

**AN IMPLEMENTATION OF INBOUND LOGISTICS MANAGEMENT ON
PUBLIC PROCUREMENT PERFORMANCE AT PUBLIC INSTITUTIONS IN
KENYA: A CASE STUDY OF KENYA MEDICAL SUPPLIES AGENCY**

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ABSTRACT

The study sought to examine the implementation of inbound logistics management on public procurement performance at public institutions in Kenya, with specific reference to Kenya Medical Supplies Agency. 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 Kenya (2005) and the Public Procurement Regulations that followed forthwith. Despite the already existing steps aimed at achieving the objectives of a fully functional procurement system, there was need to examine the implementation of inbound logistics management on public procurement performance especially at public institutions in Kenya. The specific objectives of the study were to assess the contribution of inbound transportation services to public procurement performance, assess the role of warehousing facilities on public procurement performance, to establish the contribution of inventory control systems on public procurement performance and to determine the role of information communication technology to public procurement performance at public institutions in Kenya. The target population of the study was a total of 200 employees of KEMSA, where different sections as guided by the organizational structure were treated as strata for the purposes of the study. Proportionate random sampling and simple random sampling techniques were used to arrive at the number of respondents from each section to be studied. Data was collected using questionnaires and analyzed using both descriptive and inferential statistics.

Keywords: *inbound logistics, inventory control, procurement performance, warehousing.*

Introduction

The quandaries of public procurement performance require more than just a mere policy formulation in every nation. There was need to have direct interventions that would undo the complexities that bedevil the efforts of the government as well as international organizations in supporting the public procurement performance initiatives. This chapter explored the background information on the research problem, statement of the problem, the study objectives, justification of the study and the scope of the study. Various categories of stakeholders were considered in an attempt to examine the implementation of inbound logistics management on procurement performance at public institutions in

Kenya. Great advances have been made in the field of logistics during the last few decades.

Improvements in efficiency and effectiveness have been demonstrated and recognized in all logistics-related areas i.e. outbound transportation, intra-company transportation, warehousing, inbound transport, materials handling and inventory control. Nonetheless, the majority of these efforts focused on efficiency- related efforts; optimality, prediction, planning and control i.e. on reducing uncertainty and complexity in logistics. One apparent explanation for this is the fact that logistics had not been regarded as a strategic issue until the last decade (Mentzer et al., 2004) and (Stock et al., 1999) which has identified logistics as a mere cost-reducing activity within firms. However, as logistics gains strategic importance, the dimension of effectiveness became increasingly apparent and vital (Kohn & McGinnis, 1997).

In this study efficiency was defined in accordance with (Porter, 1996) definition, as doing things right, while effectiveness was defined as doing the right things. And since “efficiency is related to resource expenditure necessary to achieve logistical effectiveness,” (Bowersox and Closs, 1996), there are many costs involved in doing the wrong things right (Kohn and McGinnis, 1997) described two dimensions of logistics strategy that they found in all organizations, represented in a study they performed. “One is an integrated orientation that seeks simultaneously to manage logistics flows, coordination, and complexity within the organization and with its external constituencies. The other is a process orientation that seeks efficiency, control, and cost reduction.” The first dimension is that of effectiveness, while the second is the efficiency dimension. Nonetheless, the efficiency-focused approach has been successful in logistics for many years and has worked relatively well in what have been, from today’s perspective, quite stable markets with minimal global exposure, relatively long product life cycles and with slow information and communication capacities.

Logistics is the management of the flow of goods and services between the point of origin and the point of consumption in order to meet the requirements of customers. Logistics involves the integration of information, transportation, inventory, warehousing, material handling, packaging, and often security. Logistics is a channel of the supply chain which adds the value of time and place utility. Today the complexity of logistics can be modeled, analyzed, visualized and optimized by plant simulation software.

Logistics adds value and can play a vital role in the organization’s profitability. However, only by linking all logistics activities directly to the organizations strategic plan can it be useful in supporting the organization’s strategy for achieving competitive advantage (Wilding, 1998a). Procurement is a supported activity in logistics which should be properly handled to enable firm’s improve cash flow, open new territories and introduction of a new products. Some of the types of logistics include; Event Logistics, Service Logistics, Business Logistics, Military Logistics, Reverse logistics, Third party Logistics and Fourth Party Logistics. Some of the objectives of logistics management are to make available the right quantity of quality products at the right place and time in the

right condition, offer the best service to consumers, minimize the cost of operations and to maintain transparency in operations.

Logistics management is important in that it ensures Ordering, billing/invoicing, handling and packaging, Product assembly and storage, warehousing and material handling, Product shipping by air, railways, waterways, pipelines, and containers, Product export, import, documentation, marking and consolidation, Product tracing, tracking, recycling and disposal and Setting of customer service standards in terms of time, availability and errors (Bowersox, 2007).

Statement of the Problem

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 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. Periodic shortages, high prices and lack of sustainable financing mechanisms are major barriers to access to medicines and the related medical equipment. Also the quality and safety of medicines are often compromised due to lack of good storage and distributions systems and an effective logistics management procedure (KEMSA Taskforce Report, 2008).

The individual and joint influences of logistics variables such as inventory management techniques, information exchange, transport services and storage facilities have not be fully understood in details in most of the sub-Saharan Africa (Ghana MOH Report, 2008). According to (Wambugu, 2010), new technologies had several advantages over manual warehousing. The logistic variable covered by the study concentrated only on warehousing automation and did not include other variables such as inventory control system, information sharing and transport services. According to (Osmonbekov et al., 2002), electronic interconnections between organizations are importance in a bid to enhance logistics efficiency and effectiveness. However, the study did not cover as to whether or not electronic interconnections impacts on organizational procurement performance. Even stock-outs, maximum and minimum inventory levels negatively affect organizations procurement performance and therefore there is need for organizations to come up with stockholding policies (Waweru, 2009).

Despite the already existing steps aimed at achieving the objectives of a fully functional procurement system, there is need to have a closer evaluation of inbound logistics elements that form the independent variables that influence procurement performance especially at public institutions such as KEMSA in Kenya. From the cited past researches, it's evident that studies on inbound logistics management on organizational procurement performance has not been carried out hence the need to carry out a study on the evaluation of inbound logistics management on procurement performance.

Literature Review

One of the first authors who used complexity theory in the logistics context is Richard Wilding. In his article "The supply chain complexity triangle" complexity is described as

uncertainty involved in supply chains, and according to this complexity is derived from, "three interacting yet independent effects (Wilding, 1998)." These are deterministic chaos, parallel interactions and demand amplification. These effects cause complexity in the logistical processes based on uncertainty in the supply chain. Wilding has also contributed with another article entitled "Chaos theory: implications for supply chain management" (Wilding, 1998) in which it is concluded that a supply chain can exhibit the characteristics of a chaotic system.

Other researchers who have used complexity theories in the logistics domain can be found at Chalmers University of Technology in Sweden. A number of texts have been published and one of the earliest is a paper written by (Lumsdén, et al., 1998). They describe complexity in logistics as being caused by the uncertainty of customer demands and time needed for sub-processes. Furthermore, three other aspects are addressed regarding the complexity of logistics, namely; a large number of system states, a heterogeneous system, and distributed decision making. They conclude that there is a need for "better models of logistical systems... that lead to better predictions of the behavior of real systems"

In the Journal of Operations Management (Choi et al., 2001) demonstrate how supply networks should be managed if we recognize them as complex adaptive systems (CAS) instead of only systems. They set out to answer the ongoing debate about system-wide optimizations based on the on the general agreement in the current literature that individual firm optimizations will create sub-optimization for the whole supply network. They argue that this has led to a situation where "many firms have spent increasing amounts of time, money, and effort in an attempt to predict and control their extended supplier system". In their examination of CAS three foci are considered apparent, those are: a) an internal mechanism, b) an environment and c) co-evolution. Within these the authors define roles, characteristics, and behavioral phenomena so that for the internal mechanism there are agents and their schema, with self-organizational behavior and emergent outcomes.

The Role of Logistics and Public Procurement Performance

(Lambert et al., 1998), define logistics as a strategic and holistic view of thinking, which embraces all links in the flow of materials and its related information in order to make the activities perform in accordance with overall business objectives. The obligations of logistics point towards its value-added role in assuring the four basic utilities place, time,

form and possession. Two of the most important roles of logistics are to add value in terms of time, place utility (Quayle and Jones, 1999).

The Council of Supply Chain Management Professionals (CSCMP, 2006) states that typical logistics activities that should be handled by the logistics function are materials handling, inventory management, transportation management and warehousing. The predecessor of CSCMP is Council of Logistics Management, CLM, and the major logistics activities according to them are transport management, inventory management, warehousing and storage, packaging, materials handling, order processing, demand/sales forecasting, customer service, procurement, warehouse site location and return goods

handling.

However, (CSCMP, 2006) has a broader view of the integrating role of logistics that incorporates integration with the marketing-, IT- and finance functions. Logistics function has a close corporation with other functional areas in almost every organization since the logistics activities works cross-functionally in many aspects (Lambert et al., 1998), According to (CSCMP, 2006) the reason for this is because logistics is involved in all levels of planning, implementation and control of the material flow. Nevertheless, the logistics function does not necessarily include procurement which can be a separate function. Procurement is sometimes excluded from the logistics function in many institutions, although it is regarded as a logistics activity by many authors. To exclude procurement from the logistics function, and perceive it as a separate function, is especially evident within institutions that have a focus on physical distribution such as wholesalers (Van Weele, 2005), separate the logistics function from the procurement function. In their view, the logistics function should work more with activities such as distribution and warehousing than procurement. Logistics competency covers transportation, inventory, warehousing, material handling and packaging (Bowersox and Close, 1996).

Inbound Transportation Services and Transportation cost

This is upstream, goods inward which focus on the receipt of manufacturing or assembly requirements and with reverse logistics. Important inward transport aspects include those relating to Just in time (JIT), global sourcing, and freight prices and cross docking. Reverse logistics or the transport of returns inwards take place because of: defects, damage, return of crates, pallets, and other empties, wrongly supplied. The management of inbound transportation can be quite crucial for firms trying to achieve a JIT process when the source of the raw material or components is located very far away. An integrated approach is required which seeks the minimum cost solution with transportation and inventory decisions taken in concert with the required level of product availability for the manufacturing and processing line (Mentzer, 2004).

Inbound transportation entail the range of activities involved in the movement of goods from points of production to final points of sale and consumption. Some examples of inbound transportation cost include: Logistics and supply chain management (SCM) infrastructure depreciation and other related costs, for example snow removal and security devices, Transportation equipment, for instance the five basic means of transporting products: air, motor carrier, train, marine, or pipeline; as well as every aspect of vehicle maintenance including fuel costing and oil change, Technology investment depreciation, such as inboard technology and application service provider (GSP system), Logistics and SCM overhead cost. This can be computed as a percentage of total fixed logistics and SCM cost. The average industry rate is estimated at 5 percent; however this figure may vary depending on the cost structure of the firm, Labor, wages and salaries for drivers and contracts to service providers (Waidringe, 2001).

Warehouse Facilities and Management

Warehouses play key role in the supply chains by defining to a great extent the success of businesses (the organization's competitiveness) in terms of cost levels and customer service. Despite the high expenses, which come by carrying inventories, warehouses function as a buffer between the variability of supply and demand, which makes them necessary element in the contemporary supply chains. The high expenses provoke the challenge for achieving low cost warehousing with a high level of customer satisfaction at the same time. However, under the influence of factors like e-commerce, supply-chain collaboration, globalization, and new management techniques such as JIT and Lean production, successful warehousing is heading towards tighter inventory control, shorter response time and a greater variety (Frazelle, 2002).

The objectives of warehousing include: Warehousing and Distribution Operating Instructions maximize the warehouse storage utilization, warehouse equipment and warehouse staff, determine and maintain an inventory of Stock Keeping Units (SKUs) so that it can provide the requested quantities of stocked commodities needed by users, Maintain an inventory of critical SKUs so that zero levels of the latter do not occur, Reduce SKUs handling, maintain SKUs accessibility, and assure the designed SKU rotation or turns, Minimize the organization's operating expenses. Logistic costs take good part of the production cost. Being nodes of the distribution activities, this is also valid for warehouses; therefore optimization of their performance is essential element in the cost structure of each organization. Warehouses presents the following three types: Distribution warehouses – products are collected (sometimes also assembled) from different suppliers and further redirected to the customers, Production warehouses – storage of raw, semi-finished and finished products in a production facility. Contract warehouses – warehouse facility used on behalf of one or more customers (Berg and Zijm, 1999). There are three types of warehouses according to their value-adding operations: Raw material and component warehouses – hold raw materials at or near the point of induction into a manufacturing or assembling process. Work-in process warehouses – hold partly completed assemblies and products at various points along an assembly or production line. Finished goods warehouses – hold inventories used to balance and buffer the variation between production schedules and demand (Frazelle,2002).

Methodology

The research design for this study was a descriptive survey design. In the research study, the opinions of the respondents at KEMSA were collected through questionnaires. The target population for this study was a total of 200 employees of KEMSA. This study made use of the stratified random sampling as one of the selection technique. Stratification was done according to organizational structure of KEMSA. Proportionate random sampling and simple random sampling techniques were used on the actual respondents.

Regression Model of Inventory Control System and its Predictors

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.685	3	5.228	7.078	.000 ^b
	Residual	67.220	91	.739		
Total		82.905	94			

a. Dependent Variable: Available Inventory Control Systems

b. Predictors: (Constant), Extent of importance of Inventory Control Systems, Technology-supported inventory control systems, Inventory Control Systems Policies

R Model for table 4.7.3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.435 ^a	.189	.162	.859

a. Predictors: (Constant), Extent of importance of Inventory Control Systems, Technology-supported inventory control systems, Inventory Control Systems Policies.

The research findings showed that in inventory management, the performance of inventory control systems were determined by independent variables such as: extent of importance of such systems, technology and the relevant policies on inventory control systems.

Findings

Improvements in efficiency and effectiveness have been demonstrated and recognized in all logistics-related areas such as outbound transportation, intra-company transportation, warehousing, inbound transport, materials handling and inventory control. Nonetheless, the majority of these efforts focused on efficiency- related efforts; optimality, prediction, planning and control such as on reducing uncertainty and complexity in logistics.

The study was conducted in Kenya Medical Supplies Agency in Kenya's capital city of Nairobi. The respondents were drawn from the logistics department, procurement department, warehouse department, information communication department and the administrative sections of KEMSA. The researcher delivered the questionnaires personally to the sampled respondents on different days. In some cases, the respondents were not available and there was no interview conducted, while the questionnaires intended for such respondents were given to one of the senior persons to fill. In three occasions the departmental heads did not fill the questionnaires due to their busy schedules and therefore they were not included in the data analyzed.

The objective of the study was to examine the implementation of inbound logistics management on public procurement performance at public institutions in Kenya. The specific objectives of the study were to assess the contribution of inbound transportation services to public procurement performance, assess the role of warehousing facilities on public procurement performance, to establish the contribution of inventory control systems on public procurement performance and to determine the role of information communication technology to public procurement performance at public institutions in

Kenya. The study interviewed logistics department, procurement department, warehousing department, information communication department and the administrative section of KEMSA.

A deficiency existed in the policy framework and policy implementation since there were no direct and clear support programmes from the government. Such support to the public institutions would ensure efficiency and effectiveness in monitoring and execution of the policy guidelines that would undo the complexities of procurement systems by way of integration and coordination. The poor management of logistics functions was majorly a contributing factor to sound public procurement systems at public institutions. The research findings showed that 38.9% of inbound transportation services used air transport while 35.8% used road transport during inbound transportation.

Railway transportation constituted a proportion of 7% and the cases where a combination of air transport, road transport, railway transport and water were used. 51% of the respondents were of the opinion that lead-time requirements were fulfilled while 44% of the total respondents thought that the available inbound transportation services did not meet the lead-time requirements. 40% of the respondents strongly agreed that there was need for a regular and consistent evaluation of inbound transportation services and that 30.5% of the respondents agreed to the process.

Those who disagreed and strongly disagreed to the regular and consistent evaluation of inbound transportation services were a proportion of 14.7% and 11.6% respectively. 34.7% of the respondents interviewed said that inbound transportation services at Kenya Medical Supplies Agency were very efficient and that 44.2% thought that the services were efficient. 10.5% of the respondents expressed that transport services were inefficient whereas 5.3% believed that transport services at KEMSA were very inefficient. 95 respondents interviewed during the study, 79 (83.2%) expressed that information communication technology was an important facet in procurement performance at public institutions such as Kenya medical supplies Agency.

On the other hand a proportion of 16.8% were of the opinion that Information Communication Technology did not form a basis for in judging a public organization's public procurement performance. 43.2% of the respondents were of the opinion that the use of Information Communication Technology in dealing with procurement processes was very efficient while 29.5% were convinced to efficiency as a measure. 10.5% and 9.5% said that there was inefficiency and extreme inefficiency respectively. 36.8% of the respondents measured excellent on what they thought about using e-procurement in their places of work. 76.8% of the respondents interviewed admitted that Information Communication technology was critical in adding value to public procurement performance at Kenya medical supplies Agency as a public institution. On the other hand, 23.2% were of the contrary opinion that Information Communication Technology was not of any significance in adding value to public procurement performance

On inventory control systems, 52.6% of the total respondents interviewed held view that Inventory Control Systems were very important in fulfilling the requirements of a fully

functional procurement system in a public organization. Also, 25.3% thought that inventory control systems were just important but those who said that the systems were not important and very unimportant were 6.3% and 11.6% respectively. 45.3% of the respondents used automated Inventory Control Systems whereas 12.6% used manual inventory control systems. Those who had operated both automated and manual inventory control systems formed a proportion of 42.1% of the total respondents interviewed and that 79% of the respondents were aware of the existence of Inventory Control Systems policies while the remaining 16% said that such policies did not exist.

A total of 69(72.6%) of the total respondents were of the opinion that warehousing services were essential logistics element in procurement performance of an institution. However, 26 (27.4%) of the respondents did assert that warehousing services were not significant to the performance of public procurement at Kenya medical Supplies Agency. The research findings were that 54.7% of the total respondents interviewed did express that the warehousing services were very efficient, 18.9% efficient; 12.6% inefficient and 7.4% being the proportion that held the measure of inefficiency of warehousing services at Kenya Medical Supplies Agency. 55.8% of the persons interviewed were convinced that the warehousing services were very effective. Further, 17.9% reported effective while 13.7% and 8.4% proportions were of ineffective and very ineffective categories respectively. 18 (18.9%) out of a total 95 respondents held the opinion that the Human Capital were excellent in terms of competence and that 25 (26.3%) out of the total measured good. What they perceived as average employees were 29 (30.5%), leaving total of 8 (8.42%) to poor and very poor categories.

Conclusions

Based on the research problem that had been formulated and having reviewed the relevant literature vis-à-vis the research findings, the research study found out that there were still cases where railway transportation services were being used during inbound transportation of drugs and medical equipment. This mode of transport resulted in poor fulfillment of lead-time requirements and this negatively affected the procurement performance of the agency. Also road transport was still being used almost at the same par with air transport contrary to the requirement that air transport would be the most preferred mode due to the nature and urgency of cargo on transit.

As relates to the attainment of timely delivery of procured drugs and medical equipment, the research found out that the choice of transportation that was selected could not meet the lead-time requirements. This was due to lack of clarity and implementation framework that could be easily executed for the realization of lead-time objectives of the procured goods. Concerning the evaluation of inbound transportation services, the findings showed that there was lack of regular and consistent evaluation of inbound transport services and yet most of the respondents were not opposed to such move.

However, there were few cases where the personnel disagreed that such measure played any important role in the management of inbound transportation services for the attainment of procurement objectives. Notably, some staffs were not even aware if such

measures of evaluation ever existed in the first place. This therefore implied that there was lack of a clear structure of evaluating modes of inbound transportation used on procured goods at the Kenya medical Supplies Agency.

The research findings also indicated that the efficiency levels in the management of inbound transportation were still very low. At least 20% of the findings reported revealed that the persons in charge of the management of inbound transportation services were either incompetent or it was simply a portrayal of laxity on matters of their duties and responsibilities. There was no clear structure that linked costs incurred on specific modes of transport and that created uncertainty in deciding on transport options to be used.

On Information Technology Management in the achievement of public procurement performance, there were still a number of situations where the respondents could not appreciate the importance of ICT in the realization of sound procurement system. This implied the lack of sensitization programmes on the needs for the use of modern ICT-based procurement systems. The available and the use Information Communication Technology that existed were not efficient and this impacted negatively on the timely exchange of information for the realization of procurement goals as planned. The use of Electronic procurement is the way forward to handle procurement on global standards,

Sanders, (2007) Some of the staffs that were in one way or the other involved in procurement were still poor when it came to the use of E-procurement at Kenya Medical Supplies Agency and this derailed the achievement of the various levels of procurement cycle.

It goes without saying that in the globalized world, the use of Information Communication Technology would in most cases put an organization onto a global commercial arena. A number of the respondents covered by the study however, still thought that there was no effect or in fact did not have an idea on how the organization's reputation would be impacted as a result of using ICT in delivering on its mandate.

The ICT platform that existed did not fully support the aspect of value addition to procurement performance but on the other hand, there were durations when value addition that resulted from the use ICT was significant to procurement activities. A section of the staffs interviewed still considered Inventory Management especially on the choice and use of inventory control systems were unimportant to the procurement proceedings at Kenya Medical Supplies Agency. The positive side, however was that a great percentage admitted to the importance and use of inventory control systems. Some of the staffs still could not comprehend or knew the role played by inventory control systems in the management of inventory.

The use of manual inventory systems as opposed to using purely automated inventory systems impaired the optimization of customer services and this further resulted to the increased inventory management costs and the operating costs. The use of inventory management methods such JIT and cyclical ordering systems did not exist. Of great importance to be concluded also was the fact that there were no inventory control systems

policies that enhanced and easy implementation of procurement effectiveness especially on inventory management in its entire standards of performance. Lack of such policies impeded on the value judgments hence profitability.

Warehousing as and its role in an inbound logistics element and in the attainment of five rights of purchasing in the Supply Chain Management, was well appreciated by the respondents. However, there was lack of efficiency in the way in which warehousing services played its role in procurement of goods at Kenya medical Supplies Agency. The level of efficiency of the warehousing services was in fact a new phenomenon to some of the staffs interviewed and therefore could not tell whether or not they were underperforming. This indicated the lack of proper policy and implementation of assessments methods that would give a detailed scorecard of warehousing as an inbound logistics element. There was no inclusion of factors such as e-commerce and supply chain collaboration and new management techniques such as lean production and JIT.

Also in terms of performance, the level of effectiveness of the warehousing services was still low and that the personnel responsible for this logistics element needed retraining and sharpening of skills that would improve on the warehousing effectiveness. Additionally the automation and use of modern technology were the reasons for the lack of effectiveness. Some of the Human Resource Personnel in charge of the warehouse were average in terms of skills that would make them deliver on the assigned tasks. This resulted in the improper and uncoordinated complementarities of between the warehouse and management of inventory levels when it came to the quantities to be procured and the need of the urgency of such goods to be procured.

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