Effect of Reverse Logistics on Procurement Performance Among State Corporations In Kenya (A Case of Kenya Medical Supplies Authority-KEMSA).

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Abstract: *The general objective of the study was to determine effects of reverse logistics on procurement performance among state corporations in Kenya. Public procurement is subjected to dynamic changes and trends of the market and interests because of growing government expenditure and funding from development partners. Cost effective management of the procurement process can significantly influence the growth and development of the Kenyan economy. The study was guided by the following research objectives: to determine the effect of third party logistics; to establish the effect of information management; to assess the effect of lean agile manufacturing; and to evaluate the effect on waste management in procurement performance in Kenya. A sample of 150 respondents were employed using stratified random sampling techniques based on strata in the management level. Completed questionnaires were edited for completeness and consistency, checked for errors and omissions and then coded and analyzed qualitatively and quantitatively. Multiple Linear Regression Analysis was used to determine the relationship between the variables and the procurement performance of state corporations in Kenya. The coefficient of determination (R-Square) resulting from the linear regression was used to determine the goodness fit of the model. The result was that there was significant relationship between third party logistics, lean agile manufacturing and procurement performance.*
Keywords: *Reverse logistics, procurement performance*

I. Introduction

Public procurement is an important function of governments for several reasons; the sheer magnitude of procurement outlays has a great impact on the economy and needs to be well managed. Indeed, in all countries in the world, estimates of the financial activities of government procurement are believed to be in the order of 10% –30 % of GNP (Callender & Mathews, 2010).Procurement in the Kenyan public sector plays a major role in the utilization of government resources and achievement of the economic development agenda. Cost effective management of the procurement process can significantly influence the growth and development of the Kenyan economy Mburu et al (2013). Therefore, increasing the effectiveness, efficiency and transparency of public procurement systems has become an ongoing concern of governments and of the international development community (OECD, 2006). Measuring performance is a graceful way of calling an organization to account and in public sector performance measurement, accountability is the central concern (Heinrich, 2007)

Reverse logistics encompasses the logistics management skills and activities for reducing, managing and disposing of wastes companies using reverse logistics consider: adaptation of their supply chains to maximize the usage of recycled products and materials from different sources, establishment of recycling, reusing, remanufacturing programmes for wastes reduction, development of reverse capabilities for taking back products from customers and usage of third parties services (Rodgers et al., 2012)

1.2 Statement of the Problem

Despite efforts by the governments of developing countries, like Kenya and development partners like World Bank to improve performance of the procurement function, public procurement is still marred by shoddy works, poor quality goods and services (David, 2012). This has led public procurement performance declining at an alarming rate resulting to a decrease in global GDP to up to 14% (WB, 2013). The efficiency and effectiveness of the public procurement in Kenya had not been realized until the creation and enactment of the Public Procurement and Disposal Act of 2005. The adoption of the public procurement regulations that followed

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forthwith gave room for the improved realization of the attainment of five rights of purchasing that has promoted mutual coexistence between the procuring entity and suppliers as well (Mentzer & Flint, 2007).

Manufacturer's product normally moves through the supply chain network to reach the distributor or customer. Any process or management after the sale of the product involves reverse logistics. If the product is defective, the customer would return the product (David, 2012). A survey by Synovate argued that poor performance as a result of lack of logistics efforts will continue to be witnessed among state corporations. Dunn and Bradstreet Barometer of Global reverse logistics (2000) reports that between 20% and 25% of all logistics relationships fail in any two-year period and half of the relationships will fail within five years due to lack of adequate strategy leading to low procurement performance.

Locally, a study by Pollock (2010), focused on improving their forward logistics activities; most have not treated the reverse logistics process with the same care and diligence afforded to traditional areas of logistics. Achieng (2011) indicated that most manufacturing and supply firms in Kenya often focus on forward logistics and as a result, they tend to overlook the importance of reverse logistics' activities and its potential of improving the firm's supply chain's performance. Recently reverse logistics has received increasing attention from both the academic world and Industries because of competition and marketing motives, direct economic motives and environmental concerns, as well as strategic and managerial implications. From the above studies, it is clear that there have been several researches conducted on reverse logistics and public procurement performance. This study therefore attempts to determine the effect of reverse logistics on public procurement performance in Kenya Medical Supplies Authority.

1.3 Research Objectives
1. To determine the influence of third party logistics on procurement performance among state corporations in Kenya.
2. To assess influence of lean agile manufacturing in procurement performance among state corporations in Kenya

1.4 Research hypothesis
H_{01}: Third party logistics has no significant influences on procurement performance among state corporations in Kenya.
H_{02}: Lean agile manufacturing has no significant influences on procurement performance among state corporations in Kenya.

II. Literature Review
This study analyzed the effect of reverse logistics on procurement performance among state corporations inKenya.

2.1 Theoretical Review
2.1.1 *Agency Theory - Third Party Logistics*
Agency theory that states that, an agency relationship is a contract under which one or more persons (principals) engages another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent. When executing the tasks within the principal-agent relationship, the agent must choose actions that have consequences for both the principal and the agent. Since these outcomes can be either negative or positive for each of the actors, the chosen action of the agent affects the welfare of both. The principal-agent relationship is often forged because the agent possesses a greater abundance of the needed skills, abilities, and/or time to perform the desired activities (Marshall, 2011).

2.1.2 *Transaction Cost Economics (TCE) Theory –Lean Agile Manufacturing*
This theory views firms as organizations comprising of people with different views and objectives. It assumes that the firm has outgrown to the extent that it substitutes for the market in determining the allocation of resources. This means the organization and structure of the firm determine price and production, with the unit of analysis being the transaction. The theory suggests that managers are opportunists and arrange firms' transactions to their interest (Williamson, 1996).

The main body of existing empirical work does not specifically or directly calculate transaction costs, but uses statistical methods in order to obtain the answers to their research questions. Such indirect operationalization methods define transaction costs or the research question directly as dependent variable. They define transaction dimensions, or even other sub-categories of them, as independent. All of these direct and indirect calculations of transaction costs are of ex post character, which represents another point of critique of TCE (Dyer, 1996).

2.1.3 Resource Based View-Waste management

The Resource-based View (RBV) is considered as one of the most influential theories in procurement management. The term ''resource'' is broad in nature, in that it refers to not only physical (tangible) assets, such as equipment, plants, and location, but also to intangible assets, such as management skill, knowledge, and organizational assets (Wiendahi, 2009). Resource based theory views the firm as a bundle of idiosyncratic resources and assets, which emphasizes the use of rate, valuable, in-imitable and un-substitutable resources to gain sustainable competitive advantage. Sehgal (2010) noted that resource-based view investigates the importance of internal resources in determining firm actions to create and maintain a competitive advantage and improve performance. However, only possessing such resources does not guarantee the development of competitive advantage or the creation of value. To obtain superior performance, firms must effectively manage, allocate, and exploit resources (Garver & Mentzer, 2009). More specifically, firms that are able to correctly match resources to specific programs and events or to environmental opportunities are more likely to develop capabilities that result in better performance (Sehgal, 2010).

2.2 Conceptual Framework

A conceptual framework explores the relationship between independent variables, moderating and dependent variables. The conceptual framework for this study show the relationship reverse logistics on procurement performance among state corporations in Kenya. The variables in the conceptual framework are originated from the theories and the models in the theoretical framework.
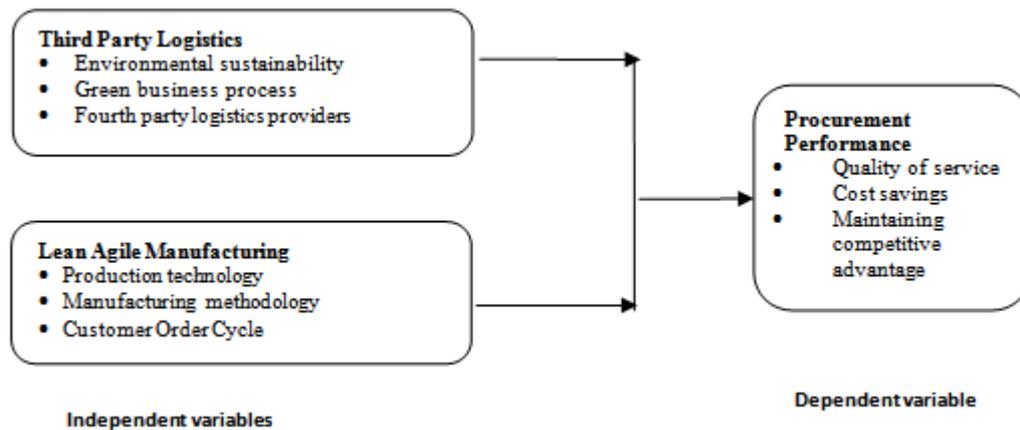

Figure 1: Conceptual Framework

2.2.1 Procurement performance

Measuring performance of government draws a considerable amount of attention from professional associations, scholars and practitioners (Holzer & Kloby, 2005). Traditionally, performance measurement has involved management accountants with budgetary control and the development of purely financial indicators such as return on investment (Chenhall, 2007). However, in today's work environment, there are increasing trends of relying on non–financial measures to assess the performance of organizations. Performance measurement has now gone beyond input and process into other sensitive areas. Politt & Bouckaert (2014) considered the shift of measurement systems beyond input and process into the more politically and methodologically sensitive area of assessing effectiveness as 'difficult and controversial'. According to Beamon(2009), supply chain performance (including public procurement) can be measured based on cost measures, costs and activity measures, cost and customer responsiveness measures, customer responsiveness measures and flexibility. From another context, Chan et al (2013) argued that there is still a lack of integration between the existing performance measurement methods and practical requirements for supply chain management.

2.2.2 Third party logistics

A third-party logistics provider (abbreviated 3PL, or sometimes TPL) is a firm that provides service to its customers of outsourced (or "Third Party") logistics services for part, or all of their supply chain management functions (Mburu et al., 2013). According to the Council of Supply Chain Management Professionals, 3PL is defined as "a firm that provides multiple logistics services for use by customers.Third party logistics providers typically specialize in integrated operation (Mburu et al., 2013), warehousing and transportation services that can be scaled and customized to customers' needs based on

market conditions, such as the demands and delivery service requirements for their products and materials (Guide & Van Wassenhove, 2013). Often, these services go beyond logistics and include value-added services related to the production or procurement of goods, services that integrate parts of the supply chain. When this integration occurs, the provider is then called a third-party supply chain management provider (3PSCM) or supply chain management service provider (SCMSP). 3PL targets a particular function in supply management, such as warehousing, transportation, or raw material provision.

2.2.3 Lean Agile manufacturing
Lean agile manufacturing refer to modern advances in production technology and manufacturing methodology that have led to reduced costs, quicker response time and improved customer service in manufacturing companies (Phelan, 2009). "Lean" and "agile" refer to two distinct concepts, but they share certain similarities. Deciding whether to design your processes to be lean, agile or both is an important first step in planning for a manufacturing business. Lean and agile processes each provide distinct benefits, which can be strengthened when the two methodologies combine. Lean manufacturing increases cash on hand by trimming expenses, while agile manufacturing increases revenue by being ready to serve a range of unexpected demands (Stank, Crum & Arango, 2009). Both concepts are also directly focused on competitiveness, which is a constant concern in the global markets in which manufacturers compete. Lean manufacturing allows companies the flexibility to reduce prices or use price promotions to attract new business, while agile manufacturing allows them to maximize the number of sales opportunities.

2.3 Empirical Review
Discussions on effect of reverse logistics on procurement performance havebeen done by various authors. Raja et al (2010) did a survey of the Uganda Third Party Logistics Systems for Public Health Commodities. The study focused on family planning commodities 2PL and 3PL logistics. The report came up with numerous findings that were used to give recommendations. The study adopted a descriptive survey design. Primary data was collected using questionnaires targeting managers in Finance, Procurement, Production and Sales and Marketing departments in each enterprise. The study established that Public health commodities reach the customer through several separate logistics systems. Some aspects of the logistics system in the MOH are integrated while others are managed separately. Systematic integration of the supply chains could result in cost and time-savings and improve product availability and efficiency at the service delivery level.

Kibet (2014), the study sought to determine the lean agile manufacturing and supply chain performance of supermarkets in Nairobi, Kenya. The study adopted a descriptive survey research design and the target population for the study was all supermarkets in Nairobi, Kenya. The research used questioner to gather information and the findings reveal to a great extent that; the supermarket has built long term relationship aimed at improving supply chain performance and has built long term relationship between its suppliers to improve its strategic and operational capacity and to enhance its value addition. The supermarkets have become more competitive, flexible and efficient with regard to procurement practices. The findings reveals that there has been growth in customer satisfaction and retention, improved quality, increased productivity, organization effectiveness, and improved customer's quality of life for the years 2009-2013. The study concludes that Strategic Supplier Partnership and Information technology adoption influence supply chain

III. Research methodology
To investigate the influence of reverse logistics on procurement performance in State Corporation in Kenya, a combination of exploratory, descriptive and causal method of researches was used. In the research, explanatory method provided the researcher with the flexibility to explore different aspects of reverse logistics in relation to procurement performance. Descriptive research assisted in investigating specific areas of the study that needs response to who, what, when, where, why, and how of the research. Causal research helped to probe the correlation between the study variables. The target population of this study were 240 employees in Kenya Medical Supplies Authority, as at 31st May 2016. A sample of 150 respondents were picked using stratified random sampling techniques based on strata in the management level. Given the target population, the researcher used a formula to calculate the sample size to be 150 as proposed by Cooper and Schindler (2003). The researcher adopted stratified random sampling technique to select the respondents. This research employed both qualitative and quantitative methods in order to strengthen the validity of data and to uphold survey findings (Cooper & Schindler, 2003). Questionnaires that had both open and close items were administered to various employees at different levels of management collect data with a response rate of 93.5 %. Statistical package for Social Science (SPSS) version 21.0 for Windows 7 was used to analyze data. Whereas quantitative data was analyzed with inferential statistics, qualitative data was analyzed using categorization.

IV. Data Analysis and Results

In evaluating the survey constructs, reliability test was doneto examine the degree to which individual items used in a construct are consistent with their measures(Nunnally, 1978). The study employed Cronbach's coefficient alpha to assess internal consistency; reliability of 0.70 is normally acceptable in basic research(Bryman & Cramer, 1997). All the alpha coefficients ranged between 0.65 and 0.9 as shown in Table 1

Table 1: Reliability coefficient of the study variables

Variable	Number of items	Reliability Cronbach's Alpha	Comments
Third party logistics	6	0.800	Accepted
Lean agile manufacturing	6	0.831	Accepted
Procurement performance	5	0.791	Accepted

Hypothesis One: Third party logistics has no significant influences on procurement performance among state Corporations in Kenya.

Third party and procurement performance-Model Summary

The coefficient of determination (R squared) of 0.134 shows that 13.4% of procurement performancecan be explained bythird party logistics. The adjusted R-square of 13.2% indicates that third party logisticsin exclusion of the constant variable explained the change in procurement performance by 13.2%, the remaining percentage can be explained by other factors excluded from the model. R of 0.367 shows that there is positive correlation between procurement performance andthird party logistics. The standard error of estimate (0.45620) shows the average deviation of the independent variables from the line of best fit. These results are shown in Table 2.

Table 2: Third party logistics and Procurement performance-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.367[a]	.134	.132	.45620

a. Predictors: (Constant), Third party logistics

Third party logistics and procurement performance-ANOVA

The result of Analysis of Variance (ANOVA) for regression coefficient as shown inTable 3 revealed (F=59.592, p value = 0.001). Since the p-value is less than 0.05 it means that there exists a significant relationship between third party logistics and procurement performancein Kenya.

Table 3 Third party logistics and Procurement performance-ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.402	1	12.402	59.592	.001[a]
	Residual	79.918	384	.208		
	Total	92.320	385			

a. Predictors: (Constant), Third party logistics
b. Dependent Variable: Procurement performance

Third party logistics and Procurement performance-Regression Weights

The study hypothesized that third party logisticshas no significant effect on procurement performancein Kenya. The study findings indicated that there was a positive significant relationship between third party logisticsand procurement performance (β=0.342 and p value=0.004). Therefore, a unit increase in third party logisticsindex led to an increase in procurement performance by 0.342. Since the p-value was less than 0.05 as shown in Table 4, the null hypothesis was rejected and the alternative hypothesis accepted. It can then be concluded that third party logisticsinfluences procurement performance Kenya.

Table 4 Third party logistics and Procurement performance- Regression Weights

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.172	.167		13.029	.000
	Third party logistics	.342	.044	.367	7.720	.004

a. Dependent Variable: Procurement performance

Discussion of findings on the relationship between third party logistics and procurement performance'

The regression analysis on Table 4 revealed that third party logisticshad aninfluence on procurement performancein Kenya. For every unit increase inthird party logistics, there was a corresponding increase by 0.342 in procurement performance. The Pearson product moment correlation coefficient revealed a moderate,

positive and significant correlation between third party logisticsand university Spin-off firms(r = 0.367, p-value = 0.004) significant at 0.05 level of significance.

These results are consistent with previous studies investigating the third party logistics and procurement performance. According to Raja et al (2010)third party logistics affect procurement performance of public sector in Uganda. The researcher argued that firm's resources align their core-competence and create value by having flexibility and adaptability against changing market environment. Environmental sustainability sharpen the focus and the need for innovative approaches of transport and logistics services and the institution is striving to reduce the negative environmental impact of the processes they carry out, while maintaining long-term profitability   (Raja et al, 2010).

Hypothesis Two: Lean agile manufacturing has no significant influences on procurement performance among state corporations in Kenya.

Model Summary for Lean agile manufacturing and the Procurement performance

From the findings in Table 5, the coefficient of determination, R2 of 0.328 displays that 32.8 % of procurement performance can be explained by lean agile manufacturing. But also, adjusted R2 of 32.7% suggested that lean agile manufacturing (excluding the constant variable) contributed 32.7% to procurement performance with the other balance percentage being described by other relevant factors outside the model. Importantly, R of 0.573 shows that there is a perfect positive correlation between procurement performance and lean agile manufacturing also at the same time Standard Error of the estimate (S.E.est) was 0.40026.

Table 5: Model Summary for Lean agile manufacturing and the Procurement performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.573[a]	.328	.327	.40026

a. Predictors: (Constant), Lean agile manufacturing

ANOVA for Lean agile manufacturing and the Procurement performance

Table 6 below indicates that the regression of lean agile manufacturing against procurement performance was significant, $F_{(1,382)} = 186.715$, $p = <.001$. This results denotes that there exists a significant relationship between lean agile manufacturing and procurement performance in Kenya.

Table 6: ANOVA for Lean agile manufacturing and the Procurement performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.914	1	29.914	186.715	.000[a]
	Residual	61.200	382	.160		
	Total	91.114	383			

a. Predictors: (Constant), Lean agile manufacturing
b. Dependent Variable: Procurement performance

Regression of Weights for Lean agile manufacturing and the Procurement performance

The research hypothesis had that lean agile manufacturing has no significant effect on procurement performance in Kenya, however the study findings indicated that there is positive significant relationship between lean agile manufacturing and procurement performance ($\beta=0.474$ and $p<0.001$). This means that, 1 unit increase in lean agile manufacturing led to an increase in procurement performance by 0.474 and since p-value was less than 0.001 then, the null hypothesis was rejected and the alternative hypothesis accepted. Therefore, the conclusion was that lean agile manufacturing influences procurement performance in Kenya.

Table 7: Regression Weights for Lean agile manufacturing and the Procurement performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.784	.124		14.429	.000
	Lean agile manufacturing	.474	.035	.573	13.664	.000

a. Dependent Variable: Procurement performance/Technology Transfer process

Discussion of findings on the relationship between Lean agile manufacturing andprocurement performance

Based on the findings from the research, it is imperative that there was significant correlation between lean agile manufacturing and procurement performance(R=0.573, p-value <.001). In addition, ANOVA results in Table 6 indicated that; $F_{(1,382)} = 186.715$, $p = <.001$ showing that there existed a significant relationship between lean agile manufacturing and procurement performance in Kenya. Table 7 showed that there was positive significant relationship between lean agile manufacturing and procurement performance ($\beta=0.474$ and

p<0.001). The results demonstrates that for every 1unit increase in lean agile manufacturing there was a comparable increase by 0.474 in procurement performance.

These results are congruent with previous studies investigating lean agile manufacturing and procurement performance. According to Kibet (2014), lean manufacturing allows the company the flexibility to reduce prices or use price promotions to attract new business and lean manufacturing increases cash on hand by trimming expenses, while at the same time increases revenue by being ready to serve a range of unexpected demands. In addition the researcher notes that companies should maximize the number of sales opportunities and lean agile manufacturing methodology in the institution have led to reduced costs.

V.   Conclusion

It can therefore be concluded from the findings of this study that third party logistics and lean agile manufacturing has a significant effect on procurement performance. The state corporations should strengthen their loop supply chain management by putting greater effort to the implementation of some key best practices. Particularly, improving provision of dependable services, quality outsourced services, reduction of fuel consumption, reduction of pollutant emissions, prequalification of suppliers that are aware of environmental issues, formal partnerships with suppliers, setting up a supply chain data base. This study contributes to empirical findings for the model of reverse logistics and procurement performance. It is concluded that evidence can be used by both educators' and researchers in their attempts to improve reverse logistics amongst supply chain functions.

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