopher, (cited in Thatte, 2007), stated that the end customer in the marketplace today determined by the success or failure of supply chains management implementation. They argued that getting the right product, at the right price, at the right time to the customer is not only improved competitive success but also the key to survival.

Many researchers, such as Tan et al. (2002) and Tan (2002) identified 24 SCM implementation from previous studies and formed six constructs: (1) supply chain integration, (2) information sharing, (3) supply chain characteristic, customer service management, (5) geographical proximity and (6) JIT capability (Jabbour, 2011). Furthermore, (Li et al, 2006), identified that the concept of supply chain management implementation encompasses (1) supplier partnership, customer relationship and information sharing, (2) supply chain responsiveness that includes operation system responsiveness, logistic process responsiveness, and supplier network responsiveness, (3) competitive advantage of the firm.

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Supply chain management implementation as a multi-dimensional construct that encompasses upstream and downstream sides of supply chain (Li et al, 2006). Donlon (1996) stated that outsourcing, supplier partnership, information sharing, cycle time, compression and continuous process flow, as a part of supply chain management implementation. While Tan et al (1998) represented supply chain management implementation in form of quality, purchasing, and customer relationship. Alvarado and Kotzab, in their empirical study focused on supply chain management implementation on inter-organizational system used, core competences, and elimination of excess in inventory through postponement. The key aspect of supply chain management implementation according to Tan et al (2002) were supply chain integration, information sharing, customer service management, geographic proximity, and JIT capabilities. Lee (2004) focused on five practices at supply chain level that are a key to create supply chain responsiveness. They include outsourcing, strategic supplier partnerships, customer relationship, information sharing, and product modularity. This study only focus on supply chain management implementation in terms of internal firm relationship, supplier and firm relationship and customer and firm relationship) and its impact on business performance.

LITERATURE REVIEW AND HYPOTHESES

SCM Implementation

Many scholars have been focused on SCM implementation in various perspectives. However, in this study try to explore the SCM implementation in three components namely; Internal firm relationship (IFR), firm-supplier relationship (FSR) and firm-customer relationship (FCR)

Internal-Firm Relationship

One of the challenges faced by organizations is the need to integrate internal functions (Pagell, 2004). Stevens (1989) features an internal relationship is a comprehensive integrated planning and control systems that regulate flow of goods and services from suppliers of raw materials into the company for processing into finished goods in and out of the organization to customers. Stevens (1989) describes the internal relationship is an important step that must be done before the external relationship can be easily achieved. Internal relationship, as suggested by anecdotal evidence, is the first step to achieving supply chain integration (Handfield and Monczka, 1998; Rosenzweig*et al*., 2003; Stevens, 1989).

Internal firm relationship consists of: (a) the existence of an integrated database to the production, logistics, distribution and vendor information, (b) easy access to key operational data from the integrated database, (c) information system which links a high integrated with various internal departments within the company, (d) an assessment of inventory information through the supply chain, (e) Obtaining the status of inventories at the right time, (f) use the planning system both computer-based marketing and production , (g) the level of system integration of high information on the production process (Lee, *et al,* 2007).

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Supplier -firm relationship and customer - firm relationship

External relationship is the integration to key customers or key suppliers. (Lambert *et al*., 1998; Lambert *et al.,* 1996) has done in empiric studies that a high correlation between relationship practices with customers and suppliers with the company's performance (Westbrook Frohlich, 2001; Rosenzweig*et al*, 2003). The existence of a growing understanding that the organization of individual companies can not compete in the long term without applying supply chain practices (Chandrashekar, 1999; Christopher, 2000).

The main objectives of relationships with key suppliers are the achievement of high quality products and services that satisfy customer needs. Often, suppliers lack the abilities and competencies required to deal with the high quality standards required by their buyers. Therefore, supplier development is necessary. Supplier development activities vary widely and they may include raising performance expectations, education and training on quality requirements and know-how for supplier personnel, recognition of supplier's achievements and performance in the form of rewards, placement of engineering and other buyer personnel at the supplier's premises and direct capital investment by the buying firm in the supplier (Krause and Ellram, 1997; Monczka et al., 1998).

Suppliers are increasingly viewed as business partners. They become more deeply involved in co-operative problem solving, in new product development and in workgroups with buyer's representatives in order to identify areas of improvement (Harland et al., 1999; Stuart and McCutcheon, 2000; Shin et al., 2000; Ragatz et al., 1997; Wynstra and Pierick, 2000; Stanley and Wisner, 2001).

Supplier relationship is considered to be a partnership and is valuable to the firm as it can be a source of competitive advantage. Research shows that the ultimate success or failure of a supply chain alliance is determined by the level of commitment, trust and cooperation of its members (Monczka et al., 1998; Handfield and Nichols, 1999; Walter et al., 2003). Thus, each part must be aware of other part's needs and should align its expectations and goals with its partners' expectations and goals (Stuart and McCutcheon, 2000; Spekman et al., 1998).

Firm and supplier relationship consists of (a) cooperation with strategic relationships with suppliers, (b) involvement of suppliers in new product development during the product design stage, (c) production planning and inventory management, (d) development of response order processing system with a rapid suppliers (e) placing the network can guarantee the delivery of trust, and (f) the exchange of information with suppliers (Lee, *et al*, 2007).

Firm-customer relationship including: planning, implementing, and evaluating a successful relationship between the provider and recipient of both upstream and downstream of the supply chain. Therefore, customer relationship management (CRM) is not only focused on inbound customer relationships but also on outbound customer relationships in SCM. Customer relations related to the company's ability to communicate to the delivery of appropriate products and services to customers locally and globally in the right time, right place, and appropriate of quantity and quality. Customer linkage especially sharing product information with customers, receiving customer orders, interact with customers to manage demand, after placing the order system, share the status of orders with customers on scheduling orders, and product delivery stage (Lee, *et al*, 2007).

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Business Performance

Firm performance has been reported as the result of organizational goals achieved through the effectiveness of strategy or techniques. Most of the firms measure financial and non-financial performances that are related to certain aspects of strategy and operations in SCM (Gunasekaran et al., 2004). Kaplan and Norton (1992); DonHee Lee (2011) stated that some firms and researchers have focused on financial performance, while others concentrated on operational performance.

Measurements of organizational performance indicate how effective strategies or operational decisions are carried out (Bowersox et al., 1999; Soosay and Chapman, 2006). Organizational performance has been measured in several types of SCM measurements such as production, distribution, inventory, delivery, and customer satisfaction based on types of industries. Shin et al. (2000) identifies two main performance factors; the supplier performance is measured by cost, lead time, quality, delivery reliability, and on time delivery; and buyer performance is measured by reliability, conformance, features, and durability of the product. Lin et al. (2005) measure organizational performance as product quality, the competitive position, and customer help. Chow et al. (2008) proposed organizational performance to evaluate the SCM effect using product quality, competitive position, and customer service (DonHee Lee, 2011)

Based on the above literature review, we proposed a conceptual model of the relationship between SCM implementation and firm performance (see Figure 1)

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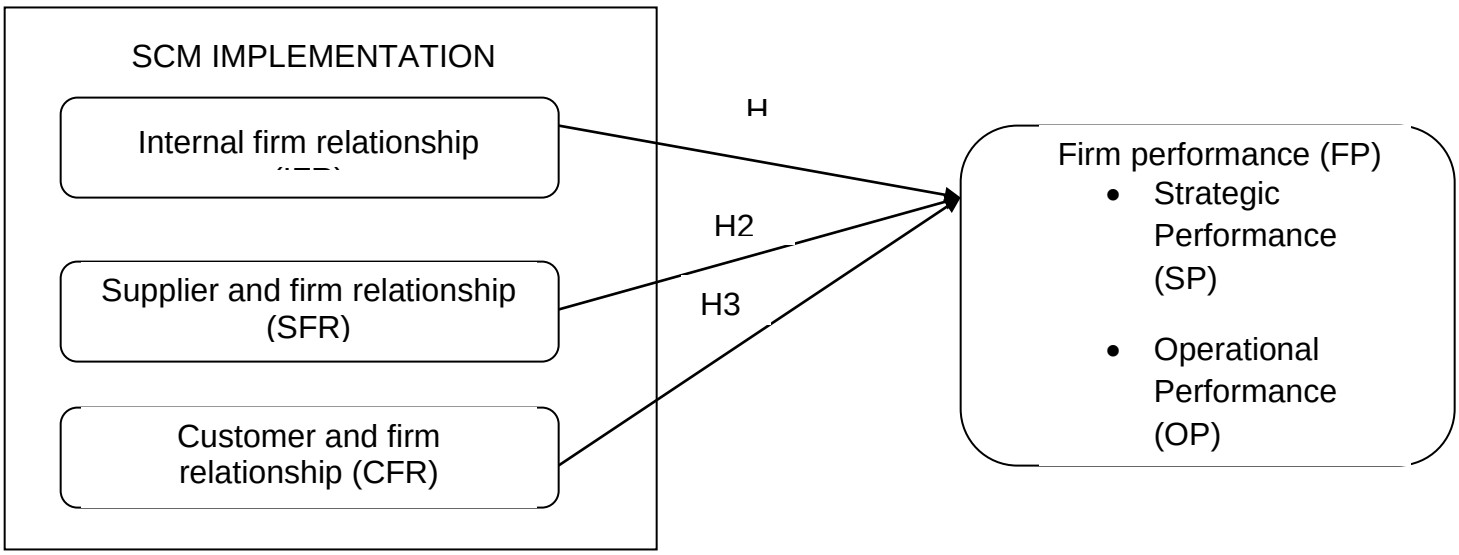
Figure 1: Proposed Research Framework



Based on the figure 1, supply chain management practices encompass internal firm relationship (IFR), supplier and firm relationship (SFR) and customer and firm relationship (CFR)) are significantly related to supply chain responsiveness (SCR). Hence, the following hypotheses will be tested:

H1a-H1b: IFR is positively related to SP and OP H2a-H2b: SFR is positively related SP and OP H3a-H3b: CFR is relatively related SP and OP

RESEARCH METHODOLOGY

Sampling and Data Collection

The research conducted based on the perspective of Malaysia manufacturing industry. Data were gathered by using questionnaire survey which was employed to a 248 managers. Therespondents were asked to indicate on a Likert scale of 1 (strongly disagree) to 5 (strongly agree) on the extent to which business performance, and the implementation of supply chain management. Several quantitative statistical technique methods have been used in this study. Cronbach's coefficient alpha was used for reliability analysis, descriptive statistic and inferential statistic such as correlation and multiple regression analyses were used to test the hypotheses.

Reliability and Validity Analysis

This measure was conducted for reliability and validity, besides the Cronbach's alpha coefficient for internal-consistency reliability of the survey questionnaire.

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Reliability Analysis

Reliability is the ability of a scale to consistently yield the same response. For Cronbach's alpha, a popular measure of internal consistency, a minimum value of 0.70 is considered acceptable for existing scales and a value of 0.60 is deemed appropriate for newly developed scales (Nunnally, 1978).

When Cronbach's α range from 0.35 to 0.70, the reliability of the measurement is medium. When it was above 0.70, the reliability of the instrument was high. If it is below 0.35, it shows low reliability and the instrument should be rejected.

According to the result of completed questionnaires, Kaiser, Meyer-Olkin (KMO) measure of sampling adequacy which indicate the proportion of variance in the variables are caused by underlying factor thus allowing for the application of factor analysis. This is supported by Barlett's Test of Sphericity value of 0.000 that is less than 0.05 thus proving that the analysis is significant. IFR (0.782), FSR (0.724), FCR (0.884), SP (0.876), OP (0.766) which are higher than0.7 and the Barlett's Test of Sphericity shows to be significant with value less than 0.05 which mean that the sample is adequate and the data is suitability for factor analysis . See detail in Table 1.

Table 1 Kaiser-Meyer-Olkin and Barlett's Test

	KMO of Sampling	Barlett's Test of Sphericity		
		Approx.Chi-Square	df	sig
IFR	0.782	391.434	21	0.000
FSR	0.724	265.956	15	0.000
FCR	0.884	784.150	21	0.000
SP	0.876	763.861	45	0.000
OP	0.766	662.296	28	0.000

After completing the factor analysis on SCM implementation, the researcher extracted three individual factors from twenty questions. Each question's component loading variance was higher than 0.5. There were IFR,FSR and FCR. The first factors, IFR, composed of the integrated database, easy access to database, integrated information system, access to inventory system, retrieving inventory status, computer based planning system and integrated product system. The Cronbach's α of these questions = 0.7733. The second factor, FSR, composed of: supplier linkage in SCM, new product design involvement, production/inventory management, rapid response system, reliable delivery system and integration information system and the Cronbach's α of these questions score 0.7035. The third factor, FCR, composed: Product information sharing, electronic data system, interactive demand forecasting, fast and easy ordering system, order schedule information sharing, order process information sharing and order delivery information sharing and the Cronbach's α of these questions score0.8707. All these factors of firm integration proof good reliability and were in accordance with the internal factors. See Table 2.

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Table 2 Summary for factor analysis of SCM practices

Factors	**Items**	**Factor loading**	**Cronbach's α**
IFR	Integrated database	0.388	0.7733
	Easy access to database	0.612	
	Integrated information system	0.556	
	Access to inventory system	0.572	
	Retrieving inventory status	0.711	
	Computer based planning system	0.702	
	Integrated product system	0.713	
FSR	Supplier linkage in SCM	0.693	0.7035
	Supplier linkage in SCM	0.586	
	Production/inventory management	0.546	
	Rapid response system	0.566	
	Reliable delivery system	0.753	
	Integration information technology	0.662	
FCR	Product information sharing	0.789	0.8707
	Electronic data system	0.804	
	Interactive demand forecasting	0.811	
	Fast and easy ordering system	0.805	
	Order schedule information sharing	0.805	
	Order process information sharing	0.667	
	Order delivery information sharing	0.560	

Table 3 shows the factor analysis of firm's performance. The first factor, strategic performance, composed of three questions: Overall our leadership is higher, overall our strategy plan is better, and The overall competitive position of our suppliers is higher. Cronbach's α of these questions = 0.85.

The second factor, operational performance, composed of three questions: Overall product quality of suppliers is higher, overall our total cost on supply chain is lower, the overall level of services of our suppliers is higher. The Cronbach's α of these score questions 0.82.

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Table 3 Summary for factor analysis of firm's performance

Factors	**Items**	**Factor loading**	**Cronbach's α**
Strategic Performance	Overall our leadership is higher	0.583	0.85
	Overall our strategy plan is better	0.625	
	The overall competitive position of our suppliers is higher	0.656	
Operational Performance	Overall product quality of suppliers is higher	0.727	0.82
	Overall our total cost on supply chain is lower	0.634	
	The overall level of services of our suppliers is higher	0.791	

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RESULTS

Descriptive statistics and Correlations

The descriptive statistics for each of the variables are shown in Table 4, including their mean, standard deviation, minimum and maximum value and the correlation. Mean for the three composite independent variables are 26.3 for IFR, 22.9 for FSR, and 27.1 FCR, respectively, with corresponding standard deviation (SD) of 3.85, 3.19, and 4.09 respectively. Means of three SCR are 37.53, 29.27, and 29.86, respectively. Table 12 also provides correlation coefficient value among variables.

Factors that influence the variance (VIF) were calculated to determine whether there are levels of multicollinearity. The VIF in this model has IFR (1.226), FSR (1.051) FCR (1.230). Relatively low inter-correlations between independent variables that indicated that no serious multicollinearity.

Correlation techniques are used to explore the relationship and prove the relationship hypothetical two or more variables when the data forming the second variable interval or ratio, and source of data from two or more variables is the same.

Correlation between independent variable (SCM implementation) and dependent variable (FP) is calculated and linier regression analysis is used in order to verify the correlation.

In this research, Pearson's Product Moment of Coefficient Correlation, and simple correlation are applied to examine correlation and predict degree of SCM implementation and FP The value of *r* should range between –1.0 and 1.0 and determines the extent and type of correlation between the variable. A value close to extremities indicates a high correlation and indicates whether the correlation is negative or positive. A close to zero value indicates no correlation and a value in between indicate the existence of correlation to some moderate degree depending on the value.

Table 4 Descriptive statistics of independent and dependent variables

	N	Min	Max	Mean	S.D
IFR	248	13	35	26.3	3.85
SFR	248	15	30	22.9	3.19
CFR	248	13	35	27.1	4.09
FP	248	37	110	83.7	15.53

Table 5 showed the correlation between independent variables (IFR,SFR,CFR) and dependent variable (FP) was positive. IFR had a correlation of 0.322, $p<0.01$ with FP, SFR had a correlation of 0.35, $p<0.01$ with FP , and CFR had a correlation of 0.37, $p<0.01$ with FP. Which mean that the respondents are more likely to evaluate SCM implementation positively when FP rated positively.

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Table 5 the correlation between independent and dependent variables

	Correlation			
	1	2	3	4
IFR	1			
SFR	0.198 **	1		
CFR	0.406 ***	0.202 **	1	
FP	0.322	0.35	0.37	1

P*<0.1, p**<0.05, p***<0.001

Regression analysis

Multiple linear regression analyses are used to develop models relating the two measures of Firm performance (SP and OP) to the three independent variables (IFR,SFR and CFR) Table 6 shows coefficients of each model along with corresponding test statistics.

In model 1 where the dependent variable is overall FP, the model seem to be reliable (p-value for F<0.01 and adjusted R-square of 0.120. The Model showed that 12% of FP is related to three independent variables (IFR,FSR,FCR).

Model 2, dependent variable is SP. The model seem to be reliable (p-value for F<0.01 and adjusted R-square of 0.099. The Model showed that 9% of FP is related to three independent variables (IFR,SFR,CFR). FCR is the most important determinant in FP with p-value for t<0.01, followed by IFR with p-value of t<0.05, while SFR is not significant with p-value of t>0.05. Results in model 2 appear to confirm H1a,H2a and H3a.

Model 3, dependent variable is OP. The model seem to be reliable (p-value for F<0.01) and adjusted R-square of 0.085. The Model showed that 8.5% of FP is related to three independent variables IFR,SFR,CFR). Once again, CFR is the most important determinant in FP with p-value for t<0.01, followed by IFR with p-value of t<0.05, while FSR is not significant with p-value of t>0.05. Results in model 3 appear to confirm H1b, H2b and H3b.

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Table 6 Model parameter estimates of supply chain responsiveness (t- value in parenthesis)

	Model 1 Dependent variable = overall FP	Model 2 Dependent variable = SP	Model 3 Dependent variable = OP
Constant	116.211 (7.422)**	22.099 (7.095)**	16.214 (5.812)**
IFR	0.949 (2.066)*	0.206 (2.257)*	0.172 (2.101)*
SFR	1.021 (1.989)*	0.109 (1.072)	0.107 (1.172)
CFR	1.524 (3.513)**	0.277 (3.208)**	0.224 (2.901)**
Adj R2	0.120	0.099	0.085
F-value	12.253**	10.000**	8.643**

*p value <0.05, **p value <0.01

SUMMARY

Questionnaires were distributed to 248 executive officers, directors, presidents, vice presidents, managers, and senior staff, using purposive sampling. Results show IFR, SFR, CFR scale was reliable and valid for measuring relationship between independent and dependent variables. The results also show that statistically significant positive relationship between IFR FSR, FCR to FP, and overall (SCM implementation) and FP. These results suggest (SCM implementation has the ability to increase FP.

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