ST. MARY'S UNIVERSITY COLLEGE
BUSINESS FACULTY
DEPARTMENT OF MANAGEMENT

AN ASSESSMENT OF INVENTORY MANAGEMENT SYSTEM: THE CASE OF ADDIS ABABA CITY ROADS AUTHORITY (AACRA)

BY

ASCHALEW KEBEDE

JUNE 2010

SMUC

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APPROVED BY THE COMMITTEE OF EXAMINERS

______________________	______________________
Department Head	Signature
______________________	______________________
Advisor	Signature
______________________	______________________
Internal Examiner	Signature
______________________	______________________
External Examiner	Signature

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List of Acronyms

AACRA: Addis Ababa City Roads Authority

ABC: Always Better Control

FSW: Fast moving, slow moving no moving

VED: Vital Essential and Desirable

EOQ: Economic order Quantity

JIT: Just in time

SIP: Specific Inventory price

ACP: Average cost product

LIFO: Last in first out

FIFO: First in first out

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Inventory analysis is one the most popular topics in production and material management. One reason is that almost all types of business organization have inventory. For many firms inventory is the largest current asset. Inventory is usually through in terms of stock of materials or idle goods that are held by an organization for use sometimes in future. Whatever form inventory tasks or whatever its purpose, it often represents a significant cost to a business firm. If a firm carries excessive inventories, it is estimated that the average annual cost of carrying inventory would be approximately 30% of the total value of inventory held by the firm. Hence, if the amount of inventory could be reduced to an optimal level, both stock cost and inventory carrying cost can be reduced to the minimum possible level. Skillful inventory management can make a significant contribution to a firms' profit (Bhat, 2003:566).

In order to arrive at the best inventory policy, i.e. the best decision rules for which and how much to hold, it is necessary to have clear picture of the inventory system. It is only an adequate description of such a system that can proceed to analyze its operation and effectiveness. Regardless of the item held in stock, an inventory system requires specification of the component shows in the input-output representation. These include the demand pattern for item held in stock the replenishment and the total or (incremental) inventory carrying cost that reflects system performance (Dervistsiotis, 1981:516).

Because of their indispensable function, inventories have been considered as important to any organization as blood is to the human body.

Addis Ababa City Roads Authority (AACRA), which was established on March 15, 1998 G.C by city administration, has powers and duties of contract administration and supervision, solving the existing roads problem and construction of new asphalt and gravel roads, sewerages, traffic safety and construction of bridge in the city. In addition to the maintenance of roads, it ensure the standard of road construction and to create proper condition the standard on which the road network is cardinally promoted in accordance of the city master plan.

Addis Ababa City Roads Authority (AACRA) has huge investment on inventories of construction material and equipment for its different project. The authority has eleven different departments among which procurement and supplies department is one of the major departments.

The authority has maintained more than 80 line items at its seven warehouses in five separate locations as detail below.

1. Heavy duty vehicles and machineries spare parts and construction material warehouses is found at “Sheromeda”
2. Crasher spare parts and small vehicles spare parts construction materials production center is located around “Augusta”
3. Different Asphalt and stork yard item warehouse is found at “Mekenissa”
4. Stationery and office equipment material warehouse is found at head office of the Authority.
5. White sand warehouse is located around “Bole Medhainialem”. From the inventory valuation method such as, first in first out (FIFO), last in first out (LIFO), simple average method and weighted moving average method. From these, the Authority uses FIFO method. Because AACRA has a huge investment and different types of inventory in its seven large warehouses which are found in the various parts of the city.

Generally, inventory management system needs much attention by managers at all levels because effective inventory management is crucial to the performance of any organization. Despite this facts many organization have not yet clearly understood the benefits of efficient and effective inventory management system. For this reason, the student researcher is motivated to conduct a study on inventory management system of the organization.

1.2 Statement of the problem

By nature, most organization do not give the required of attention to the importance and relevance of inventory management. However, good and scientific inventory management system will help the firm to be stronger and highly competitive in an existing market situation. In contrast to this, even a single item con interrupt the whole operation of a company. Due to such interruption, companies, most of the time, decide to have stock inventory. This is also resulting in unnecessarily problem such as capital tied up, excessive carrying cost and the like.

The Addis Ababa Road Authority (AACRA) has performed lot of activities, which are assigned by the city government for the accomplishment of its objectives the authority manages sundry types of inventories in different warehouses. The student researchers tried to conduct preliminary investigation on the inventory management system of the authority. From the preliminary investigation, there were many problems observed regarding the inventory management system of AACRA. Among the critical problems identified through preliminary investigation increase in the number of dead stock item in the warehouse, difficulties in the identification of the material demand of users department from the inventory and an proper recording of returned material after project completion.

1.3 Research Questions

The student researcher at the end of the study had answered to the following basic research questions.

- What are the organization's procedure used for inventory movement?
- Does the inventory available in the warehouse adequately satisfy the need of users department?
- How is the general annual inventory management practice is conducted?
- What is the inventory management system of the organization?

1.4 Objectives of the study

1.4.1 General objective

The general objective of this study was to assessing the practice of inventory management and control system, procedures and polices in Addis Ababa City Roads Authority.

1.4.2 Specific objectives

To assess the procedure used for inventory movement in the organization.

To asses the general annual inventory management practice.

To determine whether annual inventory count takes place as scheduled.

To assess the inventory management system of the organization.

Providing recommendations on the identified problems.

1.5 Significance of the study

In companies like AACRA the procurement purchasing and supplies department has the biggest role in the achievement of organizational goals. For this instance, in the year 2001 E.C budget year out of a total budget of the company approved for on force construction project, 71% of the budget was allotted for the purchase of materials and service used for construction. This department is highly dependent on the information provided by the inventory management system which is basic for the timely to as accomplishment of the projects intend to it schedule.

Therefore, the student researcher was tried to investigate basic cause and effects of problem mentioned above as obstacle for the efficient performance of the inventory management system provided timely solution to bring the desired efficiency on the department. Finally, student researcher hope that this study will served as a base for future research.

1.6 Scope of the Study

This research paper is concerned with the inventory management system of Addis Ababa City Roads Authority (AACRA). It is mainly focused on the authority and didn't attempt to explore other firms. This is due to economical and time constraints. Even if the authority established twelve years ago this study included only the last consecutive five years (1997-2001E.C).For the reason, that the organization adopted new organizational structure and systems of inventory control. The investigation of the problem associate with the inventory management system and its practice is the major and focal point for this study.

1.7 Limitation of the study

Research work requires available of sufficient time and money. From the aforementioned constraints time is the foremost resource affecting the research work. In addition to these the willingness of the concerned authority representative to adequate information, some employee reluctant to fill the questionnaire were the problem faced when conducted the research.

1.8 Operational definitions

Sundry: - means all items are different from each other than can not be described as a group.

Dead stock item: - means the item are not to be a frequently out in the warehouse it is very weak acceleration.

On force construction: - means the construction period not to be transfer in the other period it must be construction at that time.

1.9 Research design and methodology

1.9.1 Research design

Descriptive type of research was applied. Because it helps to answer the research question and achieve the stated objectives of the study.

1.9.2 Population and sampling technique

Population

The population were based on the organization has seven big warehouses, the targeted population of the authority employees (i.e.86) from procurement and supplies department which was found at different location. Each warehouse is differentiating based on type, size and nature of materials.

Sample unit

The sample units were included the procurement and supplies department the organization. Having considering of the authority size and its nature with that of the cost, time and labour require, it is difficult to take the entire population. Therefore, the student researcher was limited to use a sampling method.

Sample size

The targeted populations of the authority employees (i.e. 86) from procurement and supplies department the student researcher took a sample size of (30) that is around (35%)of the total targeted population.

Sampling technique

This research used simple random sampling techniques, this techniques was chosen in order to give equal chance during the selection of respondent from the target populations and judgmental sampling techniques also used to select the managers of the department to conduct the interview.

1.9.3 Types of data

The data of this research was collected from the following two sources.

Primary source: - Employees and managers of procurement and supplies department.

Secondary source:- Manuals of the organization, inventory sheet, annual inventory report and purchase requisition of rush orders.

1.9.4 Methods of data collection

Questionnaires were prepared and distributed to collect information about those problem was stated department and additional primary sources like personal observation, opinion and attitude of employees and department head especially working in the concerned department (i.e. procurement and supply department) were included through interview on the other hand The rest of the data for the research was obtained from manual of the organization, inventory sheet, annual inventory report and purchase requisition of rush orders.

1.9.5 Data analysis methods

Descriptive statistics analysis methods were used because any result of the study was from the sample selected and conclusions and recommendation were based on the sample study. From the statistical tools, tables and percentages used with respective interpretation of the data analyzed.

1.10 Organization of the study

This paper is organized in four chapters. The first chapter deals with introductory aspects. The second chapter concern with literature review and the third chapter deals data analysis and interpretation. The last chapter deals with summary, conclusion and recommendation, of the study.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Definition of Inventory

Defined inventory as following:

- Inventory is a detailed list of movable goods.
- Inventory is a physical stock of item that a business or production enterprise keeps in hand for efficient running of affairs or its product.
- Inventory is a quantity of goods, raw material or other resources that are idle at any given point of time.

Inventory consists of raw material, component parts, supplies or finished assemblies etc, which are purchased, form an outside source and the goods manufactured in the enterprise itself. In simple words “inventories” refers to stock held by the firm when the demand for commodities increase, the inventory level decrease, while with the inventory level increase, demand for commoditi4es decrease.

However, changes in the demand for commodity are not under the control of the firm, but the amount and time of replenishment is controllable (Sharma 1999:509).

The word inventory is defined as a stock of any item or resource used in an organization, or any resources that remain idle in an anticipation of satisfying a future demand for it in an organization.

An inventory system is the set of policies and controls that monitors level of inventory and determines what level should be maintained, when stock should be replenished and how large offers should be.

In its complete scope inventory includes inputs such as human, financial, energy, equipment, and raw materials; outputs such as parts, components, and finished goods; and interim stages of the process, such as partially finished goods or work in process. The choice of which items to include in inventory depends on the organization for instance, in manufacturing inventory generally refers to materials entities that contribute or become part of a firm's product or output. Manufacturing inventory is typically classified into segments: i.e. Raw materials, finished products, supplies, work in process and component parts. On the other hand, in service inventory generally refers to the tangible goods to be sold and the supplies necessary to administer the service (Derivitsiotis, 1981; 516).

From the definition given one can learn that any inventories have its own contribution towards organizational goal achievement.

2.2 Economic Significance of inventories and their types

For many organizations inventories represent large amounts of tied-up capital usually 15 to 40 percent of total assets. Even a small decrease in the amount of inventories held, resulting from careful analysis, may represent impressive savings without any detrimental effects on the service level provided by the system (Derivitsoitis, 1981:516)

When we come to the type of inventory, it may be classified in terms of their different uses. They are classified into two categories, namely: Direct inventory and indirect inventory.

A. **Direct Inventories:-** the inventory of those items, which become a component of finished goods, in termed as direct inventory. Direct inventories are categorized as follows;
    1. Inventory of raw materials
    2. work in process (progress (WIP) inventories
    3. finished product inventory

B. **Indirect Inventories**:- inventory of raw materials that do not from an integral part of finished products in called indirect

Inventory. This may include item such as lubricants, grace, oil, petrol, maintenance materials etc.

According to Dervitsiotis (1981:517) the types of inventories maintained by various organizations.

System	Inventory
Factory	Raw materials; parts semi finished goods; finished goods
Commercial bank	Cash reserves tellers
Hospital	Number of beds; specialized personnel; stocks of drugs, etc
Airline company	Aircraft seat miles per route; parts for engine repairs; stewardess, mechanics, etc

2.3 Functions of inventory

Inventories serve a number of functions. Among the most important are the following.

1. To meet unanticipated customer demand a customer can be a person who walks in off the street to buy a new stereo system.
2. To smooth production requirement: firm that experience seasonal patterns in demand of tern build in up inventories during preseason period to meet overly high requirements during seasonal periods.
3. To decouple operations: historically, manufacturing firms have used inventories as buffers between successive operations to maintain continuity of production that would otherwise be disrupted by events such as break downs of equipments and accidents that cause a portion of the operation to shut down temporarily.
4. To protect against stock out: delayed deliveries and unexpected increase in demand increase risk of shortage. Delays can occur because of weather condition supplier stock outs, deliveries of wrong material quality problems, and soon.

5. To take advantage of order cycles: to minimize purchase and inventory costs, a firm often buys in quantities that exceed immediate requirements. This necessitates storing some or the entire purchased amount for later use.
6. To hedge against price increases: occasionally a firm will suspect that a substantial price increase is about to occur and purchase larger than normal amount to beat the increase.
7. To permit operations: the fast that productions operation takes a certain amount of time (i.e. they are not instantaneous) means that there will generally be some work-in-process inventory.
8. To take advantage of quantity discount: - supplies may give discount on large orders (Stevenson 2005:485).

2. 4 Objectives of inventory management

Inadequate control of inventories can result in both under and overstocking of items. Under stocking results in missed deliveries, cost sales, dissatisfied customers, and production bottleneck; overstocking unnecessarily ties up funds that might be more productive elsewhere; although overstocking may appear to be the lesser of the two evils, the price tag for excessive overstocking can be staggering when inventory holding costs are high.

Inventory management has two main concerns. One is the level of customer services that it, to have the right goods, insufficient quantities, in the right place, at the right time. The other is the cost of ordering and carrying inventories.

The overall objective of inventory management is to achieve satisfactory levels of customer service while keeping inventory costs with in reasonable bounds. Toward this end, the decision maker tries to achieve a balance in stocking. He or she must make tow fundamental decisions:

the timing and size of order (i.e. when to order and how much to order) generally, the objectives of inventory control are:

- ❖ Assurance of having the items needed
- ❖ Economic buying
- ❖ Avoiding any likely shortage of material
- ❖ Reducing inventory carrying cost
- ❖ Providing flexibility to the purchase department to apply appropriate purchasing policies such as:

a. Taking quantity discounts for lower unit price
b. Forward buying in case of cost likely to increase
c. To adjust quantity to match with economic lost
d. To order full truck load to reduce transportation cost
e. To adjust quantity conforming to standard packaging requirements

In general, the object of inventory management is to minimize possible shortages and the total cost of carrying, restocking and purchasing inventories. More often than not, these costs are computed for one year. Thus, the goal is to minimize total annual cost. (Stevenson W. 1989:488-537)

2.5 Inventory System

According to Sumanth (1984:370) in relation to the inventory control system says the following:

“Inventory control is concerned with two basic questions: when to order and how much to order. An effective inventory control system will accomplish the following: Ensure that sufficient goods and materials are available; identify excess as well as fast and slow-moving items; provide accurate, concise, and timely reports to management; incur the least amount of cost in accomplishing the firs three tasks.

Manufacturing inventory and distribution inventory

Manufacturing inventory:- requirements are largely predictable because their need arises form the forecast and production plan. They are raw materials, components, and work in progress maintained to support planned manufacturing operations. As a result, the timing or arrivals of the inventory is perhaps more important that having the “exact economic order quantity.” The ideal situation would be to do away with all excess stock supplied in an order quantity and limit inventory to work in process, but this is seldom possible.

Distribution inventories: - are created form manufacturing inventories. They are the finished products designed to satisfy customer needs. And customer demand is the source of the uncertainty that plagues the manner of inventories. That uncertainty is why distribution inventories need more attention to service levels and safety stocks than do manufacturing inventories. This is not to suggest that certain manufacturing activities do not warrant safety stock for scrap losses, breakdowns, etc. however, the manufacturing requirements, benign dependent are largely predictable, whereas distribution requirements are much less predictable. In general inventory system can be divided into two major categories. These are Traditional and Modern.

A. Traditional inventory control system

The three traditional inventory control systems are:

1. Fixed-order quantity (Inventory control system)
2. Fixed-order interval (system) and
3. Combination systems

1. **The fixed order-quantity (inventory control system):-** is a perpetual system, which keeps a current recorded of the amount of inventory in stock. A fixed quantity, Q is ordered when the order point is reached (that is, when the amount on hand, without using the safety stock, will just meet the average demand during the lead time.)

this type of system lends itself to the use of EOQ purchasing methods. The system requires continuous monitoring of inventory levels, which can easily be done if the system is computerized. Because of this, it is often used for inventories that have large, unexpected fluctuations in demand, such as end-item inventories.

Economic order Quantity Concept (EOA)

According to Dobler and Burt (1996-527-528) the one has to make decision about management an inventory; it is useful to understand the behavior of the inventory-related cost factors just discussed. These factors often help a manager determine which item should or should not be carried in inventory, what inventory level should be carried for specific items, and what order quantities are appropriate for given item.

EOQ the notation of an economic order quantity as its name suggest this concept hold that the appropriate quantity to order may be the one that tends to minimize all the costs associated with the order-carrying cost, acquisition cost, and the cost of the material itself. These can now be used to develop the EOQ formula.

Annual carrying cost=annual acquisition cost

$$CC = AC$$

$$\frac{QCI}{2} = \frac{UA}{Q}$$

Solving for Q=

$$Q2\ CI = 2UA$$

$$Q = \frac{2UA}{CI}$$

This formula is the fundamental mathematical representation of the EOQ concept. The EOQ concept continues to be versatile and useful tool if it is properly applied.

David J. Sumanth 1984:372-376 further puts explicitly the classification of fixed order quantity as follows:

- ❖ Perpetual inventory system. Under this system, whenever the stock drops to the reorder level or below, an order is triggered for a quantity equal to the Economic order quantity (EOQ).

- ❖ Periodic inventory system: in the periodic inventory system, the inventory position is checked only at specified time intervals, unlike the perpetual inventory system.

2. **Fixed order-interval system: -** in the fixed order-interval system the amount of inventory in stock is reviewed at periodic intervals, such as weekly or monthly. A variable quantity, Q is then ordered on a regular basis.

The order quantity is the estimated quantity needed to bring the inventory on hand ad on order to a specified level. Sine the safely stock must provide protection over the entire cycle; it is typically larger than would be required under a fixed order quantity system, where safety stock must protect over the lead-timer only. This system does not, however, require continuous monitoring, and it is especially useful for processes that call for a consistent use of material. It also lends itself to conditions where a single review period can be used to identify several items, which can then be ordered at one time, with a possible savings in the ordering cost. Fixed order-interval system, also called fixed order-period systems lend themselves to situations where periodic physical counting of on hand materials is more practical than maintaining a perpetual count.

3. **Combination system**: combinations of the two systems described above are very prevalence. The base stock system is one of many combinations of inventory systems and has elements of both the fixed order quantity and fixed order-interval systems. In this system, inventory levels are reviewed periodically, but orders are placed only when the stock is below some specified level.

The system thus provides some of the control aspects of periodic review systems but would typically result in the placement of fewer orders, and orders of a more economic lot size.

B. Modern inventory control systems

Inventory control systems: - some of the modern inventory control system is JIT, ABC, VED, codification and standardization.

The just-in-time concept is to supply goods to a production line, a warehouse, or a customer just as they are needed. Just in time is a method of choice when

1. Products are high valued and requires close control
2. requirements are known with high certainty
3. lead-times are short and known and
4. There are not economic benefits to supplying larger than the requirements

The just-in-time (JIT) approach to the provision of materials for production is based on the philosophy that waste ought to be eliminated where possible. The term waste applies not only to materials, but to time, effort, equipment and storage space in other words it is all efficiency.

Just-In-time-System

Just-in-time (JIT):- repetitive production systems in which processing and movement of materials and goods occur just as they are needed, usually in small batches.

Just-in time Goals

1. Eliminated disruptions, such as poor quality, equipment breakdowns, changes to the schedule, and late deliveries; eliminating these will reduce the uncertainty that they system has to deals with.
2. Make the system flexible by reducing setup times and lead times

3. Eliminate waste, such as overproduction, waiting time, unnecessary transporting, processing waste, inefficient work methods, and product defects.

ABC analysis of inventories

A few products in a firm can result in most of the value or a few usually account for most of the inventory value as measured by dollar usage (the product of annual usage times unit purchase cost or production cost). Inventory control managers should avoid the distraction of unimportant details and concentrate of significant matters. Inventory control procedures should isolate those items that require detailed and precise control form those that do not.

It is often uneconomical to apply detailed inventory control analysis to all items carried in an inventory. If no adjustment is made, every item is treated the same in terms of the level of stock availability. Also, every item in stock is checked constantly or periodically for level.

However, inventory investment and operation costs ca be kept down if we recognize that not every item in inventory deserves the same attention or requires the same level of availability to satisfy customers. It is usually economical to purchase large supply of low value items and maintain little control over tem. Conversely, small quantities of high value items are purchased and tight control is exercised over them. Thus one can manage these few items intensively and control most of that inventory value. This suggests that before a firm policy for inventory control can be established each product should be classified according to its requirement.

One of the chief methods to practice selective inventory control is through ABC classification scheme. In inventory it is frequently advantageous to divide inventories into three classes: A, B and C. The A class is high value items whose dollar volume typically accounts for 70-80% of the value of the total inventory, while representing only 10-20% of the inventory items. It here fore represents the most significant few. At the other extreme class C contains 5-10 of the inventory value bet 60-70% of the inventory items. These items are low value items with very little contribution to the dollar value of invertors. In the middle is class B that contains 10-20% of the items, which hare relatively insignificant.

The breakdown in to A, B and C items is arbitrary; there could be any number of classes. Also the exact percentage of items in each class will vary form on inventory to another. The important factors are the extremes: a few items, which are significant, and a large number of items, which are relatively insignificant.

The application of different classification:

A. Items

- Frequent evaluation of forecasts
- Frequent, perhaps monthly cycle counting with tight tolerance on accuracy
- Daily updating of records
- Frequency review of demand requirements, order quantities, and safety stock; usually resulting in relatively small order quantities.
- Close follow-up and expediting to reduce lead-time

B. Items

- Similar to controls for A items with less control activities taking place less frequently

C. Items

- Basic rule is to keep them in stock
- Simple records or no records; perhaps use a periodic review of physical inventory; large order quantities and safety stock.
- Store in area readily available to production workers or order fillers.

- Count items infrequently (annually or biannually) with scale accuracy (weighing rater than counting) acceptable.

VED (Vital, Essential, and Desirable) analysis examines the items form the importance of plant operations and is not relating dot he value of annual usage. Spares related to machinery on single line operations are very important. Their non-availability can result in stoppage of the plant. These spares may be of very low value but have great importance in plant operation. Spares, therefore, should also be examined form the point of view of vital, essential, or desirable nature. The ideal decision of the quantity to be purchase would be based balanced, combined approach of ABC and VED analysis. The attention to each item in the inventory to be purchased would be determined on consideration of the matrix of ABC and VED.

Codification is used to describe an item in short, thus avoiding the necessity of a long statement very time e need to describe the item arise.

Method of Codification

One can adopt different methods of codification. They are:

1. Numerical code
2. Mnemonic code (using alphabets)
3. consonant code
4. alpha-numeric code

Standardization

Standardization means uniformity and reduction in variety. Standardization can be attempted in many areas. Standardization of procedures, standardization of specification say size, shape, color, standardization of design, standardization of machines, standardization of factory layout, if similar plants are to be repeated; standardization in building construction, standardization of test procedures etc. are some of the areas where standardization has been attempted successfully.

Standardization in case of building construction means standard size of doors; windows opening for window are conditioners, standard staircases, and standard norms of lighting.

2.6 Major Activities of inventory control

According to Chunawalla and Patel (2004:537) The inventory control is mainly concerned with the following activities.

1. Planning the inventories: - on the bases of the productions schedule form the sales forecasting in continuous production and customer orders in intermittent production, the periodic requirement of the inventories are planned in advance.
2. Procurement of inventories: - The inventories are procured form the selected suppliers according to the planned requirements. This is done through the determination of inventory needs, contacting the suppliers, comparing their quotation, selecting the supplier and placing the purchase order with the selected supplier.
3. Receiving and inspection of inventories: - the incoming materials are received, verified with the purchase order and packing slip and are inspected to the verification of the quality.
4. String and issuing the inventories: - as noted above, the inventories are procured in advance of their use. They are stored till they are requisitioned by the production department.
5. Recording the receipts and issue of inventories: - inventories are properly recorded in the bin card and attached to each bin and in the stock ledger. At end of each transaction, the entries are made in the receiving or issuing columns and the balance is struck.
6. Physical verification of inventories: - at the end of specified period the physical verification of inventories: - at the end of specified period the physical quantities of the inventors are verified with the book balance the discrepancies are ascertained.

7. Follow up function inventory control also involves the analysis of excessive usage of the inventories. If tries to find out the reasons for such excessive consumption of raw materials and parts.
8. Material standardization and substitution: - inventory control also aims to standardize the materials and to search for cheaper substitutes value engineering's a popular control technique which searches for cheaper substitutes.

2.7 Requirements for effective inventory management

According to Stevenson (2005:486) Management has two basic function concerning inventory. One is to establish a system of keeping track of items in inventory and the other is to make decision about how much and when to order. To be effective, management must have the following.

1. System to keep track of the inventory of hand and on order.
2. A reliable for cast of demand that includes an indication of possible forecast error.
3. Knowledge of lead time and lead time variability.
4. Reasonable estimate of inventory holding costs, ordering costs, and shortage costs.

2.8 Inventory counting system

Inventory counting system can be periodic or perpetual:

- **Periodic inventory system:-** a physical count of item in inventory is made at periodic intervals (e.g. weakly, monthly) in order to decide how much to order of each item. Many small retailers use this approach. A manager periodically checks the shelves and stock room to determine the quantity on hand. Then the manager estimated how much will be demanded prior to the next delivery period and bases the order quantity on that information.

Advantage of periodic system

- To order for many items occur at the same time.
- It can result in economic in processing and shipping orders.

DIS advantage of periodic system

- Is luck of control between reviews
- The need to protect against shortages between review periods by carrying extra stock
- Perpetual inventory system:- keeps track of removals form inventory on a continuous basis, so the system can provide information on the current level of inventory for each item. When the amount on hand reaches a predetermined minimum, a fixed quantity, quantity is ordered.

Advantage of perpetual system

- The system is to control provided by the continuous monitoring of inventory withdrawals.
- The fixed order quantity, management can determine an optimal order quantity.

DIS advantage of perpetual system

- This approach is the added cost of record keeping moreover, a physical count of inventories must still be performed periodically to verify records (Stevenson 2005:486-487)

2.9 Importance of inventory

According to Chunawalla and Patel (2004:522) Inventories constitute the largest component of current assets in many organizations poor management of inventories there for may result in business failure. A stock out creates an unpleasant situation for the inability to supply an item from inventory could bring production process to a halt. Conversely, if a firm carries excessive inventories, the added carrying cost may represent the different between profit and loss. Efficient inventory control, therefore, can significantly contribute to the overall profit-position of the organization.

2.10 Inventory Valuation Method

Inventories are recorded at their original cost. However, a major departure from the historical cost principle is made in the area of inventory valuation if inventory decline in value below its original cost whatever the reason for decline obsolescence, price-level changes damaged goods, and so forth the inventory should be written down to reflect this loss.

The general rule is that the historical cost principle is abandoned when the future utility of the asset is not longer as great as its original cost (Cooper and Emory 1995:448).

Lower of cost market

Inventories that experience a decline in utility are valued therefore on the basis of the lower of cost OR market instead of an original cost basis. Cost is the acquisition price of inventory computed using one of the historical cost-based methods-specific identification, average cost, FIFO, LIFO the term market in phase “the lower of cost or market “LLM generally means the cost to replace the item by purchase or reproduction. In a retailing business the term “market” refers to the market in the cost to reproduce thus the rule really means the goods are to be valued at cost or cost to replace whichever is lower (Cooper and Emory 1995:448).

According to Fess (1984: 366) valuation at lower of cost or market the market price of an item inventory is lower than its cost, the lower of cost or market method is used to value inventory. It should be noted that regardless of the method used (cost, or lower of cost or market) it is first necessary to determine the cost of the inventory market, as used in the phrase lower of cost or market is interpreted to mean the cost to replace the merchandise on the inventory data base on quantities typically purchased form the usual source of supply.

2.11 Importance of valuation of inventory

Valuation of inventory is important for various reasons, which may be:

- To know the values of each category in the warehouse
- To see the trend of value of different categories of inventories in the warehouse
- To know the quantity and the value of the inventory without stocktaking
- To prepare accurate cost accounts
- To prepare materials budget
- To work out various rations for management reporting. For example, sales to inventory; consumption to inventory; purchase to inventory and inventory turnover.
- To control inventory cost by controlling the cost of non-moving and slow-moving items.
- To control spoilage and obsolescence of materials.
- To act as a control tool in reducing cost of overheads
- To plan control price of product
- To fix the product price in a competitive market environment. Strategic decisions are required to be taken in a competitive situation.
- To evaluate purchase performance
- To find alternative materials with objective of cost reduction. For example, some of the waste materials from other industrial sectors

could be used as raw material for the product. (http://.en Wikipedia.org/wiki/importance of valuation of inventory)

2.12 Valuation of material issues

Various methods can be used for valuation of materials issue which is:

- First in first out (FIFO) method
- Last in first out LIFO)
- Simple average method
- Weighed average cost method

First in first our (FIFO)

The first in first out (FIFO) method of costing of inventory is based one the assumption that costs should be changed against revenue in the order in which they were incurred. Hence the inventory remaining is assumed to be made up of the most recent cost. Thus, the FIFO method is genially in harmony with the physical movement of material in an organization.

Last in first our (LIFO)

The last in first out (LIFO) method is based on the assumption that the most recent cost incurred should be charged against revenue. Hence the inventory remaining is assumed to be composed of the earliest costs. The use the LIFO method was originally confined to the relatively rare situation in which the units sold were taken from the most recently acquired stock.

Simple average method

The simple average method takes into consideration the price of the new consignment along with the prices of earlier consignments whose material is still in stock. Each time a new consignment is received at a new price, the average of the price paid per unit of the stock still in stores and the price of the new consignment is worked out.

This method of costing is favored in a situation where the price fluctuates rapidly over a narrow range. It gives stability to the product costing and is considered as a useful method. However, very high or very low change in the price will have to be closely monitored.

Weighted average cost method

The weighed average cost method is based on the assumption that costs should be charged against revenue according to the weighted average unit costs of the goods sold. The same weighted average unit costs are used in determining to cost of the material remaining in the inventory. The weighed average unit cost is determined by dividing the total cost of the identical unit of each commodity available for sale during the period by the related number of units of that commodity. (Fees Worren, 1984:356-357)

2.13 Factors influencing inventory management and control

Several factors influence inventory management and control. The principle effects of these factors are reflected most strongly in the level of inventory and the degree of control, planned in the inventory control system. The factors include type of product, type of manufacture, value of out put and others.

Types of product

Among the factors influenced inventory management and control, the type of product in fundamental. If the materials used in the manufacture of the product have a high unit value when purchased, a much closer control is usually in order. This same principle holds in manufacturing also. If the material used in the product is in short supply or is rationed by the government, this may influence of the purchase of this material and its stock maintained.

The manufacturing of standard products, as compared to custom-made items will influence inventories. Material needed to manufacture a standard produce is easy to obtain and a close control on the stock is not necessary. Material required producing made-to-order items needs strict control to ensure that no item is lost in the process of manufacture. Such materials ad tools are of special and expensive types and a loss of any small part will hold up the production.

Type of manufacture

The type of product, type of manufacture also influences inventory management and control. Where continuous manufacture is employed, the rate of production is the key factor. Here, inventory is of the major importance and in reality controls the production of the product. The economic advantage of this type of manufacturing is the uninterrupted operation of the machines and assembly line in the plant. It is a major offence on the part of the inventory personnel to have the plant shut down for the lack of material. Intermittent manufacture, on the other hand, permits great flexibility in the control material.

Volume

The volume of product to be made as represented by the rate of production may have little effect on the complexity of the inventory problem. Literally, millions of brass bases for light bulbs are manufactured each month involving the control of only two principal items of raw material inventory. On the other hand, the manufacture of a large locomotive involves the planning and control of thousands of items of inventory. Both the inventory problem and the difficulty of controlling production, increasing in difficulty with the number of component parts of the product and not with the quantity of products to be made (Bhat 2003:527-528)

2.14 Inventory decision models

Substantial research has been devoted to the problem of determining optimum inventory size, order quantity, usage rate and similar considerations. An entire brand in the field of operations research is dedicated to the subject (Stanley 1992:189).

In developing an inventory model it must evaluate the two basic costs associated with inventory the carrying cost and the ordering costs.

Through a careful analysis of both of these variables, we can determine the optimum order size to place to minimize costs.

- **Carrying costs:** - Carrying costs include interest on funds tied up inventory and the cost of warehouse space, insurance premiums, and material handling expenses. There is also an implicit cost associated with the danger of obsolescence and rapid price change. The letter the order place, the greater the average inventory will have on hand and the higher the carrying cost.
- **Ordering cost:** - as a second factor, we must consider the cost of ordering and processing inventory in the stock. If we maintain relatively law average inventory in stock. If we maintain relatively law average inventory in stock we must order many times and total ordering cost will be high (Stanery 1992:189).
- **Shortage costs:** - result when demand exceeds the supply of inventory on hand. These costs can include the opportunity cost of not making a sale, loss of customer goodwill, late charges, and similar costs.

Furthermore, if the shortage occurs in an item carried for internal use, the cost of lost product or down time is considered a shortage cost.

Shortage costs are sometimes difficult to measure, and they may be subjectively estimated (Stevenson 205:490).

CHAPTER THREE

3. Presentation, Analysis and Interpretation of data

This chapter deals with the presentation, analysis and interpretation of data gathered from respondents, which is the core of the study. It consists two parts the first part presents the characteristic of the sample population while the second part treats the analysis and interpretation of the data.

The primary data used for this study is collected from procurement and supplies department. This department was selected because it is directly related to inventory. Accordingly, structured questionnaires were prepared and distributed to 30/thirty/ sample size of the department employees. Out of this 26(87%) of them are returned. At the beginning of the questionnaire respondents were made aware of the objective of the study so that, they could give genuine and relevant information.

The secondary data used for the study was collected from the year 2000 and 2001 E.C inventory counting sheet, different reports on inventory and memorandum of the authority.

3.1 Characteristics of respondents

The respondents are classified by educational level, sex and work experience/service year/ in the organization. The classification of respondents in this manner will help the researcher to see the company actual practice of inventory management system from different point of view.

Table 1 characteristics of respondent

sex	Respondents	
	No	(%)percentage
Male	16	62%
Female	10	38%
Total	26	100 %

Source: survey

As it is in table 1 concerning the sex of the respondent, 16 (62%) of the respondents are males the remaining 10 (38%) of the respondents are females.

Table 1.1 educational level of respondent

Educational level	Respondents	
	No	**Percentage**
High school complete	3	12%
Diploma	17	68%
Advance diploma	0	0%
First degree	6	23%
Musters degree	0	0%
Total	26	100%

Source: survey

Table 1.1 indicates briefly the educational status of the respondents. According to the data, there is no respondent with advance diploma and masters degree, 3 (12%) respondents completed highs school, 17 (65%) are diploma holders, and the remaining 6 (23%) are with first degree qualification. As this data clearly show that shows 65% of respondent are diplomas holders, first degree holder's account for 23% implies that most personnel of the respondent have at least basic knowledge about inventory management.

In addition, based on the interview, the authority employees did not get enough training to develop their skill.

Table 1.2 work experience /service year/ of respondents

Work experience	**Respondent**	
	No	% percentage
6 month -1 years	0	0
1year –5 years	7	27%
6 years- 10 years	11	42%
10 years above	8	31%
Total	26	100%

Source: survey

With regard to service years of the respondent, the data in table 1.2 show that the workers who have been serving from 1-5 years covers 27% those who are serving from 6-10 years account for 42% the rest who are above 10 years shares 31% of the total respondents. This indicates that most of the respondents have good experience as compared to the life of the authority as a whole.

3.2 Discussion of findings

This part treats the response of data collected from respondents. The finding are presenting as follows.

Inventory systems

The Addis Ababa City Road Authority (AACRA) is engaged in a project based activates which are proposed by Engineering; Design and pavement Management Departments. After being approved by the General Manager, the project starts to implement usually form July to September/First quarter of the year/. The design department is responsible to provide the specification and quantity of the required material for the approved projects to the purchasing divisions. The same departments provide the data for the required material at the time the project expected to be stared from July-September. Purchasing division is expected to buy all the requested material at once since the organizational policy favors to the bulk purchase.

From the student researcher’s observation and an interview held with the purchasing and property section head, the researcher had identified that the organization have maintained more than 80 lines item in seven warehouse located at different part of the city. Among these inventory items are asphalt, reinforcement bar, sand, aggregates, cement, white stones and different types of spare parts are the majors once.

Having such number of inventory items and high investment on them, the authority does not have any written policy and procedure of inventory controlling system. The organization codifies its inventory items alphabetically. Each store has its own card for controlling the items. However, there is no master card, which synchronizes the activity of different item at different warehouse. Yet, the balance in each stock card is reconciled with the physical count, made at the end of each month. Besides, student researcher is able to observe that the organization have a lot of dead stock items.

Based on the request, the department purchases the request materials once in a year by applying the proper /appropriate/ purchasing methods.

In relation to the above particulars, student researcher has found the following data from the respondents.

3.2.1 Recording and reconciling

- Inventories are properly recorded in the bin card and attached to each bin (i.e. the container in which the inventories are stored) and in the stock ledger. At the end of each transaction the entries are made in the receiving and issuing columns and the balance it shows clearly.
- Recording in this context refers to items to be recorded in firms of size, quality, quantity, color, type and etc.

Table 2 Recording and reconciling

1	Are store records regularly and reconciled against returned material from completion of the projects		
	Opinion	**No of respondent**	**Percentage %**
	Yes	3	12%
	No	23	88%
	Total	26	100%

Source: survey

As the above table shows, out of the respondent 3 (12%) of the respondent agreed that store records regularly and reconciled against returned materials from completion of the projects the remaining 23 (88%) of the respondent disagreed that says not records regularly and reconciled the returned material from completion of the project but simply record on the rough paper. This implies that the company do not regularly reconcile store record against returned material.

3.2.2 Holding of safety stock inventory

Safety stocks allow the firm to protect itself from conditions of uncertainty, but they also increased the total inventory cost. Thus, it is extremely important for management to determine the proper amount of safety stock. This amount depends on many factors, such as the degree of uncertainty in demand for inventory, the lead time, the cost of stock out and so on.

A company should maintain adequate stock of material for a continuous supply to the factory for uninterrupted production. It is not possible for a company to procure a raw material when ever it is needed. A time lag to exists between demand for materials and its supply

Table 3 experience of holding inventory

1	Does the authority have the experience of holding safety stock inventory		
	Opinion	**No of respondent**	**Percentage (%)**
	Yes	26	100%
	No	0	0%
	Total	26	100%

Source: survey

As shown in the above table, all of the respondent i.e. 26 (100%) of them have answered that the authority holds safety stock inventory. The respondents stated that most of the time is from July to September is the time of safety stocks items are exhibited.

The student researcher interviewed with the head of stockyard item store. The researcher identified that the stock item value of asphalt, spare parts and reinforcement bar is very high. It is identified that their exist a high number of dead stock item including the above mentioned high valued items. This is explicitly reviewed on the question stated below.

3.2.3 Dead stock items

The stock items that are not used, can not giving services that are stayed more than two years in the warehouse the items that need additional expense and occupied space.

Table 4 Dead stock items

1	Is their any dead stock items found in your warehouse at different level or amount		
	Opinion	**No of Respondent**	**Percentage (%)**
	Yes	22	85%
	No	4	15%
	Total	26	100%

Source: survey

From the above table 4, out of the respondents, 22 (85%) of the respondent agreed that, there are different types and amount of dead stock items are found in the warehouse specify that asphalt, reinforcement bar and different model of spare parts items are the major one while the rest of the respondent, 4 (15%) disagreed that, there is no any dead stock item in the ware house. This implies that the carrying cost of the organization will increase and there will be a tide up capital and wastage of material in the organization warehouse.

3.2.4. Strong and issuing the inventory

- The inventories are procured in advance of their use they are stored till they are acquisition by the production department. The stored inventories are issued to the respective production department against the authorized material requisition.
- There should be a proper system for maintaining account of issues made to internal division or external division. This would help timely reordering to replenish stock item. When items are issued to

external division (subcontractors) controls should be formal and adequate enough to take care of payment and claims.

Table 5 Issuing and storing of inventory

1.	Is their a possibility of wrongly issuing an item which is different from stated on store requisition		
.	**Opinion**	**No of Respondent**	**Percentage (%)**
	Yes	10	38%
	No	16	62%
	Total	26	100%

Source: survey

From the above table 5, among the total respondent, 10 (i.e. 38%) have agreed on the wrong issuance of the required materials. On the other hand, 16 (62%) of the respondents indicated that there is no problem on issuing an items different from stated on requisition. One can infer that significant number of respondents agreed that there is a possibility of wrongly issuing an item, on the discrepancy between the physical and document. In the above reason the increasing of dead stock item in the warehouse.

3.2.5 Coding an Items

- ❖ The standard numerical coding of an items has to be evolved for the purpose of use in purchase, store, issue and for other purposes in order to symbolized such fundamental and particular characteristics thus, a company which codified its items as they were stocked in store or as they were ordered.
- ❖ A rationalized system of codification would reduce the number substantially at the sometime make their identification an easier job, avoiding lengthy description and confusion.

Table 6: coding an item

1	Does users' department stated code of the required items besides its description		
	Opinion	**No of respondent**	**Percentage (%)**
	Yes	0	0%
	No	26	100%
	Total	26	100%

Source: survey

From table 6, the student researcher can observe that, 26 (100%) of the respondent confirmed that there is no used to the users' department state coding because there is no written manual in the authority. This implies that there is time consummating material identification and also creates difficulty for the store keeper to identify the required material due to lack of coding.

3.2.6 Discrepancies between physical and stock balance.

- ❖ The fixed time period system, inventory is counted only at the particular time such as every month, every six month or every year and operates on fixed time period to facilitate planning their inventory count.
- ❖ Inventory records usually differ from the actual physical count, inventory accuracy refers to how well the two agree
- ❖ At the end of specified period the physical quantities of the inventory are verify with the book balance and discrepancies are as contained. The discrepancies analyzed and the reasons for the inventory losses are located.

Table 7 Discrepancies between physical and stock balance

1	Does the authority encounter any material discrepancy between the physical and stock balance		
	Opinion	**No of Respondents**	**Percentage (%)**
	Yes	24	92%
	No	2	8%
	Total	26	100%

Source: survey

Table 7 shows that among the total respondents, 24 (i.e. 92%) who are more involves in the warehouse activities agreed that, the existence of material discrepancies and the remaining 2 (8%) of the respondents had explained that there were no material discrepancies. This implies that lack of coding of the items leads to time consummating material identification and creates difficulty for the store keeper to identify the required materials.

3.2.7 Reconciliation between Finance and stock control

A frequent comparison of the two control account, viz, that in the financial books and that in the stores ledger is advisable and also of the control account in the stores ledger with an extraction of the individual balance in the ledger properly carried out, a complete agreement should be obtained through the linking up of the stores with financial book.

Table 8 Reconciliation between Finance and stock control

1	Is there any reconciliation between Finance and stock control		
	Opinion	**No of Respondent**	**Percentage (%)**
	Yes	26	100%
	No	0	0%
	Total	26	100%

Source: survey

For the above Table 8, all of the respondent i.e. 26(100%) of the respondent had answered that there exist reconciliation of documents between Finance and stock control. Additional information was gathered from the secondary document concerning the time interval of document reconciliation. The student researcher observe that there is reconciliation between finance and stock control document only once in a year.

3.2.8 Holding maximum Inventory

- The term is applied to designate the upper limit of the inventory and represents and largest quantity, which in the interest of economy should generally be kept in store
- The minimum stores:- this term is applied to designate the lower limit of the inventory and represents a reserve or margin of safety to be used in case of emergency. When requirement have been a normal, it is intended that there must always be at least this quantity available in store.

Table 9 Holding Maximum Inventory

1	At what time of the year the authority holds maximum inventory of materials in the warehouse		
	Item	**No of Respondent**	**Percentage (%)**
	Every week	-	
	Every month	-	
	Every six month	-	
	Every year	26	100%
	Total	26	100%

Source: survey

From the above table all of the respondent, 26(100%) of the respondent agreed that, the organization holding maximum inventory of materials in the warehouse from beginning of October to end of December /second quarter of the year/ this implies that the authority hold a maximum inventory of material in the warehouse at the time of the second quarter of the year more amount of stock item is holding.

3.2.9. Identical Item

Items of similar size, shape, weight and function may be stored together even through they may be classified differently or be required at different production location. According to this approach, all small parts may be stored in one place, bar stock in another casting, forging and bulky Items in another place, raw material such as steel and brass sheet etc in yet another place.

Table 10 Identical Item

1	Are identical items found at different stores		
	Opinion	**No of Respondent**	**Percentage (%)**
	Yes	15	58%
	No	11	42%
	Total	26	100%

Source: Survey.

As the above table shows out of the respondent 15(58%) of the respondent confirmed that, there are some items distributed in different store because to be near for projects location where as 11(42 %) of respondents disagreed that, there is not identical items are found at different stores. This implies that delaine and un reliable of information about the status of inventory will arise.

3.2.10 Computerized inventory system

Perpetual inventory system is immediate recording system of materials when arrived and computerized system is a way to record receipt of material by using computers and its helps to organization is getting fast up to data and reliable information about the status of inventory.

Table 11 computerized inventory system

1	Is the organization inventory system computerized		
	Opinion	**No of Respondent**	**Percentage %**
	Yes	0	0%
	No	26	100%
	Total	26	100%

Source: survey

As the above table show, all of the respondent 26 (100%) of respondent agreed that, currently inventory recording system of the organization is manual recording system not computerized but the organization is on the way (on process) in order to make inventory recording system to change computerize. This implies that controlling mechanism is poor and there is no enough information about the inventory. So it uses backward inventory controlling system.

3.2. 11 special requirements (Attention)

Some Items may be Fragile, explosive, extremely valuable or may required special atmospheric conditions for storage such materials will have to be stored in location which provide proper condition and place.

Table 12 Special attention

1	Are their any items that the organization gives special attention in the warehouse		
	Opinion	**No of Respondent**	**Percentage %**
	Yes	11	42%
	No	15	58%
	Total	26	100%

Source: survey

As the above table show, out of the total respondent 11 (42%) of the respondent agreed that organization gives special attention to some items like explosive, first aid equipment and flammable. The remaining 15 (58%) of the respondent disagreed that the organization is not gives special attention for an items in the warehouse. This implies that some sensitive item need special attention becomes spoiled and the quality of item will be reduced and it's a cost of the organization

3.2.12 Physical counting

Physical inventory counting technique in which inventory is counted frequently, rather than once or twice a year. The key to effective cycle counting and, therefore accurate records lies on deciding which items are to be counted, when and by whom.

Table 13 physical Counting

1	Does the physical counting procedure take place by an independent person		
	Opinion	**No of Respondent**	**Percentage (%)**
	Yes	19	73%
	No	7	27%
	Total	26	100

Source: survey

On the above table show out of the total respondent 19 (73%) of the respondents agreed the physical counting procedure take place by an independent person only at the end of the year and the reaming 7 (27%) of the respondents says physical counting procedure is no takes place by an independent person totally, but some committee members for annual inventory counter are independent. This implies that the physical counting procedure of the authority take place by unindependent person

CHAPTER FOUR

4. Summary, Conclusions and Recommendations

4.1 Summary

The overall objective of this study is to address the inventory management system practice of Addis Ababa City Roads Authority and to find out the problem related with inventory management system. The method that is used to prepare this research is simple random sampling technique to give equal chances for the targeted population and used primary and secondary data obtained through questionnaires, interview and analysis a written document from the Authority's report and memorandum. The method in analyzing and presenting data using descriptive analysis method like percentage and tables. The research analysis can be summarized as follow.

- From the 86 population size the researcher select 30/thirty/ employees for sample size and out of this, 26 (87%) of the respondents give their responses.
- Twenty three or (88%) of the respondent believed the store recording, and reconciled against returned material from completion of the project recording is not reasonable time an informal document and (12%) of the respondent agreed on the reasonable time or the above recording.
- All of the respondents (100%) believed that their authority have the experience of holding safety stock inventory from July to September.
- Twenty two or (85%) of the respondent believed that, the dead stock items are found in the different warehouse at different level and amount and the rest of the respondent disagreed the above description.

- Sixteen or (62%) of the respondent agreed that there is no possibility of wrongly issuing an item which is different from stated on store requisition and the rest of the respondent disagreed on the above description.
- All of the respondent (100%) believed that there is no users department stated code of required items besides its description.
- Twenty four or (92%) of the respondent believe that the authority encounter any material discrepancy between the physical and the stock balance the rest of the respondent disagreed that the above stated.
- All of the respondent (100%) believed that the reconciliation is made between Finance and stock control
- Twenty six (100%) of the respondent are agreed that, the authority holds maximum inventory of material in the warehouse at the second quarter of the year is a reasonable time.
- Fifteen or (58%) of the respondent believed that identical items found at different stores and the rest of respondents are disagreed that the above description.
- Twenty six or (100%) of the respondent agreed that, the organization of inventory system is not computerized. Currently the authority used manual inventory recording system.
- Fifteen or (58%) of the respondents agreed that, the organization does not give special attention items in the warehouse and the rest of the respondent disagreed that the above stated.
- Nineteen or (73%) of the respondent believed that the physical counting procedure takes place by an independent person and the rest of the respondent is disagreed that the above described.

4.2 Conclusions

From the major finding presented about the following conclusion were drawn.

- The authority has no any inventory management techniques such as (just-in time) JIT, ABC analysis, (Vital, Essential, and Desirable) VED, etc. which strength the inventory system rather it favors bulk purchase.
- Since the authority favor bulk purchase rather than EOQ model, for the approved projects it forced to have a huge inventory during the second quarter (October to December) this resulted in a high inventory cost. In addition to this cost, bulk purchased make some major items like asphalt which have a short shelf life to decrease there quality and in turn to be dead stock or valueless item.
- Since the organization doesn’t distribute manual to all department, which describes stock materials with their codes, the requesting unit provides a requisition, which only have name of the item. This makes the store keeper to issue similar or wrong item. These identification problems lead to different in physical count and stock balance.
- The authority starts approved projects to be implemented in July. However, the material needed for the projects are purchased and supplied to the projects mostly in December. This is due to late purchase request provided by the designing department. During this gap which is from end of September there exists stock out problem.
- Despite the fact that annual inventory is conducted every budget year, discrepancy in balance between store and stock control is observed in the warehouse. There fore the organization has no proper inventory controlling mechanism.

- The authority utilizes FIFO (first in first out) for the valuation of its inventory, but in practice materials such as deformed bar iron, sand, asphalts etc due to their nature and inadequacy of stock yard space they are not delivered on the basis of FIFO (first in first out). As a result of this, the information delivered to finance and other concerned bodies are inaccurate and not up to date.
- Even though the authority has a lot of line items, it has no computerized system. The authority is currently using the manual inventory system.
- Items which have relatively high value not get special attention on inventory controlling system of the organization.

4.3 Recommendation

Besides having a well-organized inventory management system the Authority needs to make exhaustive effort in implementing as well as improving of managing and controlling inventory in the future. The researcher insists that the following change and adjustment could be good for the Authority.

- Instead of purchasing all material at once, that result in a huge inventory cost and dead stock, the authority has to implement lot purchase that base EOQ model depending on the nature, delivery time and shelf life of the materials.
- The authority have to prepare and distribute the manual, which contains the code number and description of each stock item to make the requesting department to add the code number together with the item description that can help the issuing department to identify the requested material easily.
- There needs to be monthly reconciliation between the accounting section and the stock controlling section to make sure that the data on stock controller is correct.

- Top management ought to have the initiation to make designing department to provide their material requesting system, which can help to avoid stock out by applying planed purchase (like EOQ)
- Apart from using physical controlling system, it is advisable to use ABC analysis. ABC analysis is recommended for the reason that it is better techniques to classify and control high value items. It also helps to frequent evaluation of forecasts, top reduce lead time and daily updating of records. From the different inventory controlling models.
- Inventory management and control should be set up as a separate division. Because, it is convenient for easy inventory control purpose.
- The firm must install modern computerized inventory recording system for easy accessibility of vast information to the concerned body. Manual inventory recording system is not recommendable for big, expandable and competitive organization. Because the Authority need fast, relevance and timely information for the purpose of good inventory controlling mechanism.

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APPENDICES

Questionnaire

St. Mary's University College

Management Department

Inventory Management System Questionnaire

Dear respondent,

The propose of this questionnaire is to gather adequate information on inventory management system of Addis Ababa City Roads Authority.

In order to make the study more fruitful, your truthful response to the given question would be necessary on partial fulfillment of the bachelor degree in management, finally, I would like to forward my deepest gratitude for you unreserved co-operation in filling the questionnaire.

Please put "√" mark parallel to each items to indicate the extent of your choose.

I. Personal profile /data/

1.1 Sex

☐ Male ☐ Female

1.2 Educational level/ background

☐ Grade 12th complete ☐ Advanced diploma

☐ Vocational diploma ☐ First degree

☐ Masters degree and above

1.3 Please specify both position in the organization

____

1.4 Work experience.

☐ 6 months to 1 year ☐ 5-10 years

☐ 1-5 year ☐ 10 years and above

1.5 Are store records regularly and reconciled against returned material from completion o f the project?

Yes ☐ No ☐

If no why? ____

1.6 Does the authority have the experience of holding inventory?

Yes ☐ No ☐

If yes why? ____

1.7 Is their any dead stock in your warehouse?

Yes ☐ No ☐

If yes why? ____

1.8 Is there a possibility of wrong issuing an item which is different from stated on the store requisition?

Yes ☐ No ☐

If yes why?____

1.9 Does users' department state code of the required items besides its descriptions?

Yes ☐ No ☐

If no why?____

1.10 Does the authority encounter any material discrepancy between the physical and stock card balance?

Yes ☐ No ☐

If no why?____

1.11 Is there any reconciliation between finance and stock control section?

Yes ☐ No ☐

If now why?____

1.12 At what time of the year does the organization holds maximum amount of inventory in the warehouse?

Item	**No**
Every day	
Every week	
Every month	
Every year	
Total	

1.13 Are identical items found at different stores?

Yes ☐ No ☐

If yes why?____

1.14 Is the organization inventory system computerized?

Yes ☐ No ☐

If no why? ____

1.15 Are their any items that the organization gives special attention in the ware house?

Yes ☐ No ☐

If yes why?____

1.16 Does the general annual inventory management practice is conducted

Yes ☐ No ☐

If no why?____

Interview Questions

These interview questions are prepared to held with the procurement and supplies manager and head of stockyard section of Addis Ababa City roads Authority

1. What types of inventory does your organization have?
2. What is the objective of inventory management system in the case of Addis Ababa city Roads Authority?
3. How does the organization forecast material and who is responsible to forecast?
4. What kinds of inventory recording system does the organization use?
5. What problem is their in the inventory management control system of the organization?
6. What do you think for the future?

Thanks for your cooperation!!!

Declaration

I, the undersigned, declared that this senior essay is my original work, prepared under the guidance of Ato Henok Arega. All sources of materials used for the manuscript have been duly acknowledged.

Name ____

Signature_____________________________________

Place of submission ___________________________

Date of submission____________________________

ADVISOR'S DECLARATION

The paper has be en submitted for examination with my approval as the University College advisor

Name _______________________

Signature ___________________

Date ________________________