

Determinants of Strategic Supply Chain Management in Enhancing Organization Performance: A Study of Eldoret Water and Sanitation Company (ELDOWAS), Kenya

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Abstract: The purpose of the study was to investigate the determinants of strategic supply chain management in enhancing organization performance, a case of Eldoret Water and Sanitation Company. The target population consisted of all the managers and employees at ELDOWAS. The study adopted a descriptive survey research design, in which both stratified and simple random sampling techniques were utilized in selecting the participants for the study. This study used a sample of 60 employees and management representatives. Questionnaire, interview schedule and document analysis were used to collect data. Data was analyzed using descriptive statistical technique that included frequencies, percentages and means. Findings of the study found out that 53.3% of organisation performance was influenced by the four determinants studied in the research. Results on coefficient of variation showed that a unit change in supply chain infrastructure would affect organisation performance by $(0.14\beta_1)$, resource sharing $(0.062\beta_2)$, information flow $(0.457\beta_3)$ and organisation linkage $(0.215\beta_4)$. All the four determinants looked in this research were found to have positive influence; supply chain infrastructure $(r=0.505)$, resource sharing $(r=0.567)$, information flow $(r=0.705)$ and organisation linkage $(r=0.322)$ on organisation performance. The study recommends that ICT should be fully integrated and utilised in sharing information between the organisation and partner in the supply chain management, information systems and flow need to be enhanced to ensure that the suppliers and customers receive it on time.

Keywords: Determinants, Information flow, Infrastructure, Supply Chain Management & Resource sharing

I. INTRODUCTION

Efficient and effective SCM aimed to provide high quality products and excellent customer service and is a significant component in obtaining a competitive advantage (Fyness and Voss, 2002; Quesada, Gazo & Sanchez, 2012; Salazar, 2012). Supply chain management is advanced to contain strategic partnership arrangements with suppliers and service providers throughout the supply chain (Awino, 2002). Every action in the supply chain was important, and downfall at any action is it of strategy, documentation or performance negatively affects business objectives (Beamon, 1999). Majority of companies across the world acknowledge that a powerful and solid supply chain is one of the most crucial elements in attaining increased profitability and shareholder value (Christopher, 2005). Effective supply chain management has the ability to manage costs and enhance the compliance with company standards and key performance indicators (KPI).

The aim of SCM is to integrate both information and material flows seamlessly across the supply chain as an effective competitive weapon (Humphreys, Lu & Chan, 2004). The name was somewhat misleading as a supply chain was not a formal chain of businesses, but a network of businesses and relationships. Supply chain management is the integration of

key business processes from end-user through original suppliers that provides products, services, and information that add value for customers and other stakeholders (Moberg, Sphe & Treese, 2003). This view of SCM depicts a simplified supply chain network, the information and product flows, and the SCM processes that integrate functions within the company as well as other firms across the supply chain.

Highly challenging business environment, supply chain performance concerning strategic supply chain management plays a key role in overall company performance (Salazar, 2012). The nature of the competition is not between firms, but rather between entire supply chains (Christopher, 2005). Throughout the world, there is a challenge for to improve their supply chains. Effective development and management of the supply chain network cut the costs and enhance the customer value (Drucker, 1998). This is a sustainable source of competitive advantage in today's volatile global marketplace, where demand was difficult to estimate and supply chains required to be more flexible as a consequence (Christopher, 2005). As a public water company services provider in Eldoret town, Kenya, ELDOWAS also faces a number of challenges. This includes increased sewerage services, drillings, and maintenance, transportation, and distribution costs among others. The paper sought to determine the determinants of supply chain management that influence the performance of the water company.

Problem Statement

Evidence has shown that organizations seldom achieve the competitive advantage offered by supply chain management technique. This may be attributed to the fact that current methodologies for analyzing supply chains are not sufficiently comprehensive, particularly when it comes to understanding the complexities of SCM and organization performance in a unified context. In addition, researchers have not comprehensively answered key questions such as what are the linkages between different dimensions of SCM and what are the linkages between the underlying dimensions of SCM and SCM performance. Gap also exists in terms of understanding of the relationship between SCM performance measures and organizational performance measures. This is compounded by the fact that there is no evidence of a single study that been conducted to establish the determinants of supply chain management in water companies in Kenya. The study therefore sought to evaluate the determinants of strategic supply chain management in enhancing organization performance, a case study of Eldoret Water and Sanitation Company Eldoret.

Research Objectives

The general objective was to establish the determinants of strategic supply chain management in enhancing organization performance. The specific objectives were;

1. To determine how Supply chain infrastructure in supply chain management influence organizational performance
2. To examine the influence of resource sharing in supply chain management on organizational performance
3. To establish the influence of Information flow in supply chain management on organizational performance
4. To determine how organizational linkage in supply chain management influence organizational performance

II. REVIEW OF LITERATURE

Supply chain infrastructure is a critical component in the SCM process. According to Quesada, *et al.*, (2012), successful new products and services are critical for many organizations, since product development is one important way that firms can implement strategic intentions into real business operations. Developing products rapidly and moving them into the marketplace efficiently is important for long-term corporate success by organisations (Salazar, 2012). Whereas Handfield and Nichols (2002) estimates that in many markets, 40 percent or more of revenues come from products introduced in the prior year. Rogers (2004) opines that while the creation of successful products is a multidisciplinary process, product development and commercialization from a supply chain management perspective integrates both customers and suppliers into the process in order to reduce time to market.

The ability to reduce time to market is key to innovation success and profitability as well as the most critical objective of the process. This ensures that the product reach the intended users on time. Product development and commercialization is

the supply chain management process that provides structure for developing and bringing to market new products jointly with customers and suppliers (Rogers, Lambert, & Knemeyer, 2004). Effective implementation of SCM process not only enables management to coordinate the efficient flow of new products across the supply chain, but also assists supply chain members with the ramp-up of manufacturing, logistics, marketing and other related activities to support the commercialization of the product (Salazar, 2012). This process requires effective planning and execution throughout the supply chain, and if managed correctly should provide a competitive advantage. This research investigated whether supply chain infrastructure influence organisation competitive advantage.

SCM has been defined to explicitly recognize the strategic nature of coordination between trading partners and to explain the dual purpose of SCM to improve the performance of an individual organization, and to improve the performance of the whole supply chain (Salazar, 2012). The goal of SCM is to integrate both information and material flows seamlessly across the supply chain as an effective competitive weapon by organisations. The supplier relationship management process has both strategic and operational elements. Croxton, et al., (2001) divided the SCM process into two parts, the strategic process in which the firm establishes and strategically manages the process, and the operational process which is the actualization of the process once it has been established (Croxton *et al.*, 2001). At the strategic level, the supplier relationship management process provides the structure for how relationships with suppliers are managed. It is comprised of five sub-processes. The first strategic sub-process is to review corporate, marketing, manufacturing and sourcing strategies.

During this process the supplier relationship management team identifies supplier segments that are critical to the organization's success now and in the future (Quesada, *et al.*, 2012). By reviewing these strategies, management identifies the supplier types with whom the firm needs to develop long-term relationships. The second strategic sub-process is to identify criteria for segmenting suppliers. Supplier relationship management is often referred to in the literature as strategic supplier partnership. Moreover, Gunasekaran *et al.*, (2001) assert that a strategic partnership emphasizes long-term relationship between trading partners and promotes mutual planning and problem solving efforts. Strategic partnerships between organizations promote shared benefits and ongoing collaboration in key strategic areas like technology, products, and markets (Yoshino & Rangan, 1995).

In other works, Humphreys *et al.*, (2004) examined the role of supplier relationship management in the context of buyer-supplier performance from a buying firm's perspective using a survey of 142 electronic manufacturing companies in Hong Kong. Their results were that transaction-specific supplier development and its infrastructure factors; supplier development strategic goals, top management support of purchasing management, effective buyer-supplier communication, buyer's long-term commitment to the supplier, supplier evaluation, supplier strategic objectives, and trust in supplier which significantly correlated with the perceived buyer-supplier performance outcomes. Humphreys *et al.*, (2004) established that transaction-specific supplier development, supplier strategic objectives and trust significantly contributed to the prediction of supplier performance improvement.

Krause, Handfield, and Scannell (1998) conducted research to compare the supplier relationship management practices of manufacturing and service firms. They compared the two groups on the satisfaction derived from supplier relationship management efforts using performance goals comprising increased financial strength, supply base reduction, increased management capability, and improved technical capability; and performance goals which included quality, cost, delivery performance, and service/ responsiveness. Both groups placed moderate levels of importance for the strategic goals but rated performance goals much higher than strategic goals. According to Krause, et al., cited by Salazar (2012), the manufacturing firms placed more emphasis on quality than did the service firms, while service firms placed more emphasis on cost, delivery performance, and service/responsiveness than manufacturing firms. The only strategic goal that differentiated the two groups was financial strength where service firms placed a higher degree of importance on improving the financial strength of suppliers than did the manufacturing firms. The successful group had experienced a superior increase in supplier performance as a result of the supplier development compared to the less successful group. Specifically, the successful group experienced significantly higher improvements in incoming defects and percentage orders received complete; however, the two groups appeared to have experienced roughly the same increases in on-time delivery and order cycle time reduction (Salazar, 2012).

The product development and commercialization process has both strategic and operational elements where the strategic portion of the product development and commercialization process establishes a structure for developing a product and

moving it to market (Salazar, 2012). The operational portion is the realization of the process that has been established at the strategic level. Developing the strategic process is a necessary first step toward integrating or linking the firm with other members of the supply chain, and it is at the operational level that the day-to-day activities are executed (Rogers *et al.*, 2004; Salazar, 2012)). The objective of the strategic portion of the product development and commercialization process is to construct a formalized structure through which management executes the operational process (Lambert *et al.*, 2005).

III. RESEARCH METHODOLOGY

The study adopted a descriptive survey research design and was conducted at the Eldoret Water Supply Company. The design was considered appropriate, as it enabled the researcher to reach many subjects within limited time (Kothari, 2005). It aimed to give intense and detailed description of existing phenomenon with intent of employed data to justify and make plans that are more effective. The study targeted all the managers and employees at the ELDOWAS. ELDOWAS Management was organised in four departments. A total of 60 employees which constituted 30% of the total employees were selected using stratified and simple random sampling techniques. this study was conducted primarily through the use of questionnaires, document analysis and interviews schedules. The researcher-sought permission from the ELDOWAs to conduct and administer research instrument in their institution. Data collected was analysed using descriptive and inferential statistics.

IV. RESULTS

Employees' Perception of Organisation Performance

As the main dependent variable for the study, it was important that the study gets the response from employees regarding organisation performance based on the increase in stock levels (water), infrastructure expansion, cash flow increase, loans repayment, increase in customers connected to water and improvement in supply chain management strategies at the organisation. The responses made are given in Table 1.

Table 1 Employees' perception of organisation performance

	Disagree		Undecided		Agree	
	Freq	Percent	Freq	Percent	Freq	Percent
Overall strategies in supply chain management have improved over the past 3 years	0	0.0	3	5.0	57	95.0
The level of cash increased in the year 2013 up to date	6	10.0	6	10.0	48	80.0
ELDOWAS expanded on the infrastructure since 2013	9	15.0	6	10.0	45	75.0
Stock of ELDOWAS increased in the year 2013-2014	6	10.0	12	20.0	42	70.0
Loans acquired by ELDOWAS have decreased in the past five years	6	10.0	21	35.0	33	55.0
The number of customers of ELDOWAS increased in the past five years	3	5.0	36	60.0	21	35.0

On organisation performance, results show that majority 57 (95.0%) reported that ELDOWAS has improved supply chain management strategies in the past three years. Only 3 (5.0%) were undecided on the statement. The study findings also showed that majority 48 (80%) of employees agreed that the level of cash flow within the organisation has increased. This is because the management has resulted to automation of water billing and payment systems through adoption of current information technology. Three quarter 45 (75%) of respondents agreed that ELDOWAS has expanded infrastructure since 2013. The management representatives said that they have increased connection to Eldoret town environs to ensure that adequate water is supplied. The respondents also tended to agreed 42 (70%) with the statement that stock (water) of Eldowas has increased within the past one year. However, at least 33 (55.0%) of respondents agreed that loans acquired

by ELDOWAS have decreased in the past five years, 21 (.5%) were undecided while 6 (10.0%) disagreed with the statement. Lastly the respondents were undecided 36 (60.0%) on the statement that the number of customers has increased in the past five years, 21 (35.0%) agreed while 3 (5.0%) disagreed with the statement. This shows the main measurements for the dependent variable to be used in the current study.

Determinants of supply Chain Management in Enhancing Organisation Performance

To answer the main research question, the study regressed the four determinants of supply chain management on organisation performance. The probability level was set up at 0.05. The results of the analysis are given in Table 2 (a, b and c).

Table 2 (a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.751 ^a	.564	.533	.26481
a. Predictors: (Constant), Resource sharing, Organisation linkage, Supply chain infrastructure, Information flow				

The model summary table shows that 53.3% of the variation in organisation performance can be explained by the four determinants of supply chain management process at Eldowas. The ANOVA table testing the fitness of the regression equation is shown below.

Table 2 (b) ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.993	4	1.248	17.801	.000 ^a
	Residual	3.857	55	.070		
	Total	8.850	59			
a. Predictors: (Constant), Resource sharing, Organisation linkage, Supply chain infrastructure, Information flow						
b. Dependent Variable: Organisation performance						

The ANOVA results shows that at $\alpha=0.05$ level of significance, there exist enough evidence to conclude that at least one of the predictors is useful for predicting Eldowas performance therefore making the model to be useful. The coefficients of correlations for the independent variables are illustrated in Table 2 (c).

Table 2 (c) Coefficients^a of correlation for the independent variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.497	.471		1.056	.296	-.446	1.440
	Supply chain infrastructure	.140	.099	.174	1.408	.165	-.059	.339
	Resource sharing	.062	.096	.086	.642	.524	-.131	.255
	Information flow	.457	.111	.509	4.122	.000	.235	.679
	Organisation linkage	.215	.093	.215	2.302	.025	.028	.402
a. Dependent Variable: Organisation performance								

Findings shows that at $\alpha=0.05$ level of significance, there exist enough evidence to conclude that the slope of the independent variable is not zero hence the independent variables are predictors of organisation performance at Eldowas. The equation is presented as:

$$y = 0.497 + 0.14\beta_1 + 0.062\beta_2 + 0.457\beta_3 + 0.215\beta_4 + e$$

Moreover, when other variables are kept constant, single unit increase in supply chain infrastructure, organisation performance decreases by 0.446 but increases by 1.440. In addition when a single unit increase in information flow in supply chain management, organisation performance increases by 0.235 and 0.679. The t – values (t=4.122) of information flow is higher than that of organisation linkage (t=2.302), supply chain infrastructure (t=1.408) and resource sharing (t=0.642). However, the four variables that were being investigated are important determinants in supply chain management towards improving organisation performance.

V. CONCLUSIONS

The study members reported that supply chain management process is critical to ensure their organisation performance improved. Multiple regression results showed that the degree of correlation between the determinants of supply chain management towards organisation performance was 53.3% suggesting that organisation performance at Eldowas was accounted by the four independent predictors studied, the rest 46.7 could explained by other confounding factors that were not considered in the current study. In literature, SCM practices, mostly, have been linked directly to organizational performance. The study learned that including streamlining and making highly visible all information flow throughout the chain, is the key to an integrated and effective supply chain that would improve organisation performance. Linkages help build good relationship between the employers and customers. Investment in ICT infrastructure was also found to be a key component that would ensure effective supply chain management process. The study found out that supplier partnership can improve supplier performance, reduce time to market and increase the level of customer responsiveness and satisfaction. Information sharing leads to high levels of supply chain integration by enabling the company to make dependable delivery and introduce products to the market quickly. The study concludes that supply chain infrastructure, resource distribution, information flow and organisation linkage in supply chain management are key predictors of organisation performance.

RECOMMENDATIONS

The study makes the following recommendations;

- (i) To improve on supply chain infrastructure, organisation needs to ensure full integration of ICT in all of its processed to reduce wastage of time and resources when using the conventional methods.
- (ii) Close organisation, supplier and customer relationship should be promoted to ensure that harmonious working and exchange of information is evident
- (iii) There is need for organisations to ensure that information flow should be improved since IT seems to be centralised, for ease of communication information flow. In addition, decision making need to be delegated downwards to improve customer relationship and service delivery
- (iv) There is need for organisations to ensure that organisation linkages with suppliers are genuine and effective to ensure a win-win situation for all respondents

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