The impact of inventory management on the performance of an organization

El impacto de la gestión de inventarios en el rendimiento de una organización

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Abstract: Inventory management is important for the successful functioning of any organization. The main core objective of this research study was to determine the impact of inventory management on the performance of an organization in the case of Tanzania Zambia Railway Authority. This study was the first to be conducted in the railway sector in an African context. The study applied descriptive research design with primary data collected using questionnaire with purposive sampling method of 21 participants as sample size. Data analysis was done using Jamovi software. The findings revealed that TAZARA uses ABC analysis in decision making but not Economic Order Quantity Model in decision making in purchasing materials. The study also reveals that the introduction of ICT through electronic management system in inventory management would improve performance and that TAZARA employees need to be trained in procurement and regulations as most of the employees are young and have less work experience.

Keywords: Inventory Management, Inventory, Performance.

Resumen: La gestión de inventarios es importante para el buen funcionamiento de cualquier organización. El objetivo principal de este estudio de investigación era determinar el impacto de la gestión de inventarios en el rendimiento de una organización, en el caso de Tanzania Zambia Railway Authority. Este estudio fue el primero realizado en el sector ferroviario en un contexto africano. El estudio aplicó un diseño de investigación descriptivo con datos primarios recogidos mediante cuestionario con un método de muestreo intencional de 21 participantes como tamaño de la muestra. Los datos se analizaron con el programa Jamovi. Los resultados revelaron que TAZARA utiliza el análisis ABC en la toma de decisiones,

pero no el Modelo de Cantidad de Pedido Económico en la toma de decisiones de compra de materiales. El estudio también revela que la introducción de las TIC a través del sistema de gestión electrónica en la gestión de inventarios mejoraría el rendimiento y que los empleados de TAZARA necesitan formación en materia de adquisiciones y normativa, ya que la mayoría de los empleados son jóvenes y tienen menos experiencia laboral.

Palabras clave: Gestión de existencias, Inventario, Rendimiento.

1. Introducción

Inventory is one of the components of current tangible assets with economic value. Inventory is important for the success of organizational functions and includes all items that belong to customer satisfaction (Athumani & James, 2019). Inventory management is an important management issue for large, medium and small companies. Effective inventory flow management in supply chains is one of the key success factors (Agu et al., 2016). In order to meet the demands of customers and achieve high levels of customer satisfaction, a company would need to have enough inventory, although the cost of having enough inventory would discourage companies from having more inventory (Coyle et al.,2003). According to Agu et al. (2016), "the role of inventory management is to ensure faster inventory turnover" (p.57).

Inventory plays an important role in the growth and survival of any company because ineffective and inefficient management of inventory leads to loss of customers and decline in sales. The 21st century requires inventory management to match and mitigate the dynamics of today's competitive dynamic market.

Purpose of the Study

TAZARA is among many organizations that are facing problems of ineffectiveness in inventory control that has existed for quite some time now. The challenges may have come about due to increased activities associated with receiving, storage, movement of inventory within the organization, process or product of inventory and in due course shipping of inventory (Saleemi 2007). Even if there have been studies on inventory control, very little has been done on inventory management on the performance of an organization especially in the context of the railway sector. The railway sector has received little attention in terms of research (Yangailo, 2022; Janelle & Beuthe, 1997; Yangailo et al., 2023; Yangailo & Kaunda, 2021; Yangailo & Mpundu, 2023; Yangailo, 2023a,2023b) especially in Africa. This study, therefore, attempted to examine the impact of inventory management on the performance of an organization in TAZARA.

General Objective

The general objective of this research study was to determine the impact of inventory management on the performance in TAZARA.

Specific Objectives

The study sought to fulfil the following specific objectives:

1. To determine the model that is being used to make all material acquisition decisions.

2. Identify the challenges faced in inventory management.

3. To suggest measures that can improve the effectiveness of inventory management.

Significance of the Study

This study was carried out at TAZARA. The study would be important for TAZARA and other railway companies as it would be the first study to examine the impact of inventory management on the railway sector in the African context. The study would also provide insightful contributions to the literature on the effectiveness of inventory management systems.

Scope of the Study

The study was conducted in TAZARA with the procurement department of the Zambian and Tanzanian regions. The study focused on the impact of inventory management on the performance of an organization in TAZARA.

2. Literature Review

The materials and supplies that a business or institution carries either for sale or to provide inputs or supplies to the production process is called inventory (Arnord & Chapman, 2004). Inventory is a general term used to describe goods held in warehouses and storage facilities, most of which are usually intended to be used in connection with operations or production activities, as well as finished products awaiting shipment to customers. The framework employed in the companies to control its interest in inventory is called (Stevenson, 2010).

Theoretical Review

This research study is guided by the following theories namely Economic Order Quantity (EOQ) and Re-Order Level.

Economic Order Quantity

Inventory management must be organized in a logical way so that an organization can know when to order and how much to order (Bacchetti et al., 2010). This is made possible by calculating the Economic Order Quantity (EOQ). "Economic Order Quantity (EOQ) refers to the order size that results in the lowest sum of order and carrying costs for an inventory item" (Kaudunde, 2013, p.10). By using EOQ, organizations can minimize the costs associated with ordering and carrying inventory. Economic Order Quantity is a valuable tool for business owners who need to make decisions about how much inventory to keep on hand, how many items to order each

time, and how often to reorder in order to incur the lowest possible costs (Kumar, 2016).

Re-Order Level

Re-Order level is considered as the point at which replenishment should be ordered with inventory (Athumani & James, 2019). Re-order level is important for organizations to achieve the optimal efficiency and be effective leading to high supply chain performance and satisfy the customer satisfaction, then there is need to have two reorder levels with one that is normal while the other is supposed to be an emergency one in case of disaster (Beamon & Kotleba, 2006).

Empirical Review

A study conducted by Athumani and James (2019), investigated the impact of inventory management on the National Food Reserve Agency (NFRA) of Tanzania. The study found that economic order quantity model was used in all decision making in NRFA, and there was technological use of inventory management and control.

Anichebe and Agu (2013) investigated the impact of inventory management on the effectiveness of an organization in Nigeria. The findings presented that there is a significant relationship between good inventory management and effectiveness.

Koin et al (2014) investigated the effects of inventory management on performance of an organization, using descriptive research. The results show that inventory management system and supplier relationship have an impact on supply chain effectiveness in the manufacturing sector.

In Kenya, Kamau and Kagiri (2015) examined the influence of inventory management on the competitiveness of an organization using a descriptive research design. The study shows that inventory investment, inventory shrinkage and inventory turnover affect the competitiveness of the organization.

3. Methodology

This study utilized a descriptive research design aimed at generating vital information after the occurrence of the event. It was conducted on Tanzania Zambia Railway Authority (TAZARA) which is owned on fifty-fifty shareholding by two governments of Zambia and Tanzania. The study used descriptive statistics to present data in logical and organized form. Jamovi software was used to analyze quantitative data using descriptive statistics. The descriptive survey design was appropriate because it involves data collection to address the research questions on the status of the study (Mugenda, 2003).

Based on the type of research design, the sample size of 21 against the population target of 50 employees. A questionnaire was

distributed to 40 employees and out of the total distributed, 21 completed and returned the questionnaire which is 52.5% response rate. The target population consisted of TAZARA employees from the procurement and supply department who oversee inventory management in TAZARA. A questionnaire was distributed to the participants and they were given time to complete it. The study used purposive sampling because it usually allows the selection of a sample with knowledge and experience. Permission was first obtained from the participants, and their confidentiality was also taken into account by ensuring that the questionnaire was kept anonymous.

4. Data Presentation, Analysis and Discussion of the Research

The analysis of the study was based on statistical methods using Jamovi software. The results are presented in descriptive statistics and tables.

Response Rate

Of the 40 questionnaires distributed to the target population of 50, a total of 21 participants completed the questionnaire, representing 52.5%.

Demographic Characteristics

The demographic profile of the 21 respondents who completed the questionnaire of this research study based on their age, gender and experience is shown in Table 1.

Table 1
Demographic Profile

Description	Frequency	Percentage
Gender Female	4	20.0
Male	16	80.0
Total	20	100
Age 26-35 36-45 Above 45	12 5 1	66.7 27.8 5.5
Total	18	100
Experience Below 10 10 - 20	13 7	65.0 35.0
Total	20	100

Of the total respondents, 16(80%) were male and 4(20%) were female. In terms of age, only 1(5.5%) was above 45 years, 5(27.8%) was between 36 and 45 years, and 12(66.7%) was between 26 and 35 years. In terms of experience in the company, 7(35%) had experience

in the company between 10 and 20 years, while 13(65%) had less than 10 years of work experience.

Table 2
The Competence and Skills that TAZARA Staff in Inventory Management Possess.

Case Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
n our organization, a responsible officer authorizes purchases.	15(71.4%)	3(14.3%)	1(4.8%)	2(9.5%)	
Goods are usually inspected at the time of receiving.	9(42.9%)	7(33.3%)	4(19.0%)	1(4.8%)	
The employees pay maximum attention to those inventories whose value is highest (ABC Analysis)	12(57.1%)	8(38.1%)	1(4.8%)		
We do stocktake at least once in a year.	20(95.2%)		1(4.8%)		
We frequently conduct internal stock audit.	2(9.5%)	8(38.1%)	10(47.6%)	1(4.8%)	
Economic Order Quantity (EOQ) is used in all decision making when acquiring materials.	1(4.8%)	6(28.6%)	9(42.9%)	3(14.3%)	2(9.5%)
There is use of Information and Communications Technology (ICT) in inventory management and control.			3(14.3%)	9(42.9%)	9(42.9%)
All Stores & Stock Control staff in our organization are highly skilled.	10(47.6%)	7(33.3%)	4(19.0%)		
The employees of this organization experiences "out of stock" situations.	8(38.1%)	7(33.3%)	5(23.8%)	1(4.8%)	
We get damaged goods from our stores.	3(14.3%)	7(33.3%)	7(33.3%)	3(14.3%)	1(4.8%)

We continually receive training concerning inventory management.	1(4.8%)	1(4.8%)	5(23.8%)	8(38.1%)	6(28.6%)

From Table 2 above, 15(71.4%) of the respondents strongly agreed that responsible officers authorize purchases, 3(14.3%) agreed, 1(4.8%) were not sure and 2(9.5%) disagreed. The table also shows that 9(42.9%) of the respondents strongly agreed that goods are usually inspected at the time of receipt, 7(33.3%) agreed, 4(19.0%) were not sure and 1(4.8%) disagreed. Among the total respondents, 12(57.1%) strongly agreed that employees pay special attention to inventory whose value is very high, 8(38.1%) agreed, 1(4.8%) were not sure. 20(95.2%) respondents also strongly agreed that inventory is taken at least once a year and 1(4.8%) was not sure. 2(9.5%) strongly agreed that internal inventory is conducted frequently, 8(38.1%) agreed, 10(47.6%) were not sure and 1(4.8%) disagreed. Only 1(4.8%) of the respondents agreed that Economic Order Quantity is used in all decisions when purchasing materials, 6(28.6%) agreed, 9(42.9%) were not sure, 3(14.3%) disagreed and 2(9.5%) strongly disagreed. Of the total respondents, 3(14.3%) were not sure whether ICT is used in inventory management and control, 9(42.9%) disagreed and 9(42.9%) strongly disagreed. 10(47.6%) of the respondents strongly agreed that warehouse and inventory control personnel in TAZARA are highly skilled, 7(33.3%) agreed and 4(19.0%) were not sure. Of the total respondents, 8(38.1%) strongly agreed that TAZARA experiences out-of-stock situations, 7(33.3%) agreed, 5(23.8%) were not sure and 1(4.8%) disagreed. 3(14.3%) of the respondents strongly agreed that they receive damaged goods from the stores, 7(33.3%) agreed, 7(33.3%) were not sure, 3(14.3%) disagreed and 1(4.8%) strongly disagreed. Only 1(4.8%) strongly agreed that employees receive continuous training in inventory management, 1(4.8%) agreed, 5(23.8%) were not sure, 8(38.1%) disagreed and 6(28.6%) strongly disagreed.

Table 3
Challenges in Inventory Management

Yes	19	95.0 %	95.0 %
No	1	5.0 %	100.0 %

From table 3 above, majority of the respondents indicated that they face challenges in inventory management in TAZARA with 19(95%) indicating YES and only 1(5%) indicating NO.

Table 4

The Challenges Faced by TAZARA in Inventory Management

Not adequate space for storage	1	5.6 %	5.6 %
Specification poorly done	10	55.6 %	61.1 %
Irregular customer orders	7	38.9 %	100.0 %

From Table 4 above, 10(55.6%) of the respondents indicated that the major challenge faced by TAZARA in inventory management is poor specification. 7(38.9%) stated that irregular customer orders were the main challenge, while 1(5.6%) stated that insufficient storage space was the main challenge.

Table 5

The Recommendations to Improve Inventory Management in TAZARA

Implement Procurement Rules and Regulation	2	9.5 %	9.5 %
Introduce Electronic Management System	11	52.4 %	61.9 %
Training Employees on Procurement and Regulation	7	33.3 %	95.2 %
Routine Stock Taking	1	4.8 %	100.0 %

From Table 5 above, 11(52.4%) of the respondents recommended that there is need to introduce electronic management system in inventory management in TAZARA. 7(33.3%) recommended training of employees on procurement rules and regulations, 2(9.5%) recommended full implementation of procurement rules and regulations and 1(4.8%) recommended routine inventory taking.

5. Discussion

The results have also shown that the majority of TAZARA employees in inventory management are male compared to the female. The study also shows that most TAZARA employees in inventory management are between the ages of 26 and 35, which means that most of these employees are young people. Conversely, most employees in inventory management have less than 10 years of work experience.

The study also revealed that TAZARA uses ABC analysis in decision making and not Economic Order Quantity Model in

decision making when purchasing materials. This calls for further investigation on other inventory management techniques to determine the level of usage in TAZARA. There is a need to explore more on VED analysis, inventory turnover ratios, inventory valuation methods and determination of inventory level.

The study also revealed that TAZARA's stores and procurement are facing challenges in inventory management. The challenges are poor specification and irregular customer orders.

The study also revealed that the implementation of ICT by introducing an electronic management system in inventory management would improve performance, and that employees need to be trained in procurement and regulations as most of the employees are young and have less work experience.

6. Conclusion

The results showed that TAZARA needs to improve in inventory management and that TAZARA uses ABC analysis in decision making but not Economic Order Quantity Model in decision making when purchasing materials. There is need to conduct further research to determine the best techniques of inventory management that currently suits TAZARA.

On the other hand, there is a need to implement ICT in inventory management and frequently train and orient employees in stores and procurement department on procurement and regulations. Implementing ICT in inventory management will greatly improve decision making, operational efficiency and accuracy, resulting in cost savings and improved customer service. Conversely, to promote compliance, reduce risk, increase productivity and improve the overall effectiveness of the company's procurement processes, it is imperative to invest in regular training and education of store and procurement personnel on procurement regulations.

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