SUPPLY CHAIN OPTIMIZATION AND PERFORMANCE OF STATE CORPORATIONS IN KENYA

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ABSTRACT

The main objective of this study was to assess the effect of supply chain optimization on performance of state corporations in Kenya. Specifically, the study sought to assess the effect of demand forecasting on performance of state corporations in Kenya, to examine the effect of strategic sourcing on performance of state corporations in Kenya. The study employed descriptive research design. The target population for this study comprised of the 248 state corporations in Kenya. Using a sampling formula, a sample size of 153 respondents were identified, where the respondents were selected using a stratified random sampling technique. This study used questionnaire to collect data relevant to respond to the research questions. Quantitative data collected was analyzed using descriptive statistical techniques which included percentages, mean, standard deviation. Inferential statistics which include Pearson correlation and the Regression Analysis Model were used to test the relationship between study variables. The significance of the model was tested at 5% level of significance. Data was analysed using Statistical Package for Social Sciences (SPSS) software. The study results were presented through use of tables and figures. The finding revealed that demand forecasting had a significant and positive impact on performance of state corporations. On strategic sourcing as one of the supply chain optimization strategies, the findings revealed that strategic sourcing significantly influenced performance of state corporations in Kenya. The study concluded that there was deficiency of supply chain optimization strategies (demand forecasting, strategic sourcing) in most of the state corporations, and this negatively affected their performance. It is therefore recommended that for the state corporations to perform better and minimize wastage of public funds and ineffective service delivery, the management out to uphold supply chain optimization as a fundamental strategy to optimize their operations. The corporations ought to strengthen their relationship with suppliers for long-term benefits, embrace strategic sourcing to effectively meet their supplies needs, as well as manage the flow of inventory to minimize operational costs. The findings are informative to the supply chain practitioners particularly in the state corporations.

Key Words: Supply Chain Optimization, Performance of State Corporations, Demand Forecasting, Strategic Sourcing

Background of the Study

Supply chain optimization is one of the key components for the effective management of a company with a complex manufacturing process and distribution network (Dikirr & Omuya, 2023). Companies with a global presence in particular are motivated to optimize their distribution plans in order to keep their operating costs low and competitive. Changing conditions in the global market and volatile energy prices increase the need for an automatic decision and optimization tool. In recent years, many techniques and applications have been proposed to address the problem of supply chain optimization (Christopher, 2016). However, such techniques are often too problem specific or too knowledge-intensive to be implemented as inexpensive, and easy-to-use computer system. The effort required to implement an optimization system for a new instance of the problem appears to be quite significant. The development process necessitates the involvement of expert personnel and the level of automation is low (Christopher, 2018).

The supply chains of large corporations involve hundreds of facilities (retailers, distributors, plants and suppliers) that are globally distributed and involve thousands of parts and products (Kembel, Jones, Kline, Northcutt, Stenson, Womack & Green 2019). The goals of corporate supply chains are to provide customers with the products they want in a timely way and as efficiently and profitably as possible. Fueled in part by the information revolution and the rise of e-commerce, the development of models of supply chains and their optimization has emerged as an important way of coping with this complexity (Hugos, 2018). Indeed, this is one of the most active application areas of operations research and management science today. This reflects the realization that the success of a company generally depends on the efficiency with which it can design, manufacture and distribute its products in an increasingly competitive global economy (Monczka, *et al*, 2018)

Typically, firms carry inventories at various locations in a supply chain to buffer the operations at different facilities and in different periods. Inventories are the links between facilities and time periods (Dzupire & Nkansah-Gyekye, 2019). Inventories of raw materials, work-in-process, and finished goods are ubiquitous in firms engaged in production or distribution (by sale or circulation) of one or more products. Cost optimization is where the costs are linear, so there are unit costs and of production and storage in period (Váncza, et al, 2019). It is optimal to hold inventory in a period if the unit production cost in that period is less than that in the following period and the unit storage cost is small enough. According to Dzupire and Nkansah-Gyekye, (2020) supply chain optimization has several advantages. First, it unifies the treatment of many supply-chain models. Second, it extends the applicability of the methods to broad classes of problems outside of supply-chain management. Third, it facilitates use of the special structure of the associated graphs to characterize optimal flows and develop efficient methods of computing those flows.

Statement of the Problem

The performance of state Corporations is indicated by such factors as their contributions to social welfare, job creation, general economic empowerment and improvement of lives of the poor. However, despite the interest in the sector and the subsidies that have flowed into some of the mission-oriented state Corporations, it seems that most state Corporations struggle with the challenge of remaining viable over the long-term. One survey has found that some commercial state corporation such as Uchumi operating at the end of 2014 in Kenya were either no longer in operation or were no privatisation (CBK, 2020). The poor performance of SCs in Kenya led to outflow from central government to parastatals equivalent to 1 percent of the GDP in 2017. Further, in 2017 – 2018, the direct subsidies to parastatals amounted to Ksh 7.2 billion and as additional indirect subsidies amounted to Ksh. 14.2 billion. The levels of inflation in the country then reflected deficits financed by the Central Bank. Some ways were devised to solve

these problems, such as negotiations between SC and government in a bid to clarify the former's objectives and set targets, introduction of competition and better accountability to customers, provision of incentives in form of higher salaries and benefits to employees based on performance and increased training of employees. All these measures were not 100% successful. Failure of the above measures made many governments embark on privatization (Kamung'a, 2019).

Furthermore, in state corporations report difficulty in sustaining their operations without continued reliance on grants, external fundraising, or other subsidies. However; the commercial state corporation faces a lot of challenges (Jeske *et al.,* 2019). Some of this challenge is on how to manage customers and provide quality services. Therefore, strategic dynamic capabilities could offer a solution to this dilemma through providing a management system which incorporates all functional areas of the organization. Additionally, most of financial institutions such as state corporation losses about 20% annually by failing to attend to customer relationships (Jeske *et al.,* 2019). Research has shown that supply chain optimization influences organization performance.

A number of studies have been conducted on supply chain rationalization globally. For instance, Cousins (2015) conducted a survey on 174 firms in the UK and found out that though 92% claimed supply base reduction seemed to have reduced transaction costs. The studies found that the investigated firms looked at negotiating savings instead of focusing on streamlining the inter-organizational processes. This study was however, conducted in a developed country and not in Kenya. Several studies have been done locally; Rotich (2019) interrogated the manufacturing sector supplier management, while Wanjohi (2019) investigated the challenges facing supplier base management in Kenya and the efforts in progress. These studies however, did not look at supply chain optimization and performance of state corporations in Kenya. It is against this back drop that this study sought to examine the influence of supply chain optimization on performance of state corporations in Kenya.

General Objective

The general objective of this study was to assess the influence of supply chain optimization on performance of state corporations in Kenya.

Specific Objectives

This study was guided by the following specific objectives;

  i. To assess the influence of demand forecasting on performance of state corporations in Nairobi City County, Kenya

  ii. To examine the effect of strategic sourcing on performance of state corporations in Nairobi City County, Kenya

Theoretical review

Economic Order Quantity (EOQ) Model

EOQ model was developed by was Ford Wilson Harris in 1913 and is also known as Wilson EOQ model, who critically analyzed the model in detailed (Kumar, 2016). The use of the model has shown increase in some costs as other costs decline, an example of ordering costs decline with the inventory holdings, while holding costs rise and the total inventory associated costs curve have a minimum point. It is also known as the point where total inventory costs are minimized. EOQ is the level of inventory that minimizes the total of inventory holding costs and ordering costs.

The economic order-quantity model considers the tradeoff between ordering cost and storage cost in choosing the quantity to use in replenishing item inventories. A larger order-quantity reduces ordering frequency, and, hence ordering cost/ month, but requires holding a larger average inventory, which increases storage (holding) cost/month. On the other hand, a smaller orderquantity reduces average inventory but requires more frequent ordering and higher ordering cost/month (Kazemi *et al.*, 2018).

The EOQ model relies on a mathematical formula to calculate the optimal order quantity. This formula is derived from the trade-off between ordering costs and holding costs. Ordering costs encompass expenses incurred each time an order is placed, such as administrative costs, transportation fees, and setup costs (Yalo, Edicha & Nafiu, 2019). Holding costs, on the other hand, arise from storing inventory and include expenses like storage, insurance, and the cost of capital tied up in inventory. Despite its widespread use, the EOQ model has its limitations. For instance, it assumes constant demand, which may not always align with real-world market dynamics. Additionally, the model does not consider factors such as lead time variability, quantity discounts, or perishability of goods, which can significantly impact inventory decisions (Osho, Nwachukwu & Walter, 2022). Economic Order Quantity (EOQ) Model was used in this study to assess the effect of demand forecasting on performance of state corporations in Nairobi City County, Kenya.

Transaction Cost Theory

Transaction cost theory was developed by (Williamson 1979). The theory provides insights into the decision-making process related to whether a firm should produce a good or service in-house or engage in transactions with external suppliers. The theory helps organizations evaluate whether to produce certain goods or services internally or to source them externally. The decision is based on minimizing transaction costs, considering factors such as coordination, information, and monitoring costs (Udoka, 2021).
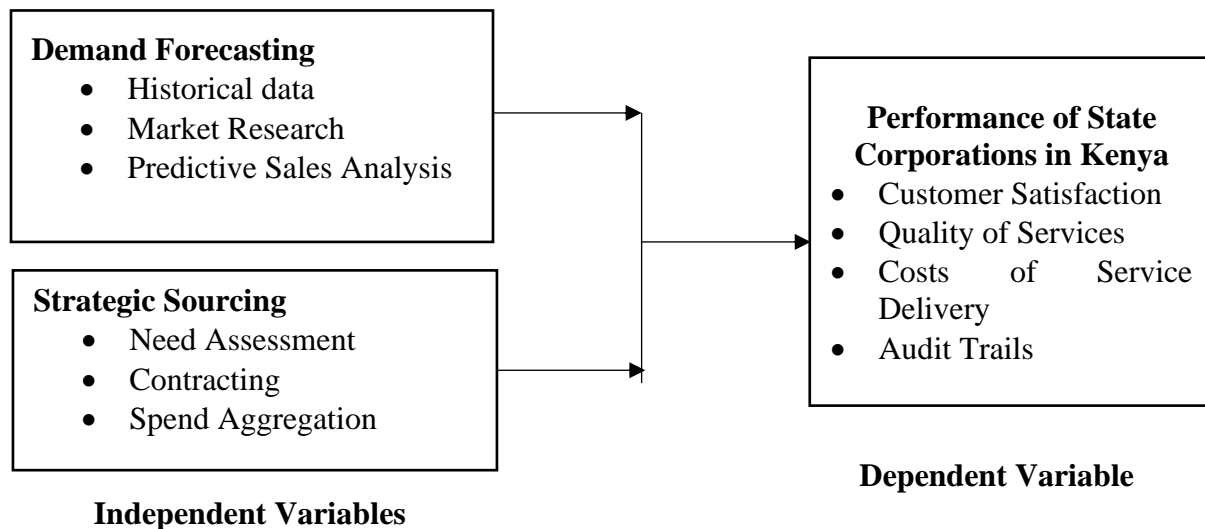
Transaction costs are also influenced by uncertainty and information asymmetry, which create risks and potential opportunistic behavior in transactions. When information is asymmetric, parties may have different levels of knowledge about the transaction, leading to difficulties in contract negotiation and enforcement. Firms may internalize certain activities to mitigate these risks and ensure greater coordination and control. TCT acknowledges that decision-makers have limited cognitive abilities and may not always make fully rational decisions. Bounded rationality affects transaction costs by influencing how parties search for information, evaluate alternatives, and negotiate contracts. Firms may internalize transactions to reduce the cognitive burden associated with market interactions and ensure more efficient decision-making (Obasa & Gado, 2022).

Transaction cost theory emphasizes the concept of asset specificity, where certain assets are dedicated to a particular transaction or relationship. In strategic sourcing, firms need to assess the level of specificity in their requirements and determine the most efficient way to source them, considering factors like the specificity of technology, investments, or knowledge (Munene & Gachengo, 2023). The theory recognizes the bounded rationality of decision-makers and the uncertainty associated with future events. In strategic sourcing, organizations deal with uncertainties related to market conditions, supplier reliability, and other external factors. TCE suggests that firms will choose governance structures that minimize transaction costs under conditions of bounded rationality and uncertainty (Basweti & Achuora, 2020). This study used Transaction Cost Theory to assess the effect of strategic sourcing on performance of state corporations in Kenya.

Conceptual Framework

According to Kombo and Tromp (2019), a concept is an abstract or general idea inferred or derived from specific instances. A conceptual framework is a set of broad ideas and principles

taken from relevant fields of enquiry and used to structure a subsequent presentation. Mugenda and Mugenda (2018) define a conceptual framework a hypothesized model identifying the model under study and the relationship between the dependent and independent variables. The independent variables of the study are demand forecasting, and strategic sourcing, while the dependent variable of the study is performance of state corporations in Kenya. Figure 2.1 provides a representation of the variables explored by this study.

Demand Forecasting
- Historical data
- Market Research
- Predictive Sales Analysis

Strategic Sourcing
- Need Assessment
- Contracting
- Spend Aggregation

Independent Variables

Performance of State Corporations in Kenya
- Customer Satisfaction
- Quality of Services
- Costs of Service Delivery
- Audit Trails

Dependent Variable

Figure 2. 1: Conceptual Framework

Demand Forecasting

Demand forecasting involves analysing historical data, market trends, and external factors to estimate the quantity of goods or services that customers' will likely purchase over a specific time horizon (Osho, Nwachukwu & Walter, 2022). Quantitative forecasting relies on mathematical models and statistical techniques to extrapolate future demand based on past sales data. These models may include time series analysis, regression analysis, and machine learning algorithms to identify patterns and trends in historical sales data and make predictions about future demand patterns (Yalo, Edicha & Nafiu, 2019).

Qualitative forecasting plays a role by relying on expert judgment, market research, and subjective inputs to anticipate demand. This approach becomes particularly valuable in situations where historical data is limited or when significant shifts occur in market conditions, consumer preferences, or external factors that quantitative models may not fully capture (Wamoto, Kaswira & Ndoto, 2023). Despite the diverse methodologies employed the ultimate objective of demand forecasting remains consistent: to equip businesses with insights into future demand patterns, enabling them to make strategic decisions regarding production, inventory management, pricing strategies, and resource allocation. Accurate demand forecasts empower businesses to optimize their operations, minimize stock outs and excess inventory, enhance customer satisfaction, and ultimately drive profitability and sustainable growth (Seroney, Wanyoike & Langat, 2019).

Strategic Sourcing

Strategic sourcing involves aligning sourcing decisions with the broader objectives of the organization to drive value creation, enhance competitiveness, and achieve strategic goals. At its essence, strategic sourcing emphasizes collaboration, innovation, and long-term relationships with suppliers to optimize the entire supply chain (Udoka, 2021). Understanding the organization's needs and priorities involves a thorough analysis of internal requirements, market dynamics, and external factors such as regulatory changes and technological advancements. By gaining a deep understanding of these factors, organizations can develop

sourcing strategies that effectively balance cost considerations with quality, reliability, and other critical factors (Obasa & Gado, 2022).

Strategic sourcing focuses on building strategic and collaborative relationships with key suppliers. This involves selecting suppliers based not only on their pricing but also on their capabilities, reliability, innovation potential, and alignment with the organization's values and goals. By nurturing strong supplier relationships, organizations can access expertise, drive innovation, and achieve mutual benefits such as cost savings and risk mitigation (Basweti & Achuora, 2020). Strategic sourcing also emphasizes risk management and resilience in the supply chain. By diversifying the supplier base, developing contingency plans, and monitoring potential disruptions, organizations can mitigate the impact of unforeseen events such as natural disasters, geopolitical instability, or supply chain disruptions. This proactive approach to risk management helps organizations maintain continuity of operations and minimize the potential for costly disruptions (Munene & Gachengo, 2023).

Strategic sourcing incorporates sustainability and ethical considerations into sourcing decisions. Organizations are increasingly recognizing the importance of environmental sustainability, social responsibility, and ethical sourcing practices. By working with suppliers who adhere to high standards of sustainability and ethical conduct, organizations can enhance their reputation, mitigate reputational risks, and contribute positively to society and the environment (Mathur, *et al,* 2018).

Empirical Review

Demand Forecasting and Organization Performance

Osho, Nwachukwu and Walter (2022) researched on human resource for-casting and effectiveness of manufacturing firms in rivers state. A cross-sectional survey research design was adopted in the study. The population of the study comprise manufacturing firm in Rivers state, Nigeria. The study found that human resource forecasting significantly influence organizational effectiveness of manufacturing firms in Rivers State and that human resource forecasting influences, and relates to organizational effectiveness. The study concluded that human resource forecasting is essential to organizational effectiveness of manufacturing firms in Rivers State.

Yalo, Edicha and Nafiu (2019) conducted a study on market driven forecasting and performance of SMEs in business competition in Ogun state, Nigeria. Survey research method was adopted in the study. The target population was 375 SMEs totalling the population of 1275 respondents. The study found market driven forecasting is not a guaranteed techniques for influencing business performance, but for planning and decision making. The study concluded that investment in market driven forecast is not sufficient enough to enhance a guaranteed business performance in business competition.

Wamoto, Kaswira and Ndoto (2023) investigated on the relationship between demand for-casting and operational performance of stores function in commercial state corporations in Kenya. The study adopted cross-sectional descriptive correlation survey research design. The target population for the study was 906 Senior Management, Procurement Managers and Inventory Management Officers in the 54 Commercial State Corporations in Kenya. The study found that demand forecasting influenced the operations within the state corporations in Kenya and that the corporations structured mechanisms that ensured there was availability of stock levels at all times had significant influence on operational performance of stores function in commercial state corporations in Kenya. The study concluded that demand forecasting influenced operation performance of stores function in commercial state corporations in Kenya.

Seroney, Wanyoike and Langat (2019) conducted a study on the influence of demand forecasting on supply chain performance of petroleum marketing companies in Nakuru County, Kenya. The study used a descriptive survey research design. 147 supply chain managers and

the procurement officers working with the petroleum marketing companies in Nakuru County, Kenya constituted the target population. The study found that hat demand forecasting has a significant effect supply chain performance. The study concluded that there exists a significant influence of demand forecasting on supply chain performance of Petroleum marketing companies in Nakuru County, Kenya.

Gatari, Shale and Osoro (2022) researched on the inventory management and sustainable performance of state corporations in Kenya. The descriptive research design was applied in carrying out the study. The 187 state corporations that are registered in Kenya were the study's target population. The study found that Inventory management significantly affected the sustainability of state corporations in Kenya. The study concluded that through proper regulation of the PPAD by the relevant authorities, the management of inventory towards enhancing the sustainable performance of the corporations is enhanced.

Strategic Sourcing and Organization Performance

Udoka (2021) investigated on outsourcing management strategies and organizational performance in manufacturing firms in South East Nigeria. The study adopted the quantitative research design. The population for this study is made up of 300 employees, of the plastic manufacturing firms in Anambra State. The study found that outsourcing for employee competence has a significant effect on organizational performance of manufacturing firms in Anambra State and outsourcing for cost reduction has positive significant effect on organizational performance of manufacturing firms in Anambra State, Nigeria. The study concluded that outsources strategies had a positive significant effect on organizational performance of plastic manufacturing firms in Anambra State, Nigeria.

Obasa and Gado (2022) conducted a study on the impact of public procurement practices on organizational performance: a study of bureau of public procurement, Abuja, Nigeria. The study used e survey design. The target population was the Bureau of Public Procurement in Abuja, Nigeria with all its branches. The study found that contract review was positively and significantly related to organizational performance and supplier picking positively and significantly affect the performance of the National Bureau of Public Procurement. The study concluded that that contract review and supplier selection all impacted outcomes positively in the National Bureau of Public Procurement.

Basweti and Achuora (2020) investigated on the influence of strategic procurement management on the performance of state corporations in Kenya. The study employed a descriptive research design. The target population was all the 187 heads of procurement of the state corporations in Kenya. The study found that supply base leveraging, inventory management system, e-procurement and strategic sourcing. The study concluded that supply base leveraging, inventory management system, e-procurement and strategic sourcing have a positive relationship with performance of the state corporations.

Munene and Gachengo (2023) conducted a study on the procurement planning practices and performance of commercial state corporations in Nairobi City County, Kenya. The study utilised descriptive and explanatory research design. The target population consisted of five (5) commercial state corporations were the respondents were selected from four core department in each of the five state corporations. The study found that procurement need identification had significant and positive effect on organizational performances of commercial state corporations in Nairobi City County. The study concluded that there was positive correlation between budget cost & estimates and organizational performance.

Tarus and Ndetro (2021) researched on the effect of strategic procurement on the performance of parastatals in Kenya. The study employed descriptive research design. The target population for the study was 187 parastatals in Kenya. The study found that inventory management systems have a positive and significant effect on the performance of parastatals in Kenya. The

study concluded that strategic sourcing, outsourcing and information technology has a positive and significant effect on the performance of parastatals in Kenya.

RESEARCH METHODOLOGY

The descriptive research design was employed where data was collected one point in time. The target population in this study was the state corporations in Kenya. There are 248 state corporations in Kenya spread across different locations in the country. Focusing on all the state corporations helped in providing a clear picture of the differences in the characteristics of the population under study. The units of analysis were the state corporations while the units of observation were the heads of procurement in the 248 state corporations. The study employed a stratified random sampling technique where the target population was divided into strata (the categorizations of the 248 state corporations) and a proportion number randomly picked from each of the stratum. Yamane' (1967) formula was used to arrive at a sample size of 153 respondents.

To select this sample as earlier indicated, a stratified random sampling technique was utilized. Data was collected using a self-administered semi-structured questionnaire. A pilot test was conducted to determine validity and reliability of the data collection instrument. According to Mugenda and Mugenda (2017) the pretest sample should be between 1% and 10% depending on the sample size. This study used 10% of the sample, which is equivalent to 16 respondents (10% of 153).

Data obtained from the field was coded, cleaned, and entered into the computer for analysis using the SPSS version 25. The data was summarized in order to see emerging trends and issues around specific themes, which are dependent on the variables and objectives. Presentation of data was done in form of quantitative reports which were presented in forms of tables and essay. For the quantitative reports, the tables consisted of mean and standard deviation values that were used to make interpretation of the analysis. Tables were used to display the rate of responses and to facilitate comparison. Inferential statistical analysis through multiple regression and correlation analysis techniques were carried out to establish the relationship between independent variables and the dependent variable. The significant of each independent variable was tested at a confidence level of 95%.

RESEARCH FINDINGS AND DISCUSSION

The study had a sample of 153 respondents who were surveyed using a structured questionnaire. A response rate of 90.8% was achieved where 139 respondents filled and returned the questionnaires for analysis. This therefore makes the study appropriate to make conclusions and recommendations since according to Kingslay (2012), a response rate of 30-60% in a study is adequate for making conclusions and recommendations.

Descriptive Results on Demand Forecasting

The first objective of the study was to assess the influence of demand forecasting on performance of state corporations in Kenya. The study sought to establish the role played by face to historical data, market research and predictive sales analysis as key methods of demand forecasting on performance of state corporations in Kenya. The respondents were asked to indicate the extent to which they agreed or disagreed with specific statements on demand forecasting. The respondents were requested to use a 5-points Likert's scale where 1 was strongly disagree, 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree. As the results on Table 4.8 portray, majority of the respondents (56.4%) disagreed that their respective state corporations collected and analyzed historic data on demand trends to forecast on future demands (Mean = 2.78; standard deviation = 1.04). The respondents further disagreed that their respective organizations had in-house historic data that was used to predict future demands (Mean = 2.57; standard deviation = 1.52) and that the corporations undertook effective market research to establish the projected demand of the products based on market factors (Mean =

2.50; standard deviation = 1.09). The findings imply that most of the state corporations did not effectively forecast on demand using the historical data approach. Failure to utilize historical data to forecast demand as expounded by Hassan and Omwenga (2023) affects organization's ability to learn from the past and effectively quantify the expected trends in demand.

The findings further revealed that most of the respondents (58.1%) disagreed with the statement that organization has a framework for undertake frequent market research to understand underlying factors that could affect demand (Mean = 2.54; standard deviation = 1.02), while 66.3% disagreed that the organizations carried out predictive sales analysis to identify the trends in future sales and demand (Mean = 2.63; standard deviation = 1.09). A good number of the respondents (59.7%) disagreed that the organizations had embraced key technologies such as Artificial Intelligence to predict sales trends and forecast demand (Mean = 2.74; standard deviation = 0.94). The respondents disagreed that there had been fewer/no instances of demand fluctuating without knowledge of the organization (Strongly Disagree = 45.9%; Disagree = 17.1%; Mean = 2.65; Std. Dev. = 0.90) and that the organization's demand forecasting was perceived to be accurate and reliable (Mean = 2.54; standard deviation = 1.04). The findings imply that demand forecasting has not been effectively upheld among most of the surveyed state corporations in Kenya. The findings concur with those by Jeamal (2022) who established that as a results of poor efforts to predict future demands, state agencies failed to be adequately prepared for future changes in demand, and this drastically affected their supply chain processes.

Table 1: Descriptive Results on Demand Forecasting

Statements	SD	D	N	A	SA	Mean	Std. Dev.
1. Our organization collects and analyzes historic data on demand trends to forecast on future demands	32.4%	24.0%	6.7%	17.1%	19.8%	2.78	1.04
2. The organization has in-house historic data that is used to predict future demands	37.1%	26.8%	11.3%	8.5%	16.4%	2.57	1.52
3. Our organization undertakes effective market research to establish the projected demand of the products based on market factors	28.5%	32.2%	10.7%	17.9%	10.7%	2.50	1.09
4. The organization has a framework for undertake frequent market research to understand underlying factors that could affect demand.	29.2%	38.9%	6.7%	13.5%	11.7%	2.54	1.02
5. Our organization carries out predictive sales analysis to identify the trends in future sales and demand	41.4%	24.9%	5.8%	15.4%	12.6%	2.63	1.09
6. The organizations has embraced key technologies such as Artificial Intelligence to predict sales trends and forecast demand	30.3%	29.4%	8.5%	19.3%	11.6%	2.74	0.94
7. There have been fewer/no instances of demand fluctuating without knowledge of the organization	45.9%	17.1%	6.2%	17.7%	13.1%	2.65	0.90
8. Our organization's demand forecasting is perceived to be accurate and reliable.	34.2%	21.2%	10.3%	15.3%	19.0%	2.54	1.04

Key: SD: Strongly Disagree; D: Disagree; N: Neutral; A: Agree; SA: Strongly Agree

Descriptive Results on Strategic Sourcing

The second objective of the study was to establish the influence of strategic sourcing on performance of state corporations in Kenya. The study sought to establish the role played by need assessment, contracting, and spend aggregation as key aspects of strategic sourcing on performance of state corporations in Kenya. The respondents were asked to indicate their level of agreement or disagreement with statements on strategic sourcing. A 5-points Likerts scale was used where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. As the findings on Table 4.9 portray, most of the respondents (70.0%) disagreed that the strategic sourcing practices are strategically aligned with the corporations' overall goals and objectives (Mean = 2.38; standard deviation = 1.53). The respondents disagreed that the organizations employed strategic sourcing to enhance operational efficiency and effectiveness. (SD = 39.4%; D = 22.5%; Mean = 2.55; standard deviation = 1.09). They further disagreed that strategic sourcing was considered a critical component of their respective organizations' procurement strategy (SD = 23.0%; D = 36.2%' Mean = 2.61; standard deviation = 1.09). The respondents indicated that their respective organizations contracted suppliers who were deemed capable of aligning with their strategic goals (SD = 22.2%; D = 41.8%; Mean = 2.29; standard deviation = 1.54). The findings are a clear indication that there was deficiency of strategic sourcing among the surveyed state corporations especially as far as contracting and need assessment aspects are concerned. According to Aityassine et al. (2022), inadequate embrace of contracting and need assessment as essential approaches to strategic sourcing leads to ineffective optimization of supply chain to minimize on costs and maximize on value for better performance.

The findings further revealed that most of the respondents (56.2%) disagreed that contracts in their respective corporations were centralized for easier management and administration (Mean = 2.68; standard deviation = 1.40). A further 59.8% of the respondents disagreed that their respective organizations actively evaluated supplier performance to ensure alignment with strategic sourcing objectives (mean = 2.68; standard deviation = 1.04). The findings revealed that most of the respondents (60.1%) disagreed that organization engages suppliers who are capable of aligning with its strategic goals on long-term contracts (Mean = 2.43; standard deviation = 1.52). They further disagreed that the corporations had a set a framework for continuous process improvement of the suppliers (Mean = 2.72; standard deviation = 1.39); and that the corporations had aggregated purchasing across the departments to streamline procurement process (Strongly Disagree = 35.2%; Disagree = 26.5%; Mean = 2.63; Std. Dev. = 1.07). The findings have portrayed the ineffective embrace of strategic sourcing among most of the surveyed state corporations in Kenya. The findings concur with those by Konene and Osoro (2023) who established that lack of strategic sourcing where the purchasing process is informed by the strategic goals of the organization was evident in most of public entities in Sub-Saharan Africa, and this had detrimental effects of the organizations' performance.

Table 2: Descriptive Results on Strategic Sourcing

Statements	SD	D	N	A	SA	Mean	Std. Dev.
1. Strategic sourcing practices are strategically aligned with our organization's overall goals and objectives.	32.5%	37.5%	5.3%	10.7%	14.1%	2.38	1.53
2. Our organization employs strategic sourcing to enhance operational efficiency and effectiveness.	39.4%	22.5%	8.2%	18.0%	11.9%	2.55	1.09
3. Strategic sourcing is considered a critical component of our organization's procurement strategy.	23.0%	36.2%	13.4%	11.2%	16.2%	2.61	1.03
4. Our organization contracts suppliers who are deemed capable of aligning with its strategic goals	22.2%	41.8%	7.4%	13.5%	15.1%	2.29	1.54
5. All contracts in our organization are centralized for easier management and administration	36.1%	20.1%	12.1%	17.5%	14.3%	2.67	1.40
6. Our organization actively evaluates supplier performance to ensure alignment with strategic sourcing objectives.	35.7%	24.1%	12.1%	11.4%	17.6%	2.68	1.04
7. The organization engages suppliers who are capable of aligning with its strategic goals on long-term contracts.	20.3%	39.9%	14.0%	13.0%	12.9%	2.43	1.52
8. The organization has a set a framework for continuous process improvement of the suppliers	30.2%	24.0%	21.6%	10.3%	13.9%	2.72	1.39
9. Our organization has aggregated purchasing across the departments to streamline procurement process.	35.2%	26.5%	9.4%	15.9%	13.9%	2.63	1.07
10. All departments/sections in the organization submit their annual demand for supplies at the same time for consolidation	14.8%	48.5%	9.8%	19.8%	7.1%	2.36	1.03

Key: SD: Strongly Disagree; D: Disagree; N: Neutral; A: Agree; SA: Strongly Agree

Descriptive Results on Performance of State Corporations

The study sought to establish the respondents' opinions on performance of state corporations in Kenya. The respondents were asked to indicate their level of agreement or disagreement with specific statements addressing performance of state corporations in terms of customer satisfaction, audit trails, cost of service delivery, and quality of services. A five-points Likert's scale was used where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. As the findings on Table 3 portray, majority of the respondents (66.3%) disagreed that their respective state corporations had effectively met their service mandates over the last five years (Mean = 2.27; standard deviation = 1.23). The respondents further disagreed that the organizations had effectively and timely paid their suppliers for the last three years (Strongly Disagree = 25.9%; Disagree = 38.8%; Mean = 2.31; standard deviation = 1.03). The study further revealed that 65.2% of the respondents disagreed that quality of goods and services offered by the organizations had significantly improved for the past five years (Mean = 2.45; standard deviation = 1.20). Most of the participants disagreed that there were few customer

complaints on the quality of services offered in their respective organizations (Strongly Disagree = 33.6%; Disagree = 36.3%; Mean = 2.38; standard deviation = 1.15); while 66.1% of the respondents disagreed that the corporations had continually absorbed their set budget satisfactorily over the past five years (Mean = 2.25; Std. Dev. = 1.56). The findings are an indication that the performance of state corporations as far as key aspects that depend of the supply chain process are concerned has not been effective.

The findings further revealed that most of the organizations (63.1%) lacked effective audit trails for their expenditure over the past five years (Mean = 2.31; Std. Dev. = 1.40). A further 67.7% of the participants disagreed that their respective organizations had significantly reduced the costs of delivering services over the past five years (Mean = 2.29; Std. Dev. = 1.24), while 65.5% disagreed that there had been minimal/no wastages of the organization's spending in the past five years (Mean = 2.17; Std.. Dev. = 1.31). The findings imply that most of the state corporations have not been effectively performing as far as quality of services, customer satisfaction and audit trails are concerned. This compares with the Auditor General's report that revealed a surge in misappropriation and poor procurement processes among state corporations that led to increased wastage of public resources. According to Basweti and Achuora (2020), due to leakages in procurement processes, state corporations failed to meet their mandates including offering quality services to the public.

Table 3: Descriptive Results on Performance of State Corporations

Statements	SD	D	N	A	SA	Mean	Std. Dev.
1. Our organization has effectively met its service mandates over the last five years	34.1%	32.2%	10.5%	14.0%	9.2%	2.27	1.23
2. Our organization has effectively and timely paid its suppliers for the last three years	25.9%	38.8%	7.3%	15.2%	12.8%	2.31	1.03
3. The quality of goods and services offered by our organization has significantly improved for the past five years	36.3%	28.9%	9.0%	11.5%	14.3%	2.45	1.20
4. There are few customer complaints on the quality of services offered in our organization	33.6%	36.3%	6.8%	15.3%	8.0%	2.38	1.15
5. Our organization has continually absorbed its set budget satisfactorily over the past five years	49.0%	17.1%	7.2%	11.8%	14.9%	2.25	1.56
6. The organization has had effective audit trails for its expenditure over the past five years	16.6%	46.5%	7.0%	8.9%	21.0%	2.31	1.40
7. The organization has significantly reduced the costs of delivering services over the past five years	28.2%	39.5%	5.8%	17.6%	8.9%	2.29	1.24
8. There have been minimal/no wastages of the organization's spending in the past five years	48.4%	17.1%	4.2%	18.2%	12.1%	2.17	1.31

Key: SD: Strongly Disagree; D: Disagree; N: Neutral; A: Agree; SA: Strongly Agree

Correlation Analysis

As the results on Table 4 revealed, demand forecasting had a Pearson correlation coefficient of 0.759 when correlated with performance of state corporations in Kenya at a significance level of 0.000<0.05. According to Saunders (2019), a Pearson correlation value of greater than 0 indicates a positive association; in that as the value of one variable increases, the value of the other variable increases as well. The author further noted that a correlation coefficient of greater than 0.5 shows a strong correlation between the variables under consideration. This therefore

implies that with increase in demand forecasting as one of the aspects of supply chain optimization, performance of state corporations in Kenya will increase. Therefore, there is a strong, significant and positive correlation between demand forecasting and performance of state corporations in Kenya.

The Pearson correlation coefficient for the strategic sourcing and performance of state corporations was 0.683. The significance level (P-values) was 0.000<0.05. This is an indication that there is a strong and significant positive correlation between strategic sourcing and performance of state corporations in Kenya. Thus, with increase in strategic sourcing as one of the aspects of supply chain optimization, the performance of state corporations in Kenya will increase.

Table 4: Correlation Analysis Results

		Performance of State Corporations	Demand Forecasting	Strategic Sourcing
Performance of State Corporations	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	139		
Demand Forecasting	Pearson Correlation	.759**	1	
	Sig. (2-tailed)	.000		
	N	139	139	
Strategic Sourcing	Pearson Correlation	.683**	.601**	1
	Sig. (2-tailed)	.000	.000	
	N	139	139	139

Regression Model Analysis Results

Regression model analysis was carried out to establish the statistical relationship between supply chain optimization and performance of state corporations in Kenya. The output was presented using the model summary (comprising of and overall correlation coefficient (R) and the coefficient of determination (R^2)), Analysis of Variance (ANOVA) test (showing the F-calculated against the F-Critical of 1.96 and the p-value against the standard p-value of 0.05) and regression coefficients for the variables and their subsequent p-values.

Model Summary

The model summary results on are as shown in Table 5. The model Sammy shows the overall correlation (r), and the coefficient of determination (R-Square) which tells the strength of the model. As the results portray, an R value of 0.789 was obtained. This is an indication that on overall, the four aspects of supply chain optimization (demand forecasting, and strategic sourcing) have a strong correlation of 78.9% with the performance of state corporations in Kenya. On the other hand, a R-square of 0.623 was obtained. This is an indication that the combined effect of demand forecasting, strategic sourcing, can lead to variation of performance of state corporations by up to 62.3%. This shows that demand forecasting, strategic sourcing, are good predictors of performance of state corporations.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.789ª	.623	.619	.44431

a. Predictors: (Constant), Demand forecasting, Strategic sourcing,

Analysis of Variance

The Analysis of Variance (ANOVA) was also carried out in the model to establish the significance of the model in predict the relationship between the predictor variables and the predicted variable (performance of state corporations). From the ANOVA results indicated in Table 6, it is evident that the regression model has less than 0.000 likelihood of giving erroneous predictions. This therefore goes to demonstrate that the model has a confidence level of over 95% and it's therefore appropriate for making concrete conclusions on the population parameters as the value of significance (p-value,) was less than 5%. The calculated F-value was greater than the critical F-value (80.079 > 11.776) indicating that the model is statistically significant to predict the relationship between supply chain optimization (Demand forecasting, Strategic sourcing) and performance of state corporations in Kenya.

Table 6: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	47.106	4	11.776	80.079	.000[b]
1	Residual	19.709	134	.147		
	Total	66.815	138			

a. Dependent Variable: Performance of State Corporations
b. Predictors: (Constant), Demand forecasting, Strategic sourcing,

Regression Coefficients

Based on the results, the beta coefficients for the variables (Demand forecasting, Strategic sourcing) are 0.314, 0.327, respectively. From these coefficients, therefore, the model becomes:

$$Y = 009 + 0.314X_1 + 0.327X_2 + \varepsilon$$

From the findings, it is evident that the beta coefficient (β) for the first variable (demand forecasting) was 0.314, implying that a unit change in demand forecasting would influence up to 31.5% of performance of state corporations in Kenya. The P-value for the variable is $0.000 < 0.05$ implying that demand forecasting has a significant influence on performance of state corporations in Kenya. The findings concur with Wamoto, Kaswira, and Ndoto (2023) who indicated that demand forecasting is a fundamental aspect of supply chain optimization that strengthens the organization's ability to plan ahead thus steering organizational performance.

On the second variable (strategic sourcing), the regression coefficients results revealed that the beta coefficient (β) for the variable was 0.327. This is an implication that a unit change in strategic sourcing would influence performance of state corporations in Kenya by 32.7%. The results further revealed that the P-value for the variable was $0.000 < 0.05$. This is an implication that strategic sourcing has a significant influence on the performance of state corporations in Kenya. The findings concur with those by Basweti and Achuora (2020) who established that strategic sourcing plays a significant role in steering continued performance of modern organizations as it ensure on-boarding of suppliers who align with organization's strategic goals and objectives.

Table 7: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.009	.171		.053	.958
Demand Forecasting	.314	.055	.283	5.657	.000
Strategic Sourcing	.327	.044	.363	7.509	.000

a. Dependent Variable: Performance of State Corporations

Conclusions of the Study

The study concluded that demand forecasting as one of the supply chain optimization strategies has a significant role to play in enhancing performance of state corporations in Kenya. The study highlights a critical gap in the effective application of demand forecasting practices among state corporations in Kenya. The failure to leverage historical data, market research, and predictive sales analysis has led to poor preparedness for demand fluctuations, ultimately hampering supply chain efficiency.

The study concluded that strategic sourcing is an integral supply chain optimization strategy that plays a significant role in enhancing performance of state corporations in Kenya. The findings underscore a critical shortfall in the effective implementation of strategic sourcing within Kenya's state corporations. The lack of alignment between strategic sourcing practices and organizational goals has led to missed opportunities for enhancing operational efficiency, reducing costs, and maximizing value. The failure to integrate need assessment, contracting, and spend aggregation into a cohesive strategic sourcing framework has hampered the optimization of supply chains, thus limiting the performance of state corporations.

Recommendations of the Study

The study draws the following recommendations to the policy and practice based on the obtained findings:

1. For the state corporations to achieve their optimal performance, they ought to fully focus on best ways to optimize supply chain processes, owing to the immense role supply chain plays in the overall success of these corporations. The management of state corporations ought to properly rethink on the supply chain processes and come up with appropriate efforts to strengthen and streamline supply chain as a key critical success factor to the corporations.

2. The corporations through the management have a duty to forecast their internal demand and external demand of their services and products so as to plan ahead and ensure adequate and timely supply. This will prevent last-minute rush which exposes the corporations to high costs of goods and services and inefficient procurement processes.

3. For the state corporations to improve performance, there is an urgent need to align procurement strategies with broader organizational objectives and to embrace strategic sourcing as a central component of their operations. The supply chain managers in these corporations ought to ensure that the suppliers engaged have a clear understanding of the corporations' strategic goals.

Recommendations of Areas for Further Research

The study focused on supply chain optimization and its effect on performance of state corporations in Kenya. It is recommended that a different study expands the conceptual focus of supply chain optimization by utilizing different strategies from those utilized in this study (demand forecasting, strategic sourcing).

The study's context was on state corporations in Kenya. It is recommended that a different study focuses on other categories of organizations in both public and private sector to establish the integration of supply chain optimization in those sectors and how it affects their performance.

REFERENCES

Agu, A. O, Azioma, O. H & Nnate, E. C. (2020). Effect of inventory management on the organizational performance of the selected manufacturing firms. *Singaporean Journal of Business Economics, and Management Studies, 5*(4), 56-69.

Basweti, M. N & Achuora, J. (2020). Influence of strategic procurement management on the performance of state corporations in Kenya. *International Journal of Supply Chain and Logistics, 4*(3), 25-49.

Choi, J. (2019). A study of the role public procurement – can public procurement make society better? The International Public Procurement Conference, Seoul, South Korea

Cooper, D. R. & Schindler, P. S. (2018). *Qualitative research: business research methods*, Boston, MA: McGraw-Hill.

Creswell, R. (2018). Research design: *qualitative, quantitative, and mixed methods approaches*. USA: Sage Publications.

Douglas M. L, (2014). The Eight Essential Supply Chain Management Processes, *Supply Chain Management Review*, 18-26.

Fine, C.H. (2018), Clock speed: Winning Industry Control in the Age of Temporary Advantage, Perseus Books, Reading, MA, p. 272.

Genpact. (2017). *Supply Chain Optimization-Hidden Opportunities to Increase Cash flows and Working Capital*

Gituro, W., & Awino, Z. (2017). An Empirical Investigation of Supply Chain Management Best Practices in Large Private Manufacturing Firms in Kenya aibuma.

Godwin, R. (2020) Employee Welfare Packages and The Performance of Public Organizations in Rivers State, Nigeria. *European Journal of Research and Reflection in Management Sciences 8*(2), 58-79.

Hassan, A. J., & Omwenga, J. Q. O. (2023). Contract management and procurement performance of State Corporation in Kenya. *International Journal of Social Science and Humanities Research (IJSSHR) ISSN 2959-7056 (o); 2959-7048 (p), 1*(1), 47-73.

Ifeoma, U.A., Ufoaroh, E.T., & Chike, P. (2023). Welfare Packages and Staff Performance in Polytechnics in Anambra State South East, Nigeria. *International Journal of Current Science Research and Review 6*(9), 6236-6245.

John, G. & Johnson, P. (2016). *Research methods for Managers, 4th Edition.* Sage Publications: London.

Kamwenji, R. W., Ngugi, P. K., & Kamaara, M. (2022) .WorkLife Balance Benefits and Employee Performance in the State Corporations in Kenya. *Journal of Human Resource and Leadership, 2*(1), 38-46.

Ketere, S. K., & Osoro, A. (2023). Supply Chain Optimization And Performance Of Dairy Processing Farms In Kiambu County, Kenya. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME), 7*(2).

Kothari, C. R. (2014). Research methodology: Methods and techniques. New Age International

Lee, K., Azmi, N., Hanaysha, J., Alzoubi, H., & Alshurideh, M. (2022). The effect of digital supply chain on organizational performance: An empirical study in Malaysia manufacturing industry. *Uncertain Supply Chain Management, 10*(2), 495-510.

Lütfi, S., (2020) Validity and reliability in quantitative research. *Business and management studies. An International Journal, European Leadership University*

Lysons, K., & Gullingham, M. (2017). *Purchasing and Supply Chain Management,* (6th Ed).London: Pearsons Hall.

Mathias, J. M & Owuor, E. D. (2018). Effects of inventory management system on organizational performance: case study of grain bulk handlers limited. *International Journal of Sciences: Basic and Applied Research, 20*(2), 215-232.

Monczka, R., Giunipero, L., Patterson, R. & Handfield, R. (2019). *Sourcing and Supply Chain Management.* New dehli: South Western.

Mose, J. M. (2017). The Critical Success Factors and Challenges in e-Procurement Adoption Among Large Scale Manufacturing Firms in Nairobi, Kenya. *European Scientific Journal* 9(13) 9 (ISSN: 1857 – 7881 (Print) e - ISSN 1857-7431).

Odhiambo, W., & Kamau, P. (2012). *Public procurement: Lessons from Kenya, Tanzania and Uganda, Working Paper 208.* Paris: OECD Development Centre.

Onyango, A. (2017). *Supply Chain Management Practices and Performance in Cement Industry in Kenya,* Unpublished MBA Project, University of Nairobi School of Business, Nairobi

Orodho .C. R. (2019). *Element of Education and Social Sciences.* Research Methods 2 nd Edition, Kanezja Publishers. New Delhi

Rajagopal, S. & Bernard, K.N. (2013), "Strategic procurement and competitive advantage", *International Journal of Purchasing & Materials Management*, 29(4), 12-20.

Ratanya, K. E. (2017). *E-procurement Implementation and Supply Chain Integration Among Large Scale Manufacturing Firms in Nairobi.* Unpublished University Of Nairobi MBA Project.

Udoka, E. P. (2021). Outsourcing management strategies and organizational performance in manufacturing firms in South East Nigeria. *International Journal of Innovative Finance and Economics Research, 9*(3), 16-28.

Wieland, A.; Wallenburg, C.M. (2017). *Supply-Chain-Management in stürmischen Zeiten. Berlin: Universitätsverlag der* TU. ISBN 978-3-7983-2304-9

Womak, K. D., Christopher W. Craighead, David J. Ketchen, Jr., and G. Tomas M. Hult (2013), "Supply Chain Knowledge and Performance: A Meta-Analysis" *Decision Sciences,* 44 (5), 843-875