

Effect of Supply Chain Disruptions Management on Procurement Performance in Secondary Schools in Kenya

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ABSTRACT

Supply Chain Disruption Management is a structured and continuous process employed in analyzing the impact of disruptions across the supply chain functions on predefined objectives and in line with their entire operational lifecycle. Information on supply process and Supply Chain Disruption Management would help institutions in making efficient procurement decisions, while lack of it may hamper institutional procurement efficiency. There exists limited information on how the management of supply chain disruptions contributes to procurement performance in public Schools in Kenya. This paper purposed to determine the effect of supply chain disruption management on procurement performance of public secondary schools in Kenya, focusing on Rachuonyo North District; seeking to establish effect of disruption assessment, determining effect of disruption monitoring and investigating effect of disruption mitigation on procurement performance in secondary schools, on a sample size of 179 from a target population of 405 respondents; and using Spearman's correlation coefficient in analysis, the study revealed significant positive correlation between supply chain disruption assessment and procurement performance, $r_s = .885, n = 197, p < 0.01$, two tails; significant positive correlation between supply chain disruption monitoring and procurement performance, $r_s = .995, n = 197, p < 0.01$, two tails, and a significant positive correlation between supply chain disruption mitigation and procurement performance, $r_s = .973, n = 197, p < 0.01$, two tails. These results demonstrate that institutions disruptions assessment, monitoring and mitigation mechanisms are significant in explaining procurement performance functions and trends. Institutions should therefore invest in designing and selecting sufficient tools, applying relevant skills and mitigation mechanism to maintain high procurement performance.

Key Words: Supply Chain Disruption, Procurement Performance

1. Introduction

Procurement performance is the aggregate outcome of the entire procurement process functions; which are carried out with a view to improving instrument and financial value to a given organisation [1]. Kawesi and Nyeko however define Procurement performance as procurement based efficiencies and effectiveness that enables a firm to realise improved operational performance [2]. [3] while appreciating that Procurement excellence is increasingly becoming an important factor in delivering efficient operations within successful companies or organisations, explains that adequate measurement of procurement success is a big issue, as bottom-up reported savings can significantly deviate from the key financial figures, when rated on value-to-the firm basis. Secondary schools being educational institutions where the second stage of the three-stage schooling periods takes place, follow elementary or primary education, and is sometimes followed by university (tertiary) education. These institutions are managed on resource based performance contractual arrangements that require effective procurement process. Other scholars state that Procurement activities strive to critically determine resource needs, source for and obtain supplies, avail supplies into the organization, and evaluate the status of supplies as a current asset; functions all of which meet Secondary school operations. The intermediary role between foundational and professional skills' acquisition levels require articulate sourcing and supplying chain management in these education institutions [4]. While appreciating the role of procurement performance to the overall performance of an organization through cost savings, improved quality and reduced lead times which leads to internal customer satisfaction, [5] allude to the fact that the performance is dependent upon continuity in the supply chain operations; which facilitates access to the requisite resources for use in the organisation. This implies that procurement is only complete if the procured products are made available. Therefore despite the clarity and compliance to the provisions of the PPOA Act, and the fact that all Secondary in one way or the other suffer supply chain disruptions, the

veracity of these disruptions to procurement performance has not been established. Supply Chain disruption resulting from intense competition from ever diminishing resources and increased government involvement on economic activities, require that purchasing performance of the organizations must be monitored against all the possible factors that may lead to disruptions

2. Statement of the research problem.

Whereas available scholarly works have strived to establish effect of supply disruptions in institutions, including in secondary education system, this has been done in a manner that compromises education performance and quality. There is however limited information on how the disruptions management affects procurement performance in such Schools systems. The Education sector throughout the world and specifically in Kenya has experienced significant changes requiring infrastructural and capital asset realignment to achieve Knowledge creation and dissemination as is core to their functions. When changes in the curriculum are effected, the ministry of education does not always ensure that resource managing teachers are adequately trained on the changes prior to implementation; and schools are also not adequately supported to procure required textbooks. This is a failure in procurement of service and materials which can end up affecting procurement performance of such schools. When schools are cannot to pay creditors, the creditors are unable to deliver supplies in time, this may also strain supply relationships.

2.1. Literature Review

It has been established that managers in new economies cannot rely any more on outdated “tried-and-true” approaches, but instead adopt new mindsets and strategies, presupposes that better understanding of supply chain disruptions management and their effects on the procurement performance; including schools and other stakeholders to know how to manage uncertainties and build reliable School supply chains [6]. Following the historical challenges surrounding public procurement such as inefficiency, corruption and disregard of fundamental "value for money" considerations, the current Act endeavours to enforce compliance and adherence, in enhancing established processes, procedures and regulations. [7]On the procurement reforms and expenditure management in public secondary schools in Kenya, established that advertising tenders and number of committee members trained in procurement had strong positive effects on expenditure efficiency. However, it has been established that PPDA has improved the competitiveness of the procurement processes among parastatals and other government institutions. Where several schools suffer from the same disruption, those that are prepared will recover faster from hardship and may take market shares from their competitors; being schools and organizations in need of the same supplies [8].

Supply chain management as a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide costs while satisfying service level requirements, takes into consideration every facility that has an impact on cost and plays a role in making the product conform to customer requirements. Indeed, in some supply chain analysis, it is necessary to account for the suppliers' suppliers and the customers' customers because they have an impact on supply chain performance [9]. Satish explains that supply chain management is to be efficient and cost-effective across the entire system; total system-wide costs, from transportation and distribution to inventories of raw materials, work in process, and finished goods, are to be minimized [10]. Thus, the emphasis is not on simply minimizing transportation cost or reducing inventories but, rather, on taking a systems approach to supply chain management. He further states that, because supply chain management revolves around efficient integration of suppliers, manufacturers, warehouses, and stores, it encompasses the firm's activities at many levels, from the strategic level through the tactical to the operational level

In his study on the challenges and opportunities in promoting science subjects choices for secondary schools students in Tanzania revealed poor quality of science classroom teaching and a serious decline in interest of students in science subjects. Nkuba concluded that, teacher-students interaction and relationship in classroom teaching and learning of science need improvement. A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers [11]. Undisrupted supply chains register good performance in procurement; they have good supplier relationships, supply of goods or services is on time, in the right quantity and with the required quality [12]. Supply Chain Disruption is an event that might happen in any part of the chain and causes undesired impacts on its (achievement of) objectives and performance. Scholars have looked at the effect of these supply disruptions on secondary education in a manner that compromises education performance and quality. However, there is limited information on how the disruptions management affects procurement performance in such Schools. But he failed to recognise that teacher supply (human capital supply) could also contribute to the poor quality on the subject classroom teaching and learning. In a study of challenges facing head teachers in the implementation of a new syllabus it was found out that rapid Changes in an existing syllabus require that schools and parents purchase

new textbooks and other instructional material, this require that schools keep changing teaching and learning resources, as well as teaching and evaluation methodologies. When changes in the curriculum are effected, the ministry of education does not ensure that teachers are adequately trained on the changes prior to implementation and schools are not adequately supported to procure required textbooks [13]. This was viewd as a disruption that affects syllabus implementation but fail to recognise that this is a failure in procurement of service and materials which can end up affecting procurement performance of such schools. It is against this background that this research will find out how supply chain disruption management affects procurement performance of public secondary schools in Rachuonyo North District, Kenya. Supply Chain Disruption Management is a structured and continuous process to analyze the impact of disruptions across the supply chain on predefined objectives and to handle them in their entire lifecycle;the process of which involves disruption assessment, mitigation and monitoring.

A Supply Chain Disruption is an event that might happen in any part of the chain and cause undesired impacts on its (achievement of) objectives and performance. As a corollary, if an event has no adverse effect on the achievement of the objectives, it is not regarded as a disruption. This emphasis on the impact on the objectives is essential as it helps better justify the investment of resources for managing disruptions [14]. Firms are more dependent upon their supply chains networks to deliver value, which makes supply chain performance more strategic and competitive issue, as it directly affects a firm's ability to generate revenue, manage cost, improve asset productivity, and enhance customer satisfaction; notwithstanding the fact that in recent years, the chain processes have become more vulnerable to disruptions. While some of this vulnerability has been due to major one-time events such as 9/11/2001 terrorist attack on world trade centre, the west-coast port strike in 2002, the 2003 Northeast blackout, and other acts of nature, many of the recent supply chain disruptions have been due to the inability of firms to better manage and control their internal as well external supply chain networks[15].Sources of supply chain disruptions include operational contingencies such as equipment mal-functions systemic failures and abrupt discontinuity of supply [16]. This implies that un-profitable suppliers are a greater risk particularly when there are no alternative sources resulting in to increased uncertainty of labour skills and a reduction of management talent in many organizations. The consequential susceptibility of the supply chain is a harmful situation is of significant which[17]refers to "an exposure to serious disturbance"; but which [18] describes as "susceptibility or predisposition to loss because of existing organizational or functional practices or conditions".

Risk assessment being the determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat (also called hazard) includes,risk identification, risk analysis, risk estimation, risk evaluation, risk reporting, risk mitigation and risk monitoring (www.education.nt.gov.au,25th,may 2013). In addition to world political events, there are several conditions that create risks in a supply chain. These include product availability [19], distance from source [20], industry capacity [21],changes in technology [22], and labor markets and management turnover [23]; including financial instability [16]. While a supply chain disruption is the situation that leads to the occurrence of risk, it is not the sole determinant of the final result. It seems consequential that also the susceptibility of the supply chain to the harm of this situation is of significant relevance. This leads to the concept of supply chain vulnerability. In other way, [17] define supply chain vulnerability as "an exposure to serious disturbance", while [18] describe vulnerability as "a susceptibility or predisposition to loss because of existing organizational or functional practices or conditions".

Procurement being the acquisition by purchase, rental, hire purchase, license, tenancy, franchise, or by any other contractual means of any type of works, assets, services or goods including livestock or any combination, is a process that is risk inherent and requires systems control [24]. It includes all activities required in order to obtain the product from the supplier and get it to the place where it is actually needed; which encompasses the purchasing function, stores, traffic and transportation, incoming inspection and quality control and assurance [25]. It developed from the need of organizations to acquire those goods and services that they could not produce but needed in their operations. Initially, the focus of contracting was typically on minimizing costs to the procurement entity rather than on delivering specific service quality outcomes. With time procurement has evolved to include new aspects like strategic sourcing, e-procurement and performance-based service contracting. In seeking to outsource for goods and services, good practice and business efficacy demand that the purchaser wants to find a supplier who will be both reliable and will provide products or services that are good value for money [26] Good value for money does not simply mean the cheapest but will include a variety of other factors such as quality, compliance with tendering criteria and after-sale service. This study however employed a descriptive research design, but did non discount for its data in-depth analysis weaknesses[27].

3. Research Methodology

Using descriptive and simple regression method, and obtaining time series data from a sample size of 197 respondents drawn from a population of 405 potential respondents consisting of the Principals, Deputy Principals, Senior masters and Head of Departments; all of whom constitute the Procurement committee; and employing opinion based Likert 5 scale self-administered questionnaire from the following sampling constructs, where

The population is of size N= 405. Sample size will be determined using the formula;

$$n = \frac{z^2 N \sigma^2}{[(N-1)e^2] + [Z^2 \sigma^2]}$$

Where; *n* =sample size required

N =total population (405)

σ =standard deviation of population (0.50) (1)

e=standard error term (0.05)

z =value of standard deviation at the required confidence level. At 95% confidence level *z* =1.96. Kothari (2004)

$$n = \frac{(1.96)^2(405)(0.5)^2}{[(405-1)(0.05)^2] + [(1.96)^2(0.50)^2]} \quad (2)$$

n=197,

it ensured respondents freedom to express their views, opinions and suggestions. Questionnaires provide anonymity that also helped in producing more candid answers and yields quantitative data that is easy to collect and analyze, consistent to dimensions of the study objectives.

4.Results and discussions

The study sought to establish the effect of supply chain disruption management on procurement performance.

TABLE4.1: correlation matrix showing research variables

			1	2	3	4
Spearman's rho	1. supply chain disruption assessment	Correlation Coefficient	1.000	.880**	.886**	.885**
		Sig. (2-tailed)	.	.000	.000	.000
		N	197	197	197	197
	2. supply chain disruption monitoring	Correlation Coefficient	.880**	1.000	.968**	.995**
		Sig. (2-tailed)	.000	.	.000	.000
		N	197	197	197	197
	3. supply chain mitigation	Correlation Coefficient	.886**	.968**	1.000	.973**
		Sig. (2-tailed)	.000	.000	.	.000
		N	197	197	197	197
	4. procurement performance	Correlation Coefficient	.885**	.995**	.973**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	197	197	197	197

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Research data, (2015)

The matrix above revealed that there was a significant positive correlation between supply chain disruption assessment and procurement performance, thus a correlation coefficient of: $r_s = .885$, $n = 197$, $p < 0.01$, two tails. This statistic shows that with an increase in supply chain assessment levels, procurement performance would also increase proportionately. The study found that majority of the respondents, 60.91% indicted that supply chain disruption assessment was done in their schools by a great extent. These findings show that majority of the schools did supply chain disruption assessment by a great extent cumulatively. The study also revealed that there was a significant positive correlation between supply chain disruption assessment and procurement performance, thus a correlation coefficient of:

$r_s = .885$, $n = 197$, $p < 0.01$, two tails. This statistic indicates that with an increase in supply chain assessment levels, procurement performance would also increase proportionately. This is in agreement with [28] whose study on supply risks management shows that both agility and robustness are important in improving supply performance. It is also in agreement with [29] whose study on Supply risk management: model development and empirical analysis shows that Superior risk identification supports the subsequent risk assessment and this in turn leads to better risk mitigation. The model explains 46 percent of the variance observed in risk performance.

4.1. Correlation matrix on the relationship between supply chain disruption monitoring and procurement performance in secondary schools

From the study a significant positive correlation was identified between supply chain disruption monitoring and procurement performance, hence improvement of performance standards was envisaged.

TABLE 4.2: correlation matrix showing research variables

			1	2	3	4
Spearman's rho	1. supply chain disruption assessment	Correlation Coefficient	1.000	.880**	.886**	.885**
		Sig. (2-tailed)	.	.000	.000	.000
		N	197	197	197	197
	2. supply chain disruption monitoring	Correlation Coefficient	.880**	1.000	.968**	.995**
		Sig. (2-tailed)	.000	.	.000	.000
		N	197	197	197	197
	3. supply chain mitigation	Correlation Coefficient	.886**	.968**	1.000	.973**
		Sig. (2-tailed)	.000	.000	.	.000
		N	197	197	197	197
	4. procurement performance	Correlation Coefficient	.885**	.995**	.973**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	197	197	197	197

** . Correlation is significant at the 0.01 level (2-tailed).

Source: research data, (2013)

From Table 4.2, there is significant positive correlation between supply chain disruption monitoring and procurement performance, with $r_s = .995$, $n = 197$, $p < 0.01$, two tails. This indicates that an increase in the level of supply chain disruption monitoring would result in proportionate increase in the level of procurement performance. From the study, majority of the respondents (65.48%) indicated that there was a moderate extent of supply chain disruption monitoring in their schools, these findings showed that most respondent's schools practice supply chain monitoring to a moderate extent, the study also revealed a significant positive correlation between supply chain disruption monitoring and procurement performance, thus: $r_s = .995$, $n = 197$, $p < 0.01$, two tails. This indicates that an increase in the level of supply chain disruption monitoring would result in proportionate increase in the level of procurement performance. Disruption monitoring is therefore a way in which schools can develop agile and robust supply chain as proposed in the empirical study by [27], Dealing with supply chain risks: Linking risk management practices and strategies to performance, which found that found that SCRM is important for agility and robustness of a company.

4.2. Correlation matrix on supply chain disruption mitigation and procurement performance in secondary schools.

From the study a significant positive correlation was identified between supply chain disruption mitigation and procurement performance, hence improvement of performance standards was envisaged.

TABLE4.3: correlation matrix showing research variables

			1	2	3	4	
Spearman's rho	1.	supply chain disruption assessment	Correlation Coefficient	1.000	.880**	.886**	.885**
			Sig. (2-tailed)	.	.000	.000	.000
			N	197	197	197	197
	2.	supply chain disruption monitoring	Correlation Coefficient	.880**	1.000	.968**	.995**
			Sig. (2-tailed)	.000	.	.000	.000
			N	197	197	197	197
	3.	supply chain mitigation	Correlation Coefficient	.886**	.968**	1.000	.973**
			Sig. (2-tailed)	.000	.000	.	.000
			N	197	197	197	197
	4.	procurement performance	Correlation Coefficient	.885**	.995**	.973**	1.000
			Sig. (2-tailed)	.000	.000	.000	.
			N	197	197	197	197

** . Correlation is significant at the 0.01 level (2-tailed).

Source: research data, (2013)

From Table 4.3 it evident that there is significant positive correlation between supply chain disruption mitigation and procurement performance, thus: $r_s = .973, n = 197, p < 0.01$, two tails. These findings indicate that there was a proportionate increase in the level of performance as a result of an increase in the level of supply chain disruption mitigation in sampled secondary schools.

4.3. Conclusion and Recommendations

There is significant positive correlation between supply chain disruption assessment and procurement performance, whereas most schools practice supply chain monitoring to a moderate extent. The study has established a significant positive correlation between supply chain disruption monitoring and procurement performance. Therefore the study recommends an increase in the level of supply chain disruption mitigation in order to improve on the procurement performance in secondary schools. Majority of the respondents indicated that the procurement performance level in schools were moderate, the study recommends the adoption of supply chain disruption management techniques in order to improve on the procurement performance.

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