THE INFLUENCE OF SUPPLY CHAIN INTEGRATION ON FIRM PERFORMANCE IN KENYA: A CASE OF DHL KENYA

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CITATION: Kagwanja, R. & Mwangangi, P (2015). The Influence of Supply Chain Integration On Firm Performance In Kenya: A Case Of DHL Kenya). *International Journal Human Resource and Procurement, 4* (4), 13-25**.**

ABSTRACT

Supply chain integration (SCI) is considered a strategic tool, which attempts to minimize operating costs and thereby enhances value for the stakeholders by linking all participating players throughout the supply chain, from suppliers to customers. Thus, this subject has attracted significant debate and discussion during the last decade. The general objective of the study was to find out the influence of supply chain integration on firm performance in Kenya using DHL Kenya as a case study. The target population of this study included managers and staff of DHL. A total of 70 respondents were targeted. Both descriptive and inferential statistics were used to analyze the data. The respondents indicated that different departments decide jointly about company objectives as shown by a mean of 3.72 and a standard deviation of 1.2955. It was also established that the firm holds joint discussion to solve operational problems (mean=4.0939, standard deviation=0.92618). The respondents indicated that the firm works with suppliers to make production plans as evidenced by a mean of 3.0303 and standard deviation of 1.45676 and participate in the sourcing decisions of suppliers (mean=3.5455, standard deviation=1.36079). It was further established that logistics activities are well integrated with the logistics activities of suppliers (mean=3.9643, standard deviation=0.76192), there is a seamless integration of logistics activities with key suppliers (mean=3.4643, standard deviation=0.91332) and logistics integration is characterized by excellent distribution, transportation and/or warehousing facilities (mean=3.5489, standard deviation=1.17722). This study provides practitioners with key recommendations to enhance supply chain integration in an organization, as such recognizing internal, supplier and customer integration as a strategic tool for competitive advantage, since competition today is based on supply chain versus supply chain and not business versus business.

Keywords: *Supply chain integration, operating costs, stakeholders, suppliers and customers.*

INTRODUCTION

In an increasingly dynamic and competitive business world, proper management of the supply chain is a key feature for promoting efficient management and developing important competitive advantages (Rao et al., 2006; Prajogo et al., 2012). Supply chain integration (SCI) is considered a strategic tool, which attempts to minimize operating costs and thereby enhances value for the stakeholders by linking all participating players throughout the supply chain, from suppliers to customers (Kwon and Suh, 2005). Thus, this subject has attracted significant debate and discussion during the last decade (Power, 2005).

Most concepts of supply chain integration explicitly recognize the existence of two flows through the chain; there is a flow of goods and an equally important flow of information. Supply chain integration must comprise both information and material, and cannot restrict itself to only one. Higher levels of integration are characterized by increased logistics-related communication, greater coordination of the firm's logistics activities with those of its suppliers and customers, and more blurred organizational distinctions between the logistics activities of the firm and those of its suppliers and customers. Coordination, collaboration, and cooperation are often used more of less interchangeably for describing integrative efforts among partners to improve the overall efficiency of the supply chain (Prajogo & Olhager, 2012).

Coordination in the supply chain has many different forms, but, as whole, the purpose of all kinds of coordination is that entities in a chain of end customer information or the final consumer of goods and services, particularly be aware of the amount of actual demand to have the knowledge to produce programs, schedule, control the level of Inventory, design their products in the way that be able to deliver them at the right time, right place to consumer in order to attract customer satisfaction and be successful in competitive market ahead of their competitors (Li and woo, 2004). The integrated supply chain structure is relatively new research area, although many studies have been made in this relationship and also partnership between manufacturer and customer or supplier. While some studies have focused on the review of relations with partners in the supply chain, others focus on managing a supply chain as a single system. It is against this background that the study sought to investigate the influence of supply chain integration on firm performance in Kenya with specific reference to DHL Kenya.

Firm Performance

Firm performance is one of the most important constructs in management research. The definition of firm performance could vary from one and another. According to Richard et al. (2012) organizational performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets and return on investment); product market performance (sales and market share); and shareholder return (total shareholder return and economic value

added) On the other hand, firm performance can also be measured using perceived performance approach (also referred to as subjective performance measure) where Likert-like scaling is used to measure firm performance from the top management perspectives (Selvarajan, 2010).
Organizational performance is a method of measuring the success of the organization to ensure that it achieves its goals. The success of an organization is gauged from several indicators both qualitative and quantitative (Fry et al., 2010). These include financial performance and non-financial performance. Performance measures may be cost-oriented or non-cost oriented and can be internal or external. Although organizational performance is the most extensively used dependent variable in organizational research, it still remains vague and loosely defined. Performance has been traditionally conceptualized in terms of financial measures; but some scholars have proposed a broader performance construct that incorporates non-financial measures including among others market share, product quality, and company image.

Statement of the Problem

According to Flynn, Huo and Zhao (2010), supply chain integration is widely considered by both practitioners and researchers a vital contributor to supply chain performance. The supply chain function of DHL still remains in traditional logistics links like storage, transportation and distribution (Armstrong and Associates, 2012). They fall far short in aspect of value-added services such as processing, distribution, zero inventory management, logistics consulting and training and logistics information service. This reduces the operational efficiency by a proportion of 20% (Rutner, Langley and John, 2011). The quality of in-service supply chain employees in DHL Kenya cannot meet the actual needs and most employees' qualities are relatively not high, and many cannot keep up with the needs of modern supply chain industry development (Armstrong and Associates, 2012). Poorly integrated supply chain in DHL causes cycles of excessive inventory and severe backlogs, poor product forecasts, unbalanced capacities, poor customer service, uncertain production plans, and sometimes even lost sales (Swink *et al.*, 2007). Supply chain integration in DHL has been hindered because of fragmented IT applications that constrain information flows and activity coordination hence the need for supply chain integration. According to Ahmed and Rafiq, (2013), fragmented IT applications can lead to a loss of upto 50% if remains unchecked.

The effects of supply chain integration (SCI) on firm performance have received considerable attention from scholars and practitioners (Flynn et al., 2010; Frohlich, 2002; Vaart and Donk, 2008). The extant literature on supply chain integration is largely driven by the typical view that a greater level of integration leads to better firm performance (Cannon et al., 2010). Supply chain integration (SCI) can help firms respond to the business challenges at the strategic, operational, and technological levels (Frohlich, 2002; Liu et al., 2010). Prajogo et al. (2012) studied logistics integration as a construct embracing the integration of information and materials along the supply chain as a supplier management practice. He indicated that there was a positive, but rather weak link, between supply chain integration and supply chain performance.

However, previous studies were conducted primarily in mature market economies (Cannon et al., 2010), which have significant differences in political, social, and economic systems compared to emerging economies. Furthermore, while internal and external integration have been extensively examined in SCI literature, certain aspects such as logistics integration, and buyer-supplier relationship (BSR) coordination have largely been neglected (Wong et al., 2011). There has also been a lack of comprehensive empirical studies of SCI dimensions involving internal, supplier, customer and logistics integration of a third party logistics such as (DHL Liu et al., 2010). Thus, the objective of this study was to re-examine the influence of SCI dimensions (internal, supplier, customer and logistics integration) on firm performance in a Kenyan context using DHL Kenya as a case study.

LITERATURE REVIEW

Scholars and practitioners have increasingly realized that supply chain integration is a great innovation in supply chain management and a new frontier of opportunities to enhance firm performance (Flynn et al., 2010; Frohlich, 2002; Kim, 2006; Kulp et al., 2004a; Lau et al., 2010; Lee and Whang, 2004). Previous studies regard supply chain integration as a construct of different dimensions and emphasize the importance of exploring supply chain integration's dimensions when evaluating its effects on firm performance (Flynn et al., 2010; Lau et al., 2010). Lau et al. (2010), for example, argue that supply chain integration "requires a fine-grained empirical analysis" (p. 21) because it "involves multiple organizational processes that integrate suppliers, internal functional units, and customers" (p. 23). Extant literature generally agrees that information sharing is the foundation of supply chain integration (Kulp et al., 2004a, b; Lau et al., 2010; Lee andWhang, 2004; Sahin andRobinson, 2002).Without information sharing, "few gains can be made in overall supply chain integration" (Lee, 2000, p. 33). Furthermore, the literature suggests that firms require a higher level of coordination to exchange decisions rights, knowledge and resources, in addition to information sharing as the foundation of supply chain integration (Lee, 2010). Kulp et al. (2004a, b), for example, propose that process collaboration, as information sharing, is a basic dimension of supply chain integration. Similarly, Sahin and Robinson (2002, 2005, p. 582) define "information sharing and decision-making coordination as two major dimensions of supply chain integration at the operational level". Following these scholars, supply chain integration is a construct consisting of information sharing and operational coordination.

Internal integration is to have the internal relations between supply and demand adjust to optimize the flow, so that products or services at a faster transmission, more flexible, more economical and effective, so that the operation of enterprises improve operational efficiency, improve business competitiveness. Internal supply chain integration has four main areas: information integration, decision-making integration, financial integration and the operations

integration. Information integration refers to the supply chain to participate in departmental information sharing, which is the basis of supply chain integration (Cheng, 2011).

Decision-making internal integration refers to a number of aspects on the synergy between the plans. Financial integration will change the supply chain nodes to pay the relationship between the departments, so as to coordinate the overall interests of the supply chain means. Operation Integration refers to the operation of upstream and downstream supply chain between the human resources (such as procurement, marketing, design, etc.) as well as the sharing of material resources (Yang 2007). Internal supply chain integration will involve the operation of enterprises of various flow and business department, coordination and restructuring, so that various departments within enterprises connected, open and effective information sharing, so that the optimal overall operation more efficient operation.

Supplier activities include activities such as placing strategic activities with suppliers, involving suppliers' capability to generate new products during the design stage, production planning, and inventory management, having a rapid response order processing system with suppliers, installing a supplier network that ensures reliable delivery, and exchanging information with suppliers. According to Yao *et al.* (2007), supplier integration has to do with data flow between two or more companies and constitutes a way towards achieving process integration, under which the supplier actually takes control over the inventory and purchasing functions of the buyer. The coordination and integration between the companies along the supply chain makes a reduction of suppliers a necessity according to the interpreters of supply chain management. This fundamental belief can be directly derived from the beliefs of coordination and integration along the material flow and win-win relationships. Having few suppliers permits not only coordination and integration along the material flow but also win-win relationships.

The ways firms relate with suppliers have changed considerably. Manufacturing firms are getting more and more focused on their core competence thus their reliance on strategic supplier increases. Among the changes, three key aspects of supplier relationships are highlighted here. First, the trend now is to build a long-term relationship with suppliers rather than short-term contracts. Second, in conjunction with the first point, firms now use fewer suppliers over a longer period of time rather than keeping a large base of suppliers which allow them to change suppliers for almost every contract. The benefits of having low price resulted from creating competition among suppliers are now changed into low total cost of ownership due to long-term and large volume of purchases. Third, the relationship with suppliers has been enhanced into strategic level where suppliers are now considered as the integral part of the firm's operations. This change has led to various avenues of collaboration, including joint improvement program, early supplier integration in product design, and profit and risk sharing. One aspect of strategic supplier relationship is extended longevity (Prajogo & Olhager, 2012). Create, maintain and improve relations between organizations aim at achieving business goals that organizations can't

achieve lonely. In supply chain configuration, inter organizational relationships is usually obtained through partnerships or buyer – seller relations. Supplier participation in the supply chain shows agreement between manufacturing organizations and their participants. This includes sharing essential information (Cheng, 2011).

Customer activity concerns processes dealing with planning, implementing, and evaluating relationships between service providers and service recipients. Customer relationship management (CRM) focuses not only on inbound customer relationships but also on outbound customer relationships in SCM. Customer activity involves the ability to communicate the delivery of products and services to end-user customers, both locally and globally (Li and woo, 2004). Customer activity is principally about the sharing of product information with customers, accepting customer orders, interacting with customers to manage demand, having an order placing protocol in the system, sharing order status with customers during order scheduling, and providing information during the product delivery stage.

Coordination in the supply chain has many different forms, but, as whole, the purpose of all kinds of coordination is that entities in a chain of end customer information or the final consumer of goods and services, particularly be aware of the amount of actual demand to have the knowledge to produce programs, schedule, control the level of Inventory, design their products in the way that be able to deliver them at the right time, right place to consumer in order to attract customer satisfaction and be successful in competitive market ahead of their competitors (Li and woo, 2004). The integrated supply chain structure is relatively new research area, although many studies have been made in this relationship and also partnership between manufacturer and customer or supplier. In an integrated supply chain, development of strong strategic partnerships with customers will facilitate understanding and the anticipation of the manufacturer's needs, in order to better meet its changing requirements (Martinez, 2009). The mutual exchange of information about products, processes, schedules and capabilities helps manufacturers develop their production plans, produce goods on time, and improve delivery performance.

Increasing competition not only guides organizations to improve their internal operations (process control and inventory management) but also focuses on the integration of suppliers and customers in the entire processes of chain. Thus, suppliers' involvement in delivering value to customers causes competitive capabilities such as quality, delivery, flexibility and cost (Prajogo & Olhager, 2012). Logistics was defined as "process of scheduling" run and control the flow, storage of raw materials, inventory in manufacturing, final product and its related information at the minimum cost. According to this definition, the entire process of logistics, combine a large number of activities with suitable integration in order to implement the right to meet customer needs to reach smooth flow of operations through the chain and the most portion of profit for organization and customer (Valizade and Malaki rad, 2011).

The goal of logistics management is planning and coordinating all activities which are necessary to achieve desired levels of quality and customer service with the lowest possible cost. Logistics is thus a link between marketing and operational activities. Logistics working area within the organization start from supply and management of raw materials to delivery final product to market and customers. (Valizade & Malaki rad, 2011) Logistics integration decreases various problems such as bullwhip effect and gives the organizations and partners the opportunity to benefit from vertical integration (quality, reliability, planning and control and lower cost). Improved logistics integration between supply chain partners yields a number of operational benefits, including reduction in costs, lead time, and risks as well as improvement in sales, distribution, customer services, and service levels and customer satisfaction."(Stock et al, 2000). Most studies reported a positive relationship between logistics integration and performance. Some of these studies include: Romano (2003) suggested logistics processes play a key role for integration between organizations.

Prajogo & Olhager (2012) wrote improving the logistics integration is an important factor for achieving operational benefits such as reduced costs, delays, hazards, improved sales, distribution, customer service, service levels and customer satisfaction. Fox et al (1993) argued logistics is responsible for coordinating companies, suppliers, and distribution centers in order to achieve all possible outcomes and supply chain goals, including timely delivery, and minimizing costs ... logistics includes the flow of materials and goods from the supplier of raw material to consumer of finished goods. Frohlich and Westbrook (2001), found much wider range of integration, the relationship is stronger with improved performance. Sheu et al (2006) concluded that the higher participation levels leads to operational efficiency in the supply chain system. Li et al (2009) stated supply chain integration is significantly associated with supply chain performance.

RESEARCH METHODOLOGY

This study employed a descriptive research design. The study population were the employees of DHL Kenya Limited and the target population of this study included managers and staff of supply chain and logistics. A total of 70 respondents were targeted. The research instruments to be used in this study were the questionnaires. After data collection, the filled-in and returned questionnaires were edited for completeness, coded and entries made into Statistical package for social sciences (SPSS version 22). Correlation was used to analyze the degree of relationship between the variables in the study. Further, regression was used to obtain an equation which describes the dependent variable in terms of the independent variable based on the regression model.

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

Inferential Analysis

Inferential analysis is utilized in this study to determine if there is a relationship between an intervention and an outcome, as well as the strength of that relationship. The inferential statistics analysis aimed to reach conclusions that extend beyond the immediate data alone between the independent variables in this study. The study conducted inferential analysis to establish the relationship between the independent variables and the dependent variable of which involved a coefficient of determination and a multiple regression analysis. The independent variables in this study included internal integration, supplier integration, customer integration and logistics integration while the dependent variable was firm performance.

Correlation Analysis

The study conducted Spearman's rank correlation coefficient which is a non parametric test. This a technique used to test the direction and strength of the relationship between two variables. Spearman's rank correlation show whether any one set of numbers has an effect on another set of numbers. It uses the statistics Rs which falls between -1 and +1.

In reference to table 4.10, the correlation matrix indicates that internal integration was highly correlated with supplier integration (.902) and moderately with customer integration (.509). Supplier integration was also highly correlated customer integration (.800). The correlation was weak between customer integration and logistics integration. Firm performance was highly correlated to internal integration (.971), supplier integration (.960), logistics integration (.955), and customer integration (.862). The correlation matrix reaffirms the findings in the descriptive analysis that internal integration, supplier integration, logistics integration, and customer integration influence firm performance.

Table: Correlation Analysis

	Internal integration	Supplier integration	Customer integration	Logistics integration	Firm performance
Internal integration	1				
Supplier integration	0.902	1			
Customer integration	0.509	0.800	1		
Logistics integration	0.853	0.483	0.356	1	
Firm performance	0.971	0.960	0.862	0.955	1

*. Correlation is significant at the 0.05 level (1-tailed).

Multiple Regression Analysis

In addition, the researcher conducted a multiple regression analysis so as to determine the influence of supply chain integration on firm performance in Kenya. Multiple regression is a statistical technique that allows us to predict a score of one variable on the basis of their scores on several other variables. The main purpose of multiple regressions is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable.

Table : Multiple Regression Analysis

		Unstandardized		**Standardized**			
		Coefficients		**Coefficients**	**t**	**T-critical**	**Sig.**
		B	**Std. Error**	**Beta**		2.643	
	(Constant)	1.224	0.312		2.358	2.643	0.000
	Internal integration	0.217	0.1440	0.185	.776	2.643	0.0387
	Supplier integration	0.118	0.1264	0.089	.849	2.643	0.038
	Customer integration	0.299	0.0715	0.235	2.0936	2.643	0.044
	Logistics integration	0.272	0.0847	0.023	0.4069	2.643	0.046

NB: T-critical Value 2.643 (statistically significant if the t-value is less than 2.643: from table of T-values).

Independent Variable: Firm Performance

The researcher conducted a multiple regression analysis so as to determine the relationship between firm performance and the four independent variables.

The regression equation ($\mathbf{Y = _0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4}$) now becomes:

$$\mathbf{Y = 1.224 + 0.217\ X_1 + 0.118 X_2 + 0.299 X_3 + 0.272 X_4}$$

Whereby Y = Firm Performance

X1 = Internal Integration

X2 = Supplier Integration

X3 = Customer Integration

X4 = Logistics Integration

According to the regression equation established, taking all factors (internal integration, supplier integration, customer integration and logistics integration) constant at zero, firm performance realized would be 1.224. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in internal integration results to a 0.217 increase in firm performance. A unit increase in supplier integration will lead to a 0.118 increase in firm performance; a unit increase in customer integration will lead to a 0.299 increase in firm performance, whereas a unit increase in logistics integration will lead to a 0.272 increase in firm performance. These results infer that internal integration, supplier integration, customer integration and logistics integration affects firm performance.

Coefficient of Determination

The coefficient of determination is a measure of how well a statistical model is likely to predict future outcomes. The coefficient of determination, r^2 is the square of the sample correlation coefficient between outcomes and predicted values. As such it explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (firm performance) that is explained by all the four independent variables (internal integration, supplier integration, customer integration and logistics integration).

Table : Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.892 (a)	.796	.303	.125

Predictors: (Constant), internal integration, supplier integration, customer integration, logistics integration.

The four independent variables that were studied, explain only 79.6% of the firm performance as represented by the R^2. This therefore means the four independent variables only contribute about 79.6% to firm performance while other factors not studied in this research contribute 20.40% of firm performance. Therefore, further research should be conducted to investigate the other factors (20.40%) that influence firm performance.

Summary of Findings

Internal Integration

According to the analysis of the findings, the respondents indicated that different departments decide jointly about company objectives. It was also established that the firm holds joint

discussion to solve operational problems and has a well-functioning information management system covering different departments. Further analysis of the findings indicated that internal integration involve the operation of enterprises of various flow and business department, coordination and restructuring. It was also established that DHL had formulated long-term collaborative decision making, exchange daily inventory information and integrated data and information.

Supplier Integration

The second objective of the study sought to determine the influence of supplier integration on firm performance in Kenya. The respondents indicated that the firm works with suppliers to make production plans and participate in the sourcing decisions of our suppliers. Further findings showed that the suppliers are trustworthy and deal with problems that arise in the course of cooperation effectively. The respondents also indicated that most of the times, DHL share information with suppliers by using email/ fax and that the participation level of suppliers in logistics processes is satisfactory. Finally, the respondents indicated that DHL builds long-term relationship with suppliers rather than short-term contracts.

Customer Integration

Majority of the respondents indicated that DHL has cooperated with our customers for a long time and that customers provide us with sales forecast for products we transport for them. The respondents also indicated that customers share sales information with the firm through information management systems and that the firm share risks with our customers. It was also established that the respondents were of the opinion that customers are trustworthy hence DHL works together with customers to promote specific products. The respondents also agreed that the firm work with customers to make production plans.

Logistics Integration

The fourth objective of the study sought to evaluate the influence of logistics integration on firm performance. The respondents indicated that the firm informs trading partners in advance of changing needs and exchange information that helps in the establishment of business planning. Further analysis indicated that trading partners keep DHL Kenya fully informed about issues that affect its business. The respondents also reiterated that logistics integration enables a centralised approach of management across the extended value network and that inter-organisational logistic activities are closely coordinated in DHL. It was further established that logistics activities are well integrated with the logistics activities of suppliers, there is a seamless integration of logistics activities with key suppliers and logistics integration is characterized by excellent distribution, transportation and/or warehousing facilities. At DHL Kenya, the inbound and outbound distribution of goods with suppliers is well integrated, information and materials flow smoothly between our clients and there is a positive relationship between logistics integration and performance.

Conclusions

In light of the findings, the study concluded that internal integration coordinates internal operations and processes appropriately and brings them together as a consonant whole while the external integration is to establish close occasions based on cooperation with suppliers and customers. After all, with respect to these differences, the main objective of integration is to achieve mutually benefits for every component of supply chain. So, integration is examined based on the aspects of integration with suppliers, internal integration, logistics integration and integration with customers.

The study also concluded that supply chain integration provides an environment for the company so that it can benefit from its internal competencies, can be sponsored by key members of supply chain, and become competitive. It was also noted that trust and commitment between company, its suppliers, and its customers lead to integration between them and create a network that mutually benefits for all members. In other words, integration helps company and its partners to extend their competitive capabilities and achieve sustainable competitive advantage.

Recommendations

This study provides practitioners with key recommendations to enhance supply chain integration in an organization, as such recognizing internal, supplier and customer integration as a strategic tool for competitive advantage, since competition today is based on supply chain versus supply chain and not business versus business. Furthermore, researchers and practitioners can use a survey instrument and the model developed and tested in this study for understanding the nature of operational (internal, supplier, logistics and customer) integration factors and their impact on supply chain performance in the organizations.

From the discussions and conclusion in this chapter, the study recommends that to improve supply chain integration, the management should make sure that all the respective heads of departments have full and clear information on time to enhance easy decision making, using the latest model of software and hardware available in the market, training of staff, adopt real time solutions in ICT, increase external linkages with customers, update customers on supply requirement and there should be open and frequent feedback between supply chain and other functions within the business.

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