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## Effects of Adoption of Inventory Control System on Customer Service Delivery: A Case of Chuka University College of Tharaka Nithi County, Kenya

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### ABSTRACT

This study investigated the effects of inventory control system on customer service delivery in Chuka University. The objectives were to identify the nature of inventory control techniques used by different departments in higher learning institution, to find out the extent of adoption of inventory control techniques by different department in higher learning institution and to determine the effect of inventory control techniques on customer service delivery in higher learning institution. The study employed the descriptive research design and the use of questionnaire in data collection. The sample was carefully selected from the population of 250 employees by use of purposive random sampling procedure. Purposive sample of seven departments providing customer service delivery was selected and sample size of 13 employees was selected from each department depending on the number of employees who provided reliable information. The data were presented using diagrams and tables. Analysis was done using frequencies and percentages. Hypotheses was tested for significance of relationship between dependent and independent variables using the chi-square. It was established that the stocks were well managed in Chuka University departments. It was found that various inventory control techniques like the JIT, two-bin and visual review were moderately employed by the departments in Chuka University. 38.4% of the employees recommended the JIT technique to be used most frequently and 30.8% suggest the TBS not to be used at all. It was established that all the stock control system were employed in Chuka University and were fairly implemented. The findings of this study will be used by the institution to come up with the appropriate inventory control model that fully satisfies customer service delivery. The recommendation is that management of the university should provide continuous training to familiarize employees on appropriate inventory control techniques.

**Keywords:** EOQ; JIT; MRP I and II; ABC Analysis; Customer care; Pareto optimality

## **1. BACKGROUND OF THE STUDY**

Inventories are one of the most important items in any organizations. If it is not well planned for either the organizations will face stock out or stock excesses each of which are risky. Stock out is a situation where stock available is less than that of the organization requirements. Stock out is very risky because it may make the organization to lose its goodwill, customers and reduces sales because customers demand will not be met on time and this will in turn affect the profit of the organization (Weele, 2004).

On the other hand, a stock excess is a situation whereby the organization holds more stock than they require. Stock excess is very risky to an organization because stock excesses ties up the organization capital of which this capital may be used to invest in other projects of the organization, which will generate more revenue for the organization.

According to Benton (2007), the term Inventories means different thing to different organizations. For example the inventories for bank is cash reserve, for telephone companies is the unissued telephone lines, for blood is the blood bank, for providing services for - parking space is the space that has not been used and for a manufacturing company is raw materials, work in progress, finished goods and material requirement and operating supplies. For hotels it is unoccupied rooms, unused stock of food materials and unsold ready foods.

For a manufacturing organizations, inventories includes raw materials, parts and components which enter the firms products in production process, semi-finished products found at various stages of production operations, Finished goods inventories and Material requirements and operating supplies (MRO) which are used in the production process but which do not become part of the product (Biggs, 2002).

Organizations hold inventories for various reasons namely economies of buying in bulk , anticipating future changes and prices for work in progress where a completely balanced production flow is impracticable, for finished goods where the holding of a buffer stock between production and customer is desirable, owing to fluctuations is the price of a commodity it is desirable to acquire stock when prices are low, in order that materials may appreciate in value through storage and in order that customers may be attracted by a range of products from which to select.

Organizations normally use various techniques to determine the optimal stock balances namely cyclical or fixed interval system, order point or fixed quantity system, just in time system, material requirement planning, material requirement planning 2, distribution requirement planning, two bin system, ABC analysis e.t.c (Burt, petcavage, pinkerton, 2010). Cyclical or fixed interval system is a time based which involves scheduled periodic reviews of the level of all inventory items. If a given items is not sufficient to sustain production operations until the next scheduled review an order is then placed to replenish supply. The frequency of reviews is determined by degree of control desired by the management (Bowersox, 2007).

Order point or fixed quantity system is an order point and quantity factors rather than on the time. This method involves safety min, remedy listening and max .under this system each inventory item needs predetermination of an order point which calls for automatic re-ordering when the stock level reach the order point and predetermination of a fixed quantity to be ordered. Under this system the fixed quantity can be determined by economic order quantity. (Schonberger and Schniederjans, 1984).

Just in time approach is an operating management philosophy. The operating concept of the system is to gear factory output tightly to distribution demand for finished goods to gear individual feeder production units tightly together and to gear the supply of production inventories tightly to manufacturing demand scheduling.

Material requirement planning system is a product oriented computerized technique aimed at minimizing inventory and maintaining delivery schedules through a bill of materials or engineering bill and an aggregation process.

Enterprise resource planning (ERP) are micro data input software programs for all of a firms information. ERP systems include production planning and inventory controls programs but go well beyond their scope the benefits of ERP systems includes cycle time reduction of key business processes, better financial management and facility system to E-commerce systems (Burt et al).

ABC Analysis: The 80-20 concept calls for a study of each item in terms of its price or cost, usage (demand) and lead-time, as well as specific procurement or technical problems. Without the data provided by such a study, an inventory manager normally does not have enough information to determine the best allocation of departmental effort and expense to the task of controlling thousands of inventory items (Branch, 2008).

Distribution Requirement planning (DRP) is a methodology for forecasting, calculating and summarizing shipping requirements between locations in a distribution network. DRP treats distribution hierarchies like bills of material in computing requirements. (Frazelle, 2001). Two-Bin System is the basic order point system, which are used in the operation of the simple two-bin system. The distinguishing feature of this system is the absence of a perpetual inventory record. In practice, the stock is separated physically into two bins, or containers.

## **2. LITERATURE REVIEW**

This research heavily borrows from the following theoretical literatures on inventory models and customers satisfaction:

### **2. 1. ABC Analysis: The 80-20 Concept**

ABC analysis also called Pareto analysis after Vilfredo Pareto an Italian economist who developed the concept during the early 20<sup>th</sup> century (Bowersox, 2007). Several studies made of large corporations have shown that 80% of all items carried in the inventory constitute 20% of the total investment while 20% of inventory items constitute 80 of total investment. In practice, an ABC analysis can be made based on either the average inventory investment in each item or the arrival shilling usage of each item.

Each item value is expressed as a percentage of the total inventory investment. Each item can be the fitted on the three classifications A, B, and C depending on the items percentage investments over the total inventory investment. The value of such an analysis so to provide a sound basis on which allocate time and personnel with respect to procurement management and the refinement of control over the individual inventory items. Clearly no manager wants to spent 75% of his time on class C low-value items and spend 25% of his time on class A high-value items

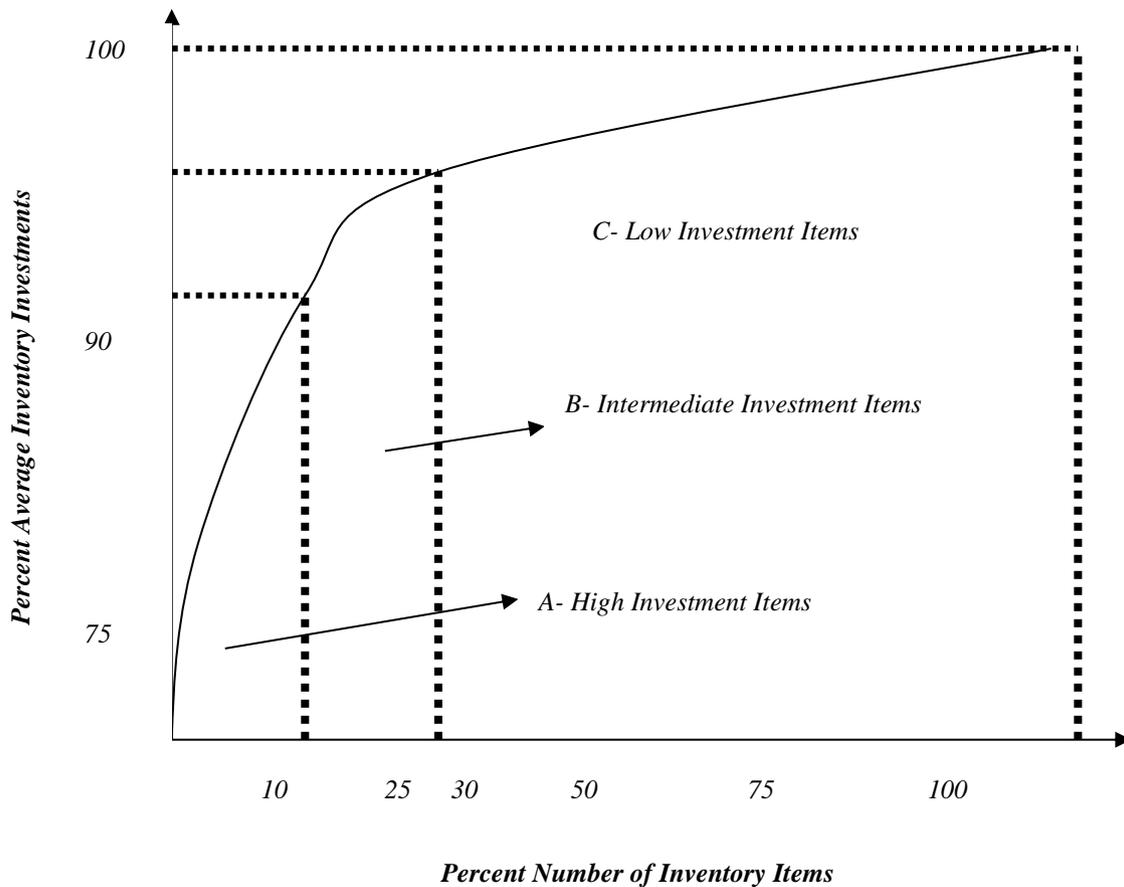


Fig. 1. A Graphic ABC Analysis of Production and MRO Inventories

## 2. 2. The just –in-Time (J-I-T) Approach (Programmed Deliveries)

J-I-T is an operating management philosophy the operating concept of the system is to gear factory output tightly to distribution demand for finished goods to gear individual feeder production units tightly together, and to gear the supply of production inventories tightly to the manufacturing demand schedule. This means that all inventories in the system including production inventions are maintained at minimal levels. (Baily et al, 2010)

It should be pointed that as practical matter only a small percentage of materials in firm will utilize the J-I-T approach. Specifically high value items. JIT approach functions much like a flow control operations, only more stringently controlled.

JIT approach works well in a continuous processing, manufacturing operations processing, or manufacturing operations. As for when and how much to order the buyer and supply work together on matters of delivery volumes and scheduling. This means the operation of more cooperative relationship e.g. collaborating between buyer and supplier.

Advantages of JIT approach includes Parts cost like lower scrap costs, lower inventory carrying costs, fast detection of and correction of unsatisfactory quality, fast response to engineering change requirements, fewer suppliers; minimal expediting; simplified receiving

activities, reduced inspection delays and reduced inventories of raw materials purchased parts, work-in-progress and finished goods.

However the limitation includes stock outs if the forecasting is faulty, requirement for the establishment of system to link buyers of suppliers, lack of safety stocks makes firms highly vulnerable to supply fail ,Removes advantage of bulk buying and requirements of much training to break down barriers between functions in the organization.

### **2. 3. Material requirement planning system (MRP)**

According to Boylani and Johnston (1994) MRP is a product oriented computerized technique aimed at minimizing inventory and maintaining delivery schedules. Through a bill of materials (BOM) or Engineering bill and an aggregation process this system generates on a weekly basis the projected materials requirements for all the finished products. The system then calculates the net requirement by subtracting on-hand inventory and any scheduled receipt for the item as production is scheduled to programmed the or the planning period. The inventory carried in this system is a functional of three factors; namely quantity purchased when each order is placed, the purchase lead time and any safety stock that is routinely carried.

This system is designed for the use with demand dependent items (production Items)

The aim of MRP is to synchronize ordering and delivery of materials with production requirements, achieve planned and controlled inventory to ensure items are available when needed, to promote planning between buyer and seller and enable repaid responses to materials shortages.

Material Requirement Planning has been expanded to include Logistics requirements planning (LRP). The idea of LRP is to combine MRP and DRP system to enable a comprehensive planning system which co-ordinates materials requirements entering the firm, other resources connected with conversion and distributions requirements connecting worth the customers.

### **2. 4. Customer response principles and systems**

Frazelle (2001) argue that Most organizations underestimates the value of good customer response and harm done by poor customer response. There are different aspect of consumer behavior that seventy five percent of the reasons customers leave a company has nothing to do with the product, of the dissatisfied customers, ninety eight percent will never complain which means they will just keep quiet, eighty five percent of the dissatisfied customers tell nine people, thirteen percent tell twenty people. A satisfied people tell five people. In the next 6 years, eighty percent of your customers will leave; a 5 percent retention rate will increase profits from twenty five to fifty five.

Customer demand is the fountainhead for all logistics activities. Fulfilling customer orders creates the needs for all logistics resources and activities. Customer response including customer service and order processing is the first of the five logistics processes. Customer demand and order processing should be done ahead of inventory planning and management. This is because the objective of inventory management is to minimize the amount of inventory needed to satisfy the customer service delivery. This should be done ahead of supply because the supply quality must meet customer expectations, transportation because transportation system must deliver product within the customer specified time windows and

warehousing because the warehouse must respond within the customer service policy response time constraints, must support the fill rate objectives and must offer the value added services specified by the customer.

The main objectives of all the four logistics processes are to satisfy the customer response requirements at the lowest possible cost. Hence, the customer response requirement must be developed before the other logistics processes can be planned and executed.

Customer response is first because, without a profitable customer response strategy, the other logistics processes are worthless. Customer response is first because the customer response plan is the agreement between the logistics organization and its external and internal customers. It is the first because it defines the constraints in the logistics optimization problem to minimize total logistics costs subject to customer service delivery. (Frazelle, 2001).

## **2. 5. Customer Response**

Before developing a customer response master plan, each organization must make a clear distinction between the customers and consumers of its products and services. The consumer is the last party in the logistics chain. The consumer is the party who uses the product for the purpose it was ultimately designed for and the consumer is the one who buys the product. The customer may or may not be the last party in the logistic chain. Depending on where you are in the supply chain, you may have no idea who is consuming your product, but you should always have a good relationship with the customer of the product. (Boylani and Johnston, 1994)

## **2. 6. Customer activity profiling**

Customer activity profile (CAP), tries to rank and categorize customers in preparation for creating a customer service policy and to profile order sizes in anticipation of developing a logistics operations strategy. The three main customer profiles are the customer sales activity profile (CSAP), item sales activity profiles (ISAP), customer –item sales activity profiles (CISAP).

## **Empirical literature on inventory control system**

Boylani and Johnston (1994) were among the early researchers to conduct a research on inventory control systems and service level measures. They argued that many organizations concentrated on achieving consistent service levels to all their customers. Inventory service levels are generally monitored using the same measure at all stock-holding depots. However, although it is generally desirable and feasible to use common measures, situations may arise in which measures vary. They concluded that relationships between six of the main aggregate service level measures have been obtained. Three application areas for these relationships have been described: comparison of service between stock-holding depots, assessment of the effect of inventory centralization/decentralization and estimation of new service levels when the service measure is changed. The relationships may be applied to the inventory as a whole or to specific classes of inventory. In the latter case, if there are inconsistencies in stock classes, then the application of the relationships should be preceded by a sensitivity analysis. If the results are found to be robust to classification rules, then the relationships may be applied at both aggregate and class levels.

Baldenus and Reichelstein (2005) also carried out a research that examined the role of historical cost information in providing managers with incentives for efficient inventory management. The findings were that it is advantageous to manage and control finished-goods inventory and to recognize these costs in income only at the date of sale. If inventory is treated as an interest-bearing asset, the residual income performance measure will reflect the value created by the production and sales decisions in the period of sale. Until that date, the residual income performance measure is unaffected by the manager's decision to build up inventory. We have also identified a role for the lower-of cost-or-market rule for short-lived products that are sold in market environments characterized by uncertainty beyond the manager's initial information. In such environments, however, accounting and market based performance measures will generally fail to align incentives for products with longer life cycles. The reason is that sunk cost considerations will then collide irreconcilably with opportunity cost considerations.

Schonberger and Schniederjans (1984) also carried out a research about Reinventing Inventory Control techniques and found that Western notions about inventory control revolve around economic order quantities and buffer stocks that are aimed at avoiding running out of stock but which result in high inventories and long lead times. Their conclusion suggested new revelations about inventory control:

- i. Whatever your purchase and manufacturing lot sizes are, they are too large.
- ii. Whatever amounts of buffer stock you carry for your own "protection," they are also too large.

## **2. 8. Empirical literature on customer service delivery**

Boylan and Johnston (1993) also carried out a research about Relationships between Service Level Measures for Inventory Systems and concluded that the Relationships between six of the main aggregate service level measures have been obtained. Three application areas for these relationships have been described: comparison of service between stock-holding depots, assessment of the effect of inventory centralization/decentralization and estimation of new service levels when the service measure is changed. The relationships may be applied to the inventory as a whole or to specific classes of inventory. In the latter case, if there are inconsistencies in stock classes, then the application of the relationships should be preceded by a sensitivity analysis. If the results are found to be robust to classification rules, then the relationships may be applied at both aggregate and class levels.

Watson (1987) examines the interactions between the demand forecasting and reordering subsystems in inventory management. He used Simulation to study the average discrepancy between a desired customer service level and that actually achieved, and the increase in average annual inventory cost resulting from fluctuations in the forecast demand parameters of several lumpy demand patterns.

The finding was that for lumpy demand patterns, demand-forecast fluctuations can cause either positive or negative shifts in the customer service level achieved. Furthermore, these shifts are often greater than the shifts due to the approximations in the reordering subsystem alone.

### **Data and methodology**

The research employed descriptive design. Primary data was collected using Questionnaires which were randomly administered to the respondents to determine the inventory control techniques used by different departments and their effects on customer service delivery. The location of the study was Chuka University College, which is in Meru south district. The population of study included all the staffs who are working in 32 departments of Chuka University College. The target population for the study is 250 employees of Chuka University. The samples were carefully selected from the population by use of purposive random sampling procedure. Purposive sample of seven departments providing customer services were targeted. This consisted of the study unit from which all data related to inventory control techniques and customer service delivery were collected.

According to Nachmias and Nachmias (2006), the sample size must be 5% of the population. From a population of 250 employees, the sample was 13 respondents. Then proportions from each department were determined as in Table 1 below:

**Table 1.** Population and sample size

<b>Department</b>	<b>Population</b>	<b>Sample size</b>
<b>Procurement</b>	7	3
<b>Finance</b>	5	2
<b>Medical</b>	3	1
<b>Estate</b>	32	5
<b>Principal's office</b>	4	1
<b>Transport</b>		
<b>Accommodation</b>	2	1
<b>Total</b>	<b>250</b>	<b>13</b>

Each of the three objectives was analyzed using descriptive statistics of frequencies and percentages. Chi-square was used in testing the three hypotheses. All the hypotheses was tested at a significant level of 0.05 by use of statistical package for social sciences (SPSS) version 17.

## **3. RESULTS**

### **3. 1. Gender of respondents**

Gender defines the different roles, obligations, and expectations of an individual. Gender also indicates the ability to make decisions and influence decisions. The study sought to find out if there was gender balance or parity among members of the different departments of Chuka University. Table 3 shows the gender distribution of the respondents.

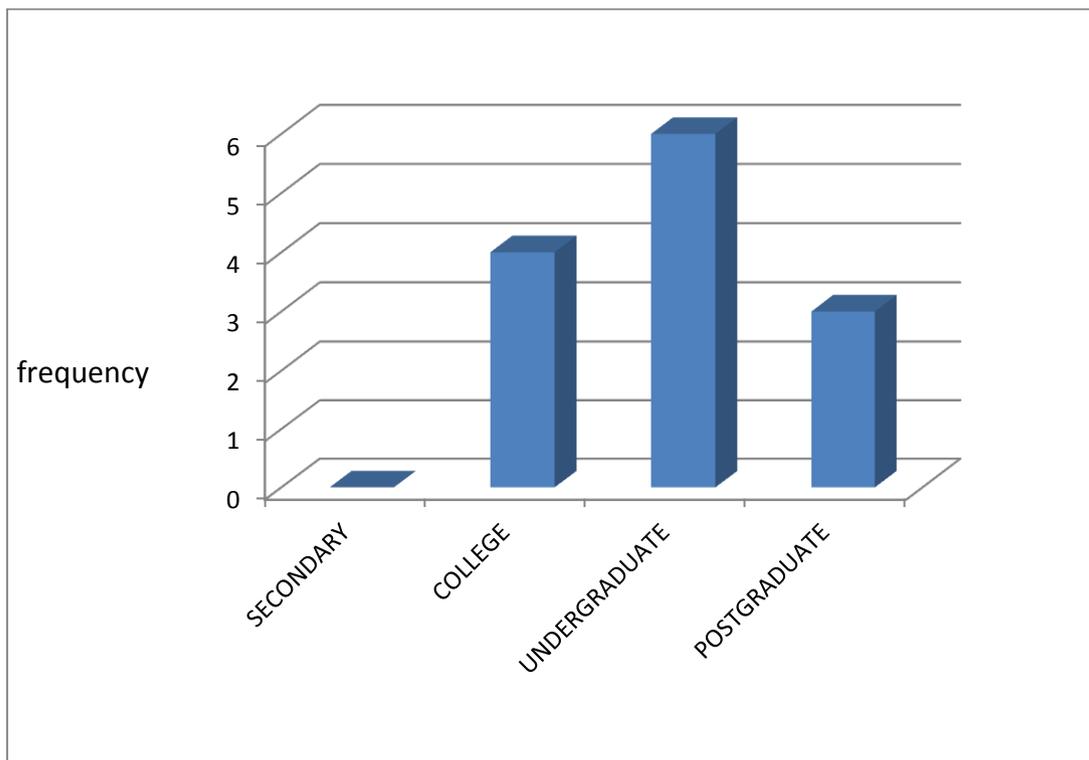
**Table 3.** Gender of respondent

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
<b>Male</b>	5	38.5
<b>Female</b>	8	61.5
<b>Total</b>	<b>13</b>	100.0

As depicted from Figure 1, 38.5% of the respondents were male while 61.5% of the respondents were female. The lower percentage of male brings to light the great gender disparity in different departments. Therefore, this shows that the majority of employees who works in service departments that deals with management of inventory are female.

**3. 2. Level of education**

Education is very important when it comes to management of inventory control systems and in general way of life. Studies have shown that there exist a link between individuals’ level of education and mastery of inventory management. Education liberates as the saying goes and helps in making individual more rational in making decisions.



**Figure 5.** Respondents level of education

Figure 5, showed that majority of the employees who deals with management of inventory had attained undergraduate studies, accounting for 46.2%. Study also revealed that none of the employees who deal with inventory management had secondary level of education; this in itself implies that inventory management require more than just mere education gotten from secondary school. The 30.7% accounting for college level were staffs who have got diploma's in various disciplines and managed to work in the departments that deals with management of inventories. The 23.1% accounting for postgraduates are heads of department that deals with inventory management.

### 3. 3. Inventory management practices and their effects

The study sought to find out whether the departments at the university use inventory control system in their daily operations. 100% of the respondents suggested that they deal with stock/materials in their departments. All the respondents were 100% aware about the inventory control techniques used in their department. 85% of the respondents indicated that the stocks were well managed in their departments while 15% suggested that stock management is average. The study showed that none of the respondents suggested that stock is poorly managed.

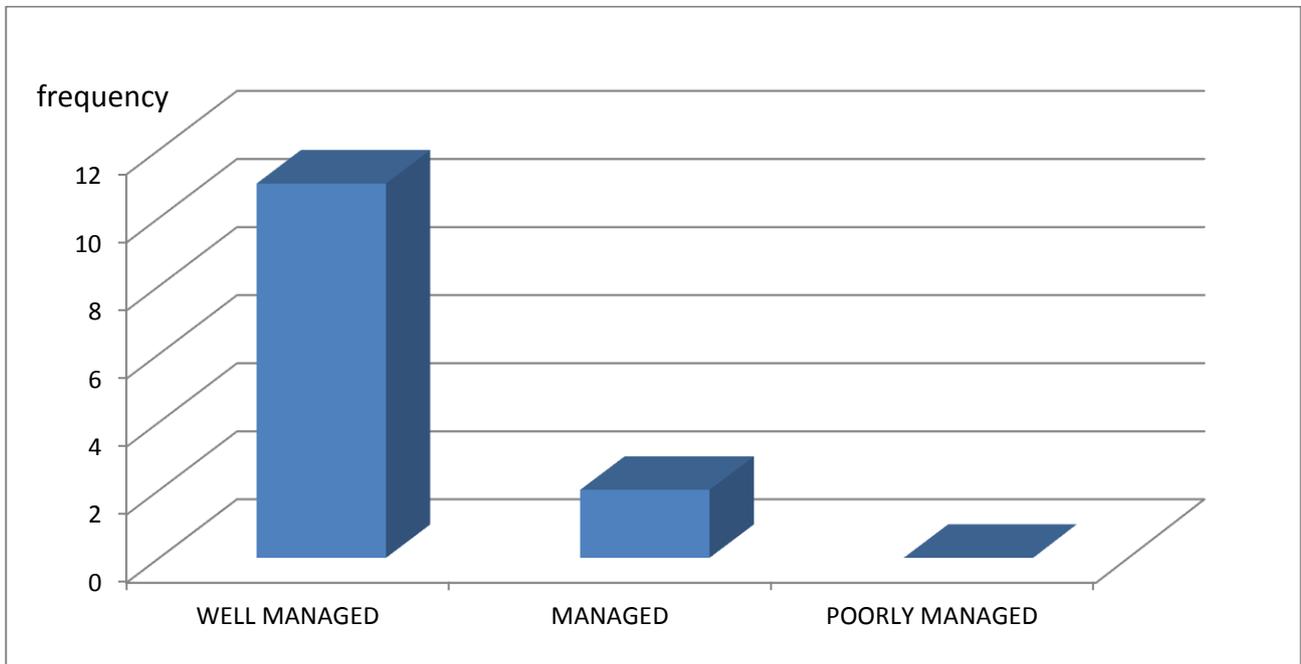


Figure 6. Respondents response on level of stock management

Figure 5 shows that 84.6% of the respondents shows that stock are well managed, 15.4% indicated that the stock were averagely managed and non of the respondents indicated that the inventory management is poor.

**3. 4. The extent of use of stock control methods.**

The study sought to find out the extent to which different inventory control methods are used in different departments. Understanding of inventory control techniques was an important issue because one has to understand what he or she was doing in order to implement it properly.

**Table 4.** Response of the respondents concerning extent of inventory control techniques\_used

Methods	No Extent	Some Extent	Moderate	High Extent
Just in time	0(0%)	2(15.4%)	5(30.5%)	6(46.2%)
Material requirement planning.	2(15.4%)	2(15.4%)	4 (30.8%)	5 (38.5%)
Two-Bin System	1 (7.7%)	1 (7.7%)	5(30.5%)	6(46.2%)
Visual Review system	0(0%)	3 (23.1%)	5 (38.5%)	5 (38.5%)
Entreprise resource planning	1 (7.7%)	3 (23.1%)	4 (30.8%)	5 (38.5%)

As shown in Table 4, 46.2% of the respondents suggested that just in time is used to high extent and non of the respondents suggested that it is used to no extent.38.5% of the respondents suggested that material requirement planning is used to high extent,15.4% said that it is used to some extent and 15.4% said it is used to no extent. 46.2% of the respondents suggested that the two-bin system is used to high extent, 7.7% suggested that it is used to some extent and 7.7% said that it is used to no extent.38.5% of the respondents suggested that the visual review system is used to high extent, 38.5% said that it is moderately used and none of the respondents suggested that it is used to no extent.38.5% of the respondents suggested that enterprise resource planning is used to high extent and 7.7% of the respondents said it is used to no extent.

**3. 5. Respondents suggestion on appropriate stock control methods.**

The study sought to find out the methods that employees recommend to be used in their departments, be it just in time, material requirement planning, two-bin systems, or the visual review system among others. Table 5 shows the response of the respondents in regard to extent of inventory control techniques used.

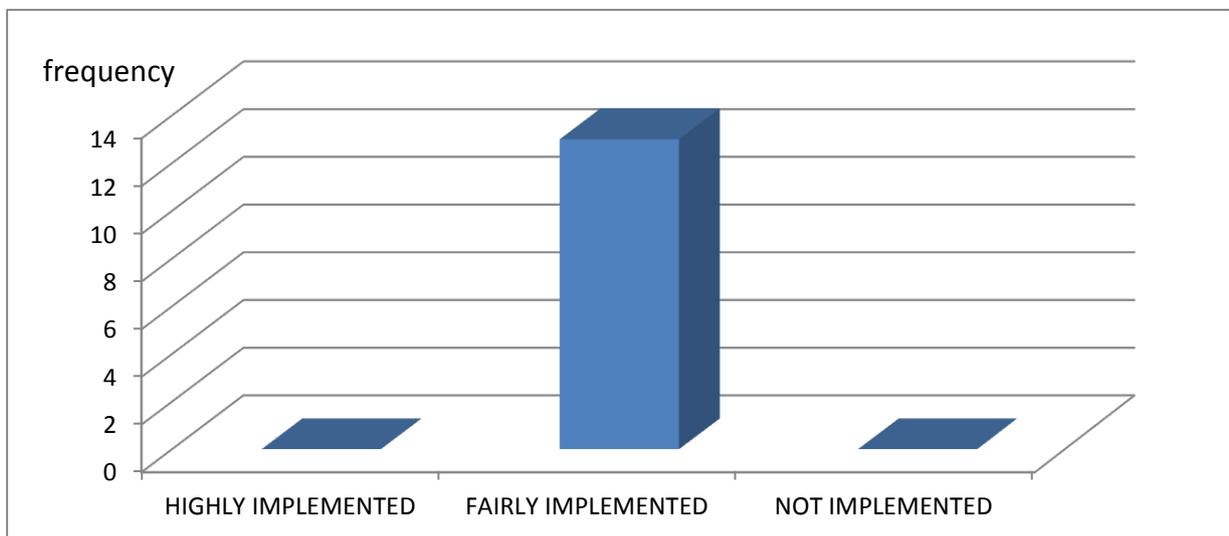
**Table 5.** Respondents recommendation on inventory control methods

Methods	Most Frequently	Frequently	Less frequently	Not at All
Just in time	5 (38.4%)	4 (30.8%)	3 (23.1%)	1 (7.7%)
Material requirement planning.	4 (30.8%)	7 (53.8%)	2 (15.4%)	0%
Two-Bin System	1 (7.7%)	2 (15.4%)	6 (46.2%)	4 (30.8%)
Visual Review system	4 (30.8%)	6 (46.2%)	3 (23.1%)	0%

As shown in table 5, 38.4% of the respondents recommendations was that just in time technique to be used most frequently and 7.7% recommends that the just in time technique not to be used at all. 53.8% of the respondents recommend the material requirement planning technique to be used frequently and non of the respondents recommended that the material requirement planning technique not to be used at all.46.2% of the respondents recommends the two- bin system to be used less frequently and 7.7% of the respondents recommends not to be used at all. 46.2% of the respondents recommend that the visual review system to be used frequently and none of the respondents recommended not to be used at all.

### 3. 6. Level of implementation of stock control systems

The study sought to find out the level of implementation of stock control systems by the university departments. The result is as shown in Figure 7 below:



**Figure 7.** Level of implementation of stock control systems

**3. 7. The impact of stock control systems on customer service delivery**

The study sought to find out the level of agreement on the impact of stock control systems on customer service delivery.

**Table 6.** Respondents response on impact of stock control systems on customer service\_delivery

<b>Level of agreement</b>	<b>Frequency</b>	<b>Percent</b>
<b>Strongly agree</b>	13	100%
<b>Agree</b>	0	0%
<b>Undecided</b>	0	0%
<b>Disagree</b>	0	0%
<b>Strongly disagree</b>	0	0%
<b>Total</b>	<b>13</b>	<b>100.0</b>

The study showed that 100% of the respondents strongly agree that that stock control system has got impact on customer service delivery.

**3. 8. Level of agreement in which inventory control system meets customer demands**

The study sought to find out the level of agreement on how inventory control technique meets customer demands.

**Table 7.** Level of agreement in which inventory technique meets customer demands.

<b>Customer demand</b>	<b>Agree</b>	<b>Strongly Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Don't know</b>
<b>Quick order processing</b>	7(53.8%)	6(46.2%)	0(0%)	0(0%)	0(0%)
<b>Quality product/services</b>	5(38.5)	8(61.5)	0(0%)	0(0%)	0(0%)
<b>Provide right quantity</b>	4(30.8%)	3(23.1%)	5(38.5)	0(0%)	1 (7.7%)
<b>Charge fair price</b>	3(23.1%)	3(23.1%)	7(53.8%)	0(0%)	0(0%)
<b>Value added services</b>	6(46.2%)	7(53.8%)	0(0%)	0(0%)	0(0%)

As shown in Table 7 above 53.8% of the respondents agree that inventory control technique will lead to quick order processing and none of the respondents disagreed that it leads to quick order processing. 615% of the respondents strongly agreed that inventory control technique will lead to providing quality products and services to customers and non of the respondents disagreed that it provides quality products to customers. 38.5% of the

respondents disagreed that inventory control method provides customer with the right quantity and non of the respondents strongly disagreed that it provides the right quantity to customers. 53.8% of the respondents disagreed that the inventory control technique provides fair price to customers and non the respondents disagreed that inventory control method provides fair price to customers. 53.8% of the respondents strongly agreed that the inventory control method provides value added services to customers and non of the respondents disagreed that it provides value added services to customers.

**3. 9. The respondents opinions on level of customer satisfaction**

The study sought to find out the respondents views on the level of customer satisfaction.

**Table 8.** Respondents response on level of customer satisfaction

<b>Level of customer satisfaction</b>	<b>Frequency</b>	<b>Percent</b>
<b>Highly satisfied</b>	0	0%
<b>Satisfied</b>	13	100%
<b>Dissatisfied</b>	0	0%
<b>Don't know</b>	0	0%
<b>Totals</b>	13	100.0

Table 8 indicates that all the respondents of university departments suggested that the customers of the university are satisfied with the inventory control technique adopted. The findings show that 100% of the respondents response was that customers are satisfied with the services offered.

**3. 10. Customer service policy**

The study sought to find out if the university departments has customer service policy

**Table 9.** Response on customer service policy

<b>Customer service policy</b>	<b>Frequency</b>	<b>Percent</b>
<b>Yes</b>	13	100%
<b>No</b>	0	0%
<b>Totals</b>	<b>13</b>	<b>100.0</b>

The results shows that the university departments have got customer service policy which is in use.

**3. 11. The effects of ineffective inventory control system on customer service delivery**

The study sought to find out the effects of ineffective inventory control system on customer service delivery. 100% of the respondents suggested that ineffective inventory control system will lead to loss of good will of the institution.

**3. 12. Adoption of inventory management techniques and customer satisfaction.**

The study sought to find out whether there is any relationship between the level of adoption and service delivery. Results from the respondents were analyzed descriptively and results presented in the Table 11 below.

**Table 10.** JIT techniques and customer satisfaction

			Level of satisfaction by customers		
			Unsatisfied	Satisfied	Highly satisfied
<b>Adoption level of JIT</b>	Some extent		1(7.7%)	1(7.7%)	0(0%)
	Moderate		1(7.7%)	3(23.1%)	1(7.7%)
	High extent		0(0%)	0(0%)	6(46.2%)
<b>Total</b>		<b>2(15.4%)</b>	<b>4(30.8%)</b>	<b>7(58.8%)</b>	

Chi-square = 10.539, d.f = 4, P-value = 0.032

The P-value of 0.032 indicates that there exists significant relationship between the adoption of the Just in time technique and the level of customer satisfaction.

**Table 11.** ERP techniques and customer satisfaction.

			Level of satisfaction by customers		
			Unsatisfied	Satisfied	Highly satisfied
<b>Adoption level of ERP</b>	No extent		1(7.7%)	0(0%)	0(0%)
	Some extent		1(7.7%)	2(15.4%)	0(0%)
	Moderate		0(0%)	2(15.4%)	2(15.4%)
	High extent		0(0%)	0(0%)	5(38.5%)
<b>Total</b>		<b>2(15.4%)</b>	<b>4(30.8%)</b>	<b>7(53.8%)</b>	

Chi-square = 14.393, d.f = 6, P-value = 0.026

The above P-value indicates that there is a significant relationship between the level of customer satisfaction and the adoption of the ERP.

**Table 12.** MRP techniques and customer satisfaction

		Level of satisfaction by customers		
		Unsatisfied	Satisfied	Highly satisfied
<b>Adoption level of MRP</b>	No extent	0(0%)	1(7.7%)	1(7.7%)
	Some extent	1(7.7%)	1(7.7%)	0(0%)
	Moderate	1(7.7%)	2(15.4%)	1(7.7%)
	High extent	0(0%)	0(0%)	5(38.5%)
<b>Total</b>		<b>2(15.4%)</b>	<b>4(30.8%)</b>	<b>7(53.8%)</b>

Chi-square = 9.054, d.f = 6 , P-value = 0.171

The p-value of 0.171 indicates that there is no significant relationship between adoption of MRP and the level of customer satisfaction.

**Table 13.** Two bin system techniques and customer satisfaction

		Level of satisfaction by customers		
		Unsatisfied	Satisfied	Highly satisfied
<b>Adoption level of Two bin system</b>	No extent	1(7.7%)	0(0%)	0(0%)
	Some extent	1(7.7%)	0(0%)	0(0%)
	Moderate	0(0%)	4(30.8%)	1(7.7%)
	High extent	0(0%)	0(0%)	6(46.2%)
<b>Total</b>		<b>2(15.4%)</b>	<b>4(30.8%)</b>	<b>7(53.8%)</b>

Chi-square = 21.914, d.f = 6 , P-value = 0.001

From the table above the result indicates the P-value of .001. This is less than .05 significance level. This implies that there exists a relationship between visual method implementation and the level of customer satisfaction.

**Table 14.** Visual review system techniques and customer satisfaction

				Level of satisfaction by customers		
				Unsatisfied	Satisfied	Highly satisfied
<b>Adoption level of Visual review</b>	Some extent			1(7.7%)	1(7.7%)	1(7.7%)
	Moderate			1(7.7%)	3(23.1%)	1(7.7%)
	High extent			0(0%)	0(0%)	5(38.5%)
<b>Total</b>				<b>2(15.4%)</b>	<b>4(30.8%)</b>	<b>7(53.8%)</b>

Chi-square = 7.676, d.f = 4 , P-value = 0.104

The above results indicate that there exists no relationship between the customer satisfaction and the adoption of the visual review technique.

### 3. 13. Inventory control system and service delivery

In this hypothesis the study sought to find out whether there is any relationship between the inventory control system implementation and service delivery. Results from the respondents were analyzed descriptively and results presented in the tables 16 below:

**Table 15.** Implementations of stock control system and levels of satisfaction by customers

				Level of satisfaction by customers		
				Unsatisfied	Satisfied	Highly satisfied
<b>Level of implementation of stock control System.</b>	Not implemented			1(7.7%)	0(0%)	0(0%)
	Fairly implemented			1(7.7%)	3(23.1%)	0(0%)
	Highly implemented			0(0%)	1(7.7%)	7(53.8%)

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<b>Total</b>	<b>2(15.4%)</b>	<b>4(30.8%)</b>	<b>7(53.8%)</b>
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Chi-square = 14.219, d.f = 4 , P-value = 0.007

The p-value above of 0.007 compared to the significance interval of .05 indicates that there exists the relationship between the level of implementation of stock control systems and the level of satisfaction by the customers.

#### **4. SUMMARY OF THE MAJOR FINDINGS**

Based on the research objectives, research hypothesis and the analysis of the study in chapter four, the following major findings were established:

- a) That 100% of the employees who work in Chuka University departments were above secondary level of education and they all have adequate knowledge on inventory control techniques that are practiced in their own departments.
- b) It was established that the stocks were well managed in Chuka University departments.
- c) It was found that various inventory control techniques were moderately employed by the departments in Chuka University.
- d) Majority of the employees recommends the just in time technique to be used most frequently with 38.4%. 30.8% recommends the two bin system not to be used at all.
- e) It was established that all the stock control systems were employed in Chuka University and were fairly implemented.
- f) It was also established that the stock control systems had 100% impact on customer service delivery and also the adoption of inventory control system meets customers demand by giving them quality goods and services.
- g) It was also revealed that the customers of Chuka University College were satisfied with the inventory control system used.
- h) It was also established that the university has got customer service policy and the ineffective use of inventory control systems on customer service delivery will lead to loss of customers.

#### **5. CONCLUSIONS**

Inventory management is an important management approach and hence should be made a priority by all organizations whether profit making or non-profit making. As proven by the findings, inventory management practices despite being adopted have not been implemented to the optimum. Therefore, effort should be made to ensure full implementation of the inventory control system to ensure its great benefits in organizations as far as costs are concerned. As the results of the findings showed that inventory management has bright future for organizations, this shows the impact it had through the years in improving performance and reducing organizational costs.

## **Recommendations**

The following recommendations were made, based on the research findings:

- a) The organizations should come up with ways of measuring the impact of managing inventory control technique on their operations cost and devise contingency plans to remove the obstacles that hinder fully adoption of inventory management practices.
- b) All the departments should use inventory control technique appropriately.
- c) Management of the university should provide continuous training to familiarize employees on appropriate inventory control techniques.
- d) The organization should be made aware of the importance of appropriate inventory techniques in improving customer service level.

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