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EFFECT OF PROCUREMENT OPTIMIZATION ON PERFORMANCE OF COMMERCIAL STATE CORPORATION IN KENYA

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ABSTRACT

This study focused on determining the effect of procurement optimization on the performance of commercial State Corporation in Kenya. In many companies, there is great potential to increase efficiency by optimizing your procurement and supply chain processes. Increased efficiency, cost savings and quality improvements can all be achieved by optimizing existing processes and integrating new processes. Optimization of procurement activities generates efficiency improvements and increases effectiveness of procurement processes. Activities within each stage of procurement can be reprogrammed and executed in line with prevailing legal, regulatory and policy frameworks to improve performance. The study was limited to the following objectives; To establish the significance of sourcing optimization on the performance of commercial State Corporation in Kenya and to determine the effect of transport optimization on the performance of commercial state corporation in Kenya. This study adopted a mixed research design. Both qualitative data and quantitative data was collected. The target population was 561 respondents which comprised of the employees working at the finance, procurement, warehouse, contract management and transport units of the commercial state corporations. Proportionate stratified sampling technique was used to determine the specific sample size of each strata of the study. Data was obtained through questionnaire and annual reports. Data analysis was done through SPSS Version 24 and the analyzed data was presented in form of tables. The findings of the study were found to be in agreement with the past studies. Procurement optimization technique was found to be contributing towards customer satisfaction, return on investments and return on assets and thus overall improvement of performance of commercial state corporations in Kenya. The findings of the study were used to provide recommendations to the stakeholders at large on need for optimizing their procurement operations.

Key words; *Sourcing Optimization, Transport Optimization, Performance*

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INTRODUCTION

Procurement optimization refers to a holistic approach rather than an individualistic one. It refers to the process of attaining optimum value creation using people, process and technology. The role of procurement extends far beyond the belief that procurement's primary function is to obtain goods and services in response to internal needs. A world-class procurement process aims to optimize the whole procurement process to boost efficiency and create significant business value. Since the procurement process touches on every organizational department and impacts revenue directly, it is essential to keep the process running smoothly by regularly reviewing what's working well and what may needs to be optimized for greater efficiency (Hooper & Hokanson , 2000).

Broadly supply chain optimization can be viewed as a means to maximize revenue and/or product margins by building the right thing at the right time for the right people. To achieve this goal requires a sophisticated level of understanding and action. There are three internal corporate objectives for supply chain optimization. At a basic level these are the goals for: finance (inventory minimization), sales (flexibility and availability), and production (consistent production line loading). However, the goal is to optimize revenue and/or product margin. This requires viewing the full end-to-end cycle of the value chain. The value chain adds the processes that happen between the shipment of your product and it reaching the hands of the end customer (Hooper & Hokanson, 2000).

Effective supply chains must be flexible and responsive to the changing dynamics in the marketplace, in manufacturing and technology, and in consumer expectations. This is also true for public health supply chains, which must respond and adapt to dynamic environments. But, change must be planned and based on today's demands and tomorrow's opportunities and risks. Supply chain optimization is a powerful, practical tool that can improve performance now and position supply chains for the future. Optimization is a commercial-sector approach to designing, In Nigeria, a transport optimization analysis provided critical input into the design of a strategic planning, and continuous improvement in supply chain new vendor managed inventory distribution system. Here, workers complete the first operations. It can be used to design new supply chains, or to redesign existing supply chains (Hooper & Hokanson, 2000).

Using simulation software and routine data, the optimization process identifies flexible strategies for increasing the performance and cost effectiveness of each supply chain function. It can present a variety of options for supply chain leaders to consider, such as locating warehouses, setting inventory levels, creating or revising transport routes, removing distribution tiers, and reengineering business processes. The process also helps determine the resource requirements for each option; it can also help estimate what impact future changes may have on the system. While often thought to be an academic exercise, private sector supply chains routinely use modeling in optimization analyses to help reduce cost and improve long-term supply chain performance. Supply chain optimization outputs are based on models and software simulations, but they are practical and easy to understand (Du and Chen, 2017).

This technology can help improve field sales, merchandizing and marketing, and enable direct services to the consumer (through customized location-based coupons or services that improve employee productivity in the field). Providing information such as provenance, origin, item contents and specialized information on demand about sustainability, local content or manufacturing methodology enhances the brand and allows companies to connect directly with the consumer. Utilize source data such as POS sales, as well social media information to identify trends and demand changes much earlier and enable your supply chain to respond faster to increase sales, improve service levels and reposition inventory to maximize true benefits. Multi-channel programs will change

expectations from supply chain forecasting/planning paradigms to building responsive supply chains. Many organizations try to do too many things or don't realize that they can outsource repetitive or tasks or one-off projects (for e.g. determining the optimal distribution network; the payment and audit of freight bills or supporting enhancement of its information systems). Quite often it seems as though an organizations' internal resources are able to do better job in the short run (Du and Chen, 2017). Most often, by relying upon a specialized third-party provider, a better value will be realized in the long term. Focusing on your organizations core competencies will help you grow your business (Hooper & Hokinson, 2000).

Manufacturers have been forced to evolve or perish when it comes to optimizing the processes as well as navigating the new tools and best practices for supply chain management. Most have become acutely aware of the challenges and trade-offs that affect their increasingly complex, competitive and transparent supply chains. At any point in time, an optimized supply chain stays lean, manages costs and perhaps most critically, responds instantaneously to even minor fluctuations in demand (Hooper & Hokinson, 2000).

In today's demand driven in the world, it is not easy to underestimate the complexity of global supply chains. Yet the growth of global markets, increasing customer expectations, rising costs, and more intense and diverse competitive pressures are driving the development of new supply chain strategies and intricate network designs (Mentzer et al., 2011). That increasing complexity is exactly why supply chain networks need to be frequently re-evaluated. In fact, a world class supply chain network is essential for product to consistently flow from the point of manufacture to the end user, regardless of the industry served. A well-designed supply chain network can significantly improve margins, support expansion into new markets, enhance the customer experience, and reduce operating costs. That applies to companies in all stages of maturity: Growth-oriented companies, companies in transition, and companies with stable business operations can all benefit from distribution networks that are optimized to meet ever present challenges and opportunities (Kopczak & Johnson, 2010).

Supply chain optimizations in many companies in Africa are systems that are used to connect firms together for the purpose of the management of products, materials, information and financial report flows manage. They integrate different sets of operations into a single supra-organization that crosses individual organizations boundaries (Schary, Skjott-Lasen, &Tag, 2015). Supply chain optimization is applied by companies across the globe due to its demonstrated results such as delivery time reduction, improved financial performance, greater customer satisfaction, building trust among suppliers, and others. According to Ronald, Michael and Rodger (2014) properly implemented, SCM can positively impact many functions and outcomes of the organization including product quality, customer responsiveness and resultant satisfaction, manufacturing cost control, product and market flexibility, and macro performance outcomes including market share.

Firms operating in the current Kenyan business environment are faced with stiff competition, increased customer demands, and dynamic business environment (Bosire, 2007 and Stuart 2011). Equally, today's Supply Chain Management (SCM) need coordination and integration of activities and resources across firms which spread through decentralized geographical locations and have a high degree of operational complexity (Chopra et al., 2007). Moreover, there is a growing need for supply chains to embrace responsiveness due to more sophisticated and ever-changing customer demands (Dreyer et al., 2008).

Commercial state cooperation are government parastatals that directly generate income, and can therefore independently manage their financial obligations. Where government services may be managed as commercial operations, the State-owned Enterprises Act allows the government to

provide these services through a similar organizational form as private sector enterprises. Four main Acts govern the public sector financial management system; the State Sector Act 1988 include definitions of the roles of chief executives of government departments, and gives them the authority to manage their departments; the Public Finance Act 1989 governs the use of public money; the state-owned Enterprises Act 1986 allows government to conduct some of its commercial activities like private sector businesses, and the Fiscal Responsibility Act 1934 charge government with declaring its short and long term financial intentions.

Many reasons why the impacts of these state corporations have been negative include; obsolete procurement and poor financial management structures, politicization and poor corporate governance, weak supervisory mechanism, prosecution of chief executives for abuse of office and misappropriation of funds is usually not carried out (Economic Survey, 2011).

Statement of the problem

In many companies, there is great potential to increase efficiency by optimizing your procurement and supply chain processes. Increased efficiency, cost savings and quality improvements can all be achieved by optimizing existing processes and integrating new processes. Manufacturing and services companies face a common challenge on effectively delivering innovative products and services to customers. Supply chain improvements are a key focus for companies looking to improve financial results through cost reductions, gross margin enhancement and working capital velocity. Optimization of procurement activities generates efficiency improvements and increases effectiveness of procurement processes. Activities within each stage of procurement can be reprogrammed and executed in line with prevailing legal, regulatory and policy frameworks to improve performance.

Our business world is increasingly uncertain and vulnerable. Historical data indicate that the total number of natural and man-made disasters has increased dramatically over the last 10 years. These include terrorist attacks, wars, earthquakes, economic crises, strikes, computer virus attacks, and so forth (Choi et al., 2016). Besides the above unpredictable disasters, inherent supply chain uncertainties, such as random production yield, lead time variation, stochastic demand, stochastic capacity, fluctuating price, and floating currency may lead to catastrophic economic consequences. What is worse, multiple types of random factors and disruptions coexist and combine with each other, which may cause further damage to supply chains in today's complex business environments (Arena et al. 2010, 2011; Wu et al. 2014).

Decline in profitability of the commercial state corporations resulted to a decline in the global Gross Domestic Product (GDP) from 5.0 percent in the year 2010 to 3.08 percent in the year 2011 as a result of poor supply chain optimization strategies Kenya National Bureau of Statistics (KNBS, 2013). KNBS (2013) also observed that, poor supply chain optimization of the manufacturing firms in Kenya contributed to a decline in GDP to 1.5 percent in the year 2014 from 7.0 percent achieved in the year 2013. In his study on strategic sourcing, Sommers (2019) emphases most of the companies these days use sourcing optimization solutions to effectively gain materials management, logistics and transportation. These tools have become very versatile. However, there is still lack of understanding of functionality and more ways to maximize value from the tools. This hinders the strategic use of such tools to increase savings. In response, both industry and academia are striving to develop and to implement new operations research solutions to better manage the supply chain risks (Heckmann et al. 2015; Snyder et al. 2016; Lawrence et al. 2016).

This study was motivated by the importance of addressing the challenges faced by supply chain systems in the presence of multiple uncertain factors. It majorly focused on the crucial areas of innovative supply chain optimization models,

including supply chain operations processes, competition and interactions in supply chains, and supply chain contracting and coordination thus effect of procurement optimization technique on the performance of commercial State Corporation in Kenya

Objectives of the study

The general objective of this study was to determine the effect of procurement optimization technique on the performance of commercial State Corporation in Kenya. The specific objectives were;

- To establish the effect of sourcing optimization on the performance of commercial state corporation in Kenya
- To determine the effect of transport optimization on the performance of commercial state corporation in Kenya

LITERATURE REVIEW

Social Exchange Theory

The genesis of social exchange theory goes back to 1958, when American sociologist George Homans published an article entitled "Social Behavior as Exchange." Homans devised a framework built on a combination of behaviorism and basic economics. In the immediate years that followed, other studies expanded the parameters of Homans' fundamental concepts (Devalkar, Anupindi & Sinha, 2011). Social exchange theory is a concept based on the notion that a relationship between two firms is created through a process of cost-benefit analysis. In other words, it's a metric designed to determine the effort poured in by an individual in a firm-to-firm relationship. The measurement of the pluses and minuses of a relationship may produce data that can determine if someone is putting too much effort into a relationship (Onyango & Shale, 2017). The theory is unique in the sense that it doesn't necessarily measure relationships on emotional metrics. Rather, its systematic processes rely on mathematics and logic to determine balance within a relationship. While the theory can be used to measure romantic relationships, it can also be applied to determine the balance within a friendship (Devalkar, Anupindi & Sinha, 2011).

The concept of optimization is not new, but historically took a great deal of people power and time and required large mainframe computers. In the last two decades hardware and software advances have made this application available to more companies (Onyango & Shale, 2017). The technology varies by provider, but in general it is based on specialized software that solves linear and non-linear programming models using extremely fast computers with lots of memory. By using these powerful tools, some large problems can be solved in less than one second, but a solution time of about 20 seconds is more common (Devalkar, Anupindi & Sinha, 2011).. However, extremely large, complex problems still may require a day of computing time to find a solution. Early applications of sourcing optimization were concerned with buying transportation services for national and international shipping routes, which included all of the complexities identified (Devalkar, Anupindi & Sinha, 2011). Many suppliers were available, none of which could provide shipping for all modes and all routes. Also many shipping lanes needed to be covered, and the lanes could change from year to year. Furthermore, the type of transportation needed varied, including full-load, less-than-truckload, multi-modal, wide load and refrigerated (Devalkar, Anupindi & Sinha, 2011).

Through the ability to test many scenarios, optimization can provide visibility to the lowest-cost sourcing solutions. Supply managers can then focus on those that can practically be implemented. After reducing the attractive alternatives to a manageable set, negotiations can focus on key suppliers to work on the details of the agreements. There is little supplier resistance to optimization because the process is virtually invisible to them. Indeed, the process can work to the suppliers' advantage by letting them bid their most competitive packages and not be constrained to bidding on lots designed by the buying organization (Caplice & Sheffi, 2003). Re-bids may force suppliers

to lower bid prices, but also provides the opportunity to "stay in the game" and often be presented with the opportunity to bid on additional business. The time spent analyzing bids can be reduced by as much as 50 percent using optimization instead of spreadsheets (Caplice & Sheffi, 2003). However, with spreadsheets, all of the bid combinations for a complex buy were never fully analyzed, so the reduction in analysis time with optimization does not represent the total benefit. Moreover, the time actually devoted to analysis is spent more productively by testing business rules, rather than just finding feasible solutions. So, using optimization, less time is required to do more productive work (Caplice & Sheffi, 2003).

After the sourcing team analyzes the results from the initial round of bidding, the team often asks for re-bids from some or all of the suppliers. The company might suggest that a supplier submit a more competitive bid, bid on another combination of business, or consider bundling different packages. The re-bids can be readily incorporated into the optimization process to produce new sourcing solutions (Caplice & Sheffi, 2003). The approach to analyzing bids is systematic and consistent from event to event. Finding the best solutions no longer depends on the inspiration of spreadsheet users. The process is repeatable and teachable. And, as supply managers become more familiar with the technique, there is less need for outside assistance. The costs associated with backup sources to mitigate risk can be quickly evaluated. This evaluation can help minimize the chances for supply disruptions while highlighting the costs of such actions. Because the optimization process is verifiable and repeatable, proposed sourcing solutions can be readily explained and defended. Executive management can readily understand the cost impact of various business rules and decide if seemingly attractive polices are worth additional costs (Caplice & Sheffi, 2003).

As is true of any application, optimization comes with its own set of challenges. First, there is a cost to acquire and use the optimization software from a provider. Most optimization users have a suite of purchasing tools that includes an optimization module. But optimization modules can also be secured without buying a complete suite of tools. Training is highly recommended, even for "self-serve" applications, and can be secured from the providers for additional fees (Caplice & Sheffi, 2003). Beyond the training needed to implement and run the software, consulting services are often needed to construct a mathematical model that corresponds with the sourcing problem to be solved. Constructing appropriate models is not straightforward or intuitive, and the skill level needed is not often found in purchasing/supply departments. For at least the first time optimization is used, specialized consulting help will be needed (Caplice & Sheffi, 2003). For large, complex problems, sustained consulting help will be needed to construct the problem in such a way that it can actually be solved by the available software and hardware. Assistance may also be needed to create alternative bid scenarios and correctly interpret the results. In general, sourcing optimization models cannot be solved by desktop applications on desktop computers. Servers with lots of speed, memory and specialized software are needed to handle the great number of variables and constraints and to present solutions in a reasonable amount of time. These services are made available "on demand" by the service providers. "Paralysis through analysis" is a real danger with optimization, particularly for large problems with many stakeholders who want to test many different business rules. Buying companies need to have procedures for ending scenario testing and proceeding with the tentative awards and final negotiations (Caplice & Sheffi, 2003).

Systems Theory

System Theory (ST) brings together various components of a complex supply chain (that is the human, capital, information, materials, financial resources and even the suppliers etc.) to form a subsystem which is then part of a larger system of supply chains or network. The theory argues that

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for a holistic perspective ST must be employed to understand the internal and external factors that shape an organization's supply chain performance. Companies for a longer time kept "safety stock" on hand as a solution to deal with stock outs, however on the other hand it adversely added cost to the process. Later supply chain management took a broader perspective that carefully put into picture the entire supply chain incorporating integration of activities of multiple suppliers (Jespersen & Skjott-Larsen, 2005).

In 1992, Lee and Billington wrote about the importance of managing the supply chain and common mistakes that companies made, as well as opportunities that supply chain management presented. Computer models for supply chain management were limited at that time, but the authors noted that it was still possible to establish metrics for each link in the supply chain and begin to hold each link accountable for their performance. By taking this approach, and by using the burgeoning power of computers to integrate information systems, companies would be able to adopt a system-wide approach to their supply chain that would give them a significant competitive advantage over the rest of the market (Lee & Wu, 2006).

However, an important point in the supply chain is how logistics services are managed, whether made through internal management or even by logistics service providers (Lee & Wu, 2006). Whether one or the other managerial model is adopted, transportation management stands out, not only because of the operating cost it represents, but also because it directly affects the level of service intended to maintain with suppliers and customers. In this line of digital evolution, Information and Communication Technology (ICT) has introduced several tools that help in the management of transportation, such as routing systems, freight and fleet management, cargo and vehicle tracking (Rattner, 2006).

Transport optimization focuses on more operational transportation questions; it can be used to identify optimal routing, and the number and type of vehicles to serve expected demand. It can also compare potential transport options; for example, using different size vehicles, or changing routing length and number of vehicles. As with network optimization, various scenarios can also be run through a simulation exercise to estimate the potential impact of adverse shocks to the system, or gradual changes over time (Sauvageau & Frayret, 2015).

Both creating the routes and assigning routes to resources can lead to complex puzzles with a large number of constraints, including driving time legislation, congestion and required service and capabilities. In some sub-industries this is handled as a daily batch optimization (e.g. in retail distribution), but it can also be a rolling process throughout the week (e.g. in 24-hour business, international transport, etc.). For transport companies it is also important to plan for both the known and unknown orders (e.g. pick-ups), which will be added at a later stage during execution. For distribution planning this is usually resolved by incorporating regular pick-ups (based on history) in the plan at the beginning and by reserving time in the route for unknown orders (Sauvageau & Frayret, 2015).

When assigning routes to resources the objective is to utilize the fleet effectively (maximum number of utilized hours per truck) and to minimize repositioning (empty mileage). Additional constraints are driving time legislation, and getting drivers back to their home base (Devalkar, Anupindi & Sinha, 2011). The combination of truck, driver and trailer can be flexible, so there may be the potential to implement logistic concepts such as drop and hook, swap trailer, hot seating or trailer pools. In the case of intermodal transport you can reduce trailer transportation costs by using (unguided) intermodal transport: this means computing the best route for the trailer, given all the modalities with their tariffs, timetables and service conditions (Sauvageau & Frayret, 2015).

During execution, real time information is input into the optimizer. This could be new (or canceled or changed) orders from the administration system (TMS, ERP, WMS), but it could also be changes related to execution itself, such as actual arrival time (based on GPS or geofencing), changes to delivery sequence, changed volumes, canceled or refused deliveries, and missed pick-ups. For the latter a new visit should be created, but depending on the reason the cost of the current visit should be charged. Proposals for adding new orders (at the order entry stage if possible, or proposals via the web) are also important functions (Devalkar, Anupindi & Sinha, 2011).

Filters are useful in efforts to minimize disruptions to the current operational plan as they allow the dispatcher to concentrate solely on any disruptions or other issues that arise. This usually involves manual intervention to assess the disruption. Where unacceptable, orders should be planned again. It is also essential to maintain effective control during execution in order to ensure a high-quality operation (Devalkar, Anupindi & Sinha, 2011). Optimization software supports dynamic route optimization with the capability to recalculate and visualize expected arrival times and to inform customers where relevant. During and after execution of the plan, planners can review the operational results by tracking performance, particularly for subcontractors (e.g. costs per vehicle/km, loading rate, vehicle utilization per route, etc.). Moreover, the real-time integration of onboard computers and mobile devices makes it possible to compare planned versus actual routes, to recalculate ETAs in the event of congestion or delays, and therefore to optimize the entire transportation process. The results of the planned or actual route can be used as the basis for "self-billing": the pro-forma invoice which the sub-contractor charges to the client (Devalkar, Anupindi & Sinha, 2011).

Within this context, this study aims to describe the features of transport optimization and fleet management applications that transportation companies can provide to promote and improve services in meeting the deliveries made by Logistics Service Providers (LSP). Focusing on how the information from the tracking and freight system relates to the management of service customer level and discussing whether these managerial tools contribute both to the operation and to the relationship with the customer (da Silveira & Cagliano , 2006). In this sense, one relevant research factor is to demonstrate the synergy between fleet management and monitoring, since the incorporation of different devices created through the advancement of voice and data communication systems via mobile or satellite have transformed the methods of monitoring and managing of transportation and delivery operations (Hooper & Hokanson , 2000).

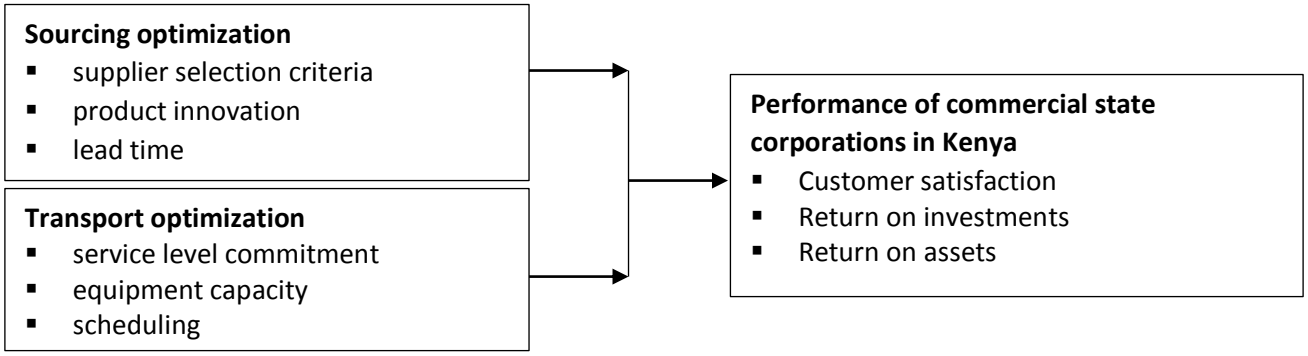

Figure 1: Conceptual Framework

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Empirical review

Zha, Zhang, Yue, and Hua (2017) study the coordination issue of a service supply chain with platform effort-induced demand. The service supply chain is made up of a service provider firm, e.g., a hotel, and a service platform. Two kinds of customers are considered: the category of customers who order rooms from the hotel's front desk, and those who book rooms through the platform. Two newsvendor settings are proposed to depict the demands of the two parties independently. The major finding is that a cost sharing contract can achieve channel coordination imperfectly but, given that the cost of the sales effort is also shared, the channel is coordinated and a win–win is guaranteed if the new cost sharing contract terms are properly designed.

Yang and Ma (2017) investigate the commonly used two-part tariff contracting scheme with asymmetric information in a supply chain consisting of one retailer and two unreliable competing retailers. In their model, the suppliers lead the game by simultaneously and independently announcing the two-part tariff contract to the retailer in the first stage.. Their major finding is that a higher degree of substitution implies a lower purchasing price but a higher fixed fee. With numerical experiments, they further show that the information rent increases with the degree of substitution. However, they uncover that a larger intensity of competition is disadvantageous to the supplier.

Fu, Ma, Ni, and Cai (2017) investigate a decentralized hybrid push-pull assembly system with multiple suppliers and one assembler, where some suppliers are stronger than the assembler and some are weaker. The authors assume that each supplier is unreliable and provides a complementary component to the assembler, which faces an uncertain demand. They analyze the pricing and production decisions of all players in such an assembly system by using a three-stage game theoretic approach. Moreover, they introduce a buyback contract (between the stronger suppliers and the assembler) and a subsidy contract (between the weaker suppliers and the assembler) to develop a mechanism to coordinate the decentralized assembly system. They show that the coordination mechanism consisting of the above two contracts can arbitrarily allocate the system profit among all players, and, thus, may achieve a desirable Pareto improvement.

Cheng, Yang, and Tsay (2017) develop an integrated model for understanding and designing more flexible and structured supply chain contracts from the perspective of the buyer, the supplier, and the system as a whole in an open supply chain, defined as when both parties have possible alternative partners. The authors demonstrate that a wide range of contract types can be viewed as a composite of fixed and flexible components, and that changing the composition alters the allocation of exposure between the contract parties, to uncertainties in both price and demand. They also suggest that the concept of relative contract value (with respect to a reference alternative) provides a means to analyze the interaction between a contract and its alternatives and quantify the ramifications of contract price uncertainty. To assist practitioners with supply contract design, different contract structures are analyzed with respect to how to configure a structured contract when the total supply chain profit is maximized, and how this profit is allocated between the parties.

Zhao, Choi, Cheng, and Wang (2017) conduct a mean–variance analysis of the commonly seen wholesale pricing contract in a single supplier/single retailer supply chain. Demand is considered to be stochastic and price-dependent. The supply chain is led by the supplier. The authors focus on exploring the efficiency of a wholesale pricing contract with the considerations of contract value risk. Their results suggest that a supply chain contract with the high expected-profit-based-efficiency tends to have a high value risk, and thus an appropriate balance between the expected outcome and the value risk associated with the contract should be pursued when designing the supply chain contract. Their findings help to explain why some supply chain

contracts that are proven to be theoretically effective for achieving supply chain coordination do not work well in practice.

Liu, Yang, Wang, and Bai (2017) explore the influences of the uncertainties of the functional logistics service provider's (FLSP's) operation and customer requirements on the optimal scheduling decisions within a logistics service supply chain (LSSC). A multi-objective programming model for the LSSC scheduling problem is established. The optimization problem aims to minimize the total order operation cost in the LSSC, to minimize the difference between the total expected operation time and the customer requirement time, and to maximize the satisfaction of FLSPs. A genetic algorithm approach is applied to solve the problem after the multi-objective programming model is transformed into a single-objective model. The influences of some relevant parameters on the scheduling performance are investigated with a numerical analysis. One major finding is that the time windows of the FLSP's operation and customer requirement have a significant interrelationship.

Thorsen and Yao (2017) propose a robust optimization modeling framework for an inventory control problem subject to uncertain lead times and uncertain demand. They use a Benders' decomposition approach to develop the optimal inventory policy parameters, which do not require the knowledge of random variable distributions and order crossovers. Their numerical study compares the performances between their proposed approach and the sample average approximation (SAA) method, and it indicates that the proposed approach provides more stable and robust solutions, especially when the realized distribution is different than the sampled distribution.

Maihami, Karimi, and Ghomi (2017) consider a joint inventory and pricing optimization problem for a non-instantaneous deteriorating product. The randomness lies in product demand and the deteriorating process. Also a two-echelon trade credit policy is adopted. The conditions for the existence and uniqueness of the optimal solution on selling price and inventory decisions are provided, and an algorithm is developed to find the optimal solution. Numerical studies are performed to show the sensitivities of the system decisions and performances to the system parameters such as ordering cost, trade credit period, and payable interest. The results indicate that the retailer's total profit increases significantly with the consideration of the non-instantaneous deteriorating product feature and the trade credit policy.

METHODOLOGY

This study adopted a mixed research design. A mixed methods design is characterized by the combination of at least one qualitative and one quantitative research components. The target population was 561 employees from the State Corporations at various management levels. The sample size of the study was determined using the following formulae to arrive at a sample size of 85 respondents:

$$n = \frac{N}{1 + N (e^2)}$$

Stratified random sampling technique was used in this study. Primary data was collected by using questionnaires. Before processing the responses, data preparation was done on completed questionnaires by editing, coding, entering and cleaning the data. The results of the study was generated in both qualitative and quantitative data. Quantitative data was coded and entered into statistical packages for Social Scientists (SPSS Version 24) and was analysed using descriptive statistics while qualitative data was analysed using content analysis. Multiple linear regression analysis was conducted to determine the effect of procurement optimization on the performance of commercial State Corporation in Kenya.

FINDINGS

Effect of sourcing optimization on the performance of commercial State Corporation in Kenya

Respondents gave their level of agreement and disagreement with various statements that relate with the effect of sourcing optimization on the performance of commercial State Corporation in Kenya. The results obtained were as presented in Table 1.

Table 1: Sourcing optimization on the performance

Statement	Mean	Std. Dev.
Flow of information between the buyer and the supplier promotes productivity	3.797	0.791
Supplier selection criteria has effect on the strength and type of buyer supplier relationship that is likely to be developed between the two firms.	3.805	0.731
Supplier selection criteria and firm performance are directly proportional	3.814	0.951
Joint product development has effect on the quality of goods and services received by the end users.	3.881	0.730
Lead time has effect on a firm's competitive advantage.	3.839	0.867

N=69

The findings presented in table 1 showed that respondents agreed that: Flow of information between the buyer and the supplier promotes productivity (M=3.797); Supplier selection criteria has effect on the strength and type of buyer supplier relationship that is likely to be developed between the two firms (M=3.805); Supplier selection criteria and firm performance are directly proportional (M=3.814); Joint product development has effect on the quality of goods and services received by the end users (M=3.814); the organization reviews contract performance to ensure reduced costs in future contracts (M=3.881); and Lead time has effect on a firm's competitive advantage (M=3.839).

Effect of transport optimization on the performance of commercial State Corporation in Kenya

Respondents indicated their level of agreement and disagreement with various statements that relate with the effect of transport optimization on the performance of commercial State Corporation in Kenya. The results were as presented in Table 2.

Table 2: Transport optimization on the performance

Statement	Mean	Std. Dev.
Service level commitments should be communicated among employees	3.839	0.827
Service level commitment helps in building employee's attitude.	3.805	0.719
Equipment capacity has significance on the overall production and performance of an organization.	3.765	0.967
Business to business communication can ensure improvement of performance.	3.763	0.834
Schedule has an effect on the level of performance in shipping firms.	3.661	0.869

From the findings, respondents agreed that Service level commitments should be communicated among employees (M=3.839); Service level commitment helps in building employee's attitude (M=3.805); Equipment capacity has significance on the overall production and performance of an organization (M=3.765); Business to business communication can ensure improvement of performance (M=3.763); costs have reduced by the organization employing collective bargaining since both parties become satisfied at the end (M=3.763); and Schedule has an effect on the level of performance in shipping firms (M=3.661).

Organization Performance

Respondents gave their level of agreement on various statements relating with organization performance. The results were as presented in Table 3.

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Table 3 Organization Performance

Statement	Mean	Std. Dev.
To what extent has your organization achieved customer satisfaction	3.746	0.889
To what extent has your organization achieved return on investments	3.746	0.786
To what extent has your organization achieved return on assets	3.763	0.967

From the findings, respondents were in agreement that there has been improved customer satisfaction (M=3.746); return on investments (M=3.746); and return on assets (M= 3.763).

Inferential Statistics

Inferential statistics infer from the sample to the population. They determine probability of characteristics of population based on the characteristics of the sample. Inferential statistics help assess strength of the relationship between the independent variables and the dependent variable.

Pearson Product Moment Correlation

Table 4: Correlation Analysis

		Performance	Sourcing optimization	Transport optimization
Organizational Performance	Pearson Correlation	1		
	Sig. (2-Tailed)			
	N	69		
Sourcing optimization	Pearson Correlation	.517*	1	
	Sig. (2-Tailed)	.035		
	N	69	69	
Transport optimization	Pearson Correlation	.566*	.483	1
	Sig. (2-Tailed)	.004	.080	
	N	69	69	69

From the findings, sourcing optimization was found to be having a positive and significant relationship with organization performance (r = .517, p-value = 0.035) and transport optimization was found to be positively and significantly related to organization performance (r = 0.566, p-value = 0.004). These findings therefore suggest that sourcing optimization and transport optimization influences organization performance.

Regression Analysis

A multiple linear regression analysis was done to examine the relationship of the independent variables with the dependent variable.

Model Summary

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762[a]	.581	.508	.68293

a. Predictors: (Constant), sourcing optimization, transport optimization
b. Dependent Variable: Organisation performance

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From the findings, the value of adjusted R^2 was 0.508 which suggests that 50.8% variation in organization performance can be attributed to change in sourcing optimization and transport optimization. Moreover, the remaining 49.2% suggest that there are other factors that can explain variation in organization performance which were not included in this model. The findings further show that the variables under investigation are strongly and positively related as indicated by correlation coefficient (R) value of 0.762.

Table 6: Coefficients of Determination

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.114	.051		2.259	.002
Sourcing optimization	.387	.172	.399	2.247	.003
Transport optimization	.316	.150	.318	2.113	.014

a. Dependent Variable: Organization performance

The regression model was;

$Y = 0.114+0.387X_1+0.316X_2+\varepsilon$

Where: Y= Organization performance, X_1= sourcing optimization and X_2=transport optimization

The equation above revealed that holding sourcing optimization and transport optimization variables to a constant zero, organization performance will be at a constant of 0.114 units.

From the findings, the study found that sourcing optimization has a positive significant effect on organization performance as shown by a regression coefficient of 0.387. The relationship was found to be significant as the p-value (0.003) was less than the significance level (0.05). Therefore, a unit increase in sourcing optimization leads to an increase in organization performance by 0.387 units.

The study also found that transport optimization has positive significant effect on organization performance as shown by a regression coefficient of 0.316. The relationship was found to be significant as the p-value (0.014) was less than the significance level (0.05). Therefore, increasing transport optimization by a single unit would lead to an increase in organization performance by 0.316 units.

CONCLUSION AND RECOMMENDATIONS

Sourcing optimization influences the performance of an organization. The study further concludes that supplier selection criteria, product innovation and lead time are among other internal integration factors influenced the performance of commercial State Corporations in Kenya. Sourcing optimization should provide excellence in customer service and business practice. Through embracing sourcing optimization commercial State Corporations in Kenya have benefited from improved stakeholder relationships, resource allocation and fulfillment of set goals between complementary functions. This has made it easy for the company to ensure increased sales volume.

The transportation costs of logistics enterprises are influenced by the fixed costs and variable costs involved in the transportation process. The study concludes that transport optimization influences the performance of an organization. By embracing policies that ensure service level commitment, equipment capacity and scheduling, commercial State Corporations in Kenya have improved their performance levels. This has enabled the company have more customers thus increasing the market share. Analysis of the logistics costs of enterprises reveals that transportation costs are an important part of the costs of logistics enterprises. Therefore,

it is very important to study how transportation costs can be optimized in logistics enterprises.

Procurement professionals are increasingly recognizing that developing partnerships with main suppliers can indeed deliver significant benefits to both the buyer and supplier. Before this transition, businesses were somehow neglecting SRM since their main focus was more about nurturing customer relationships and reduce costs. Eventually, organizations have understood the considerable benefits of a good supplier relationship management. A research by PWC showed that there is a positive link between the good supplier relationship management with the following positive outcomes: an increase in market share, responsiveness to market changes, increased return on investment, shortening order fulfillment leads times. Having good negotiators within an organization represents a major advantage. As organizations become aware of how essential it is, many companies are now opting for negotiation training to help their employees develop their negotiation competence and knowledge. With such training, an organization is likely to benefit in various ways: employees will improve their negotiation skills, which in turn ensure good deals for the company, leading to higher profitability. Therefore employees become skilled enough to engage in negotiations with suppliers or clients by keeping in mind key objectives.

Transportation Optimization is the process of determining the most efficient means of moving product to the customer while maintaining a desired service level, given a static supply chain network. The customer can be an internal component of the company or the traditional, external consumer. Adhering to these defined operational constraints will result in an executable, optimal solution for the desired time window and drive the execution of producing and shipping product for that time period.

Suggestions for Further Studies

An optimized procurement process will positively affect an organization's bottom line and increase efficiency and profitability. This will ultimately add significant value to your organization as a whole. To make the most of procurement optimization, the right strategies must be implemented and employees should be well-trained.

This study focused on the different types of procurement optimization that a firm can opt to implement. The study clearly explained the different kinds of benefits which can accrue to a firm. It is equally important to note that the various costs (opportunity cost, challenges) of implementation of the different types of integration were not discussed in this study. The researcher therefore recommends that these aspects of procurement optimization should be considered as issues of interest by future researchers.

REFERENCES

Anderson, E. J., & Coltman, T. (2011). What drives the choice of a third-party logistics provider? Journal of Supply Chain Management, 97--115.

Caplice, C., & Sheffi, Y. (2003). Optimization-based procurement for transportation services. Journal of Business Logistics, 24(2), 109-128.

Caplice, C., & Sheffi, Y. (2003). Optimization-based procurement for transportation services. Journal of Business Logistics, 24(2), 109-128.

Cheng, Z., Yang, X., & Tsay, A. A. (2017). Designing structured supply contracts under demand and price uncertainty in an open supply chain. Annals of Operations Research, 257(1-2), 519-536.

Choi, T. M., Govindan, K., Li, X., & Li, Y. (2017). Innovative supply chain optimization models with multiple uncertainty factors. Annals of Operations Research, 257(1-2), 1-14.

Chopra, K. (2005). Entrepreneur Endorser. Available at SSRN 761465.

Cooper, A. G., & Schindler, B. M. (2000). Sampling Techniques.

da Silveira, G. J., & Cagliano , R. (2006). The relationship between interorganizational information systems and operations performance. International Journal of Operations \& Production Management, 232--253.

Devalkar, S. K., Anupindi, R., & Sinha, A. (2011). Integrated optimization of procurement, processing, and trade of commodities. Operations Research, 59(6), 1369-1381.

Devalkar, S. K., Anupindi, R., & Sinha, A. (2011). Integrated optimization of procurement, processing, and trade of commodities. Operations Research, 59(6), 1369-1381.

Du, C. ,Chen, Z., Song, W. & Liu, L. (2017, October). Research on warehouse management system based on association rules. In 2017 6th International Conference on Computer Science and Network Technology (ICCSNT) (pp. 208-212). IEEE.

Eskigun, E., Uzsoy, R., Preckel, P. V., Beaujon, G., Krishnal, S., & Tew, J. D. (2005). Outbound supply chain network design with mode selection, lead times and capacitated vehicle distribution centers. European Journal of Operational Research, 182- 206.

Flynn et. al. (2010). The impact of supply chain integration on performance: A contingency and configuration approach.

Fu, H., Ma, Y., Ni, D., & Cai, X. (2017). Coordinating a decentralized hybrid push–pull assembly system with unreliable supply and uncertain demand. Annals of Operations Research, 257(1-2), 537-557.

Hooper, S., & Hokanson , B. (2000). The changing face of knowledge. Social Education, 28-31.

Hoopes, D. G., Madsen, T. L., & Walker, G. (2003). Guest editors' introduction to the special issue: why is there a resource-based view? Toward a theory of competitive heterogeneity. Strategic Management Journal, 24(10), 889-902.

Hu, W., Li, Y., & Wang, W. (2017). Benefit and risk analysis of consignment contracts. Annals of Operations Research, 257(1-2), 641-659.

Jespersen, B. D., & Skjott- Larsen, T. (2005). Supply chain management: in theory and practice.

Lee, H. L., & Wu, J. C. (2006). A study on inventory replenishment policies in a two-echelon supply chain system. Computers \& Industrial Engineering, 257--263.

Liu, W., Yang, Y., Wang, S., & Bai, E. (2017). A scheduling model of logistics service supply chain based on the time windows of the FLSP's operation and customer requirement. Annals of Operations Research, 257(1-2), 183-206.

Onyango K. & Shale N. (2017). Role of Multi-Echelon Distribution Systems on Supply Chain Performance in Manufacturing Sector In Kenya: A Case of Toyota Kenya. International Journal of Management and Commerce Innovations ISSN 2348-7585 (Online) Vol. 5, Issue 2, pp: (288-302).

Rattner, S. (2006, August 9). Retrieved from Lean enterprise institute: http://www.lean.org/common/display/?o=223

Sauvageau, G., & Frayret, J. M. (2015). Waste paper procurement optimization: An agent-based simulation approach. European Journal of Operational Research, 242(3), 987-998.

Thorsen, A., & Yao, T. (2017). Robust inventory control under demand and lead time uncertainty. Annals of Operations Research, 257(1-2), 207-236.

Xu, X., He, P., Xu, H., & Zhang, Q. (2017). Supply chain coordination with green technology under cap-and-trade regulation. International Journal of Production Economics, 183, 433-442.

Zha, Y., Zhang, J., Yue, X., & Hua, Z. (2015). Service supply chain coordination with platform effort-induced demand. Annals of Operations Research, 235(1), 785-806.

Zhang, R., & Liu, B. (2017). Group buying decisions of competing retailers with emergency procurement. Annals of Operations Research, 257(1-2), 317-333.