Effects of Inventory Management Practices on Operational Performance in Mombasa County Government, Kenya

Joram Tovesi Simwa [a*] and Peter Wamalwa Barasa [a]

[a] *School of Business and Economics, Mount Kenya University, Thika, P.O Box 42702-80100, Mombasa, Kenya.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Original Research Article

ABSTRACT

This study aimed at establishing the effect of inventory management practices on the operational performance of Mombasa County government. The specific objectives included the following: to examine the impact of JIT model on the operational performance of Mombasa County government; to assess the effect of Activity Based Costing (ABC) on the operational performance of Mombasa County government; to determine the impact of Economic Order Quantity (EOQ) on the operational performance of Mombasa County government and to establish the impact of stock taking practice on the operational performance of Mombasa County government. The research study reviewed Just in Time Theory, Systems theory and the transactional theory. This study used a descriptive survey design. The target population was all the 250 employees working in Mombasa County government that included ICT officers, Finance officers, Budgeting officers, Internal Audit officers and Procurement officers. Sample size of 96 employees was drawn from and was selected by the use of

_____

Corresponding author: E-mail: tovesisimwa@gmail.com;

stratified random sampling. Data was collected using a questionnaire. Data analysis was done with the aid of SPSS version 28. Inferential statistics was displayed by the use of correlations and regression analysis. The ethical considerations for this study included confidentiality, informed consent, privacy and anonymity. Correlation analysis revealed that there was a significant correlation between the Operational Performance of the County Government of Mombasa and Activity Based Costing practice ($\beta = 0.321$, $p< 0.05$). This is followed by Economic Order Quantity X3 ($\beta = 0.289$, $p< 0.05$), Stocktaking X4 ($\beta = 0.251$, $p< 0.05$), and Just in Time Model X1 ($\beta = 0.243$, $p< 0.05$), in that order.

1. INTRODUCTION

Hayes, (2022) defines inventory management as the ability of an organization to order, store, and use and sell processed raw materials, components and finished products. According to Panigrahi, Mishra, Samantaray, & Jena, (2022), inventory management performs a significant role in enhancement of an organization's operational efficiency. It leads to better productivity and reduced cost of production. This means that it is a very important element in the supply chain process of an organization. Frye, (2022) also posits that effective inventory management leads to high levels of responsiveness, efficiency and profitability in an organization.

Operational performance focuses on improved productivity with minimum effort [1]. It enables organizations to achieve their goals of service and product delivery efficiently. Modern technology, good planning and resource management aid in achieving optimum operational performance. According to Schmidt & Raman, [2], internal control which includes inventory management, enhance operational performance in organizations. It minimizes operational disruptions, reduces company risk, and builds up market confidence in the supply chain of a highly competitive world. Best operational strategies and commitments need to be employed in order to increase productivity while reducing risks (Dora, & Kumar, 2022).

Inventory management is the process of keeping track of all the stock in an organization (Hayes, 2022). These include purchases and procurements such as raw material and other inputs. It also includes the work in progress items which include unfinished products. Finally, it includes the finished products which are up for sale. These items need to be managed in such a manner that wastages and losses are minimized

and productivity optimized. JIT, ABC, EOQ and Stock taking are among the ways in which inventory management is made effective (Frye, 2022). Inventory management contributes to operational performance thus resulting in profitability in organizations and better service delivery in public institutions.

Globally, inventory management is significant for effective and efficient performance of organizations. It plays an important in controlling inventories that may be stored for future production. A study carried out in the United States of America by Williamson, (2022), demonstrated a significant correlation between inventory turnover and profitability. An organization is said to be operating optimally when the inventory turnover is high. This turnover includes the ability of a company to turn its products or services in sales. The inventory turnover is calculated in terms of ratios. The cost of goods is divided by the average inventory. It shows how effective the management is in managing the firm's inventory and generating sales.

In Malaysia, retailers are forced to ensure that there is improvement in inventory accuracy and a good management system for the warehousing. This smoothens the tracking of inventory management (Vatumalae, Rajagopal, Sundram, & Hua 2022). Inventory management tracking involves physically counting all the inventory of a company. It is also kwon as stock taking. It can be done using electronic scanners or done periodically. Inventory numbers can also be compared with financial statements. In India the effectiveness of inventory management has been found to impact on operational efficiencies in steel manufacturing firms [3]. Therefore, inventory management is a global concept which functions significantly in supply chain management.

In Africa, inventory management is also significant for effective and efficient performance of organizations. In a study conducted in Nigeria by Ogah. Asiegbu & Moradeyo [4], it was established that poor management of inventory resulted in poor quality, slow speed and the inflexibility of manufacturing operations in firms. A study on how inventory, forecasting and JIT affect the performance of companies in Rwanda, it was found that there was a significant effect [5]. In Tanzania Mbugi, & Lutego, (2022), found that the practice of the management of inventory affects the performance of organizations. Olanipon, Akinola, & Oladele, (2022) conducted a study in healthcare institutions in Nigeria. They assessed the impact that inventory management had on performance. Their findings revealed that the management of inventory significantly influenced performance positively.

In Kenya, inventory management also plays an effective and efficient role in the performance of organizations. Studies conducted in Kenya also show a significant correlation between inventory management and operational performance (Musivo, & Chege, [6], Kamau, & Thogori, [7], Panigrahi, [8]. A study conducted by Collins & Patrick, (2021) showed that stock taking significantly influenced the operational performance in milk processing firms. In another research conducted by Rumenser, (2022), it was established that inventory stocktaking leads to efficiency and economic improvement in the performance of organizations in Indonesia. In another study by Collins & Patrick, (2021) it was revealed that the JIT model had a significant effect on the operational performance.

Mombasa County government has undergone many challenges among them procurement which is reflected in inventory management and poor operational performance. There are cases of unaccounted for expenditure and inflated expenditures among others. These cases are shown in the stock taking in the County of Mombasa. There are also cases of items which are purchased that are not utilized for a long time. These challenges in the County government affect the productivity and delivery of services which translates to poor operational performance [9].

1.1 Specific Objectives of the Study

i. To examine the Influence of Just In Time (JIT) Model on Operational performance of the county government of Mombasa.

ii. To establish the effect of Activity Based Costing (ABC) on Operational performance of the county government of Mombasa.

iii. To determine the effect of Economic Order Quantity (EOQ) on operational performance in Mombasa County government

iv. To assess the effect of Stock Taking Practice on Operational performance of the county government of Mombasa.

2. LITERATURE REVIEW

This research reviewed Just in Time Theory, Systems theory and the Transactional theory.

2.1 Conceptual Frame Work

The conceptual framework depicts the relationship between independent and dependent variables graphically. When JIT, ABC, EOQ and stocktaking are manipulated, they either influence operational performance positively or negatively as shown in the Fig 1.

2.2 Effect of Just in Time (JIT) Model on Operational

2.2.1 Performance of the county government of Mombasa

Many organizations all over the world employ different strategies in order to cope with the demands of the market which has become very competitive. JIT is often adopted so as to enhance the operational performance of organizations. JIT enables the organizations to improve in their productivity, output and general performance on the supply chain. It focuses on the reduction and elimination of costs and enables the organization to translate high operational performance into deliverables.

JIT is based on customer behavior. Products arrive as and when they are ordered on the basis of customer behavior analysis. In a study carried out in Nigeria on commercial livestock, Ufua, Ibidunni, Papadopoulos, Matthew, Khatoon & Agboola, (2022) found that the effective use of Just in time concept led to better operational performance. In another study by Collins & Patrick, (2021) it was revealed that the JIT model significantly affected the operational performance of organizations in Kenya. Shou, Shan & Li (2022) carried out research the influence of JIT effect of just in time on supply chain practices. The study revealed that just in time improves operational performance.
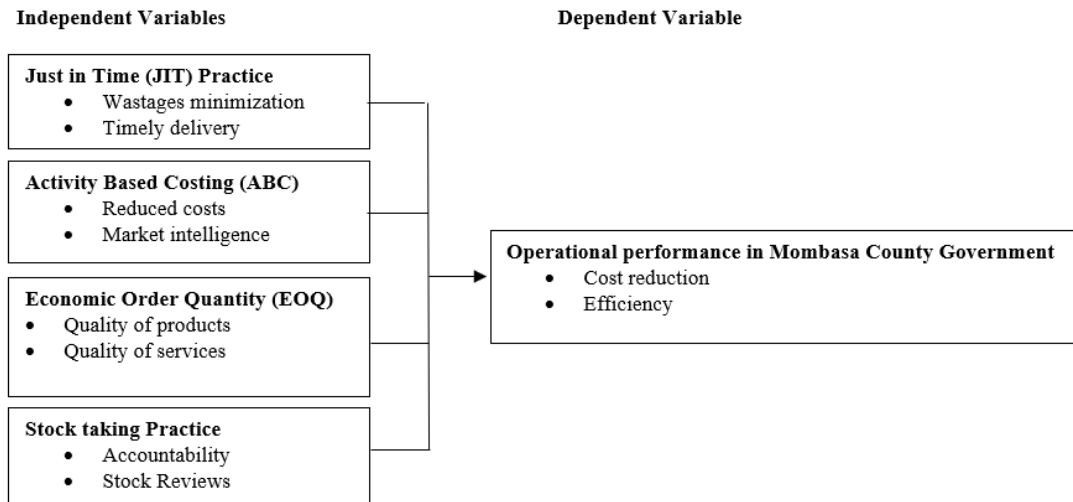
Fig. 1. Conceptual framework
Source: Researcher, 2023

Olanipon, Akinola, & Oladele, (2022) conducted a study in healthcare institutions in Nigeria to examine the influence of the management of inventory on organizational performance. The research revealed that JIT had a significantly positive influence on the performance stock management. Li, Ying, Yan, & Fan, (2022) carried out a study in China and found that JIT had a significantly influenced the output of companies positively. This shows that it has appositive impact on its operational performance. Hamadneh, Alshurideh, Al Kurdi, & AlHamad, [10] conducted a study on JIT and supply chain management. They found that JIT enhances supply chain performance since it meets customer demands.

2.2.2 Effect of Activity Based Costing (ABC) on Operational performance of the county government of Mombasa

ABC practice involves putting items into categories according to how they are valued. In inventory management, items are identified and matched with the customer's needs and demands. Resources are therefore controlled and allocated efficiently which helps to increase sales and reduce obsolete inventory. Organizations are able to ways of managing their inventories using key metrics. The inventories are managed based on data resulting from the analysis of demand.

The demand, profit and importance of inventory contribute significantly in categorizing products so as to meet customer needs, increase sales

volumes, and realize high profits. The prizes of the products are set strategically depending on the information received. The products which are not needed by the customers or which are not on demand are reduced in quantity. Organizations are able to identify the areas in production or manufacturing and sales that are able to bring more value in the company. Supply chain runs smoothly, costs are reduced and resources are allocated efficiently [11].

ABC analysis classifies the inventory of an organization into three categories. Its significance comes in setting priorities, which allows management to exert control over the managed topics based on priorities established on a case-by-case or selective basis. In category A, there are goods of high value but their quantity is low, Category B, has goods of moderate value and moderate quantity while in category C, the goods are of low value but their quantity is high.

The ABC inventory classification system is designed to enable the evaluation of each item maintained in stock as well as the identification of the particular care needs for each inventory group (Ravinder & Misra, 2014). The management of each category is independent. Olanipon, Akinola, & Oladele, (2022) conducted a study in healthcare institutions in Nigeria to examine the influence the management of inventory on performance. From the research, they revealed that ABC had a positive influence on the performance stock management. Pattimeta, (2023) in his study found that activity-based costing significantly affected positively.

Gitau (2016) looked on organizational productivity and inventory management techniques in Kenyan parastatals. This study found that the organizational productivity of Kenyan parastatals will increase by 0.642 units for every unit increase in the ABC Inventory Model. The study conducted by Okello (2011) aimed to determine how inventory management techniques affect the performance of non-governmental organizations. A unit in ABC examination would result in a 0.683 rise in the operational performance of non-governmental organizations, according to the study's examination of the data using descriptive statistics.

2.2.3 Effect of Economic Order Quantity (EOQ) on Operational performance of the county government of Mombasa

Economic order quantity, according to Mwangangi and Senelwa (2018), is the level of inventory that ought to be ordered all at once. The amount of goods ordered all at once has an impact on ordering and holding expenses, which in turn affects profitability. EOQ is a model that is frequently utilized to manage inventory in a variety of industries, according to writers like Blackburn (2010). Onchoke and Wanyoike (2016) state that the use of the model has yielded results such as an increase in some expenses while a decrease in other costs, a minimum point on the curve representing all costs connected with inventory, and a fall in ordering costs with inventory holdings. The term "point of minimum total inventory costs" is another name for it. The Equilibrium Quantity (EOQ) is the inventory level at which ordering and holding expenses are minimized.

EOQ utilizes a formula which calculates accurately the number of items which are the most economical so as to minimize costs and at the same time maximize the value when restocking the inventory. It minimizes storage costs by arriving at the number of units per order that are most economical. Only the most needed units are stocked. It is also business specific in the sense that only the specific number of items required by the customers are produced and stocked. Therefore, a smooth restocking is possible under EOQ. Its aim is to ensure that when making orders per batch, only the right amount of inventory is ordered.

In a study conducted in Tanzania, Mbugi, & Lutego, (2022) found that EOQ affects the operational performance of an organization through cost reductions. Olanipon, Akinola, & Oladele, (2022) conducted a study in healthcare institutions in Nigeria to examine the influence of the management of inventory management practices on organizational performance. They found that EOQ had a significantly positive influence on the performance stock management. It had led to efficiency, reduction of costs and optimal profit and return on investment. In a study on the application of EOQ to improve efficiency in the supply coffee raw materials Susilowati, & Aria, [12] found that EOQ had a significantly positive impact on operational performance. In a study carried out in Indonesia, Satwika & Tsuroya, [13] found that EOQ approach to inventory management could lead to saving of cost at the rate of 6.7% per year.

2.2.4 Effect of stock taking practice on operational performance of the county government of Mombasa

Stocktaking involves the physical counting of all the stock on the organizations premises or rented space. The actual physical stock is checked against the numbers recorded in books. The goods which are in good condition are noted. Those which have damages are also noted. The items that may be leaking and those that may have been damaged while in transit are also noted. After correlation of the items has been done, the warehouse is then disposed of the damaged items and fresh stock is then purchased and restocked according to demand.

Sometimes while taking stock all or most of the other activities in the organization may be halted but these usually takes a short time. During stock taking, any issues that may result in a loss are identified and mitigation done to avert the situation. Profits are therefore increased and losses minimized. It also helps to get assets into the balance sheet correctly. It enables the accurate monitoring of real time stock levels. Expiry dates are also managed in good time.

Review of prizes is also done efficiently due to the data obtained from stock taking. Teerasoponpong & Sopodang, (2022) conducted research on the function of inventory recording on firm performance. They found that inventory recording had a positively influence on the performance of organizations. In another study carried out by Wint (2022), it was found that accurate inventory recording led to better operational performance. Customer loyalty followed the good performance.

A study conducted by Collins & Patrick, (2021) showed that perpetual stock taking significantly influenced the performance of milk processing firms in Kenya. In another study conducted by Rumenser, (2022), it was established that inventory stocktaking leads to efficiency and economic improvement I the performance of organizations in Indonesia. Iliemena, Okwudili, Aniefor, Rachael, Jones, Sunday, Odukpya, Jones, & Olumide. (2022), also carried out a study in Nigeria and found that stock taking plays a function in the operational performance of health institutions.

3. METHODOLOGY

3.1 Research Design

The current research adopts a descriptive survey, which is appropriate because it enables the description, explanation and portrayal of the characteristics of an event the way it exists. It also allows for extensive data collection from a large study population which determines how variables influence each other (Mugenda & Mugenda, 2013).

Descriptive design is an observational in nature and focuses on the identification of patterns resulting from data without inferring about cause and effect between the variables. It systematically describes and analyzes the characteristics under observation by providing numerical data about the description of the phenomena that is being studied in terms of frequency, size and so forth. It enables a detailed understanding on the subject under research without having control over the variables (Mugenda & Mugenda, 2013). The participants are studied in their natural setting. The descriptive survey was suitable for the study because it included the identification of trends, characteristics, categories and frequencies in the inventory management and operational performance in a supply chain setup.

3.2 Target Population

Target population refers to the entire population being investigated (Mugenda & Mugenda, 2013). This study targeted 250 employees of Mombasa County government. They were targeted because they occupy a better position to provide vital information that was needed in the study. The Table 1 illustrates the target population of the research.

3.3 Sample and Sampling Procedure

According to Kothari, (2004), the subset within any given population is referred to as a sample. Fisher et al, (2003), provides the formula below for the calculation of sample size for a target population below 10,000 as is the case with the current study.

$$n = \frac{z^2 p(1 - p)}{d^2}$$

In the formula, n is the sample size, z is standard deviation, d is the margin of error and the value of p is assumed to be 0. 5. When substituted, the value of n becomes 96.

$$n = \frac{(1.96^2)(0.5)(1 - 0.5)}{(0.1)^2}$$

$$n = 96$$

The sample size of the research involved 96 employees from Mombasa County government. They were selected by use of stratified random sampling. This method was convenient for the study since the samples represented the target population and sampling bias will be eliminated.

Table 1. Target population

Section	Population
ICT officer	86
Finance officer	47
Budgeting officer	33
Internal Audit officer	24
Procurement officers	60
Total	**250**

Source: Mombasa County Treasury (2023)

Table 2. Sample size

Section	Population	Sample
ICT officer	86	30
Finance officer	47	23
Budgeting officer	33	11
Internal Audit officer	24	8
Procurement officers	60	24
Total	**250**	96

Source: Researcher (2023)

3.4 Data Collection Methods

The researcher used a questionnaire as the main tool for data collection. It was best suited for the research because of the limited time available for data collection and also because of the research

objectives. The questionnaires were structured as per the research objectives. They followed a five-point Likert scale and had open ended questions which were constructed to capture qualitative data.

The researcher used qualitative and quantitative methodologies to collect data from the respondents. The quantitative technique helped to collect descriptive data. Responses were grouped according to frequencies, means and standard deviations among other measures. Open-ended questions were answered freely according to the opinions of the respondents and were grouped according to their thematic concerns.

The researcher administered questionnaires in person and also with the help of research assistants. To begin with, an introductory letter was obtained from the university which the researcher shared with the respondents. He then informed the respondents about confidentiality. He informed them on the purpose of the research as was for academic purposes only and not for any other reason and that all their responses were to be kept confidential. According to Lungu & Marian, (2022), most of the information to be obtained from the respondents is of high-level confidentiality and need to be handled as such by the researcher.

3.5 Validity and Reliability of Research Instrument

In order to determine the validity and reliability of data, a pilot study was carried out in Kilifi County where the researcher purposefully selects ten respondents from Kilifi County government. The findings of the pilot study informed the research about the likely impact of the management of inventory on performance of operations. The data collected from the pilot study informed the research on the instruments' validity. Necessary adjustments were made on the questionnaire before conducting the actual research.

Reliability is the degree to which the data collected will produce results which are consistent. In order to guarantee the study instruments about their reliability, 30 respondents were selected randomly and issued with the questionnaires. The scores from their responses were analyzed by using SPSS version 28. Cronbach's coefficient alpha determined internal consistency. According to Mugenda & Mugenda (2013), Cronbach's alpha value, (α) of 0.7 and

above indicated a level of reliability that is acceptable.

Mugenda & Mugenda (2013) posits that validity is the level or degree by which any deviations made on the recorded scores are significant, valuable and fitting. It shows how much the instrument measure and to what extent it aims to measure. In order to ensure validity, a pilot test on the questionnaire was administered to respondents who did not participate in the final research. The researcher also carried out a test-retest on the questionnaire piloted. The questionnaires were checked and rechecked, adjusted where necessary and had all missteps wiped out. The results are in Table 3.

In order to verify the instrument's reliability in this study, the suggested constructs' reliability was assessed using Cronbach's Alpha. According to Table 3, The Mombasa County Government's operational performance scored 0.782, whereas the Just-in-time practice scored 0.814, Activity Based Costing practice scored 0.851, Economic Order Quantity practice scored 0.776, Stocktaking practice scored 0.862, and so on. This demonstrates that measurements of changeable things have a high degree of internal consistency.

4. DATA ANALYSIS AND DISCUSSION

4.1 Influence of JIT Model on Operational Performance of the County Government of Mombasa

On a 5-point scale, the respondents were asked to indicate how much they agreed with each of the given issues regarding the JIT Model on Operational Performance of the County Government of Mombasa. They have to mark the most relevant column with a checkmark ($\sqrt{}$). According to Table 4's findings, the majority of respondents agreed that the JIT Model had an impact on the Mombasa County Government's operational performance (Mean = 3.9224, Std Dev = 0.6946). Furthermore, the majority of respondents supported direct customer delivery of completed goods (Mean=3.978, Std Dev =0.783) and agreed that work in progress is always at the minimum amounts (Mean=4.421, Std Dev = 0.898). The majority (Mean=3.754, Std Dev=0.606) agreed that wasting work in progress is rarely the case. Additionally, most respondents stated that suppliers set the schedule for services and that they do it in the quickest

amount of time (Mean=3.628, Std Dev=0.621; Mean=3.831, Std Dev=0.565). The results support Taiichi's [14] claim that the main goals of JIT are to enhance output and achieve continuous quality through manufacturing without wasting any resources or producing dangerous or wasteful parts. One can meet customer needs and improve product productivity and flexibility by implementing Just-In-Time (JIT) supply chain management techniques.

4.2 Influence of Activity Based Costing (ABC) Practice on Operational Performance of the County Government of Mombasa

On a 5-point scale, the respondents were asked to indicate how much they agreed with each of the given statements regarding Activity Based Costing (ABC) on Operational Performance of the County Government of Mombasa. They have to mark the most relevant column with a checkmark (√). Based on their responses, as indicated in Table 5, the majority of respondents believed that the application of ABC had improved market intelligence (Mean=3.89, Std Dev =0.54) and reduced administration costs (Mean=4.33, Std Dev =0.63). The majority (Mean = 3.81, Standard Deviation = 0.66) agreed that operational and inventory costs should be decreased. Furthermore, the majority of respondents concurred that the ABC method has shortened procurement cycle times (Mean=3.99, Std Dev =0.32) and improved decision making (Mean=4.2, Std Dev = 0.53). To represent how resources and activities are actually used, an activity-based approach makes use of a variety of drivers. Comparatively speaking, traditional cost systems, which usually depend on a small number of volume-based metrics, like direct labor hours or sales volume, assign costs less accurately than when numerous drivers are used (Krumwiede and Roth, 1997). Customers, suppliers, goods, and supply chains that are a part of these operations are allotted charges by ABC [15,16].

Table 3. Summary of cronbach's alpha reliability coefficient

Variables	Number of Items	Cronbach's Alpha
Just in time X_1	5	0.814
Activity Based Costing X_2	5	0.851
Economic Order Quantity X_3	5	0.776
Stocktaking X_4	5	0.862
Operational performance of the county government of Mombasa	5	0.782

Source: Research data (2023

Table 4. JIT Model on operational performance of the county government of mombasa

Statement	Mean	Std Dev
Work in progress is always at the minimum quantities	4.421	0.898
Finished goods are directly delivered to customers	3.978	0.783
Wasting work in progress seldom occurs	3.754	0.606
Services are provided in the shortest time possible	3.628	0.621
Timetable scheduling is made by suppliers	3.831	0.565
Average	**3.9224**	**0.6946**

Source: Research data (2023)

Table 5. Activity Based Costing (ABC) Practice on Operational Performance of the County Government of Mombasa

Statement	Mean	Std Dev
Reduced Administration Costs	4.33	0.63
Improved Market Intelligence	3.89	0.54
Reduced Operational & Inventory Costs	3.81	0.66
Enhanced Decision making	4.20	0.53
Shortened Procurement Cycle Times	3.99	0.32
Average	**4.044**	**0.536**

Source: Research Data (2023

4.3 Effect of Economic Order Quantity (EOQ) on Operational Performance of the County Government of Mombasa

On a 5-point scale, the respondents were asked to indicate how much they agreed with each of the given statements regarding Activity Based Costing (ABC) on Operational Performance of the County Government of Mombasa. They have to mark the most relevant column with a checkmark (√). Table 6 illustrates the majority of respondents' responses, which indicate that the implementation of Economic Order Quantity (EOQ) has contributed to both improved product quality (Mean = 3.69, Std Dev = 0.79) and a reduction in waste (Mean = 3.96, Std Dev = 0.48). There has been timely delivery of goods and timely delivery of services since the introduction of Economic Order Quantity (EOQ), according to the majority (Mean=3.79, Std Dev = 0.48).

EOQ is a model that is frequently utilized to manage inventory in a variety of industries, according to writers like Blackburn (2010). Onchoke and Wanyoike (2016) state that the use of the model has yielded results such as an increase in some expenses while a decrease in other costs, a minimum point on the curve representing all costs connected with inventory, and a fall in ordering costs with inventory holdings. The term "point of minimum total inventory costs" is another name for it. The Equilibrium Quantity (EOQ) is the inventory level at which ordering and holding expenses are minimized.

4.4 Effect of Stock Taking Practice on Operational performance of the county government of Mombasa

The researcher requested the respondents to state their level of agreement in relation to each of the given items concerning Stock Taking Practice on Operational Performance of the County Government of Mombasa on a 5-point scale. They were to insert a tick (√) in the most appropriate column. From the study findings in Table 7, the respondents agreed that county government conducts Real-time updates on stock levels (mean = 3.75, SD = 0.97), the county government has centralized inventory management (mean = 3.72, SD = 0.83), there is effort of prevention of stock outs (products getting out of stock) (mean = 3.47, SD = 0.98). Finding are supported by the study done by Mwangangi and Senelwa (2018) studied the influence of Inventory Control Techniques on Service Delivery in Parastatals in Kenya and the results indicated that there was a positive and significant correlation.

Table 6. Economic Order Quantity (EOQ) practice on operational performance of the county government of mombasa

Statement	Mean	Std Dev
Reduction in wastes	3.96	0.48
Improved quality of products	3.69	0.79
Improved quality of services	3.76	0.48
Timely delivery of products	3.67	0.67
Timely delivery of services	3.85	0.76
Average	**3.786**	**0.636**

Source: Research data (2023

Table 7. Stock taking practice on operational performance of the county government of mombasa

Statement	Mean	Std Dev
Real-time updates on stock levels	3.75	0.97
Fewer inventory counts	3.86	0.89
Centralized inventory management	3.72	0.83
Prevention of stock outs (products getting out of stock)	3.47	0.98
Less overtime pays	3.68	0.49
Average	**3.696**	**0.832**

Source: Research Data (2023)

Table 8. Correlation Matrix of Independent variables for Steel Manufacturing Companies in Kenya

Variables	Test	Just In Time X1	Activity Based Costing X2	Economic Order Quantity X3	Stocktaking Practice X4
Just In Time X1	Pearson Correlation	1	.570**	.269**	.318**
	Sig. (2-tailed)		.000	.000	.000
	N	94	94	94	94
Activity Based Costing X2	Pearson Correlation	.570**	1	.272**	.161*
	Sig. (2-tailed)	.000		.000	.012
	N	94	94	94	94
Economic Order Quantity X3	Pearson Correlation	.269**	.272**	1	.247**
	Sig. (2-tailed)	.000	.000		.000
	N	94	94	94	94
Stocktaking Practice X4	Pearson Correlation	.318**	.161*	.247**	1
	Sig. (2-tailed)	.000	.012	.000	
	N	94	94	94	94

**. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed)

4.5 Test of Multicollinearity of Independent Variables

All of the factors were shown to be connected when they were correlated with one another, as table 8 illustrates. Just-in-time (X_1) had a statistically significant and positive correlation with Activity Based Costing (X_2), Economic Order Quantity (X3), and Stocktaking Practice (X_4), all at p-values less than 0.01. There was a significant and positive correlation between the Economic Order Quantity X_3 Practice (r = 0.272, p<0.01) and the Stocktaking Practice X_4 (r = 0.161, p<0.05) with Activity Based Costing Practice X_2. Lastly, there was a positive and substantial correlation (r = 0.247, p<0.01) between Stocktaking Practice X_4 and Economic Order Quantity X_3.

Table 8 shows that the variables' correlation is smaller than r < 0.6, which minimizes the multicollinearity issue. The approach is unable to discern the relative contributions of independent variables when there is multicollinearity (Norusis, 2009). Regression analysis can be made easier by following the general rule of thumb that correlations between the independent variables should be less than 0.70 (Lind et al., 2011).

4.6 Multiple Regression Results for the effect of Inventory Management Practices on the Operational Performance of Mombasa County Government

Table 9 displays the results of results of a multivariate regression analysis showed that inventory management practices that included the Just In Time Model (X_1), Activity Based Costing (X_2), Economic Order Quantity (X_3), and Stocktaking Practice (X_4) to predict the Operational Performance of the County Government of Mombasa. There was a high linear association between inventory management techniques and the operational performance of the County Government of Mombasa, as indicated by the linear regression results, which show R^2= 0.462 and R= 0.712. The operational performance of the Mombasa County Government, our dependent variable, had 46.2% of its variability explained by the other variables.

Table 10 shows that the Operational Performance of the County Government of Mombasa is statistically and significantly predicted by the inventory management methods, with an ANOVA test result of $F_{(4, 96)}$ = 45.134, p<.05, and R^2 =.462.

Determining the variables' beta coefficient was another goal of the investigation. Operational Performance of the County Government of Mombasa = 0.352 + 0.243 Just In Time Model + 0.321 Activity Based Costing practice + 0.289 Economic Order Quantity + 0.251 Stocktaking practice, according to the findings displayed in Table 11.

Where;

X_1= Just In Time Model, X_2 = Activity Based Costing practice, X_3= Economic Order Quantity practice, X_4 = Stocktaking and Y= Operational Performance of the County Government of Mombasa

Hence;

Operational Performance of the County Government of Mombasa = 0.352 + 0.223 Just In Time Model + 0.321 Activity Based Costing practice + 0.289 Economic Order Quantity practice + 0.251 Stocktaking practice

Table 9. Model summary for operational performance of the County Government of Mombasa

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.712[a]	.462	.451	.60254

a. Predictors: (Constant), JIT Model X1, Activity Based Costing X2, EOQ X3, Stocktaking X4
b. Dependent Variable: Operational Performance of the County Government of Mombasa

Table 10. ANOVA[a] (F-Test) analysis for operational performance of the county government of Mombasa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.670	4	18.125	45.134	.000[b]
	Residual	57.526	92	.492		
	Total	104.196	96			

a. Dependent Variable: Operational performance of the county government of Mombasa
b. Predictors: (Constant), JIT Model X1, Activity based costing X2, EOQ X3, stocktaking X4

Table 11. Coefficients[a] for operational performance of the county government of mombasa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.352	.264		2.172	.031
	Just In Time Model X1	.243	.056	.145	2.201	.029
	Activity Based Costing X2	.321	.060	.190	2.987	.003
	Economic Order Quantity X3	.289	.051	.182	3.305	.001
	Stocktaking X4	.251	.060	.349	6.302	.000

a. Dependent Variable: Operational Performance of the County Government of Mombasa
The general regression Model arrived at was $Y = 0.352 + 0.223X_1 + 0.321X_2 + 0.289X_3 + 0.251X_4$

According to Table 11, there is a significant correlation between the Operational Performance of the County Government of Mombasa and Activity Based Costing practice (β = 0.321, p< 0.05). This is followed by Economic Order Quantity X_3 (β = 0.289, p< 0.05), Stocktaking X4 (β = 0.251, p< 0.05), and Just in Time Model X_1 (β = 0.243, p< 0.05), in that order. Based on the analysis, the Operational Performance of the County Government of Mombasa was statistically significantly predicted by all four independent variables (practices of inventory management).

5. SUMMARY OF THE FINDINGS

5.1 Influence of JIT Model on Operational Performance of the County Government of Mombasa

According to the results, most respondents (Mean=3.9224, Std Dev=0.6946) agreed that the JIT Model had an impact on the Operational Performance of the County Government of Mombasa. JIT Model had a significant correlation between the Operational Performance of the County Government of Mombasa (β = 0.243, p<

0.05). From the descriptive analysis, the majority of respondents supported direct customer delivery of completed goods (Mean=3.978, Std Dev =0.783) and agreed that work in progress is always at the minimum amounts (Mean=4.421, Std Dev = 0.898). The majority (Mean=3.754, Std Dev=0.606) agreed that wasting work in progress is rarely the case. Additionally, most respondents stated that suppliers set the schedule for services and that they do it in the quickest amount of time (Mean=3.628, Std Dev=0.621; Mean=3.831, Std Dev=0.565).

5.2 Influence of Activity Based Costing (ABC) Practice on Operational Performance of the County Government of Mombasa

From the descriptive analysis, most respondents (Mean=4.044, Std Dev=0.536) agreed that the Activity Based Costing (ABC) Practice had an influence on Operational Performance of the County Government of Mombasa. The majority of respondents believed that the application of ABC had improved market intelligence (Mean=3.89, Std Dev =0.54) and reduced administration costs (Mean=4.33, Std Dev =0.63). The majority (Mean = 3.81, Standard Deviation = 0.66) agreed that operational and inventory costs should be decreased. Furthermore, the majority of respondents concurred that the ABC method has shortened procurement cycle times (Mean=3.99, Std Dev =0.32) and improved decision making (Mean=4.2, Std Dev = 0.53). Activity Based Costing (ABC) Practice had a significant correlation between the Operational Performance of the County Government of Mombasa (β = 0.321, p< 0.05).

5.3 Influence of Economic Order Quantity (EOQ) Practice on Operational Performance of the County Government of Mombasa

Descriptive analysis shows that most respondents (Mean=3.786, Std Dev=0.636) agreed that the Activity Based Costing (ABC) Practice had an influence Operational Performance of the County Government of Mombasa. Majority of responses, which indicate that the implementation of Economic Order Quantity (EOQ) has contributed to both improved product quality (Mean = 3.69, Std Dev = 0.79) and a reduction in waste (Mean = 3.96, Std Dev = 0.48). There has been timely delivery of goods

and timely delivery of services since the introduction of Economic Order Quantity (EOQ), according to the majority (Mean=3.79, Std Dev = 0.48). Activity Based Costing (ABC) Practice had a significant correlation between the Operational Performance of the County Government of Mombasa (β = 0.321, p< 0.05).

5.4 Influence of Stocktaking Practice on Operational Performance of the County Government of Mombasa

From the descriptive findings, most respondents (Mean=3.696, Std Dev=0.832) agreed that Stocktaking Practice had an effect on Operational Performance of the County Government of Mombasa. The respondents agreed that county government conducts Real-time updates on stock levels (mean = 3.75, SD = 0.97), the county government has centralized inventory management (mean = 3.72, SD = 0.83), there is effort of prevention of stock outs (products getting out of stock) (mean = 3.47, SD = 0.98). Stocktaking Practice had a significant correlation between the Operational Performance of the County Government of Mombasa (β = 0.251, p< 0.05).

6. CONCLUSION

Correlation analysis revealed that there was a significant correlation between the Operational Performance of the County Government of Mombasa and Activity Based Costing practice (β = 0.321, p< 0.05). This is followed by Economic Order Quantity X_3 (β = 0.289, p< 0.05), Stocktaking X4 (β = 0.251, p< 0.05), and Just In Time Model X1 (β = 0.243, p< 0.05), in that order. Based on the analysis, the Operational Performance of the County Government of Mombasa was statistically significantly predicted by all four independent variables (practices of inventory management).

The results of a multivariate regression analysis showed that inventory management practices that included the Just In Time Model (X_1), Activity Based Costing (X_2), Economic Order Quantity (X_3), and Stocktaking Practice (X_4) to predict the Operational Performance of the County Government of Mombasa. There was a high linear association between inventory management techniques and the operational performance of the County Government of

Mombasa, as indicated by the linear regression results, which show $R^2 = 0.462$ and $R = 0.712$. The operational performance of the Mombasa County Government, our dependent variable, had 46.2% of its variability explained by the other variables. The Operational Performance of the County Government of Mombasa was statistically and significantly predicted by the inventory management methods, with an ANOVA test result of $F(4, 96) = 45.134$, $p < .05$, and $R^2 = 0.462$.

7. RECOMMENDATIONS

The County Government should implement Economic Order Quantity, as the study recommended, so that it can determine how much stock to order when. By using economic Order quantity, it is necessary to improve contact with important suppliers in order to reduce expenses associated with quantity and product deviations. This will also assist in reducing the cost of placing orders, holding orders, and the overall cost of purchasing, shipping, and storing the product.

In addition, the study suggested that the Mombasa County government employ the ABC analysis technique to predict supply demand in advance and adjust stock levels appropriately. This would guarantee that county management would control inventory expenditures by implementing the ABC practice.

To help with operational performance improvement, the study suggests putting the JIT paradigm into practice. This is accomplished by determining, repurposing, or eliminating obsolete inventory, which would result in a drop in the amount of inventory on hand. It is also advantageous for the business to order fewer inventories more frequently in order to manage cash flow and inventory reduction.

Lastly, the County Government of Mombasa should carry out perpetual stock taking as it has significant influence on the operational performance of the organization. During stock taking, any issues that may result in a loss are identified and mitigation done to avert the situation.

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Dora M, Kumar M. Operational improvement programs and humanitarian operations. Production Planning & Control. 2022;33(6-7):513-516.
DOI: 10.1080/09537287.2020.1834137
2. Schmidt W, Raman A. Operational disruptions, firm risk, and control systems. Manufacturing & Service Operations Management. 2022;24(1):411-429.
3. Panigrahi RR, Mishra PC, Samantaray A, Jena D. Management of inventory for firms' efficiency–a study on steel manufacturing industry. Journal of Advances in Management Research; 2022.
DOI: 10.1504/IJVCM.2021.10033598
4. Ogah M, Asiegbu G, Moradeyo N. Effect of Raw Material Inventory on Operational Performance in An Emerging Economy: Insight from The Nigerian Manufacturing Sector. International Journal on Recent Trends in Business and Tourism (IJRTBT). 2022;6(2):31-43.
DOI: 10.22067/ijaaf.2023.43618.129
5. Sylvere M, Irechukwu EN. Inventory Management practices and operational performance of manufacturing companies in Rwanda: A Case of Bralirwa Plc. Journal of Strategic Management. 2022; 6(2).
DOI:10.1504/IJVCM.2021.10033598
6. Musivo MC, Chege P. Procurement management practices and performance of community based projects in Machakos County, Kenya. International Journal of Project Management. 2022;3(3).
7. Kamau M, Thogori M. Supply chain management practices and performance of non-governmental organizations in health sector in Nairobi City County, Kenya. International Journal of Social Sciences Management and Entrepreneurship (IJSSME). 2022; 6(1).
DOI: 10.29322/IJSRP.13.04.2023.p13624
8. Panigrahi RR. 3 Inventory management practice and performances of

manufacturing. Emerging Trends in Decision Sciences and Business Operations. 2022; 46.
DOI: 10.1504/IJVCM.2021.10033598

9. Okeyo OK, Kaplelach S. Financial management practices and financial performance of selected small and medium enterprises in Mombasa County, Kenya. International Academic Journal of Economics and Finance. 2022;3(7): 372:385, 2.
DOI: 10.59413/ajocs/v1.i2.2

10. Hamadneh S, Alshurideh M, Al Kurdi B, AlHamad A. The impact of just in time strategy and pull chain strategy on supply chain performance. International Journal of Business Analytics and Security (IJBAS). 2022;1(1):39-58.
DOI: 10.54489/ijbas.v1i1.134

11. Pattimeta A. The effect of activity based costing (ABC) on Company Performance (Doctoral dissertation, Universitas Sultan Ageng Tirtayasa); 2023.
DOI: 10.21474/IJAR01/8384

12. Susilowati S, Aria RR. Application of economic order quantity and reorder point methods in improving the efficiency of coffee raw material supply (Case Study at PT. Herbal Salam). IJISTECH (International Journal of Information System and Technology). 2022; 6(1):69-77.
DOI: 10.21107/ijseit.v5i1.8911

13. Olanipon OO, Akinola AA, Oladele MA. Inventory management and organisational performance in tertiary healthcare institutions in Southwest Nigeria. FUOYE Journal of Finance and Contemporary Issues. 2022;3(2):201-220.

14. Benjamin Mwangangi Mumo, Anaya W. Senelwa. Influence of inventory control techniques on service delivery in parastatals in Kenya. Case study of Kenya Medical supplies Authority. International journal of science and research (IJSR). 2018;4(5). Paper ID: ART20182523
DOI: 10.21275/ART20182523.

15. Onchoke and Wanyoike. Influence of inventory control practices on procurement performance of agrochemicals distributors in Nakuru Central Sub-County, Kenya; 2016.
DOI: 10.11648/j.ijefm.20160403.14

16. Iliemena, Okwudili, Aniefor, Rachael, Jones, Sunday, Odukpya, Jones, Olumide. Inventory management and control systems in covid-19 pandemic era: An exploratory study of selected health institutions in Anambra State, Nigeria; 2022. Online ISSN: 2249-4588 & Print ISSN: 0975-5853