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Influence of Inventory Management on Technical Performance at Kenya Power and Lighting Company Limited

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Abstract: There have been a lot of difficulties in determining the desired stock levels that ensures a free flow of materials without incurring heavy expenses in stocking those materials and without any stock being rendered obsolete. The study sought to assess the influence of Inventory Management on the technical performance of Kenya Power and Lighting Co. Ltd. Specifically, the study evaluated the influence of; inventory forecasting, inventory control systems, inventory management strategy on technical performance of Kenya Power and Lighting Company and assess the moderating influence of industry specific factors on technical performance of Kenya Power and Lighting Company. The study used the descriptive research design in conducting the study. The population of the study consisted of employees working in operations and inventory management. The study population was considered manageable and therefore census approach was used, and no sampling was done. The study used primary method in data collection collected using questionnaires. The qualitative data from the open-ended questions was analyzed using content analysis because the focus was on interpretation of the results rather than quantification while quantitative data from the close ended questions was analyzed by use SPSS. The study found out that three main inventory management approaches have been adopted at KPLC which include Inventory management strategy, Inventory Forecasting and Inventory control systems. However, the study established that these inventory management approaches had varying extents of adoption at KPLC with industry focusing strategies being the most utilized and inventory management strategy being the least utilized. The study also found out that the inventory management strategies had a significant positive effect on the operational performance when combined. The industry specific factors were further found out to have a significant moderating effect on the technical performance at KPLC.

Keywords: *Inventory Management, Technical performance, Inventory forecasting, Inventory control systems, Inventory management strategy, Industry specific factors*

Introduction

Effective inventory management provides a potential system to improve organizational technical performance by matching inventory management practices and competitive advantages in the competitive world (Prempeh, 2015). Inventory management across the supply chain is a big challenge for improving coordination among the value chain in the organizations. Controlling inventory is the need of the hour as it formulates the future of the business in terms of its success/failure as competition is intense, growing day-by-day (Fariza, Saad, Mohd & Zien, 2015). Inventory management represents one of the most important assets that businesses possess, because the turnover of inventory represents one of the primary sources of revenue generation and subsequent earnings for the company (Prempeh, 2015).
In the past, inventory management was not seen to be necessary. In fact excess inventories were considered as indication of wealth. Management by then considered over stocking beneficial. But today firms have started to embrace effective inventory management (Shah & Shin, 2007). Managers, now more than ever before, need reliable and effective inventory control in order to reduce costs and remain competitive. According to Fariza *et al.,* (2015), inventory alone account for as much as 30% of the organization invested capital. Proficient and powerful operational execution is required to augment an organization's competitive edge through improvement of value, cost reduction quality, persistence, time to market, and item development, client lead times, stock levels, and conveyance time (Ngatia, 2013).

However, the influence of inventory management on technical performance among utility companies have been understated (World Bank, 2016). This could be due to low value of inventory reported in the companies' financial statements. Kenya Power for example in financial year 2016-17 reported inventories with a value of KES 9.6 billion, 14% of total current assets (KPLC, 2017). However, KPLC's 90% of the cost component is energy acquired from power generating companies. The poor perception of inventory level at utility firms had led to failure to implement robust inventory management techniques leading to lost stocks (World Bank, 2016). Consequently, there are minimal studies examining the influence of inventory management on technical performance among utility firms with studies concentrating on manufacturing firms.

Statement of the Problem

Inventory constitutes the most significant part of firms in the energy sector. Because of the huge inventories maintained, a considerable sum of an organization's fund is committed to them. Thus it becomes absolutely imperative to manage inventories efficiently so as to avoid the costs of changing production rates, overstocking, stock outs and unnecessary cost (Holmbom & Segerstedt, 2014). Organizations use inventory control not only to ensure materials and products timely availability but also to ensure superior customer service and to achieve competitive advantage. There have been a lot of difficulties in determining the desired stock levels that ensures a free flow of materials without incurring heavy expenses in stocking those materials and without any stock being rendered obsolete (Okinyi, 2015). In spite of the importance of electricity companies in an economy, the influence of inventory management on technical operation has been understated with most studies examining manufacturing firms and other inventory intensive companies.

Kolias (2011) studied inventory-performance link using construction firms listed in Bursa Malaysia. The study found that there was a positive correlation between inventory turnover and capital intensity as a result of the nature of investments. Berhane (2015) conducting a study on inventory management practices of Ethiopian electric utility found that the management had information about the material shortages but failed to solve the problem. Some employees used the shortage as an opportunity for unethical activities and the management didn't take remedial action. Notably, while there has been many studies on inventory management, researchers have not explored the influence of inventory management on technical performance of utility companies in spite of the expected losses in case of inappropriate management of inventory. The studies have also found positive influence of inventory management without detailing what constitutes to inventory management for the positive results. The studies have also not related inventory management to technical performance. This study therefore sought to examine the influence of inventory management on technical performance of Kenya Power and Lighting Company Ltd. The study sought to answer the question; what is the influence of inventory management on technical performance at KPLC?

Objectives of the Study

i. To evaluate the influence of inventory forecasting on technical performance of Kenya Power and Lighting Company Ltd.

ii. To evaluate the influence of inventory control systems on technical performance of Kenya Power and Lighting Company Ltd.

iii. To determine the influence of inventory management strategy on technical performance of Kenya Power and Lighting Company Ltd.

iv. To assess the moderating influence of industry specific factors on technical performance of Kenya Power and Lighting Company Ltd.

Theoretical Review

Stock Diffusion Theory

Stock diffusion theory outlines a dynamic approach to inventory management used for non-stationary items with non-constant means and variance. According to stock diffusion theory, stock consumption is modeled as a Markov process with a slow diffusion term. Fokker Planck equation is used to derive the probability distribution of stock consumption and reorder time. Management of the inventory distributed in this manner makes it possible to keep safety stock at minimum levels (Braglia, 2013). Stock diffusion theory explains the process of ensuring the inventory costs are kept at minimal levels without interrupting the internal operations of the organization (Eaton, 1999). This theory also takes into account the fluctuations in market. The market environment is dynamic and hence the nature of distribution of items. When fluctuations occur in supply market, the outcome is directly experienced by the product buyers and users (Angel, 2005). Stock diffusion concept can also be applied in supply environment with random and controllable demand and continuous input flow with fixed uncontrollable rate under finite storage capacity (Kitaeva, 2014).

Thus, according to the theory, the effectiveness of inventory management practices depend on how various aspects of inventory management are interconnected and information flows in the organization (Eaton, 1999). The theory recognizes the importance of inventory management in enhancing technical performance. The theory recognizes that to manage inventory, there are a lot of uncertainties in the environment. There is thus the need to develop internal inventory control systems that allows direct and real time flow of information on materials; information flow between suppliers and the organization. Organizations must develop internal structures, policies and procedures upon which all internal inventory control operations are based (Eaton, 1999).

Resource Dependency Theory

According to resource dependency theory, firms seek to reduce uncertainty and manage dependence by purposely structuring their exchange relationship, establishing formal and semi-formal relationship with other firms' (Mito, 2015). Through the developed linkages and relationships, organizations can reduce inconveniences that come as a result of market dynamics. This theory can be applied in internal inventory control. Organizations can form strategic, long term relationships with suppliers and product users to ensure smooth and timely delivery of materials (Angel, 2005). With long term supplier-customer relationship, the organization is able to buffer itself from internal and external organizational and environmental changes and achieve optimal inventory control (Kitaeva, 2014).

Resource dependency theory is based on six assumptions; firstly, organizations depend on resources for their internal operations. The second assumption is that the resources originate from outside the organization; they are bought from other organizations. Thirdly, the resources are scarce and competitive and therefore require strategic decisions to be made about what to buy, in what quantity and at what times. Lastly, resource dependency is directly linked to the organization's power which is a rational, situational and mutual (Gerald, 2009). Resource dependency theory looks at how the resources outside the organization determine internal operations of the organization. The theory implication to the study is that technical performance and inventory management practices put in place by an organization are as a result of the resources allocated to the processes to achieve success on these variables. Thus, an organization with appropriate internal systems and processes will have better inventory management practices and this will result to improved technical performance (Mito, 2015).

Economic Order Quantity (EOQ) Model

Economic order quantity is the optimal quantity required to minimize the order and holding costs. EOQ is an accounting formula that gives the least point of order and storage costs. The economic order quantity model considers the trade-off between ordering cost and storage costs in determining the optimal quantity to use in replenishing item inventories. A large order quantity reduces the frequency of making orders thus reducing the order costs but increases the storage costs and other costs associated to storage. A small order quantity reduces the storage costs but increases the order costs due to several orders being made (Holmbom & Segerstedt, 2014).

The Economic Order Quantity model has been extensively used in both engineering and business disciplines. Roach (2005) asserts in both disciplines EOQ has practical and specific applications in illustrating concepts of cost trade-offs.

Given that

TC = PD + (Dk/Q) + (hQ/2) where: P = Unit Purchase price, Q = Order Quantity, Q* = optimal order Quantity, D = Annual Demand Quantity, k = fixed cost per order, h = Annual holding cost per unit. To determine the minimum point of the total cost curve, we determine its derivative with respect to Q and set it equal to zero.

Thus

$0= -Dk/Q^2 + h/2$

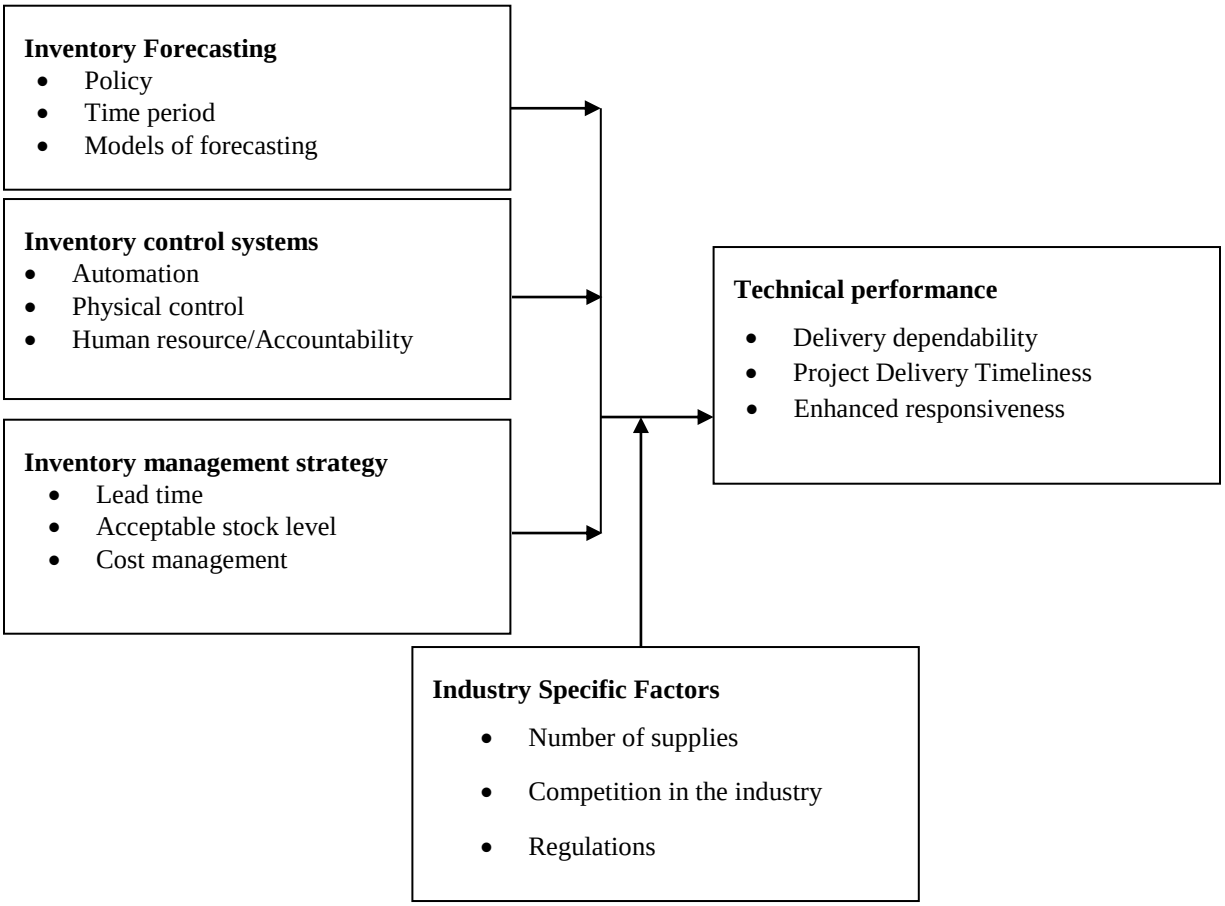
From the above equation Q= Q*

Therefore, $Q^{*2} = 2Dk/h$

Thus the Economic Order Quantity $Q^* = \sqrt{(2Dk/h)}$

Inventory cost is a function of order cost and holding costs. The model argues that inventory management has an effect on performance. There exists an optimal quantity which minimizes the costs and maximizes performance. Thus, according to the model, there is relationship between inventory management and technical performance. The ability of the organization like KPLC determining the optimal inventory management practices will influence technical performance. Failure of the organization in determining the optimal inventory quantity and hence inventory management strategies will be detrimental to technical performance at KPLC.

Conceptual Framework



Independent Variable **Moderating Variable** **Dependent Variable**

Figure 1 Conceptual Framework

Inventory Forecasting

The success of inventory management is dependent on inventory forecasting to determine the reorder level. Important considerations during inventory forecasting are the forecasting policy, time period, models of forecasting and review of the forecasted results. The forecasting policy specifies details of who does the forecasting, for what period, what information is required among others. Forecasting models may include economic order quantity among others.

Forecasting inventory requirements is a big deal in inventory management. Doing so ensures that organization will not run out of popular items, as well as helping in gauging the trends and demands for the items (EIM (2018).

Inventory Control Systems

Inventory cannot be managed adequately without automation. Inventory management systems track inventory through the entire supply chain or the portion of it a business operates in. That covers everything from production to retail, warehousing to shipping, and all the movements of stock and parts between. It means a business can see all the small moving parts of its operations, allowing it to make better decisions and investments. Different inventory managers focus on different parts of the supply chain though most businesses are usually more interested in the ordering and sales end of the chain (Gerald, 2009). A physical inventory may be mandated by financial accounting rules or the tax regulations to place an accurate value on the inventory, or the business may need to count inventory so component parts or raw materials can be restocked. Businesses may use several different tactics to minimize the disruption caused by physical inventory. The success of inventory management will be as good as the people assigned the responsibility. Making people accountable to physical inventory management and various inventory management levels improves the extent to which inventory is managed (Swaleh, 2014).

Inventory Management Strategy

Inventory management is about the strategy adopted by the organization. The strategy more often than not considers the lead time (adoption of just in time approaches), acceptable stock level (buffer stocks), sophistication of the inventory management model and inventory cost management models (Rajeev, 2008). An organization that adopts just in time strategy may have short production runs, which means manufacturers can move from one type of product to another very easily. This method reduces costs by eliminating warehouse storage needs. However, disruptions in supply chain may affect operations. A cost sensitive inventory strategy may require firms to acquire a lot of stocks during price stock periods (Berhane, 2015).

Industry Specific Factors

Industry factors which influence the nature of inventory management include number of supplies, competition in the industry and regulations. Industry specific factors influence the nature of inventory management techniques put in place. Competition level will determine the nature of systems adopted by firms to maximize performance. Globally, regulations in the industry affect the nature of inventory management techniques put in place. World Bank (2016) found that high total losses due to inappropriate inventory management were prevalent in most Latin American countries at the beginning of the 1990s, in a scenario characterized by poor performance of state-owned enterprises, poor service quality, and low access rates. To the contrary, Chinese state-owned provincial electric power companies generally showed good operational performance, in terms of service provided to existing customers, losses which were low, and connection of new consumers in rural areas. In US, inventory management improved with privatization of electricity generation (World Bank, 2016).

Technical Performance

Indicators of performance in this study will be delivery dependability, cost effectiveness, quality of services/output, timeliness and enhanced responsiveness. Technical performance alludes to the procedures equipped towards coordination and upgrade of work exercises and results inside an association. Proficient and powerful operational execution is required to augment an organization's competitive edge through improvement of value, cost reduction quality, persistence, time to market, and item development, client lead times, stock levels, and conveyance time (Ngatia, 2013).

Research Methodology

This study used the descriptive research design in conducting the study. The descriptive research design enables one to obtain information concerning the current situation and other phenomena and wherever possible to draw valid conclusion from the facts discussed (Creswell, 2008). The population of the study consisted of employees working in operations and inventory management. The staff were drawn from 11 regions. The respondents was 113 management staff working at the various regions. The study population was considered manageable and therefore census approach will be used and no sampling was done. The study used primary method in data collection. This was through the use of questionnaires. A structured questionnaire made of both open ended and closed ended questions was employed to collect data. A five point Likert scale was used for the subjects to choose their responses which then enabled the researcher to quantitatively analyse the data. The data received was in both qualitative and quantitative forms since this research employed triangulation (use of both qualitative and quantitative methods).

The qualitative data from the open ended questions was analyzed using content analysis because the focus was on interpretation of the results rather than quantification while quantitative data from the close ended questions was analyzed by use of SPSS and was analyzed using descriptive statistics which included frequencies, percentages, standard deviation and arithmetic mean. Multiple regression model was used to measure the relationship between the independent variables and the dependent variable which are explained in the model. The regression model also helps to explain the magnitude and direction of relationship between the variables of the study through the use of coefficients like the coefficient of determination and the level of significance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = Technical Performance, $\{\beta_i ; i=1,2,3,4\}$ = The coefficients for the various independent variables, X_1 = Inventory Control Systems, X_2 = Inventory Forecasting, X_3 = Inventory Management Strategy, X_4 = Industry Specific Factors, ε = Standard error, β_0 is the constant term. The analyzed data was then represented in figures and tables.

Results

Questionnaires were issued to employees working in operations and inventory management departments at various regions of KPLC. In this regard, a total of 113 questionnaires were issued out, of which 97 were duly filled and returned. This translates to a response rate of 86%.

Respondents Demographic Information

Table 1 Respondent Demographic Information

Demographic Characteristic	Category	Percentage
Department of the respondent	operations	14%
	Supply chain	50%
	Inventory	36%
Position of the respondents	Senior management	20%
	Middle level management	62%
	Low level management	12%
	Professional	6%
Duration at current position	<1 year	12%
	2-3 years	21%
	4-5 years	30%
	>5 years	37%
Respondent's level of education	High school	12.2%
	Diploma	21.95%
	Degree	39.02%

Descriptive results

Inventory Forecasting

The findings show that, to a large extent, there is an inventory policy which guides the inventory forecasting at KPLC (mean of 4, standard deviation of 1.0). To a large extent, inventory forecasting is done for fixed time period (mean of 3.76, standard deviation of 1.018) and to a large extent forecasted results and models are constantly reviewed (mean of 3.65, standard deviation of 1.128). To a moderate extent, there are a set of models which are used in forecasting of inventory (mean of 3.4, standard deviation of 1.161). Overall, inventory forecasting has been adopted at KPLC to a large extent with an average mean of 3.7 and 1.024. This shows that the inventory forecasting strategies were in use in enhancing the technical performance at the firm to a large extent.

Table 2 Inventory Forecasting

Inventory Forecasting	Mean	Std Dev
There is an inventory policy which guides the inventory forecasting at KPLC	4	1
Inventory forecasting is done for fixed time period	3.76	1.018
There are a set of models which are used in forecasting of inventory	3.4	1.161
The forecasted results and models are constantly reviewed	3.65	1.128
Mean	**3.7**	**1.024**

Inventory Control Systems

The findings revealed that to a large extent, there are physical control mechanisms at KPLC and contributes to inventory management (mean of 3.65, standard deviation of 1.182). To a moderate extent, inventory management activities are assigned to specific members of staff to enhance inventory control (mean of 3.19, standard deviation of 1.318) and inventory management at KPLC is moderately automated and moderately aid in management of inventory (mean of 3.27, standard deviation of 1.433). Overall, the inventory control systems were moderately established with a mean of 3.37 and standard deviation of 1.311. This shows that the inventory control systems were yet to be fully utilized in undertaking inventory management initiatives in the organization as they are only adopted moderately.

Table 3 Inventory control systems

Inventory control systems	Mean	Std Dev
Inventory management at KPLC is automated and aid in management of inventory	3.27	1.433
There are physical control mechanisms at KPLC and contributes to inventory management	3.65	1.182
Inventory management activities are assigned to specific members of staff to enhance inventory control	3.19	1.318
Mean	**3.37**	**1.311**

Inventory Management Strategy

The findings obtained show that, to a large extent, there is a fixed lead time which is adhered to by all suppliers (mean of 3.78, standard deviation of 0.869) and KPLC has cost management strategy in relation to inventory management (mean of 3.59, standard deviation of 1.344). To a moderate extent, there are set of inventory management models applied at KPLC (mean of 3.46, standard deviation of 1.251) and there are acceptable

stock levels against which ordering should be done (mean of 3.45, standard deviation of 1.021). This shows that inventory management strategy was adopted at KPLC to a large extent, having an average mean of 3.57 and standard deviation of 1.121.

Table 4 Inventory Management Strategy

Inventory management strategy	Mean	Std Dev
There is a fixed lead time which is adhered to by all suppliers	3.78	0.869
There are acceptable stock levels against which ordering should be done	3.45	1.021
There are set of inventory management models applied at KPLC	3.46	1.251
KPLC has cost management strategy in relation to inventory management.	3.59	1.344
Mean	3.57	1.121

Industry Specific Factors

As shown by Table 5 to a large extent; the number of suppliers (mean of 3.8, standard deviation of 0.909), competition level (mean of 3.75, standard deviation of 1.137) and regulations (mean of 3.54, standard deviation of 1.155) influenced the technical performance at KPLC. This implies that the industry specific factors had a large extent of impact on the technical performance with an average mean of 3.7 and standard deviation of 1.067.

Table 5 Industry Specific Factors

Industry Specific Factors	Mean	Std Dev
Number of suppliers	3.8	0.909
Competition level	3.75	1.137
Regulations	3.54	1.155
Mean	3.697	1.067

Technical Performance at KPLC

The results obtained revealed that, to a large extent, there was increased dependability at KPLC (mean of 3.69, standard deviation of 0.795). To a moderate extent, there was enhanced project completion timeliness and responsiveness. Overall, KPLC was established to have a moderate extent of technical performance with an average mean of 3.46 and standard deviation of 1.042.

Table 6 Technical Performance at KPLC

Technical Performance	Mean	Std Dev
Increased dependability	3.69	0.795
Enhanced project completion timeliness	3.47	1.156
Responsiveness	3.22	1.175
Mean	3.46	1.042

As shown by Table 7, delays in project completion had a maximum of 411, a minimum of 15 and a mean of 141.9. Response rate had a maximum of 16.69, a minimum of 1.48 and a mean of 4.1. Reliability had a maximum of 114.85, a minimum of 4.12 and a mean of 12.8.

Table 7 Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Delays in Project Completion	93	15	411	141.9	82.7
Response rate	60	1.48	16.69	4.1	2.5
Reliability (CAIDI)	58	4.12	114.85	12.8	15.2

Response Rate

The response in minutes for the reported incidences is as shown by Figure 2. The findings show there was no specific trend with the fastest being 2 minutes and the slowest being 16.69 minutes.

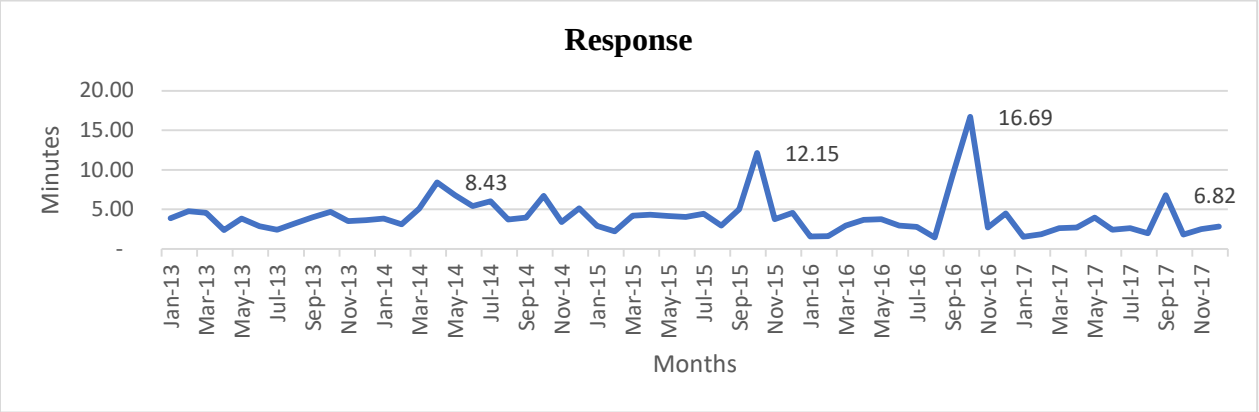


Figure 2 Response Rate

Reliability

This section aimed at finding out the reliability of the technical operations at KPLC based on the customer average interruptions duration index (CAIDI). The findings show that the reliability was relatively constant, however, there was a high episode of 114.85 in November 2016 as per Figure 3

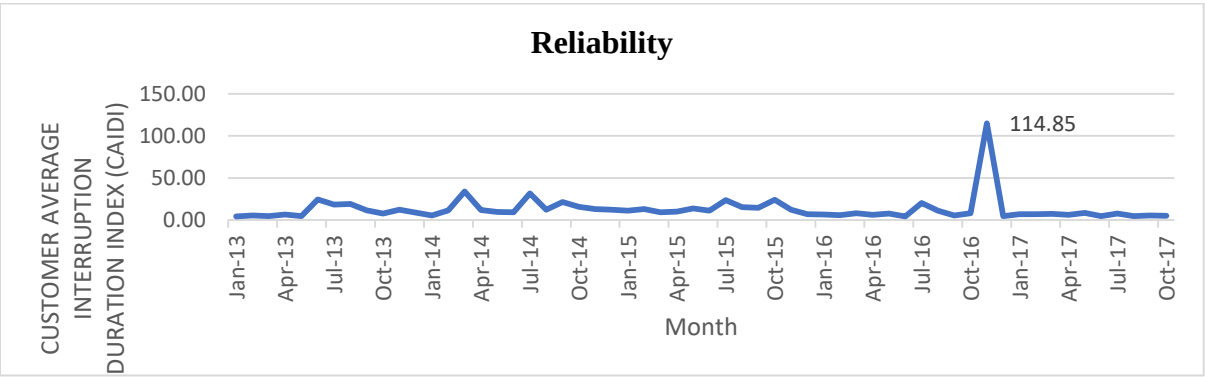


Figure 3 Reliability

Project Completion

As shown by Table 8 majority of the projects (87%) were not completed while only 13% were completed within time. This implies that most of the projects were either never completed or completed past target time resulting in very low completion levels.

Table 8 Project completion

Status	No of Projects	Percent
Not Completed (past target time)	81	87%
Completed within time	12	13%
Total	93	100%

Correlations Results

Table 9 gives the relationship between different sets of variables that was obtained. The correlation analysis results showed that Inventory Forecasting had a Pearson Coefficient of 0.422 and a p-value of 0.000, Inventory Control Systems had a Pearson Coefficient of 0.238 and a p-value of 0.019, Inventory Management Strategy had a Pearson Coefficient of 0.443 and a p-value of 0.000 and Industry Specific Factors had a Pearson Coefficient of 0.526 and a p-value of 0.000. This means that all the variables had a positive effect on the technical performance of KPLC. Hence an increase in the units of the variables will result in improved technical performance. The effect was significant as all the p-values were less than 0.05. This means that they can predict the changes in the technical performance at any given time.

Table 9 Correlation Analysis

		Technical performance	Inventory Forecasting	Inventory control systems	Inventory management strategy	Industry Specific Factors
Inventory Forecasting	Pearson Correlation	.422**				
	Sig. (2-tailed)	0.000				
Inventory control systems	Pearson Correlation	.238*	.345**	1		
	Sig. (2-tailed)	0.019	0.001			
Inventory management strategy	Pearson Correlation	.443**	.332**	.374**	1	
	Sig. (2-tailed)	0.000	0.001	0.000		
Industry Specific Factors	Pearson Correlation	.526**	.559**	0.146	.433**	1
	Sig. (2-tailed)	0.000	0.000	0.154	0.000	
	N	97	97	97	97	97

Regression analysis results

Table 10 shows the model summary. The results show that the inventory management practices namely; Inventory management strategy, Inventory Forecasting, Inventory control systems and industry specific factors explain only 68.9% of the total variation of the technical performance at KPLC (R^2=0.689). This means that 31.1% of the changes in the technical operational factors is accounted for by other factors not presented in the model.

Table 10 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.830	0.689	0.758	0.67149

The study further conducted an Analysis of Variance to check on the significance of the Model. The findings were as shown in Table 11.

Table 11 Test of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
81	Regression	16.387	3	5.462	12.114	.000
	Residual	41.934	93	0.451		
	Total	58.321	96			

The test of variance results obtained show that model one, $F_{(3, 93)} = 12.114$, $P < .001$ is valid for further analysis. Hence, the effect of independent variables on the model has significant effect on the dependent variable. Inventory management thus has significant effect on technical performance at KPLC. The model coefficients are presented in Table 12.

Table 12 Model Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	Beta	Std. Error	Beta	t	Sig.
(Constant)	0.843	0.451		1.868	0.065
Inventory Forecasting	0.375	0.118	0.308	3.193	0.002
Inventory control systems	0.004	0.08	0.005	0.055	0.956
Inventory management strategy	0.339	0.098	0.339	3.472	0.001

The results in Table 12 indicate that all the inventory management variables namely, Inventory Forecasting ($\beta_1 = 0.375$, $P = 0.002$), Inventory Control systems ($\beta_2 = 0.004$, $P = 0.956$) and Inventory management strategy ($\beta_3 = 0.339$, $P = 0.001$) have a positive effect on the technical performance. However only Inventory Forecasting and Inventory management strategy are significant as their p-values are less than 0.05. Thus, inventory forecasting and inventory management strategy positively improves technical performance at KPLC.

Discussion of Findings

Influence of inventory forecasting on technical performance

The study found out that the inventory forecasting strategies that were most adopted included there being an inventory policy and inventory forecasting being done for a fixed time period with the least adopted being set of models used for forecasting of inventory. Overall, inventory forecasting was established to be adopted at KPLC to a large extent with an average mean of 3.7 and 1.024. This shows that the inventory forecasting strategies were in use in enhancing the technical performance at the firm to a large extent. The correlation analysis was further utilized in establishing the influence of inventory forecasting on the technical performance.

The results of the correlation analysis showed that Inventory Forecasting had a Pearson Coefficient of 0.422 and a p-value of 0.000. This implies that it had a positive and significant effect on the technical performance which was also confirmed by the regression model coefficients obtained (β_1 = 0.375, P =0.002). Hence increasing in the inventory forecasting strategies would result in improved technical performance. The positive influence is supported by EIM, (2018) who argue that forecasting ensures that organization will not run out of popular items, as well as helping in gauging the trends and demands for the items (EIM (2018). Gardner, (2009) showed that choosing the forecasting technique would make a difference in determining inventory investment and customer service. This is further supported by Babai et al. (2012) who indicate that the use of traditional forecasting techniques are often ineffective when demand is intermittent or lumpy in nature.

Influence of inventory control systems on technical performance

The most utilized inventory control system was found out to be having automations in inventory control and the least was the inventory activities being assigned to specific members of the staff to enhance inventory management. The inventory control systems were established to be implemented moderately with an average mean of 3.37 and standard deviation of 1.311. This shows that the inventory control systems were yet to be fully utilized in undertaking inventory management initiatives in the organization as they are only adopted moderately. However, despite the moderate extent of adopting, the correlation analysis revealed that inventory control systems had a positive and significant effect on the technical performance as it had a Pearson Coefficient of 0.238 and a p-value of 0.019. The same was established by the regression model coefficients which shows that the inventory control systems played a significant role in ensuring that the firms performed effectively operation wise (β_2 = 0.004, P =0.956). Juan and Mertinez (2002) also found that effective inventory control systems helped increase operational efficiency of firms; improves customer service; reduces inventory and distribution costs; and enables businesses track items and their expiration dates consequently balance between availability and demand. Mogere, Oloko and Okibo (2013) on the other hand conducted a case study on Gianchore tea factory to assess how inventory control systems affect operational performance in the tea industry and found out that use of material requirement planning, distribution planning, and vendor managed inventory had a positive influence on operations efficiency and by extension on organizational performance.

Influence of inventory management strategy on technical performance

The most adopted inventory management strategy was found out to be a fixed lead time that must be adhered to and the least being acceptable stock levels. Generally, it was found out that inventory management strategy was only adopted at KPLC moderately, having an average mean of 3.57 and standard deviation of 1.121. This indicates that the inventory management strategy was not yet fully integrated and used in enhancing the technical performance of the organization. The inventory management is essential in organizations through ensuring adequate stock levels and flow of operation. This in the long run results in enhanced technical performance which was also established by the correlation analysis whereby Inventory Management Strategy had a Pearson Coefficient of 0.443 and a p-value of 0.000. Therefore, increased units of inventory management strategies will translate in enhanced performance as the same was confirmed by the regression analysis coefficients (β3 = 0.339, P =0.001).

Kimaiyo, and Ochiri (2014) 8studying the role of inventory management strategy on performance of manufacturing firms in Kenya, case of new Kenya Cooperative Creameries also found that use of inventory strategies resulted in improved performance at the organization. However, this contradicts Berhane, (2015) who established that a cost sensitive inventory strategy may require firms to acquire a lot of stocks during price stock periods (Berhane, 2015).

Moderating influence of industry specific factors on technical performance

The industry specific factors were indicated to have a large extent of moderating effect on the technical performance with an average mean of 3.7 and standard deviation of 1.067. This entails the number of suppliers, regulation and competition level. Thus, these type of prevailing specific industry factors highly predetermine how KPLC conducted its operations and performed. The effect was established to be highly significant as the correlation analysis results showed that Industry Specific Factors had a Pearson Coefficient of 0.526 and a p-value of 0.000. Favorable industry specific factors will result in improved performance whereas unconducive industry related factors will result in reduced performance.This relates to Swaleh, (2014) who found out that industry factors influence the nature of inventory management include number of supplies, competition in the industry and regulations. Similarly, Rosalan (2013) studied Inventory Control System Practice in Kuantan Food Processing Small Medium Enterprise and found that it is essential to put into. While, World Bank (2016) found that regulations in the industry affected the nature of inventory management techniques put in place. Consideration of the industry before deciding on the deciding on the inventory management model.2

Influence of Inventory Management practices on technical performance at Kenya Power and Lighting Co. Ltd

The study found out that these practices have a moderate influence on technical performance at KPLC with an average mean of 3.46 and standard deviation of 1.042. The secondary analysis further revealed that though the reliability of the operations at KPLC based on the customer average interruptions duration index (CAIDI) was relatively constant, there was no specific trend on the response rate and most of the projects were either never completed or completed past target time resulting in very low completion levels. On the effect of the inventory management practices on the technical performance, the regression analysis found out that the inventory management practices namely; Inventory management strategy, Inventory Forecasting and Inventory control systems explain only 68.9% of the total variation of the technical performance at KPLC (R^2=0.689). This means that 31.1% of the changes in the technical performance is accounted for by other factors not presented in the model.

The positive relation is explained by Prempeh, (2015) who argues that effective inventory management provides a potential system to improve organizational technical performance by matching inventory management practices and competitive advantages in the competitive world. Similarly, Kimaiyo, and Ochiri (2014) studying the role of inventory management on performance of manufacturing firms in Kenya, case of New Kenya Cooperative Creameries found that use of inventory control systems affects implementation of quality inventory management. This coincides with Kolias (2011) who studied inventory-performance link using construction firms listed in Bursa Malaysia. The study found that there was a positive correlation between inventory control system and performance.

Conclusions

The study established that three main inventory management practices have been adopted at KPLC which include Inventory management strategy, Inventory Forecasting and Inventory control systems. The study concludes that inventory management practices have been recognized as a crucial tool in enhancing operations at KPLC. However, the study found out that these inventory management practices had varying extents of adoption at KPLC. The study therefore concludes that each inventory management practice had a different priority level and utilization which was highly based on their perceived individual effects. The study further found out that the inventory management practices had a significant positive effect on the technical performance when combined. The study therefore concludes that the current technical performance at KPLC can be well accounted for by the available inventory management practices. Hence, improvemenent and diversification of the inventory management practices will result in improved technical performance at the firm. The industry specific factors were also found out to have a significant moderating effect on the technical performance at KPLC. The study therefore concludes that it is essential to put into consideration the industry specific factors in formulation and implmentation of the management strategies.

Recommendations

The study found that inventory forecasting has significant positive effect on technical performnace. The study therefore recommends that KPLC should pay more attention on inventory forecasting. The company should assess the shortcomings on the current inventory forecasting techniques and assess how these could be more enhanced. Better more precise techniques should be adopted and thus lead to positive influence on technical performance at KPLC. The study also recommends that the KPLC should aslo focus more on the inventory control system practices that are likely to accrue more benefits on technical performance. This will go a long way in not only boosting but also improving the performance at large. This will enable KPLC to not only better manage inventory but also enhance technical performance and performance at large. The study findings were that inventory management strategies positively and significantly affects technical performance. The study thus recommends that KPLC to have clearly stated inventory management strategies. The strategies to be communicated to the staff dealing with inventory. The strategies should be regularly reviewed and benchmarked with those of other utility companies globally. This will improve technical performance at KPLC. The industry specific factors were also found out to have a significant moderating effect on the perfomance of KPLC. The study thus recommends that these industry specific factors such as number of suppliers, regulation and competition level to be put in consideration in the management of operations at the firm. This will ensure that any challenges arising from these factors are mitigated and also the strategies put in place are aligned so as to benefit the most from the industry related factors.

Conflict of Interest

No potential conflict of interest was reported by the authors.

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