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

AN ASSESMENT OF INVENTORY MANAGEMENT PRACTICE IN ETHIOPIAN TELECOMMUNICAITON CORPORATION

BY
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SMUC
ADDIS ABABA

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A SENIOR ESSAY SUBMITTED
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APPROVED BY THE COMMITTEE OF EXAMINERS

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SUBMISSION APPROVAL SHEET

The senior research paper has been submitted to the department of the management in partial fulfillment for the requirements of BA Degree in Management with my approval as an advisor.

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Declaration

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

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CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Inventory management is essential for all organizations. However, it's efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of the stock out, ordering or purchase, setup and the like.

Inventory means (stock of goods). Inventory may mean row materials, work in progresses, maintenance materials, processed and semi processed materials, oil, fuel and lubricants as well as finished and semi finished goods. They may be either in solid, liquid or gaseous form, required for the future use, manly in the production process as incase of finished goods for resale period. The need for this research arises from the existing situation of the Ethiopian Telecommunication Corporation.

1.2 Background of the Organization

The introduction of telecommunication services in Ethiopia dates back to 1894, seventeen years after the invention of telephone technology in the world. The Ethiopian Telecommunications Corporation is the oldest Public Telecommunication Operator (PTO) in Africa. Since its establishment, the corporation has managed to serve the public and the country by providing fast communication services such as land line telephone, wireless telephone technology, rural connectivity, school net, teleconference, internet service and other related services using modern technology.

The corporation's survival depends up on receiving, issuing, supplying and inventory, appropriate stores material management system which can integrate it

with its environment by identifying the opportunities, strength and weakness of its own and offered by the surrounding.

Material management is a basic tool in various organizations because inventory management system is required to plan, organize, direct and coordinate different activities from the point of their beginning to the point of their utilization and disposal. Moreover, it includes activities such as purchasing, inventory control, and store. Therefore, inventory management is necessary to balance materials which are on hand and already used.

This research is focus on assessment of inventory management practices taking place in Ethiopian Telecommunication Corporation.

1.3 Statement of the Problem

Inventory management is essential for all organizations. However, its efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of stock out, ordering or purchase, setup and the like.

Most of the time, decide to have over stock inventory results in unnecessarily problems such as capital tied up, excessive carrying cost and the like.

- The Balance in the Inventory sheet run out is incorrect because of its bulk nature of materials and issue of incorrect quantity.
- The Stock Balance in the store and the Stock Card Balance are not the same and posting might be done in the wrong card
- Materials are stored for the long period and it leads to:-
  - Obsolesce,
  - Losing material identity their stock number might not be there,
  - Difficulty during inventory due to misplacement.

1.4 Basic research questions

Thus, from the identified problem this research try to address the following research questions.

- What does the inventory management practice of ETC look like?
- What inventory system ETC uses?
- What techniques are being used to determine annual consumption in ETC?
- What are the internal controls over inventory and stockholding procedure of the corporation?
- What problems are encountered in relation to inventory management in ETC?

1.5 Objectives of the Study

1.5.1 General objectives

The general objective of the study was to make an assessment of the inventory management practice of Ethiopian Telecommunication Corporation, so as try to show how to improve its performance.

1.5.2 Specific objective:-

- To assess the inventory management practice of ETC,
- To examine the type of inventory system ETC uses,
- To identify the techniques that is used ETC in exploring its annual consumption,
- To identify the internal control over inventory and stock holding procedures of the corporation,
- To identify the main problems encountered in relation to inventory management of ETC.

1.6 Significance of the study

- This study will have significant important regarding how maximum and minimum levels of stock are kept at their optimum lot, in ETC.

- How a good inventory management can improve the provision of materials when they are needed.
- How a well-structured storage system results in an efficient inventory reporting, which can facilitate accurate provision of information for the corporation's financial statement and management decisions.
- Regarding to pin point the possible solution to overcome the already existed problem.

1.7 Scope of the study

The scope of the research is delimited to the ETC inventory management system practices at the central warehouse level. The study does not cover inventory management practices in the regional warehouses.

1.8 Limitation of the study

Even though the intention is to investigate the problem of inventory management practices of Ethiopian Telecommunication Corporation, the researcher did not include regional warehouses due to time and financial resource.

1.9 Research Design and Methodology

1.9.1 Research Design

To asses the problem stated in the study, the researcher used the descriptive design method.

1.9.2 Population and sampling technique

The researcher used sampling unit selected from employees of ETC at central warehouse. The total populations are 141 (one hundred forty one). Among the total population for 40 (forty) employees questioner were given chance by using a non-probability convenience sampling method and interview were held with 6 (six) warehouse employees in order to get the right persons who are more concerned to the subject matter.

1.9.3 Types of data used

Types of data were both primary and secondary data. Primary data was collected from employees of the corporation and secondary data was collected from books, documents, and company reports to support the study.

1.9.4 Methods of data analysis

The collected data was analyzed using descriptive analysis techniques that were presented by tables. The study depends mainly on qualitative methods of data analysis as the project data sources are dominantly qualitative ones. Thus, for those data collected through interview and documentation review descriptive analysis is performed.

1.10 Organization of the study

The study is organized in to four chapters. The first chapter deals with introduction, the second chapter deals with related review of the study, the third chapter describes data presentation, analysis and interpret the general overview of inventory management activities and provides data analysis and finally the fourth chapter contains summary, conclusion and recommendation.

CHAPTER TWO

2. REVIEW OF RELATED LITRATURE

2.1 Definition of Inventory

Different authors define inventory management in different ways some of these are: -

Inventory can be defined as "Items held to ensure smooth plant operation, improve customer service, attain lot-size economies, or overcome timing or distance differences between operations. Overall objective (as with any investment): is to improve company's return on investment." **(Liman, 1981:191)**

Although inventories are classified in many ways, the following classification is convenient for use in further discussion of the topic:-

2.1.1 Production inventories:- Row materials, parts and components, which enter the firm's product in the production process. These may consists of two general types.

a. Special items manufactured to company specifications and

b. Standard industrial items purchased "off the shelf"

2.1.2 MRO inventories:- Maintenance, Repair, and Operating supplies which are consumed in the production process but which do not become part of the product.

2.1.3 In process inventories:- Semi finished products found at various stages of the production operation

2.1.4 Finished goods inventories:- completed products ready for shipment **(Dobler, 2001:519)**

2.2 Inventory Management

The inventory management activity is concerned with the planning and control of inventories. There are two general types of inventory. **(Edward M., 1997: 281)**

1. Dependent demand inventory and
2. Independent demand inventory

Dependent demand inventory:- Is made up of inventory items that are consumed with in an organization to produce a finished product.

Independent demand inventory:- Comprises inventory items consumed by customer's external to the organization.

2.3 Inventory control

The technique for ensuring availability of materials, which at the same time, holds in check, generally through a system, the tending to hoard larger amount of stock than is necessary. Citation

2.4 Inventory analysis:-

There are various types of analysis for different resource especially for control purpose one has to analyze various data. Analytical methods are useful in defining problems in order to strike at a solution.

Analysis is the first step for effective inventory control. Then we classify the items in to their importance experience has shown that relatively small portion of the items in the inventory accounting for a large portion of the value of the inventory investment.

2.5 Purposes of Inventory

All firms including just in time (JIT) operations keep a supply of inventory for the following reasons.

1. **To maintain independence of operations:-** A supply of materials at a work center allows that center flexibility in operations for example because there are for making each new production setup, this inventory allow management to reduce the number of setups.

Independence of workstations is desirable on assembly lines as well. The time that it takes to do identical operations will naturally vary from one unit to the next. Therefore, it is desirable to have a cushion of several parts with in the workstation so that shorter performance times can compensate for longer performance time. This way the average out put can be fairly stable.

2. **To meet variation in product demand:-** If the demand for the product is known precisely, it may be possible (though not necessarily economical) to produce the product to exactly meet the demand. Usually, however, demand is not completely known, and a safety or better stock must be maintained to absorb variation.
3. **To allow flexibility in production scheduling:-** A stock of inventory relieves the pressure on the production system to get the goods out. This causes longer lead times, which permit production planning for smoother flow and lower-cost operation through larger lot-size production. High setup costs, for example, favor producing a larger number of units once the setup has been made.
4. **To provide a safeguard for variation in raw material delivery time:-** When materials are ordered from a vendor, delays can occur for a variety of reasons a normal variation in shipping time, a shortage of material at the vendor's plant causing backlogs, an unexpected strike at the vendor's plant or at one of the shipping companies, a list order, or a shipment of incorrect or defective material.

5. **To take advantage of economic purchase order size:-** There are costs to place an order labor, phone calls, typing, postage, and so on. Therefore, the larger each order is the fewer the order that need be written. Also, shipping costs favor larger orders the larger the shipment, the lower the per-unit cost. **(Robert Jacbs, 1998: 513-515)**

2.6 The functions of inventories

Examining the functions of inventory clearly shows that they are the result of many interrelated decisions and polices within an organization as a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. (In the long term, of courses, all inventories are controllable). The following classification of inventory functions reveals the multipurpose roles played by inventories. **(Fraser Johnson, 2002: 204)**.

2.6.1 Transit or pipeline inventories:

These inventories are used to stock the supply and distribution pipelines linking an organization to its suppliers and customers as well as internal transportation points. They exist because of the need to move material from one point to another.

2.6.2 Cycle inventories:

These stocks arise because of management's decision to purchase, produce, or sell in lots rather than individual units or continuously. Cycle inventories accumulate at various points in operating systems. The size of the lot is a trade off between the cost of holding inventory and cost of marking more frequent orders and/or set-ups.

2.6.3 Buffer or uncertainty inventories or safety stocks:

These stocks exist as a result of uncertainties in demand or supply. Finished goods buffers protect against unforeseen demand or production failures.

2.6.4 Anticipation or certainty inventories:

These stocks are accumulated for a well-defined future need. Reasons for anticipation stocks may include strikes, weather, shortages, or announced price increases.

2.6.5 Decoupling inventories

The existence of decoupling inventories at major process linkage points makes it possible to carry on each side of the point relatively independently of each other.

Why classify inventories by function

By examining the functions of inventory, it is clear that they are the result of many interrelated decisions and polices with in an organization a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. In the long term, of courses, all inventories are controllable. **(Fraser Johnson, 2002: 207)**

2.7 The forms of inventory

The five commonly recognized forms of inventories are:

1. Raw materials purchased parts, and packaging;
2. Work in process;
3. Finished goods;
4. Maintenance, repair, and operating supplies (MRO)
5. Resale item.

For resource industries, service organizations, and public organizations, MRO inventories may be substantial.

2.8 Inventory function and form framework

Combining the five forms and five functions of manufacturing inventory gives the 25 types of inventory that make up the inventory profile of an organization. Presented with some of the managerial decision variables affecting each type. Not all inventory types will be present to the same extent in each organization; indeed some may be completely absent. The 25 types make inventory control a more complex but a more easily focused task. **(Fraser Johnson, 2002:208)**

2.9 Efforts of reduce inventories

Because of the high cost of carrying inventory, many systems have been developed to reduce stocks. Japanese manufactures have spearheaded such efforts in mass production industries. Suppliers often located very near the plant deliver items directly to the point of use in the plant at very frequent intervals. The uses of kabanas and variety of just-in-time inventory management schemes have revolutionized manufacturing thinking about all forms of inventories. Nevertheless, it is useful to understand the nature and costs of inventories so that appropriate polices and procedures can be developed for specific organizational needs.

Many purchases cover repetitive items often-held in inventory. Thus: inventory policy has a great influence on purchase quantity decisions. The question of how much to order, when, or how much to carry in stock are key decisions subject to continuous improvement examination along with the focus on quality and customer, employee, and supplier satisfaction. It is important in making delivery, inventory, or purchase order size decisions to understand why inventories exist and what they serve. **(Fraser Johnson 2002: 201)**

2.10 Key questions for the supply decision-maker

Should we:

- Change the way we forecast?
- Initiate a stockless purchasing system?
- Purchase the items differently?

How can we

- Improve our inventory management?
- Obtain supplier cooperation for JIT?
- Make lot-sizing decisions better?

Continuous improvement; speed to market; customer, employee, and supplier satisfaction; and global competitiveness require dedication to productivity and value-added activities. These organizational goals drive management attitudes to quality, quantity, and delivery, with profound impact on the acquisition process. With respect to quantity and delivery considerations, the most telling evidence comes from inventory reduction and the drive to increase frequency of deliveries, while decreasing the amount delivered at one time. Accompanying efforts in set up time reduction, just-in-time (JIT) system, stockless systems, order cost reduction, EDI and e-commerce are all part of the same drive.

2.11 Factors affecting quantity and delivery decisions

The decisions of how much to acquire and when, logically follow classification of what is required; the natural response is to say. “Buy as much as you need when you need it. “Such a simple answer is not sufficient, however.

First managers must make purchase decisions before, often a long time before, actual requirements are known. Therefore, they must relay on forecasts, not only of future demand, but of also lead times, prices, and other costs. Such forecasts are rarely, if ever, perfect.

Second, there are costs associated with placing orders, holding inventory, and running out of materials and goods.

Third, materials may not be available in the desired quantities without paying a higher price or delivery charge.

Forth, suppliers may offer reduced prices for buying larger quantities.

Fifth, shortages may cause serious consequences. **(Fraser Johnson 2002: 194)**

2.12 Main types of inventory cost

The relevance of cost elements in a given situation depends on the decisions to be made. Many costs remain fixed when the order size of only one item is doubled, but the same costs may well become variable when 5,000 items are under consideration. The main types of inventory costs are:- (Fraser Johnson 2002: 202)

1. Carrying costs
2. Stock out costs
3. Ordering or purchase costs
4. Setup costs

2.12.1 Carrying costs:-

These include handling charges; the costs of storage facilities or ware house rentals; the costs of equipment to handle inventory; storage labor, and operating costs, insurance premiums, breakage, pilferage, obsolescence, taxes, and investment or opportunity costs. In short, any cost associated with having, as opposed to not having, inventory is included.

The cost to carry inventory can be very high, for e.g. recent estimates of the annual cost to carry production inventory ranged from 25 to 50 percent of the value of the inventory:

There are several methods for calculating inventory carrying costs, the basic elements are:

1. Capital costs,
2. Inventory service costs,
3. Storage space costs, and
4. Inventory risk costs.

Once the firm has estimated its carrying costs as a percentage of inventory value, annual inventory carrying costs can be calculated as follows:

(Carrying cost per year + (average inventory value) x (Inventory carrying cost as a % of inventory value)

Average Inventory value = (material unit cost) x (average inventory in units) **(Liman, 1981: 185).**

2.12.2 Stock out cost

These are the cost of not having the required parts or materials on hand when and where they are needed. They include lost contribution on lost sales (both present and future) change over costs necessitated by the shortage, substitution of less suitable or more expensive parts or materials, rescheduling and expediting costs, labor and machine idle and so on. **(Liman, 1981: 185).**

2.12.3 Ordering or purchase costs

These include the managerial, clerical, material, telephone, mailing, fax e-mail, accounting, transpiration, inspection, and receiving costs associated with a purchase or production order. **(Liman, 1981: 185-186).**

2.12.4 Setup Cost

These refer to all the costs of setting up a production run. Setup costs may be substantial. They include such learning-related factors as early spoilage and low production output until standard rates are achieved as well as the more common considerations, such as setup employee's wages and other costs, machine downtime, extra tool wear, parts (and equipment) damaged during setup, and so on.

How is it calculated?

The order points is based on the expected usage during the lead-time, that is during the time it takes for the new order to be written up, ordered, and received.

Considering L = Lead time

R = Annual Demand

The recorder point, p, is the lead-time, L, times daily demand

$$P = \frac{LR}{360}$$

What is an order point?

It is the point at which a replenishment order is placed, so as to prevent a run-out of stock while waiting for the replenishment order to come in.

Lead Time

The time interval needed to complete a portion or all of the activities in a replenishing cycle. It includes the time to identify a replenishment requirement, process the order, and receive the item in stock, ready for use. **(Liman, 1981:190)**

2.13 When to place an order

The "when to order" point is determined by the expected demand during the time it takes (called the "lead time") for the material to be ordered and received. The expedited demand (or the lead-time itself) may fluctuate: safety stock can be maintained to protect against such problems. **(Liman, 1981:33)**

Economic Order Quantity

Unlike lot-for-lot ordering, which uses actual period demands; other lot sizing model depend on demand forecasts, which re intern, often based on past average demand. The economic order quantity (EOQ) is such a model, and may be appropriate for management of a single inventory item.

EOQ is the number of units of a single item that should be planned whenever an order is placed so as to minimize the inventory management costs of that single item during a given time period, usually one year. **(Shniderjans, 1997:421)**

It is suitable for construction materials of Ethiopian Telecommunications Corporation.

When not to apply the EOQ approach

There are circumstances where the EOQ approach cannot be used, or must be adjusted to the exigencies of the business. Examples include; job shop operations; production cycling; erratic demand conditions; evaluation of price discounts; and space, capital and production capacity restrictions.

It is not appropriate for fixed items like furniture instruments, tools, and equipment of Ethiopian Telecommunications Corporation.

In situations where custom designed, randomly ordered, or low volume products are involved, a make-to-order approach is often most appropriate.

In addition, where detailed production planning necessarily dictates the basic timing and quantities of components, EOQ is a secondary consideration to the storage capacity, production, and material flow requirements **(Fraser Johnson, 1981: 60)**

2.14 Managing Independent Demand Economic Order Quantity models

2.14.1 Fifes Quantity Models

The objective of the model is to minimize the total annual costs. In the very simplest form of this model, annual demand (R), variable order or set up cost (S), Lead time (L), and holding cost percentage (K), are all constant now and in the future.

When inventory drops to the reorder point (P), a fixed economic order quantity (A) is ordered, which arrives after lead-time (L). Back orders and stock outs are not allowed.

Total cost is given as purchase cost, plus set up or order cost, plus holding cost, or:

$$TC = \frac{RC + RS + QKC}{A \qquad 2}$$

The minimum value of

Q (also known as the EOQ) is found at:

$$EOQ = \sqrt{\frac{2DCO}{Q}}$$

2.14.2 Fixed period model

In fixed period models, orders are placed only at review time. The inventory level must, therefore, be adjusted to prevent stock outs during the review period and lead-time.

2.15 Just-in-time (JIT) Inventory management system

The just-in-time (JIT) system is a Japanese philosophy that is used to manage all types of inventory, purchasing and production function in an organization.

The goal of JIT inventory system is to eliminate or reduce all types of inventory (raw materials, work-in process, and finished goods). Why do organizations want to eliminate inventory? By eliminating inventory, the cost of maintaining that inventory is eliminated as well. This is accomplished by using the following logic: **(Shniderjans, 1997: 316)**

1. Acquire raw materials just in time to have them manufactured into component parts.
2. Manufacture component parts just in time to have them assembled into finished products.
3. Assemble finished products just in time for their consumption in the market place.

2.16 Procedures for inventory taking

- All materials are listed in accordance with stock numbers.
- Record and post all documents and last receipt and issue vouchers
- Discontinue further posting until the result of stock taking is entered
- Verify bin card quantity against stock card quantity to trace and error
- Count all normal stock including scrap, residuals and items on loan.
- To keep stock sheets under control of one supervisor
- Hold record for damaged, deteriorated of issued with out document
- Stock taking should be made in orderly manner.
- When shortage and overages lists are prepared. The rechecking does not reveal discrepancies between the card balance and the physical count
- The inventory sheet should be prepared according to classification of the accounting system
- The stock sheet designed to contain the following information
    - ✓ The stock sheet are numbered
    - ✓ Date of stock taking
    - ✓ Location
    - ✓ Stock number
    - ✓ Description
    - ✓ Unit of stock found
    - ✓ Unit price
    - ✓ Value of stock found
    - ✓ Stock checker's signature
    - ✓ Remarks (Ethiopian Telecommunication material Management directives)

2.17 Scrap, Surplus and Obsolete Materials and Equipment

Scrap:- is a term used to describe recyclable materials left over from every manner of product consumption, such as parts of vehicles, building supplies, and surplus materials. Often confused with waste, scrap in fact has significant monetary value.

Surplus Materials and Equipment:- Shall be defined as material, equipment, or parts including capitalized equipment, which are in excess of normal operating or repair requirements.

Obsolete Materials and Equipment:- Shall be defined as material, equipment, or parts, which are no longer useable in the service for which they were purchased and which cannot be utilized safely or economically or any other purpose.

2.18 Methods of Inventory Valuation

Inventory has to be properly valued based on the following reason:-

a. Determination of income

The inventory valuation is mainly exterminating the true income earned by business during a particular period. Gross profit is the excess of sales over cost of goods sold Cost of goods sold is a curtained by adding opening inventory to and deducting closing inventory from purchases.

b. Determination of financial position

The inventory at the end of a period is to be shown as current asset in the balance sheet of the organization incase the inventory is not properly valued the balance sheet will not disclose the correct financial position of the business **(Maheshwari D., 1997:267)**

Traditional cost

Traditional cost of inventories is the aggregate of cost of purchase, costs of conversion and other costs incurred in bringing the inventories to the present location and condition. Thus traditional cost includes not only all the costs

incurred for bringing and making them fit for use in production but also the price paid for acquisition of inventories or for sale. Example the transportation cost, duties paid, insurance in transit, manufacturing expenses, wage paid or manufacturing expenses incurred for converting raw materials into finished products. However, selling expenses such as advertisement expenses, or storage costs should not be included. Inventory costing method is not based on physical flow of goods on the shelf's. For most organizations, the actual physical flow of goods in First-in-first-out (FIFO). Regardless of physical flow of goods, an organization can use any of the inventory costing methods. Generally Accepted Accounting Principles (GAAP) only requires that the inventory costing method used be rational and systematic, **(Short & W., 1990: 309)**

As they stated that, an organization is required to use the same inventory costing method for all inventory items and no particular justification is needed for the selection of one or more of the acceptable methods. However, a change in method is significant needs special disclosures in the notes to the financial statement. These methods are weighted over age inventory costing, first-in-first-out (FIFO) inventory method, last-in, first-out (LIFO) inventory costing method, and specific identification inventory costing method.

2.18.1 Weighted-Average Inventory method

The weighted average costing method is usually justified because it is simple to apply and is less subject to income manipulation. The inventory is priced on the basis Average prices paid for the goods.

The weight average method requires computation of the weight average unit costs of the goods available for sales or service. In a periodic inventory system the computed unit cost is multiplied by the number of units in inventory to derive the total cost of ending inventory cost of good sold is determined by subtracting the ending inventory amount from the amount of goods available for sale/service, **(Short G&W, 1990: 309)**

For example the weighted method would be applied as using a periodic inventory system.

Computation of the weighed average unit cost for the period

Total goods available for sale at cost = weighed average cost per unit for the period
Total goods available for sale unit

Generally, the weighted average cost method is representative of costs during the entire period including the beginning inventory rather than of the cost only at the beginning end, or at one point during the period. Representative costs are reported on both the balance sheet (ending inventory) and the income statement (cost of goods sold).

2.18.2 Firs-in, First-out inventory costing method

The first-in, first-out method frequently called (FIFO) assumes that the oldest unit i.e. the first cost in) are the first unit sold (i.e. the first cost out). The units in the beginning inventory are treated as if they were sold first. Then the units from the first purchase are sold next, and soon until the units left in the ending inventory all comes from the most recent purchases. FIFO allocates the oldest unit costs to cost of goods sold and the most recent unit cost the ending inventory.

Often, FIFO is justified because is consistent with the actual physical flow of goods. In most business the first goods placed in stock are the actual physical flow of goods. **(Short G. & Welsch, 1990: 310).**

2.18.3 Last-in, first-out inventory costing method

The Last-in, first-out method, often called LIFO; assume that the most recently acquired goods are sold first. Regardless of the physical flow of goods, LIFO treated the cost of the most recent units purchases as cost of goods sold. Therefore, the unit costs of the banging inventory and the earlier unit cost of beginning inventory and the earlier purchase remain in the ending inventory. The LIFO flow assumption is the exact opposite of the FIFO flow assumption.

LIFO can be manipulated by buying or not buying or not buying goods at the end of period when unit costs have changed. By this action, it is possible to manipulated costs of goods sold and hence reported income on the income statement LIFO cost of good sold based on the latest unit cost, which is realistic measurement of the current cost of items that where sold. In contrast, on the balance sheet the ending inventory amount is based on the oldest unit costs, which may be an unrealistic valuation.**(Short G. & W., 1990: 310-11)**

CHAPTER THREE

3. Data Presentation Analysis and Interpretation

3.1 Introduction

This chapter is intended to provide information gathered from the primary and secondary source as well as based on the researcher's observation from the organization. The primary data is a combination of questionnaire and interview, while the secondary data is obtained from the organization's unpublished documents.

The survey was conducted to assess the aspects of inventory management practices at Ethiopian Telecommunication Corporation. The aim of the assessment is going to provide the analysis and interpretation of the questionnaire's and interview data. The questionnaires were given to 40 respondents of the organizations employee. Additionally, interview was made with 6 selected employees of the organization.

Table 1 General Characteristics of the respondents

Item	Response	Frequency	Percentage
Age	18-30	16	40
	31-40	10	25
	Above 40	14	35
	Total	**40**	**100**
Sex	Male	24	60
	Female	16	40
	Total	**40**	**100**
Educational level	12 completed	5	12.5
	Diploma	12	30
	1st Degree	23	57.5
	Above 1st Degree	-	-
	Total	**40**	**100**
Work experience	1-5 years	21	52.5
	6-10 years	12	30
	11-15 years	5	12.5
	> 15 years	2	5
	Total	**40**	**100**

Source: Survey 2010

3.2 General background of the respondents

According to the above table 1, out of the total 40 respondents who respond to the questionnaire 16(40%) of them have an age range from 18-30 years, 10(25%) of the other ones have an age range from 31-40 years. Apart from this 14(35%) of the remaining one have an age greater than 40 years. This implies that the corporations have adult potential workers.

According to the above table out of the total 40 respondents 24(60%) of them are males but, 16 (40%) of the remaining one are females this implies that the corporation have more of male employees in its inventory management department.

According to the above table the educational status of the respondents is characterized that out of the total 40 respondents 5(12.5%) of them are 12^{th} completed, 12(30%) of the other ones are diploma holders, 23(57.5%) of the remaining ones are degree holders this indicates that the educational status of the corporations employees is some what good.

With regard to the work experience of the employees out of the total 40 respondents 21(52.5%) of the respondents have a work experience from 1-5 years. 12(30%) of the other have a work experience that amounts for 5 years that is 6-10 years, the other 5 and 2 respondents have a work experience 11 -15 years and greater than 15 years respectively.

Table 2 Performance indicator of the inventory management

Respondents						
Item	**Yes**		**No**		**Total**	
	f	Percentage	*f*	Percentage	*f*	Percentage
Do you have good interdepartmental relation ship	14	35	26	65	40	100
Do you uses improved inventory system to handle its inventories	16	40	24	60	40	100
Do you have good relationship with its suppliers	14	35	26	65	40	100
Is the organization evaluate system on its time	10	25	30	75	40	100
Is the organization identifies its annual consumption	8	20	32	80	40	100

Source: Survey 2010

3.3 Performance indicators of the inventory management in the corporation

Ones organization inventory management can indicate in different way. But the common one, are type of inventory, period of inventory and other related ones.

According to the above table 2, the researcher takes the above performance indicator to assess the corporation inventory management. These include interdepartmental relationships, using improved inventory system, having good relationship with its suppliers, evaluation of its system on time, and identifying the annual consumption of the corporation. Based on this concerning to the first indicator that is having good interdepartmental relationship out of the total 40 respondents 14(35%) of them agree with the existence of good interdepartmental relationship in the inventory management departments of the corporation but, 26 (65%) of the remaining one did not agree with the idea. This implies that the inventory management department of the corporation needs to improve its departmental relationship to improve its management status.

Concerning to the second indicator that is using inventory system to handle its inventory out of the total 40 respondents 16(40%) of them agrees with the existence of the indicator in the inventory management department of the corporation but, 24(60%) of the other ones did not agree with the stated idea. This implies that the inventory department of the corporation still needs to employ more modern inventory management system method to manage its huge inventory.

Concerning to the third idea that is having good relationship with its suppliers, 14(35%) of the respondents agrees with the existence of good relationship between the inventory management system and its inventory suppliers. But 26 (65%) of the remaining ones did not agree with the existence of the stated performance indicator in the inventory management department of the corporation. This implies that the inventory management department of the corporation did not have a good relationship with its suppliers.

Timely evaluation of the inventory management system is also taken as a one performance indicator in the inventory management department of the corporation. on this side out of the total 40 respondents 10(25%) of them agrees with the existence of timely evaluation of the inventory system but, 30(75%) of them did not agree with its existence. This indicates that the inventory system of the corporation did not evaluate on time and this can cause a big failure to the inventory system because timely evaluation is a critical issue to identify strength and weakness of the item and to take a measurable decision based on the out put.

On the other hand, identification of annual consumption of the corporation is also taken as one indicator to the status inventory management department of the corporation. According to this 8(20%) of the corporations agree with the existence of that annual consumption identification but 32(80%) of the remaining did not

agree with its existence. This implies that the departments have poor performance in identifying its annual consumption amounts.

3.4 Techniques of inventory valuation

Table 3 The types of inventory valuation method the corporation commonly use

Item	Response	Frequency	Percentage
Which type of inventory valuation method does the corporation commonly use?	FIFO method	26	65
	LIFO method	12	30
	Weighted average method	2	5
	Other	-	-
	Total	**40**	**100**

Source: survey 2010

According to the above table 3, there are three inventory management systems that implement in the corporations inventory department these are FIFO LIFO, weighted average method. Based on this, out of the total 40 respondents 26(65%) of them agrees with the commonly used FIFO method, 12(30%) of the other one said the commonly used inventory method is LIFO method 2(5%) of the other ones also response the commonly used one is weighted average method. This implies that the inventory of department widely implement FIFO method.

Table 4 Effectiveness of implementation the corporation guideline

Item	Response	frequency	Percent
Effectiveness of implementation the corporation's guideline	Good	8	20
	Fair	12	30
	poor	20	50
	Total	**40**	**100**

Source: Survey 2010

According to the above table 4, the inventory department have implemented the corporation guidelines based on this, 8(20%) of the respondents respond that the effectiveness of the implementation is good and 12(30%) of the major respondents respond that the effective implementation of the corporations, procedure in inventory management of the corporation is fair, but 20 (50%) of the remaining respondents respond that the implementation level of the inventory procedures of the corporation by the inventory department of the corporation is poor. This implies that, even if there are good manners and procedures of inventory in the corporation manuals, its practical implementation is poor.

Problems associated with inventory management of ETC inventory management, in its nature have different problems that relates with cost, time and supply side.

Table 5 Level of the problem associated with inventory management

Items	Level of the problem							
	High		Medium		Low		Total	
	f	% age	*f*	% age	*f*	% age	*f*	% age
High cost of inventory management	10	25	18	45	12	30	40	100
Poor managerial efficiency	18	45	12	30	10	25	40	100
Poor encoding of material identity	10	25	18	45	12	30	40	100
High misplacement	14	35	16	40	10	25	40	100

Source: Survey 2010

According to the above table 5, the main determinants that face the inventory management of the corporation are high cost of inventory management, poor managerial efficiency, poor encoding of material identity and high misplacement. Based on this, with regard to the high cost of inventory management problem out of the total 40 respondents 10(25%) of them responds with the high level of the problem in the department. 18(45%) of them respond medium level, 12(30%) of

them respond low level of high cost of inventory management. About managerial efficiency, 18(45%) of respondents respond that, on high level of the problem, 12(30%) of them respond that medium level and 10(25%) of them respond low level of poor managerial efficiency.

With regard to the problem of poor encoding of material identity 10(25%) of the respondents respond that this problem faces highly in inventory management department of the corporation and 18(45%) of the other ones agree with medium level determination of the problem but, 12(30%) of the respondents respond that the impact of the problem to the inventory department status of the corporations inventory system is low. This indicates that the problem is less to the performance of the inventory department of the corporation.

High misplacement is also taken as a problem to the inventory department of the corporation. According to this, 14(35%) of the respondents agrees with the idea that the stated problem is highly existed and 16(40%) of the other respondents respond that the problem is medium, but 10(25%) of the remaining respondents respond that the stated problem have low impact to the status of the inventory. This implies that, the inventory system of the corporation is influenced through high misplacement problem.

3.5 Analysis of interview held with ETC warehouse employees

According to the interview held with ETC warehouse employees, Ethiopian Telecommunication Corporation makes inventory once in a year always in June 30 at a given inventory period.

With regard to determining maximum inventory the respondents said that corporation's inventory department does not have maximum or minimum inventory stock. Only in some specific items such as A4 papers, different vouchers & forms (for internal use) and billing papers. They make a standard

maximum and minimum inventory of stock level with collaboration to stock control section.

Concerns to cost component for the inventory the respondents respond that the main cost components are time cost, holding cost the most common cost. That is holding cost is increase in terms of days and months, when high materials in the store is high much more inventory taking cost is also high. Additional payment cost is also the cost that need for additional time work for supervisors and labor wages.

Concerning to rid of obsolete, surplus and scrap materials in context to the corporation, obsolete and scrap material are occurred in all section of stores. Namely in network material, building and electric material, hand tools equipment, office furniture, stationary, power and satellite, and in exchange (PBX) material stores. Scrap materials for the corporation from the manufacturing section, metal, wood work, cement product, materials work shop peace of woods and metals fail of raw materials and sub standard materials. Obsolete (outdated) materials, such as old telephone, operator machine old phones, tower equipments, old typewriters, electrical typewriter, old fax machines, and others.

Mechanisms that the corporation uses to rid of obsolete, surplus and scrap materials are: according to the respondents, the corporation formed three teams namely material and stock control, warehouse administration and manufacturing. Those teams work at Akaki Cable and Jimma Ber pool stores. Some materials such as office furniture and computers donate to schools, and for different institutions. Others sell by auction/tender to rid those materials but the formed committees do not work properly to solve the existed problem because the formed committees do not give any consideration to collect those materials as needed.

Concerning to inventory planning the corporation does not use specific inventory forecasting method, rather it uses the following inventory planning system.

Management materials are purchased under working order base for example work order 02/088/46 for this specific work order it plans the necessary matter. Based on this procuring of items will be performed, the inventory does not plan for items therefore, it hold much inventories. The other system is project materials base (consumption base forecast) this is purchasing conduct base on the need of the project. For example for ALCATEL, NOKIA, ERICSON, and ZTE projects and so on. The other is based on stock item which forecasted only for stock purpose but the corporations have to use different plans in the future time.

According to the interviewed respondents, the corporation does to hedge against increase of price is, when materials are needed collect peroforma to purchase those items the collected peroforma have dead lines or amendment and the supplier who deliver materials with discount is acceptable.

The mechanisms to avoid inventory shortage in the corporation are material register planning, reorder point for stationary materials the company uses a periodic inventory recording system that records twice in a year at that time close manual inventory recording system is implemented.

According to the interviewed respondents of the satisfaction of user departments based in the right quantity, in the right quality, at the right time and at the right place are medium satisfaction.

CHAPTER FOUR

4. Summary of findings, Conclusion and recommendation

This part of the paper deals with the summary of findings, general conclusions and recommendation.

4.1 Summary of findings

According to the analysis part of the paper majority of 60% of the respondents are males, 40% of them have also an age range 18-30 with regard to their educational status majority or 57.5% of the respondents are degree holders. Concerning to the existence of performance indicators in the corporation inventory department to do of them agrees with the non existence of good interdepartmental relation ship 65% of the other ones agrees with non existence of good relation ship of the corporation with its suppliers.

Concerning to the inventory valuation methods that implemented in the department 65% of them responds the dominant one FIFO method the respondents also respond on the effective implementation of guidelines, method in the department based in this majority of 50% of them agrees with the poor effectiveness of its implementation.

The respondents also respond their idea on the main determinants of the corporation inventory department based on this 25% of the respondents agree with existence of high cost of inventory management. 45% of the others respond with medium level of the problem. On poor encoding of material identity in the inventory of department of the corporation 40% of the respondents also respond with the existence of medium level of high misplacement problem in the inventory department of the corporation.

4.2 Conclusions

Different organizations have different structured performed and organized inventory department based on their type, nature and amount. Based on this, Ethiopian Telecommunication Corporation inventory looks like as with low level of interdepartmental relationship, have medium level improved inventory system to handle its inventories and has no good relationship with its supplier, poor level of evaluation of its system on time and low level of capacity to identify its annual consumption.

There are different techniques in inventory valuation system of an organization the most common ones are FIFO, LIFO and weighted average method. Ethiopian Telecommunication Corporation implements FIFO method in its most activities but FIFO method the one method that can take into account by the corporation due to its nature of purchasing system.

The corporations have different manuals and procedures that need to purchase inventory materials for the day to day activity of these corporation, the manuals integrates the right quantity, the right quality, at the right time and at the right place peculiarity but their implementation by the inventory department is very low.

The main problems that face in the inventory department of the corporation are high cost of inventory management, poor encoding of material identity and high misplacement of inventories with medium status.

Planning is the determinant managerial input for the good performance of activity. Inventory planning also needs to implement good inventory technique in the department but, Ethiopian Telecommunication Corporation did not implement forecasting plan instead it uses work order base and other related use.

4.3 Recommendation

As indicated in the conclusion part of the paper, the inventory departments of the corporation have low level of interdepartmental relationship, medium level of using improved inventory methods, low level of evaluation and poor performance in identifying annual consumption. All the stated problems are internal problems that can be solve by the corporation management bodies with out taking additional external cost. So, the corporation should improve interdepartmental relationship through evaluating each department performance, integrate activities, assign stock controller for all stores. As the corporation is the technology corporation, it should implement and improve technological inventory techniques like electronic and automated.

Materials evaluation is a determinant factor for the success or failure for the organization's activity. So, the inventory system of the corporation should evaluate its day to day activity to identify its strength and weaknesses.

Lack of identifying annual consumption results for unnecessary cost such as capital tied up, excessive holding cost, obsolesces and the like. Therefore, the corporation should control these kinds of problems by knowing its annual consumption forecast, by controlling inventory sheet run out and stock card balance. And also the corporation should change the manual inventory system to technological modern one.

The inventory methods have their own advantages and disadvantages based on this different organization uses different methods of inventory system the corporations should implemented the FIFO but the other two methods have also implemented in inventory terms that relate to their nature like project base purchase should used LIFO.

Implementing the manuals of corporation should control through the departmental heads and general managers of the corporation.

As stated in the conclusion part of the paper, the dominant problems are cost of inventory management, poor managerial efficiency high misplacement of inventories and high encoding problem. These stated problems should improve through creating a committed management and implementing modern technological inventory system in the practice of the department.

The corporation’s inventory department should plan its each activities based on forecasting at the beginning of the work year. In this case, specific goals should forecast and their performance should evaluate monthly or quarterly.

ST. MARY'S UNIVERSITY COLLEGE
BUSINESS FACULTY
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BY
ADDISIE GEBREMEDHIN

JUNE 2010
SMUC
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A SENIOR ESSAY SUBMITTED
TO THE DEPARTMENT OF MANAGEMENT
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APPROVED BY THE COMMITTEE OF EXAMINERS

_____	_____
Chairperson	Signature
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Advisor	Signature
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Examiner	Signature
_____	_____
Examiner	Signature

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ACRONYMS

ETC . . . . . Ethiopian Telecommunication Corporation

MRO . . . . . Maintenance, Repair and operating

EOQ. . . . . Economic Order Quantity

JIT . . . . . Just In Time

FIFO. . . . . First-in, First-Out

LIFO. . . . . Last-in, First-Out

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Inventory management is essential for all organizations. However, it's efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of the stock out, ordering or purchase, setup and the like.

Inventory means (stock of goods). Inventory may mean row materials, work in progresses, maintenance materials, processed and semi processed materials, oil, fuel and lubricants as well as finished and semi finished goods. They may be either in solid, liquid or gaseous form, required for the future use, manly in the production process as incase of finished goods for resale period. The need for this research arises from the existing situation of the Ethiopian Telecommunication Corporation.

1.2 Background of the Organization

The introduction of telecommunication services in Ethiopia dates back to 1894, seventeen years after the invention of telephone technology in the world. The Ethiopian Telecommunications Corporation is the oldest Public Telecommunication Operator (PTO) in Africa. Since its establishment, the corporation has managed to serve the public and the country by providing fast communication services such as land line telephone, wireless telephone technology, rural connectivity, school net, teleconference, internet service and other related services using modern technology.

The corporation's survival depends up on receiving, issuing, supplying and inventory, appropriate stores material management system which can integrate it

with its environment by identifying the opportunities, strength and weakness of its own and offered by the surrounding.

Material management is a basic tool in various organizations because inventory management system is required to plan, organize, direct and coordinate different activities from the point of their beginning to the point of their utilization and disposal. Moreover, it includes activities such as purchasing, inventory control, and store. Therefore, inventory management is necessary to balance materials which are on hand and already used.

This research is focus on assessment of inventory management practices taking place in Ethiopian Telecommunication Corporation.

1.3 Statement of the Problem

Inventory management is essential for all organizations. However, its efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of stock out, ordering or purchase, setup and the like.

Most of the time, decide to have over stock inventory results in unnecessarily problems such as capital tied up, excessive carrying cost and the like.

- The Balance in the Inventory sheet run out is incorrect because of its bulk nature of materials and issue of incorrect quantity.
- The Stock Balance in the store and the Stock Card Balance are not the same and posting might be done in the wrong card
- Materials are stored for the long period and it leads to:-
  - Obsolesce,
  - Losing material identity their stock number might not be there,
  - Difficulty during inventory due to misplacement.

1.4 Basic research questions

Thus, from the identified problem this research try to address the following research questions.

- What does the inventory management practice of ETC look like?
- What inventory system ETC uses?
- What techniques are being used to determine annual consumption in ETC?
- What are the internal controls over inventory and stockholding procedure of the corporation?
- What problems are encountered in relation to inventory management in ETC?

1.5 Objectives of the Study

1.5.1 General objectives

The general objective of the study was to make an assessment of the inventory management practice of Ethiopian Telecommunication Corporation, so as try to show how to improve its performance.

1.5.2 Specific objective:-

- To assess the inventory management practice of ETC,
- To examine the type of inventory system ETC uses,
- To identify the techniques that is used ETC in exploring its annual consumption,
- To identify the internal control over inventory and stock holding procedures of the corporation,
- To identify the main problems encountered in relation to inventory management of ETC.

1.6 Significance of the study

- This study will have significant important regarding how maximum and minimum levels of stock are kept at their optimum lot, in ETC.

- How a good inventory management can improve the provision of materials when they are needed.
- How a well-structured storage system results in an efficient inventory reporting, which can facilitate accurate provision of information for the corporation's financial statement and management decisions.
- Regarding to pin point the possible solution to overcome the already existed problem.

1.7 Scope of the study

The scope of the research is delimited to the ETC inventory management system practices at the central warehouse level. The study does not cover inventory management practices in the regional warehouses.

1.8 Limitation of the study

Even though the intention is to investigate the problem of inventory management practices of Ethiopian Telecommunication Corporation, the researcher did not include regional warehouses due to time and financial resource.

1.9 Research Design and Methodology

1.9.1 Research Design

To asses the problem stated in the study, the researcher used the descriptive design method.

1.9.2 Population and sampling technique

The researcher used sampling unit selected from employees of ETC at central warehouse. The total populations are 141 (one hundred forty one). Among the total population for 40 (forty) employees questioner were given chance by using a non-probability convenience sampling method and interview were held with 6 (six) warehouse employees in order to get the right persons who are more concerned to the subject matter.

1.9.3 Types of data used

Types of data were both primary and secondary data. Primary data was collected from employees of the corporation and secondary data was collected from books, documents, and company reports to support the study.

1.9.4 Methods of data analysis

The collected data was analyzed using descriptive analysis techniques that were presented by tables. The study depends mainly on qualitative methods of data analysis as the project data sources are dominantly qualitative ones. Thus, for those data collected through interview and documentation review descriptive analysis is performed.

1.10 Organization of the study

The study is organized in to four chapters. The first chapter deals with introduction, the second chapter deals with related review of the study, the third chapter describes data presentation, analysis and interpret the general overview of inventory management activities and provides data analysis and finally the fourth chapter contains summary, conclusion and recommendation.

CHAPTER TWO

2. REVIEW OF RELATED LITRATURE

2.1 Definition of Inventory

Different authors define inventory management in different ways some of these are: -

Inventory can be defined as "Items held to ensure smooth plant operation, improve customer service, attain lot-size economies, or overcome timing or distance differences between operations. Overall objective (as with any investment): is to improve company's return on investment." **(Liman, 1981:191)**

Although inventories are classified in many ways, the following classification is convenient for use in further discussion of the topic:-

2.1.1 Production inventories:- Row materials, parts and components, which enter the firm's product in the production process. These may consists of two general types.

a. Special items manufactured to company specifications and

b. Standard industrial items purchased "off the shelf"

2.1.2 MRO inventories:- Maintenance, Repair, and Operating supplies which are consumed in the production process but which do not become part of the product.

2.1.3 In process inventories:- Semi finished products found at various stages of the production operation

2.1.4 Finished goods inventories:- completed products ready for shipment **(Dobler, 2001:519)**

2.2 Inventory Management

The inventory management activity is concerned with the planning and control of inventories. There are two general types of inventory. **(Edward M., 1997: 281)**

1. Dependent demand inventory and
2. Independent demand inventory

Dependent demand inventory:- Is made up of inventory items that are consumed with in an organization to produce a finished product.

Independent demand inventory:- Comprises inventory items consumed by customer's external to the organization.

2.3 Inventory control

The technique for ensuring availability of materials, which at the same time, holds in check, generally through a system, the tending to hoard larger amount of stock than is necessary. Citation

2.4 Inventory analysis:-

There are various types of analysis for different resource especially for control purpose one has to analyze various data. Analytical methods are useful in defining problems in order to strike at a solution.

Analysis is the first step for effective inventory control. Then we classify the items in to their importance experience has shown that relatively small portion of the items in the inventory accounting for a large portion of the value of the inventory investment.

2.5 Purposes of Inventory

All firms including just in time (JIT) operations keep a supply of inventory for the following reasons.

1. **To maintain independence of operations:-** A supply of materials at a work center allows that center flexibility in operations for example because there are for making each new production setup, this inventory allow management to reduce the number of setups.

Independence of workstations is desirable on assembly lines as well. The time that it takes to do identical operations will naturally vary from one unit to the next. Therefore, it is desirable to have a cushion of several parts with in the workstation so that shorter performance times can compensate for longer performance time. This way the average out put can be fairly stable.

2. **To meet variation in product demand:-** If the demand for the product is known precisely, it may be possible (though not necessarily economical) to produce the product to exactly meet the demand. Usually, however, demand is not completely known, and a safety or better stock must be maintained to absorb variation.
3. **To allow flexibility in production scheduling:-** A stock of inventory relieves the pressure on the production system to get the goods out. This causes longer lead times, which permit production planning for smoother flow and lower-cost operation through larger lot-size production. High setup costs, for example, favor producing a larger number of units once the setup has been made.
4. **To provide a safeguard for variation in raw material delivery time:-** When materials are ordered from a vendor, delays can occur for a variety of reasons a normal variation in shipping time, a shortage of material at the vendor's plant causing backlogs, an unexpected strike at the vendor's plant or at one of the shipping companies, a list order, or a shipment of incorrect or defective material.

5. **To take advantage of economic purchase order size:-** There are costs to place an order labor, phone calls, typing, postage, and so on. Therefore, the larger each order is the fewer the order that need be written. Also, shipping costs favor larger orders the larger the shipment, the lower the per-unit cost. **(Robert Jacbs, 1998: 513-515)**

2.6 The functions of inventories

Examining the functions of inventory clearly shows that they are the result of many interrelated decisions and polices within an organization as a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. (In the long term, of courses, all inventories are controllable). The following classification of inventory functions reveals the multipurpose roles played by inventories. **(Fraser Johnson, 2002: 204)**.

2.6.1 Transit or pipeline inventories:

These inventories are used to stock the supply and distribution pipelines linking an organization to its suppliers and customers as well as internal transportation points. They exist because of the need to move material from one point to another.

2.6.2 Cycle inventories:

These stocks arise because of management's decision to purchase, produce, or sell in lots rather than individual units or continuously. Cycle inventories accumulate at various points in operating systems. The size of the lot is a trade off between the cost of holding inventory and cost of marking more frequent orders and/or set-ups.

2.6.3 Buffer or uncertainty inventories or safety stocks:

These stocks exist as a result of uncertainties in demand or supply. Finished goods buffers protect against unforeseen demand or production failures.

2.6.4 Anticipation or certainty inventories:

These stocks are accumulated for a well-defined future need. Reasons for anticipation stocks may include strikes, weather, shortages, or announced price increases.

2.6.5 Decoupling inventories

The existence of decoupling inventories at major process linkage points makes it possible to carry on each side of the point relatively independently of each other.

Why classify inventories by function

By examining the functions of inventory, it is clear that they are the result of many interrelated decisions and polices with in an organization a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. In the long term, of courses, all inventories are controllable. **(Fraser Johnson, 2002: 207)**

2.7 The forms of inventory

The five commonly recognized forms of inventories are:

1. Raw materials purchased parts, and packaging;
2. Work in process;
3. Finished goods;
4. Maintenance, repair, and operating supplies (MRO)
5. Resale item.

For resource industries, service organizations, and public organizations, MRO inventories may be substantial.

2.8 Inventory function and form framework

Combining the five forms and five functions of manufacturing inventory gives the 25 types of inventory that make up the inventory profile of an organization. Presented with some of the managerial decision variables affecting each type. Not all inventory types will be present to the same extent in each organization; indeed some may be completely absent. The 25 types make inventory control a more complex but a more easily focused task. **(Fraser Johnson, 2002:208)**

2.9 Efforts of reduce inventories

Because of the high cost of carrying inventory, many systems have been developed to reduce stocks. Japanese manufactures have spearheaded such efforts in mass production industries. Suppliers often located very near the plant deliver items directly to the point of use in the plant at very frequent intervals. The uses of kabanas and variety of just-in-time inventory management schemes have revolutionized manufacturing thinking about all forms of inventories. Nevertheless, it is useful to understand the nature and costs of inventories so that appropriate polices and procedures can be developed for specific organizational needs.

Many purchases cover repetitive items often-held in inventory. Thus: inventory policy has a great influence on purchase quantity decisions. The question of how much to order, when, or how much to carry in stock are key decisions subject to continuous improvement examination along with the focus on quality and customer, employee, and supplier satisfaction. It is important in making delivery, inventory, or purchase order size decisions to understand why inventories exist and what they serve. **(Fraser Johnson 2002: 201)**

2.10 Key questions for the supply decision-maker

Should we:

- Change the way we forecast?
- Initiate a stockless purchasing system?
- Purchase the items differently?

How can we

- Improve our inventory management?
- Obtain supplier cooperation for JIT?
- Make lot-sizing decisions better?

Continuous improvement; speed to market; customer, employee, and supplier satisfaction; and global competitiveness require dedication to productivity and value-added activities. These organizational goals drive management attitudes to quality, quantity, and delivery, with profound impact on the acquisition process. With respect to quantity and delivery considerations, the most telling evidence comes from inventory reduction and the drive to increase frequency of deliveries, while decreasing the amount delivered at one time. Accompanying efforts in set up time reduction, just-in-time (JIT) system, stockless systems, order cost reduction, EDI and e-commerce are all part of the same drive.

2.11 Factors affecting quantity and delivery decisions

The decisions of how much to acquire and when, logically follow classification of what is required; the natural response is to say. “Buy as much as you need when you need it. “Such a simple answer is not sufficient, however.

First managers must make purchase decisions before, often a long time before, actual requirements are known. Therefore, they must relay on forecasts, not only of future demand, but of also lead times, prices, and other costs. Such forecasts are rarely, if ever, perfect.

Second, there are costs associated with placing orders, holding inventory, and running out of materials and goods.

Third, materials may not be available in the desired quantities without paying a higher price or delivery charge.

Forth, suppliers may offer reduced prices for buying larger quantities.

Fifth, shortages may cause serious consequences. **(Fraser Johnson 2002: 194)**

2.12 Main types of inventory cost

The relevance of cost elements in a given situation depends on the decisions to be made. Many costs remain fixed when the order size of only one item is doubled, but the same costs may well become variable when 5,000 items are under consideration. The main types of inventory costs are:- (Fraser Johnson 2002: 202)

1. Carrying costs
2. Stock out costs
3. Ordering or purchase costs
4. Setup costs

2.12.1 Carrying costs:-

These include handling charges; the costs of storage facilities or ware house rentals; the costs of equipment to handle inventory; storage labor, and operating costs, insurance premiums, breakage, pilferage, obsolescence, taxes, and investment or opportunity costs. In short, any cost associated with having, as opposed to not having, inventory is included.

The cost to carry inventory can be very high, for e.g. recent estimates of the annual cost to carry production inventory ranged from 25 to 50 percent of the value of the inventory: There are several methods for calculating inventory carrying costs, the basic elements are:

1. Capital costs,
2. Inventory service costs,
3. Storage space costs, and
4. Inventory risk costs.

Once the firm has estimated its carrying costs as a percentage of inventory value, annual inventory carrying costs can be calculated as follows:

(Carrying cost per year + (average inventory value) x (Inventory carrying cost as a % of inventory value)

Average Inventory value = (material unit cost) x (average inventory in units) **(Liman, 1981: 185).**

2.12.2 Stock out cost

These are the cost of not having the required parts or materials on hand when and where they are needed. They include lost contribution on lost sales (both present and future) change over costs necessitated by the shortage, substitution of less suitable or more expensive parts or materials, rescheduling and expediting costs, labor and machine idle and so on. **(Liman, 1981: 185).**

2.12.3 Ordering or purchase costs

These include the managerial, clerical, material, telephone, mailing, fax e-mail, accounting, transpiration, inspection, and receiving costs associated with a purchase or production order. **(Liman, 1981: 185-186).**

2.12.4 Setup Cost

These refer to all the costs of setting up a production run. Setup costs may be substantial. They include such learning-related factors as early spoilage and low production output until standard rates are achieved as well as the more common considerations, such as setup employee's wages and other costs, machine downtime, extra tool wear, parts (and equipment) damaged during setup, and so on.

How is it calculated?

The order points is based on the expected usage during the lead-time, that is during the time it takes for the new order to be written up, ordered, and received.

Considering L = Lead time

R = Annual Demand

The recorder point, p, is the lead-time, L, times daily demand

$$P = \frac{LR}{360}$$

What is an order point?

It is the point at which a replenishment order is placed, so as to prevent a run-out of stock while waiting for the replenishment order to come in.

Lead Time

The time interval needed to complete a portion or all of the activities in a replenishing cycle. It includes the time to identify a replenishment requirement, process the order, and receive the item in stock, ready for use. **(Liman, 1981:190)**

2.13 When to place an order

The "when to order" point is determined by the expected demand during the time it takes (called the "lead time") for the material to be ordered and received. The expedited demand (or the lead-time itself) may fluctuate: safety stock can be maintained to protect against such problems. **(Liman, 1981:33)**

Economic Order Quantity

Unlike lot-for-lot ordering, which uses actual period demands; other lot sizing model depend on demand forecasts, which re intern, often based on past average demand. The economic order quantity (EOQ) is such a model, and may be appropriate for management of a single inventory item.

EOQ is the number of units of a single item that should be planned whenever an order is placed so as to minimize the inventory management costs of that single item during a given time period, usually one year. **(Shniderjans, 1997:421)**

It is suitable for construction materials of Ethiopian Telecommunications Corporation.

When not to apply the EOQ approach

There are circumstances where the EOQ approach cannot be used, or must be adjusted to the exigencies of the business. Examples include; job shop operations; production cycling; erratic demand conditions; evaluation of price discounts; and space, capital and production capacity restrictions.

It is not appropriate for fixed items like furniture instruments, tools, and equipment of Ethiopian Telecommunications Corporation.

In situations where custom designed, randomly ordered, or low volume products are involved, a make-to-order approach is often most appropriate.

In addition, where detailed production planning necessarily dictates the basic timing and quantities of components, EOQ is a secondary consideration to the storage capacity, production, and material flow requirements **(Fraser Johnson, 1981: 60)**

2.14 Managing Independent Demand Economic Order Quantity models

2.14.1 Fifes Quantity Models

The objective of the model is to minimize the total annual costs. In the very simplest form of this model, annual demand (R), variable order or set up cost (S), Lead time (L), and holding cost percentage (K), are all constant now and in the future.

When inventory drops to the reorder point (P), a fixed economic order quantity (A) is ordered, which arrives after lead-time (L). Back orders and stock outs are not allowed.

Total cost is given as purchase cost, plus set up or order cost, plus holding cost, or:

$$TC = \frac{RC + RS + QKC}{A \qquad 2}$$

The minimum value of

Q (also known as the EOQ) is found at:

$$EOQ = \sqrt{\frac{2DCO}{Q}}$$

2.14.2 Fixed period model

In fixed period models, orders are placed only at review time. The inventory level must, therefore, be adjusted to prevent stock outs during the review period and lead-time.

2.15 Just-in-time (JIT) Inventory management system

The just-in-time (JIT) system is a Japanese philosophy that is used to manage all types of inventory, purchasing and production function in an organization.

The goal of JIT inventory system is to eliminate or reduce all types of inventory (raw materials, work-in process, and finished goods). Why do organizations want to eliminate inventory? By eliminating inventory, the cost of maintaining that inventory is eliminated as well. This is accomplished by using the following logic: **(Shniderjans, 1997: 316)**

1. Acquire raw materials just in time to have them manufactured into component parts.
2. Manufacture component parts just in time to have them assembled into finished products.
3. Assemble finished products just in time for their consumption in the market place.

2.16 Procedures for inventory taking

- All materials are listed in accordance with stock numbers.
- Record and post all documents and last receipt and issue vouchers
- Discontinue further posting until the result of stock taking is entered
- Verify bin card quantity against stock card quantity to trace and error
- Count all normal stock including scrap, residuals and items on loan.
- To keep stock sheets under control of one supervisor
- Hold record for damaged, deteriorated of issued with out document
- Stock taking should be made in orderly manner.
- When shortage and overages lists are prepared. The rechecking does not reveal discrepancies between the card balance and the physical count
- The inventory sheet should be prepared according to classification of the accounting system
- The stock sheet designed to contain the following information
    - ✓ The stock sheet are numbered
    - ✓ Date of stock taking
    - ✓ Location
    - ✓ Stock number
    - ✓ Description
    - ✓ Unit of stock found
    - ✓ Unit price
    - ✓ Value of stock found
    - ✓ Stock checker's signature
    - ✓ Remarks **(Ethiopian Telecommunication material Management directives)**

2.17 Scrap, Surplus and Obsolete Materials and Equipment

Scrap:- is a term used to describe recyclable materials left over from every manner of product consumption, such as parts of vehicles, building supplies, and surplus materials. Often confused with waste, scrap in fact has significant monetary value.

Surplus Materials and Equipment:- Shall be defined as material, equipment, or parts including capitalized equipment, which are in excess of normal operating or repair requirements.

Obsolete Materials and Equipment:- Shall be defined as material, equipment, or parts, which are no longer useable in the service for which they were purchased and which cannot be utilized safely or economically or any other purpose.

2.18 Methods of Inventory Valuation

Inventory has to be properly valued based on the following reason:-

a. **Determination of income**

The inventory valuation is mainly exterminating the true income earned by business during a particular period. Gross profit is the excess of sales over cost of goods sold Cost of goods sold is a curtained by adding opening inventory to and deducting closing inventory from purchases.

b. **Determination of financial position**

The inventory at the end of a period is to be shown as current asset in the balance sheet of the organization incase the inventory is not properly valued the balance sheet will not disclose the correct financial position of the business **(Maheshwari D., 1997:267)**

Traditional cost

Traditional cost of inventories is the aggregate of cost of purchase, costs of conversion and other costs incurred in bringing the inventories to the present location and condition. Thus traditional cost includes not only all the costs

incurred for bringing and making them fit for use in production but also the price paid for acquisition of inventories or for sale. Example the transportation cost, duties paid, insurance in transit, manufacturing expenses, wage paid or manufacturing expenses incurred for converting raw materials into finished products. However, selling expenses such as advertisement expenses, or storage costs should not be included. Inventory costing method is not based on physical flow of goods on the shelf's. For most organizations, the actual physical flow of goods in First-in-first-out (FIFO). Regardless of physical flow of goods, an organization can use any of the inventory costing methods. Generally Accepted Accounting Principles (GAAP) only requires that the inventory costing method used be rational and systematic, **(Short & W., 1990: 309)**

As they stated that, an organization is required to use the same inventory costing method for all inventory items and no particular justification is needed for the selection of one or more of the acceptable methods. However, a change in method is significant needs special disclosures in the notes to the financial statement. These methods are weighted over age inventory costing, first-in-first-out (FIFO) inventory method, last-in, first-out (LIFO) inventory costing method, and specific identification inventory costing method.

2.18.1 Weighted-Average Inventory method

The weighted average costing method is usually justified because it is simple to apply and is less subject to income manipulation. The inventory is priced on the basis Average prices paid for the goods.

The weight average method requires computation of the weight average unit costs of the goods available for sales or service. In a periodic inventory system the computed unit cost is multiplied by the number of units in inventory to derive the total cost of ending inventory cost of good sold is determined by subtracting the ending inventory amount from the amount of goods available for sale/service, **(Short G&W, 1990: 309)**

For example the weighted method would be applied as using a periodic inventory system.

Computation of the weighed average unit cost for the period

$$\frac{\text{Total goods available for sale at cost}}{\text{Total goods available for sale unit}} = \text{weighed average cost per unit for the period}$$

Generally, the weighted average cost method is representative of costs during the entire period including the beginning inventory rather than of the cost only at the beginning end, or at one point during the period. Representative costs are reported on both the balance sheet (ending inventory) and the income statement (cost of goods sold).

2.18.2 Firs-in, First-out inventory costing method

The first-in, first-out method frequently called (FIFO) assumes that the oldest unit i.e. the first cost in) are the first unit sold (i.e. the first cost out). The units in the beginning inventory are treated as if they were sold first. Then the units from the first purchase are sold next, and soon until the units left in the ending inventory all comes from the most recent purchases. FIFO allocates the oldest unit costs to cost of goods sold and the most recent unit cost the ending inventory.

Often, FIFO is justified because is consistent with the actual physical flow of goods. In most business the first goods placed in stock are the actual physical flow of goods. **(Short G. & Welsch, 1990: 310).**

2.18.3 Last-in, first-out inventory costing method

The Last-in, first-out method, often called LIFO; assume that the most recently acquired goods are sold first. Regardless of the physical flow of goods, LIFO treated the cost of the most recent units purchases as cost of goods sold. Therefore, the unit costs of the banging inventory and the earlier unit cost of beginning inventory and the earlier purchase remain in the ending inventory. The LIFO flow assumption is the exact opposite of the FIFO flow assumption.

LIFO can be manipulated by buying or not buying or not buying goods at the end of period when unit costs have changed. By this action, it is possible to manipulated costs of goods sold and hence reported income on the income statement LIFO cost of good sold based on the latest unit cost, which is realistic measurement of the current cost of items that where sold. In contrast, on the balance sheet the ending inventory amount is based on the oldest unit costs, which may be an unrealistic valuation.**(Short G. & W., 1990: 310-11)**

CHAPTER THREE

3. Data Presentation Analysis and Interpretation

3.1 Introduction

This chapter is intended to provide information gathered from the primary and secondary source as well as based on the researcher's observation from the organization. The primary data is a combination of questionnaire and interview, while the secondary data is obtained from the organization's unpublished documents.

The survey was conducted to assess the aspects of inventory management practices at Ethiopian Telecommunication Corporation. The aim of the assessment is going to provide the analysis and interpretation of the questionnaire's and interview data. The questionnaires were given to 40 respondents of the organizations employee. Additionally, interview was made with 6 selected employees of the organization.

Table 1 General Characteristics of the respondents

Item	Response	Frequency	Percentage
Age	18-30	16	40
	31-40	10	25
	Above 40	14	35
	Total	**40**	**100**
Sex	Male	24	60
	Female	16	40
	Total	**40**	**100**
Educational level	12 completed	5	12.5
	Diploma	12	30
	1st Degree	23	57.5
	Above 1st Degree	-	-
	Total	**40**	**100**
Work experience	1-5 years	21	52.5
	6-10 years	12	30
	11-15 years	5	12.5
	> 15 years	2	5
	Total	**40**	**100**

Source: Survey 2010

3.2 General background of the respondents

According to the above table 1, out of the total 40 respondents who respond to the questionnaire 16(40%) of them have an age range from 18-30 years, 10(25%) of the other ones have an age range from 31-40 years. Apart from this 14(35%) of the remaining one have an age greater than 40 years. This implies that the corporations have adult potential workers.

According to the above table out of the total 40 respondents 24(60%) of them are males but, 16 (40%) of the remaining one are females this implies that the corporation have more of male employees in its inventory management department.

According to the above table the educational status of the respondents is characterized that out of the total 40 respondents 5(12.5%) of them are 12^{th} completed, 12(30%) of the other ones are diploma holders, 23(57.5%) of the remaining ones are degree holders this indicates that the educational status of the corporations employees is some what good.

With regard to the work experience of the employees out of the total 40 respondents 21(52.5%) of the respondents have a work experience from 1-5 years. 12(30%) of the other have a work experience that amounts for 5 years that is 6-10 years, the other 5 and 2 respondents have a work experience 11 -15 years and greater than 15 years respectively.

Table 2 Performance indicator of the inventory management

Respondents						
Item	Yes		No		Total	
	f	Percentage	*f*	Percentage	*f*	Percentage
Do you have good interdepartmental relation ship	14	35	26	65	40	100
Do you uses improved inventory system to handle its inventories	16	40	24	60	40	100
Do you have good relationship with its suppliers	14	35	26	65	40	100
Is the organization evaluate system on its time	10	25	30	75	40	100
Is the organization identifies its annual consumption	8	20	32	80	40	100

Source: Survey 2010

3.3 Performance indicators of the inventory management in the corporation

Ones organization inventory management can indicate in different way. But the common one, are type of inventory, period of inventory and other related ones.

According to the above table 2, the researcher takes the above performance indicator to assess the corporation inventory management. These include interdepartmental relationships, using improved inventory system, having good relationship with its suppliers, evaluation of its system on time, and identifying the annual consumption of the corporation. Based on this concerning to the first indicator that is having good interdepartmental relationship out of the total 40 respondents 14(35%) of them agree with the existence of good interdepartmental relationship in the inventory management departments of the corporation but, 26 (65%) of the remaining one did not agree with the idea. This implies that the inventory management department of the corporation needs to improve its departmental relationship to improve its management status.

Concerning to the second indicator that is using inventory system to handle its inventory out of the total 40 respondents 16(40%) of them agrees with the existence of the indicator in the inventory management department of the corporation but, 24(60%) of the other ones did not agree with the stated idea. This implies that the inventory department of the corporation still needs to employ more modern inventory management system method to manage its huge inventory.

Concerning to the third idea that is having good relationship with its suppliers, 14(35%) of the respondents agrees with the existence of good relationship between the inventory management system and its inventory suppliers. But 26 (65%) of the remaining ones did not agree with the existence of the stated performance indicator in the inventory management department of the corporation. This implies that the inventory management department of the corporation did not have a good relationship with its suppliers.

Timely evaluation of the inventory management system is also taken as a one performance indicator in the inventory management department of the corporation. on this side out of the total 40 respondents 10(25%) of them agrees with the existence of timely evaluation of the inventory system but, 30(75%) of them did not agree with its existence. This indicates that the inventory system of the corporation did not evaluate on time and this can cause a big failure to the inventory system because timely evaluation is a critical issue to identify strength and weakness of the item and to take a measurable decision based on the out put.

On the other hand, identification of annual consumption of the corporation is also taken as one indicator to the status inventory management department of the corporation. According to this 8(20%) of the corporations agree with the existence of that annual consumption identification but 32(80%) of the remaining did not

agree with its existence. This implies that the departments have poor performance in identifying its annual consumption amounts.

3.4 Techniques of inventory valuation

Table 3 The types of inventory valuation method the corporation commonly use

Item	Response	Frequency	Percentage
Which type of inventory valuation method does the corporation commonly use?	FIFO method	26	65
	LIFO method	12	30
	Weighted average method	2	5
	Other	-	-
	Total	**40**	**100**

Source: survey 2010

According to the above table 3, there are three inventory management systems that implement in the corporations inventory department these are FIFO LIFO, weighted average method. Based on this, out of the total 40 respondents 26(65%) of them agrees with the commonly used FIFO method, 12(30%) of the other one said the commonly used inventory method is LIFO method 2(5%) of the other ones also response the commonly used one is weighted average method. This implies that the inventory of department widely implement FIFO method.

Table 4 Effectiveness of implementation the corporation guideline

Item	Response	frequency	Percent
Effectiveness of implementation the corporation's guideline	Good	8	20
	Fair	12	30
	poor	20	50
	Total	**40**	**100**

Source: Survey 2010

According to the above table 4, the inventory department have implemented the corporation guidelines based on this, 8(20%) of the respondents respond that the effectiveness of the implementation is good and 12(30%) of the major respondents respond that the effective implementation of the corporations, procedure in inventory management of the corporation is fair, but 20 (50%) of the remaining respondents respond that the implementation level of the inventory procedures of the corporation by the inventory department of the corporation is poor. This implies that, even if there are good manners and procedures of inventory in the corporation manuals, its practical implementation is poor.

Problems associated with inventory management of ETC inventory management, in its nature have different problems that relates with cost, time and supply side.

Table 5 Level of the problem associated with inventory management

Items	Level of the problem							
	High		Medium		Low		Total	
	f	% age	*f*	% age	*f*	% age	*f*	% age
High cost of inventory management	10	25	18	45	12	30	40	100
Poor managerial efficiency	18	45	12	30	10	25	40	100
Poor encoding of material identity	10	25	18	45	12	30	40	100
High misplacement	14	35	16	40	10	25	40	100

Source: Survey 2010

According to the above table 5, the main determinants that face the inventory management of the corporation are high cost of inventory management, poor managerial efficiency, poor encoding of material identity and high misplacement. Based on this, with regard to the high cost of inventory management problem out of the total 40 respondents 10(25%) of them responds with the high level of the problem in the department. 18(45%) of them respond medium level, 12(30%) of

them respond low level of high cost of inventory management. About managerial efficiency, 18(45%) of respondents respond that, on high level of the problem, 12(30%) of them respond that medium level and 10(25%) of them respond low level of poor managerial efficiency.

With regard to the problem of poor encoding of material identity 10(25%) of the respondents respond that this problem faces highly in inventory management department of the corporation and 18(45%) of the other ones agree with medium level determination of the problem but, 12(30%) of the respondents respond that the impact of the problem to the inventory department status of the corporations inventory system is low. This indicates that the problem is less to the performance of the inventory department of the corporation.

High misplacement is also taken as a problem to the inventory department of the corporation. According to this, 14(35%) of the respondents agrees with the idea that the stated problem is highly existed and 16(40%) of the other respondents respond that the problem is medium, but 10(25%) of the remaining respondents respond that the stated problem have low impact to the status of the inventory. This implies that, the inventory system of the corporation is influenced through high misplacement problem.

3.5 Analysis of interview held with ETC warehouse employees

According to the interview held with ETC warehouse employees, Ethiopian Telecommunication Corporation makes inventory once in a year always in June 30 at a given inventory period.

With regard to determining maximum inventory the respondents said that corporation's inventory department does not have maximum or minimum inventory stock. Only in some specific items such as A4 papers, different vouchers & forms (for internal use) and billing papers. They make a standard

maximum and minimum inventory of stock level with collaboration to stock control section.

Concerns to cost component for the inventory the respondents respond that the main cost components are time cost, holding cost the most common cost. That is holding cost is increase in terms of days and months, when high materials in the store is high much more inventory taking cost is also high. Additional payment cost is also the cost that need for additional time work for supervisors and labor wages.

Concerning to rid of obsolete, surplus and scrap materials in context to the corporation, obsolete and scrap material are occurred in all section of stores. Namely in network material, building and electric material, hand tools equipment, office furniture, stationary, power and satellite, and in exchange (PBX) material stores. Scrap materials for the corporation from the manufacturing section, metal, wood work, cement product, materials work shop peace of woods and metals fail of raw materials and sub standard materials. Obsolete (outdated) materials are such as old telephone, operator machine, old phones, tower equipments, old typewriters, electrical typewriter, old fax machines, and others.

Mechanisms that the corporation uses to rid of obsolete, surplus and scrap materials are: according to the respondents, the corporation formed three teams namely material and stock control, warehouse administration and manufacturing. Those teams work at Akaki Cable and Jimma Ber pool stores. Some materials such as office furniture and computers donate to schools, and for different institutions. Others sell by auction/tender to rid those materials but the formed committees do not work properly to solve the existed problem because the formed committees do not give any consideration to collect those materials as needed.

Concerning to inventory planning the corporation does not use specific inventory forecasting method, rather it uses the following inventory planning system.

Management materials are purchased under working order base for example work order 02/088/46 for this specific work order it plans the necessary matter. Based on this procuring of items will be performed, the inventory does not plan for items therefore, it hold much inventories. The other system is project materials base (consumption base forecast) this is purchasing conduct base on the need of the project. For example for ALCATEL, NOKIA, ERICSON, and ZTE projects and so on. The other is based on stock item which forecasted only for stock purpose but the corporations have to use different plans in the future time.

According to the interviewed respondents, the corporation does to hedge against increase of price is, when materials are needed collect peroforma to purchase those items the collected peroforma have dead lines or amendment and the supplier who deliver materials with discount is acceptable.

The mechanisms to avoid inventory shortage in the corporation are material register planning, reorder point for stationary materials the company uses a periodic inventory recording system that records twice in a year at that time close manual inventory recording system is implemented.

According to the interviewed respondents of the satisfaction of user departments based in the right quantity, in the right quality, at the right time and at the right place are medium satisfaction.

CHAPTER FOUR

4. Summary of findings, Conclusion and recommendation

This part of the paper deals with the summary of findings, general conclusions and recommendation.

4.1 Summary of findings

According to the analysis part of the paper majority of 60% of the respondents are males, 40% of them have also an age range 18-30 with regard to their educational status majority or 57.5% of the respondents are degree holders. Concerning to the existence of performance indicators in the corporation inventory department to do of them agrees with the non existence of good interdepartmental relation ship 65% of the other ones agrees with non existence of good relation ship of the corporation with its suppliers.

Concerning to the inventory valuation methods that implemented in the department 65% of them responds the dominant one FIFO method the respondents also respond on the effective implementation of guidelines, method in the department based in this majority of 50% of them agrees with the poor effectiveness of its implementation.

The respondents also respond their idea on the main determinants of the corporation inventory department based on this 25% of the respondents agree with existence of high cost of inventory management. 45% of the others respond with medium level of the problem. On poor encoding of material identity in the inventory of department of the corporation 40% of the respondents also respond with the existence of medium level of high misplacement problem in the inventory department of the corporation.

4.2 Conclusions

Different organizations have different structured performed and organized inventory department based on their type, nature and amount. Based on this, Ethiopian Telecommunication Corporation inventory looks like as with low level of interdepartmental relationship, have medium level improved inventory system to handle its inventories and has no good relationship with its supplier, poor level of evaluation of its system on time and low level of capacity to identify its annual consumption.

There are different techniques in inventory valuation system of an organization the most common ones are FIFO, LIFO and weighted average method. Ethiopian Telecommunication Corporation implements FIFO method in its most activities but FIFO method the one method that can take into account by the corporation due to its nature of purchasing system.

The corporations have different manuals and procedures that need to purchase inventory materials for the day to day activity of these corporation, the manuals integrates the right quantity, the right quality, at the right time and at the right place peculiarity but their implementation by the inventory department is very low.

The main problems that face in the inventory department of the corporation are high cost of inventory management, poor encoding of material identity and high misplacement of inventories with medium status.

Planning is the determinant managerial input for the good performance of activity. Inventory planning also needs to implement good inventory technique in the department but, Ethiopian Telecommunication Corporation did not implement forecasting plan instead it uses work order base and other related use.

4.3 Recommendation

As indicated in the conclusion part of the paper, the inventory departments of the corporation have low level of interdepartmental relationship, medium level of using improved inventory methods, low level of evaluation and poor performance in identifying annual consumption. All the stated problems are internal problems that can be solve by the corporation management bodies with out taking additional external cost. So, the corporation should improve interdepartmental relationship through evaluating each department performance, integrate activities, assign stock controller for all stores. As the corporation is the technology corporation, it should implement and improve technological inventory techniques like electronic and automated.

Materials evaluation is a determinant factor for the success or failure for the organization's activity. So, the inventory system of the corporation should evaluate its day to day activity to identify its strength and weaknesses.

Lack of identifying annual consumption results for unnecessary cost such as capital tied up, excessive holding cost, obsolesces and the like. Therefore, the corporation should control these kinds of problems by knowing its annual consumption forecast, by controlling inventory sheet run out and stock card balance. And also the corporation should change the manual inventory system to technological modern one.

The inventory methods have their own advantages and disadvantages based on this different organization uses different methods of inventory system the corporations should implemented the FIFO but the other two methods have also implemented in inventory terms that relate to their nature like project base purchase should used LIFO.

Implementing the manuals of corporation should control through the departmental heads and general managers of the corporation.

As stated in the conclusion part of the paper, the dominant problems are cost of inventory management, poor managerial efficiency high misplacement of inventories and high encoding problem. These stated problems should improve through creating a committed management and implementing modern technological inventory system in the practice of the department.

The corporation's inventory department should plan its each activities based on forecasting at the beginning of the work year. In this case, specific goals should forecast and their performance should evaluate monthly or quarterly.

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APPENDEX

St. Mary's University College

Interview question for administrative and department heads.

1. How do you control the corporation inventory
    a. Periodically
    b. Perpetually

2. How do you determine the level of maximum inventory?
    _____
    _____
3. What does the cost components of the inventory look like for the past four years?
    a. Ordering cost
    b. Carrying cost
    c. Shortage cost
    d. Purchase cost

4. What mechanisms are there to get rid of obsolete, surplus, and scrap materials?
    _____
    _____

5. What methods of inventory planning are there in the corporation?
    _____
    _____
6. What does the corporation do to hedge against increase of price?
7. What mechanisms of avoiding inventory shortage in use by the corporation?
8. What kind of inventory recording system does the company use?
9. If you have additional comment
10. What does the degree of satisfaction of user departments look like with the availability of materials

	Very High	**High**	**Medium**	**Very Low**	**Low**
In the right quantity					
In the right quality					
At the right time					
At the right place					

Thank you for your cooperative!!

St. Mary University College

Questionnaire on the Assessment of Inventory Management Practices in Central Warehouse in ETC

Dear respondents, this questioner is designed to assist in preparing a senior easy research paper for B.A. Degree in management at St. Mary's University College. It will be used to gather an overview ideas and insights on the assessment of inventory management of central warehouse practices in Ethiopian Telecommunication Corporation.

Your honest, accurate and clear response will be highly appreciated. I would like to express my gratitude and appreciation for devoting your precious time.

Enclosing your name in not necessary.

Make a thick (✓) in the box(s) provided.

Write your answers on the space provided for those questions which have not available choices.

1. Age

   18 – 30 ☐ 31 – 40 ☐ above 40 ☐

2. Sex

   Male ☐ Female ☐

3. Work Position _____

4. How many years experience do you have in ETC?

   A. 1-5 ☐ B. 6-10 ☐ C. 11- 15 ☐ D. Above 15 ☐

5. Education Level

   A. 12 ☐ B. Diploma ☐ C. Degree ☐ D. Master ☐

6. Is there good inter departmental relationship?

   A. Yes ☐ B. No ☐

7. Do you use improved system to handle inventories?

   A. Yes ☐ B. No ☐

8. Does your company has good relationship with suppliers?

A. Yes ☐ B. No ☐

9. Do you feel annual consumption is known?

A. Yes ☐ B. No ☐

10. Which type of inventory method does the Corporation use?

A. FIFO method ☐ B. LIFO method ☐

C. Weighted average ☐

If any other specify _____

_____

11. There are directives issued for explaining the aims and objectives of inventory management activates. In your corporation directives and guidelines are applied or not?

A. Good ☐ B. Fair ☐ C. Poor ☐

12. Do you think the company has an efficient inventory management system?

A. High ☐ B. Medium ☐ C. Low ☐

13. Do you believe that the method you used for conduction inventory is correct and up to date?

A. High ☐ B. Medium ☐ C. Low ☐

14. Is encoding of materials identity of the corporation good?

A. High ☐ B. Medium ☐ C. Low ☐

15. What is the level of high misplacement of materials of the corporation?

A. High ☐ B. Medium ☐ C. Low ☐

Thank you for your co-operative!!

SUBMISSION APPROVAL SHEET

The senior research paper has been submitted to the department of the management in partial fulfillment for the requirements of BA Degree in Management with my approval as an advisor.

NAME: Merga Mekuria

SIGNATURE: _____

DATE OF SUBMISSION: _____

Declaration

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

Name Addisie G/Medhin

Signature _____

Place of Submission Addis Ababa (St. Mary University College)

Date of Submission June 2010

St. Mary University College

Questionnaire on the Assessment of Inventory Management Practices in Central Warehouse in ETC

Dear respondents, this questioner is designed to assist in preparing a senior easy research paper for B.A. Degree in management at St. Mary's University College. It will be used to gather an overview ideas and insights on the assessment of inventory management of central warehouse practices in Ethiopian Telecommunication Corporation.

Your honest, accurate and clear response will be highly appreciated. I would like to express my gratitude and appreciation for devoting your precious time.

Enclosing your name in not necessary.
Make a thick (✓) in the box(s) provided.
Write your answers on the space provided for those questions which have not available choices.

1. Age

   18 – 30 ☐ 31 – 40 ☐ above 40 ☐

2. Sex

   Male ☐ Female ☐

3. Work Position _____

4. How many years experience do you have in ETC?

   A. 1-5 ☐ B. 6-10 ☐ C. 11- 15 ☐ D. Above 15 ☐

5. Education Level

   A. 12 ☐ B. Diploma ☐ C. Degree ☐ D. Master ☐

6. Is there good inter departmental relationship?

   A. Yes ☐ B. No ☐

7. Do you use improved system to handle inventories?

   A. Yes ☐ B. No ☐

8. Does your company has good relationship with suppliers?

A. Yes ☐ B. No ☐

9. Do you feel annual consumption is known?

A. Yes ☐ B. No ☐

10. Which type of inventory method does the Corporation use?

A. FIFO method ☐ B. LIFO method ☐ C. Weighted average ☐

If any other specify _____

_____

11. There are directives issued for explaining the aims and objectives of inventory management activates. In your corporation directives and guidelines are applied or not?

A. Good ☐ B. Fair ☐ C. Poor ☐

12. Do you think the company has an efficient inventory management system?

A. High ☐ B. Medium ☐ C. Low ☐

13. Do you believe that the method you used for conduction inventory is correct and up to date?

A. High ☐ B. Medium ☐ C. Low ☐

14. Is encoding of materials identity of the corporation good?

A. High ☐ B. Medium ☐ C. Low ☐

15. What is the level of high misplacement of materials of the corporation?

A. High ☐ B. Medium ☐ C. Low ☐

Thank you for your co-operative!!

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Tele Negarit, volume 44 No. 01 September 2007.

St. Mary's University College

Interview question for administrative and department heads.

1. How do you control the corporation inventory
    a. Periodically
    b. Perpetually

2. How do you determine the level of maximum inventory?
    _____
    _____

3. What does the cost components of the inventory look like for the past four years?
    a. Ordering cost
    b. Carrying cost
    c. Shortage cost
    d. Purchase cost

4. What mechanisms are there to get rid of obsolete, surplus, and scrap materials?
    _____
    _____

5. What methods of inventory planning are there in the corporation?
    _____
    _____
6. What does the corporation do to hedge against increase of price?
7. What mechanisms of avoiding inventory shortage in use by the corporation?
8. What kind of inventory recording system does the company use?
9. If you have additional comment
10. What does the degree of satisfaction of user departments look like with the availability of materials

	Very High	**High**	**Medium**	**Very Low**	**Low**
In the right quantity					
In the right quality					
At the right time					
At the right place					

Thank you for your cooperative!!

APPENDEX

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Inventory management is essential for all organizations. However, it's efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of the stock out, ordering or purchase, setup and the like.

Inventory means (stock of goods). Inventory may mean row materials, work in progresses, maintenance materials, processed and semi processed materials, oil, fuel and lubricants as well as finished and semi finished goods. They may be either in solid, liquid or gaseous form, required for the future use, manly in the production process as incase of finished goods for resale period. The need for this research arises from the existing situation of the Ethiopian Telecommunication Corporation.

1.2 Background of the Organization

The introduction of telecommunication services in Ethiopia dates back to 1894, seventeen years after the invention of telephone technology in the world. The Ethiopian Telecommunications Corporation is the oldest Public Telecommunication Operator (PTO) in Africa. Since its establishment, the corporation has managed to serve the public and the country by providing fast communication services such as land line telephone, wireless telephone technology, rural connectivity, school net, teleconference, internet service and other related services using modern technology.

The corporation's survival depends up on receiving, issuing, supplying and inventory, appropriate stores material management system which can integrate it

with its environment by identifying the opportunities, strength and weakness of its own and offered by the surrounding.

Material management is a basic tool in various organizations because inventory management system is required to plan, organize, direct and coordinate different activities from the point of their beginning to the point of their utilization and disposal. Moreover, it includes activities such as purchasing, inventory control, and store. Therefore, inventory management is necessary to balance materials which are on hand and already used.

This research is focus on assessment of inventory management practices taking place in Ethiopian Telecommunication Corporation.

1.3 Statement of the Problem

Inventory management is essential for all organizations. However, its efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of stock out, ordering or purchase, setup and the like.

Most of the time, decide to have over stock inventory results in unnecessarily problems such as capital tied up, excessive carrying cost and the like.

- The Balance in the Inventory sheet run out is incorrect because of its bulk nature of materials and issue of incorrect quantity.
- The Stock Balance in the store and the Stock Card Balance are not the same and posting might be done in the wrong card
- Materials are stored for the long period and it leads to:-
  - Obsolesce,
  - Losing material identity their stock number might not be there,
  - Difficulty during inventory due to misplacement.

1.4 Basic research questions

Thus, from the identified problem this research try to address the following research questions.

- What does the inventory management practice of ETC look like?
- What inventory system ETC uses?
- What techniques are being used to determine annual consumption in ETC?
- What are the internal controls over inventory and stockholding procedure of the corporation?
- What problems are encountered in relation to inventory management in ETC?

1.5 Objectives of the Study

1.5.1 General objectives

The general objective of the study was to make an assessment of the inventory management practice of Ethiopian Telecommunication Corporation, so as try to show how to improve its performance.

1.5.2 Specific objective:-

- To assess the inventory management practice of ETC,
- To examine the type of inventory system ETC uses,
- To identify the techniques that is used ETC in exploring its annual consumption,
- To identify the internal control over inventory and stock holding procedures of the corporation,
- To identify the main problems encountered in relation to inventory management of ETC.

1.6 Significance of the study

- This study will have significant important regarding how maximum and minimum levels of stock are kept at their optimum lot, in ETC.

- How a good inventory management can improve the provision of materials when they are needed.
- How a well-structured storage system results in an efficient inventory reporting, which can facilitate accurate provision of information for the corporation's financial statement and management decisions.
- Regarding to pin point the possible solution to overcome the already existed problem.

1.7 Scope of the study

The scope of the research is delimited to the ETC inventory management system practices at the central warehouse level. The study does not cover inventory management practices in the regional warehouses.

1.8 Limitation of the study

Even though the intention is to investigate the problem of inventory management practices of Ethiopian Telecommunication Corporation, the researcher did not include regional warehouses due to time and financial resource.

1.9 Research Design and Methodology

1.9.1 Research Design

To asses the problem stated in the study, the researcher used the descriptive design method.

1.9.2 Population and sampling technique

The researcher used sampling unit selected from employees of ETC at central warehouse. The total populations are 141 (one hundred forty one). Among the total population for 40 (forty) employees questioner were given chance by using a non-probability convenience sampling method and interview were held with 6 (six) warehouse employees in order to get the right persons who are more concerned to the subject matter.

1.9.3 Types of data used

Types of data were both primary and secondary data. Primary data was collected from employees of the corporation and secondary data was collected from books, documents, and company reports to support the study.

1.9.4 Methods of data analysis

The collected data was analyzed using descriptive analysis techniques that were presented by tables. The study depends mainly on qualitative methods of data analysis as the project data sources are dominantly qualitative ones. Thus, for those data collected through interview and documentation review descriptive analysis is performed.

1.10 Organization of the study

The study is organized in to four chapters. The first chapter deals with introduction, the second chapter deals with related review of the study, the third chapter describes data presentation, analysis and interpret the general overview of inventory management activities and provides data analysis and finally the fourth chapter contains summary, conclusion and recommendation.

CHAPTER TWO

2. REVIEW OF RELATED LITRATURE

2.1 Definition of Inventory

Different authors define inventory management in different ways some of these are: -

Inventory can be defined as "Items held to ensure smooth plant operation, improve customer service, attain lot-size economies, or overcome timing or distance differences between operations. Overall objective (as with any investment): is to improve company's return on investment." **(Liman, 1981:191)**

Although inventories are classified in many ways, the following classification is convenient for use in further discussion of the topic:-

2.1.1 Production inventories:- Row materials, parts and components, which enter the firm's product in the production process. These may consists of two general types.

a. Special items manufactured to company specifications and

b. Standard industrial items purchased "off the shelf"

2.1.2 MRO inventories:- Maintenance, Repair, and Operating supplies which are consumed in the production process but which do not become part of the product.

2.1.3 In process inventories:- Semi finished products found at various stages of the production operation

2.1.4 Finished goods inventories:- completed products ready for shipment **(Dobler, 2001:519)**

2.2 Inventory Management

The inventory management activity is concerned with the planning and control of inventories. There are two general types of inventory. **(Edward M., 1997: 281)**

1. Dependent demand inventory and
2. Independent demand inventory

Dependent demand inventory:- Is made up of inventory items that are consumed with in an organization to produce a finished product.

Independent demand inventory:- Comprises inventory items consumed by customer's external to the organization.

2.3 Inventory control

The technique for ensuring availability of materials, which at the same time, holds in check, generally through a system, the tending to hoard larger amount of stock than is necessary. Citation

2.4 Inventory analysis:-

There are various types of analysis for different resource especially for control purpose one has to analyze various data. Analytical methods are useful in defining problems in order to strike at a solution.

Analysis is the first step for effective inventory control. Then we classify the items in to their importance experience has shown that relatively small portion of the items in the inventory accounting for a large portion of the value of the inventory investment.

2.5 Purposes of Inventory

All firms including just in time (JIT) operations keep a supply of inventory for the following reasons.

1. **To maintain independence of operations:-** A supply of materials at a work center allows that center flexibility in operations for example because there are for making each new production setup, this inventory allow management to reduce the number of setups.

Independence of workstations is desirable on assembly lines as well. The time that it takes to do identical operations will naturally vary from one unit to the next. Therefore, it is desirable to have a cushion of several parts with in the workstation so that shorter performance times can compensate for longer performance time. This way the average out put can be fairly stable.

2. **To meet variation in product demand:-** If the demand for the product is known precisely, it may be possible (though not necessarily economical) to produce the product to exactly meet the demand. Usually, however, demand is not completely known, and a safety or better stock must be maintained to absorb variation.
3. **To allow flexibility in production scheduling:-** A stock of inventory relieves the pressure on the production system to get the goods out. This causes longer lead times, which permit production planning for smoother flow and lower-cost operation through larger lot-size production. High setup costs, for example, favor producing a larger number of units once the setup has been made.
4. **To provide a safeguard for variation in raw material delivery time:-** When materials are ordered from a vendor, delays can occur for a variety of reasons a normal variation in shipping time, a shortage of material at the vendor's plant causing backlogs, an unexpected strike at the vendor's plant or at one of the shipping companies, a list order, or a shipment of incorrect or defective material.

5. **To take advantage of economic purchase order size:-** There are costs to place an order labor, phone calls, typing, postage, and so on. Therefore, the larger each order is the fewer the order that need be written. Also, shipping costs favor larger orders the larger the shipment, the lower the per-unit cost. **(Robert Jacbs, 1998: 513-515)**

2.6 The functions of inventories

Examining the functions of inventory clearly shows that they are the result of many interrelated decisions and polices within an organization as a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. (In the long term, of courses, all inventories are controllable). The following classification of inventory functions reveals the multipurpose roles played by inventories. **(Fraser Johnson, 2002: 204)**.

2.6.1 Transit or pipeline inventories:

These inventories are used to stock the supply and distribution pipelines linking an organization to its suppliers and customers as well as internal transportation points. They exist because of the need to move material from one point to another.

2.6.2 Cycle inventories:

These stocks arise because of management's decision to purchase, produce, or sell in lots rather than individual units or continuously. Cycle inventories accumulate at various points in operating systems. The size of the lot is a trade off between the cost of holding inventory and cost of marking more frequent orders and/or set-ups.

2.6.3 Buffer or uncertainty inventories or safety stocks:

These stocks exist as a result of uncertainties in demand or supply. Finished goods buffers protect against unforeseen demand or production failures.

2.6.4 Anticipation or certainty inventories:

These stocks are accumulated for a well-defined future need. Reasons for anticipation stocks may include strikes, weather, shortages, or announced price increases.

2.6.5 Decoupling inventories

The existence of decoupling inventories at major process linkage points makes it possible to carry on each side of the point relatively independently of each other.

Why classify inventories by function

By examining the functions of inventory, it is clear that they are the result of many interrelated decisions and polices with in an organization a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. In the long term, of courses, all inventories are controllable. **(Fraser Johnson, 2002: 207)**

2.7 The forms of inventory

The five commonly recognized forms of inventories are:

1. Raw materials purchased parts, and packaging;
2. Work in process;
3. Finished goods;
4. Maintenance, repair, and operating supplies (MRO)
5. Resale item.

For resource industries, service organizations, and public organizations, MRO inventories may be substantial.

2.8 Inventory function and form framework

Combining the five forms and five functions of manufacturing inventory gives the 25 types of inventory that make up the inventory profile of an organization. Presented with some of the managerial decision variables affecting each type. Not all inventory types will be present to the same extent in each organization; indeed some may be completely absent. The 25 types make inventory control a more complex but a more easily focused task. **(Fraser Johnson, 2002:208)**

2.9 Efforts of reduce inventories

Because of the high cost of carrying inventory, many systems have been developed to reduce stocks. Japanese manufactures have spearheaded such efforts in mass production industries. Suppliers often located very near the plant deliver items directly to the point of use in the plant at very frequent intervals. The uses of kabanas and variety of just-in-time inventory management schemes have revolutionized manufacturing thinking about all forms of inventories. Nevertheless, it is useful to understand the nature and costs of inventories so that appropriate polices and procedures can be developed for specific organizational needs.

Many purchases cover repetitive items often-held in inventory. Thus: inventory policy has a great influence on purchase quantity decisions. The question of how much to order, when, or how much to carry in stock are key decisions subject to continuous improvement examination along with the focus on quality and customer, employee, and supplier satisfaction. It is important in making delivery, inventory, or purchase order size decisions to understand why inventories exist and what they serve. **(Fraser Johnson 2002: 201)**

2.10 Key questions for the supply decision-maker

Should we:

- Change the way we forecast?
- Initiate a stockless purchasing system?
- Purchase the items differently?

How can we

- Improve our inventory management?
- Obtain supplier cooperation for JIT?
- Make lot-sizing decisions better?

Continuous improvement; speed to market; customer, employee, and supplier satisfaction; and global competitiveness require dedication to productivity and value-added activities. These organizational goals drive management attitudes to quality, quantity, and delivery, with profound impact on the acquisition process. With respect to quantity and delivery considerations, the most telling evidence comes from inventory reduction and the drive to increase frequency of deliveries, while decreasing the amount delivered at one time. Accompanying efforts in set up time reduction, just-in-time (JIT) system, stockless systems, order cost reduction, EDI and e-commerce are all part of the same drive.

2.11 Factors affecting quantity and delivery decisions

The decisions of how much to acquire and when, logically follow classification of what is required; the natural response is to say. “Buy as much as you need when you need it. “Such a simple answer is not sufficient, however.

First managers must make purchase decisions before, often a long time before, actual requirements are known. Therefore, they must relay on forecasts, not only of future demand, but of also lead times, prices, and other costs. Such forecasts are rarely, if ever, perfect.

Second, there are costs associated with placing orders, holding inventory, and running out of materials and goods.

Third, materials may not be available in the desired quantities without paying a higher price or delivery charge.

Forth, suppliers may offer reduced prices for buying larger quantities.

Fifth, shortages may cause serious consequences. **(Fraser Johnson 2002: 194)**

2.12 Main types of inventory cost

The relevance of cost elements in a given situation depends on the decisions to be made. Many costs remain fixed when the order size of only one item is doubled, but the same costs may well become variable when 5,000 items are under consideration. The main types of inventory costs are:- (Fraser Johnson 2002: 202)

1. Carrying costs
2. Stock out costs
3. Ordering or purchase costs
4. Setup costs

2.12.1 Carrying costs:-

These include handling charges; the costs of storage facilities or ware house rentals; the costs of equipment to handle inventory; storage labor, and operating costs, insurance premiums, breakage, pilferage, obsolescence, taxes, and investment or opportunity costs. In short, any cost associated with having, as opposed to not having, inventory is included.

The cost to carry inventory can be very high, for e.g. recent estimates of the annual cost to carry production inventory ranged from 25 to 50 percent of the value of the inventory:

There are several methods for calculating inventory carrying costs, the basic elements are:

1. Capital costs,
2. Inventory service costs,
3. Storage space costs, and
4. Inventory risk costs.

Once the firm has estimated its carrying costs as a percentage of inventory value, annual inventory carrying costs can be calculated as follows:

(Carrying cost per year + (average inventory value) x (Inventory carrying cost as a % of inventory value)

Average Inventory value = (material unit cost) x (average inventory in units) **(Liman, 1981: 185).**

2.12.2 Stock out cost

These are the cost of not having the required parts or materials on hand when and where they are needed. They include lost contribution on lost sales (both present and future) change over costs necessitated by the shortage, substitution of less suitable or more expensive parts or materials, rescheduling and expediting costs, labor and machine idle and so on. **(Liman, 1981: 185).**

2.12.3 Ordering or purchase costs

These include the managerial, clerical, material, telephone, mailing, fax e-mail, accounting, transpiration, inspection, and receiving costs associated with a purchase or production order. **(Liman, 1981: 185-186).**

2.12.4 Setup Cost

These refer to all the costs of setting up a production run. Setup costs may be substantial. They include such learning-related factors as early spoilage and low production output until standard rates are achieved as well as the more common considerations, such as setup employee's wages and other costs, machine downtime, extra tool wear, parts (and equipment) damaged during setup, and so on.

How is it calculated?

The order points is based on the expected usage during the lead-time, that is during the time it takes for the new order to be written up, ordered, and received.

Considering L = Lead time

R = Annual Demand

The recorder point, p, is the lead-time, L, times daily demand

$$P = \frac{LR}{360}$$

What is an order point?

It is the point at which a replenishment order is placed, so as to prevent a run-out of stock while waiting for the replenishment order to come in.

Lead Time

The time interval needed to complete a portion or all of the activities in a replenishing cycle. It includes the time to identify a replenishment requirement, process the order, and receive the item in stock, ready for use. **(Liman, 1981:190)**

2.13 When to place an order

The "when to order" point is determined by the expected demand during the time it takes (called the "lead time") for the material to be ordered and received. The expedited demand (or the lead-time itself) may fluctuate: safety stock can be maintained to protect against such problems. **(Liman, 1981:33)**

Economic Order Quantity

Unlike lot-for-lot ordering, which uses actual period demands; other lot sizing model depend on demand forecasts, which re intern, often based on past average demand. The economic order quantity (EOQ) is such a model, and may be appropriate for management of a single inventory item.

EOQ is the number of units of a single item that should be planned whenever an order is placed so as to minimize the inventory management costs of that single item during a given time period, usually one year. **(Shniderjans, 1997:421)**

It is suitable for construction materials of Ethiopian Telecommunications Corporation.

When not to apply the EOQ approach

There are circumstances where the EOQ approach cannot be used, or must be adjusted to the exigencies of the business. Examples include; job shop operations; production cycling; erratic demand conditions; evaluation of price discounts; and space, capital and production capacity restrictions.

It is not appropriate for fixed items like furniture instruments, tools, and equipment of Ethiopian Telecommunications Corporation.

In situations where custom designed, randomly ordered, or low volume products are involved, a make-to-order approach is often most appropriate.

In addition, where detailed production planning necessarily dictates the basic timing and quantities of components, EOQ is a secondary consideration to the storage capacity, production, and material flow requirements **(Fraser Johnson, 1981: 60)**

2.14 Managing Independent Demand Economic Order Quantity models

2.14.1 Fifes Quantity Models

The objective of the model is to minimize the total annual costs. In the very simplest form of this model, annual demand (R), variable order or set up cost (S), Lead time (L), and holding cost percentage (K), are all constant now and in the future.

When inventory drops to the reorder point (P), a fixed economic order quantity (A) is ordered, which arrives after lead-time (L). Back orders and stock outs are not allowed.

Total cost is given as purchase cost, plus set up or order cost, plus holding cost, or:

$$TC = \frac{RC + RS + QKC}{A \qquad 2}$$

The minimum value of

Q (also known as the EOQ) is found at:

$$EOQ = \sqrt{\frac{2DCO}{Q}}$$

2.14.2 Fixed period model

In fixed period models, orders are placed only at review time. The inventory level must, therefore, be adjusted to prevent stock outs during the review period and lead-time.

2.15 Just-in-time (JIT) Inventory management system

The just-in-time (JIT) system is a Japanese philosophy that is used to manage all types of inventory, purchasing and production function in an organization.

The goal of JIT inventory system is to eliminate or reduce all types of inventory (raw materials, work-in process, and finished goods). Why do organizations want to eliminate inventory? By eliminating inventory, the cost of maintaining that inventory is eliminated as well. This is accomplished by using the following logic: **(Shniderjans, 1997: 316)**

1. Acquire raw materials just in time to have them manufactured into component parts.
2. Manufacture component parts just in time to have them assembled into finished products.
3. Assemble finished products just in time for their consumption in the market place.

2.16 Procedures for inventory taking

- All materials are listed in accordance with stock numbers.
- Record and post all documents and last receipt and issue vouchers
- Discontinue further posting until the result of stock taking is entered
- Verify bin card quantity against stock card quantity to trace and error
- Count all normal stock including scrap, residuals and items on loan.
- To keep stock sheets under control of one supervisor
- Hold record for damaged, deteriorated of issued with out document
- Stock taking should be made in orderly manner.
- When shortage and overages lists are prepared. The rechecking does not reveal discrepancies between the card balance and the physical count
- The inventory sheet should be prepared according to classification of the accounting system
- The stock sheet designed to contain the following information
    - ✓ The stock sheet are numbered
    - ✓ Date of stock taking
    - ✓ Location
    - ✓ Stock number
    - ✓ Description
    - ✓ Unit of stock found
    - ✓ Unit price
    - ✓ Value of stock found
    - ✓ Stock checker's signature
    - ✓ Remarks (Ethiopian Telecommunication material Management directives)

2.17 Scrap, Surplus and Obsolete Materials and Equipment

Scrap:- is a term used to describe recyclable materials left over from every manner of product consumption, such as parts of vehicles, building supplies, and surplus materials. Often confused with waste, scrap in fact has significant monetary value.

Surplus Materials and Equipment:- Shall be defined as material, equipment, or parts including capitalized equipment, which are in excess of normal operating or repair requirements.

Obsolete Materials and Equipment:- Shall be defined as material, equipment, or parts, which are no longer useable in the service for which they were purchased and which cannot be utilized safely or economically or any other purpose.

2.18 Methods of Inventory Valuation

Inventory has to be properly valued based on the following reason:-

a. Determination of income

The inventory valuation is mainly exterminating the true income earned by business during a particular period. Gross profit is the excess of sales over cost of goods sold Cost of goods sold is a curtained by adding opening inventory to and deducting closing inventory from purchases.

b. Determination of financial position

The inventory at the end of a period is to be shown as current asset in the balance sheet of the organization incase the inventory is not properly valued the balance sheet will not disclose the correct financial position of the business **(Maheshwari D., 1997:267)**

Traditional cost

Traditional cost of inventories is the aggregate of cost of purchase, costs of conversion and other costs incurred in bringing the inventories to the present location and condition. Thus traditional cost includes not only all the costs

incurred for bringing and making them fit for use in production but also the price paid for acquisition of inventories or for sale. Example the transportation cost, duties paid, insurance in transit, manufacturing expenses, wage paid or manufacturing expenses incurred for converting raw materials into finished products. However, selling expenses such as advertisement expenses, or storage costs should not be included. Inventory costing method is not based on physical flow of goods on the shelf's. For most organizations, the actual physical flow of goods in First-in-first-out (FIFO). Regardless of physical flow of goods, an organization can use any of the inventory costing methods. Generally Accepted Accounting Principles (GAAP) only requires that the inventory costing method used be rational and systematic, **(Short & W., 1990: 309)**

As they stated that, an organization is required to use the same inventory costing method for all inventory items and no particular justification is needed for the selection of one or more of the acceptable methods. However, a change in method is significant needs special disclosures in the notes to the financial statement. These methods are weighted over age inventory costing, first-in-first-out (FIFO) inventory method, last-in, first-out (LIFO) inventory costing method, and specific identification inventory costing method.

2.18.1 Weighted-Average Inventory method

The weighted average costing method is usually justified because it is simple to apply and is less subject to income manipulation. The inventory is priced on the basis Average prices paid for the goods.

The weight average method requires computation of the weight average unit costs of the goods available for sales or service. In a periodic inventory system the computed unit cost is multiplied by the number of units in inventory to derive the total cost of ending inventory cost of good sold is determined by subtracting the ending inventory amount from the amount of goods available for sale/service, **(Short G&W, 1990: 309)**

For example the weighted method would be applied as using a periodic inventory system.

Computation of the weighed average unit cost for the period

Total goods available for sale at cost = weighed average cost per unit for the period
Total goods available for sale unit

Generally, the weighted average cost method is representative of costs during the entire period including the beginning inventory rather than of the cost only at the beginning end, or at one point during the period. Representative costs are reported on both the balance sheet (ending inventory) and the income statement (cost of goods sold).

2.18.2 Firs-in, First-out inventory costing method

The first-in, first-out method frequently called (FIFO) assumes that the oldest unit i.e. the first cost in) are the first unit sold (i.e. the first cost out). The units in the beginning inventory are treated as if they were sold first. Then the units from the first purchase are sold next, and soon until the units left in the ending inventory all comes from the most recent purchases. FIFO allocates the oldest unit costs to cost of goods sold and the most recent unit cost the ending inventory.

Often, FIFO is justified because is consistent with the actual physical flow of goods. In most business the first goods placed in stock are the actual physical flow of goods. **(Short G. & Welsch, 1990: 310).**

2.18.3 Last-in, first-out inventory costing method

The Last-in, first-out method, often called LIFO; assume that the most recently acquired goods are sold first. Regardless of the physical flow of goods, LIFO treated the cost of the most recent units purchases as cost of goods sold. Therefore, the unit costs of the banging inventory and the earlier unit cost of beginning inventory and the earlier purchase remain in the ending inventory. The LIFO flow assumption is the exact opposite of the FIFO flow assumption.

LIFO can be manipulated by buying or not buying or not buying goods at the end of period when unit costs have changed. By this action, it is possible to manipulated costs of goods sold and hence reported income on the income statement LIFO cost of good sold based on the latest unit cost, which is realistic measurement of the current cost of items that where sold. In contrast, on the balance sheet the ending inventory amount is based on the oldest unit costs, which may be an unrealistic valuation.**(Short G. & W., 1990: 310-11)**

CHAPTER THREE

3. Data Presentation Analysis and Interpretation

3.1 Introduction

This chapter is intended to provide information gathered from the primary and secondary source as well as based on the researcher's observation from the organization. The primary data is a combination of questionnaire and interview, while the secondary data is obtained from the organization's unpublished documents.

The survey was conducted to assess the aspects of inventory management practices at Ethiopian Telecommunication Corporation. The aim of the assessment is going to provide the analysis and interpretation of the questionnaire's and interview data. The questionnaires were given to 40 respondents of the organizations employee. Additionally, interview was made with 6 selected employees of the organization.

Table 1 General Characteristics of the respondents

Item	Response	Frequency	Percentage
Age	18-30	16	40
	31-40	10	25
	Above 40	14	35
	Total	**40**	**100**
Sex	Male	24	60
	Female	16	40
	Total	**40**	**100**
Educational level	12 completed	5	12.5
	Diploma	12	30
	1st Degree	23	57.5
	Above 1st Degree	-	-
	Total	**40**	**100**
Work experience	1-5 years	21	52.5
	6-10 years	12	30
	11-15 years	5	12.5
	> 15 years	2	5
	Total	**40**	**100**

Source: Survey 2010

3.2 General background of the respondents

According to the above table 1, out of the total 40 respondents who respond to the questionnaire 16(40%) of them have an age range from 18-30 years, 10(25%) of the other ones have an age range from 31-40 years. Apart from this 14(35%) of the remaining one have an age greater than 40 years. This implies that the corporations have adult potential workers.

According to the above table out of the total 40 respondents 24(60%) of them are males but, 16 (40%) of the remaining one are females this implies that the corporation have more of male employees in its inventory management department.

According to the above table the educational status of the respondents is characterized that out of the total 40 respondents 5(12.5%) of them are 12^{th} completed, 12(30%) of the other ones are diploma holders, 23(57.5%) of the remaining ones are degree holders this indicates that the educational status of the corporations employees is some what good.

With regard to the work experience of the employees out of the total 40 respondents 21(52.5%) of the respondents have a work experience from 1-5 years. 12(30%) of the other have a work experience that amounts for 5 years that is 6-10 years, the other 5 and 2 respondents have a work experience 11 -15 years and greater than 15 years respectively.

Table 2 Performance indicator of the inventory management

Respondents						
Item	**Yes**		**No**		**Total**	
	f	Percentage	*f*	Percentage	*f*	Percentage
Do you have good interdepartmental relation ship	14	35	26	65	40	100
Do you uses improved inventory system to handle its inventories	16	40	24	60	40	100
Do you have good relationship with its suppliers	14	35	26	65	40	100
Is the organization evaluate system on its time	10	25	30	75	40	100
Is the organization identifies its annual consumption	8	20	32	80	40	100

Source: Survey 2010

3.3 Performance indicators of the inventory management in the corporation

Ones organization inventory management can indicate in different way. But the common one, are type of inventory, period of inventory and other related ones.

According to the above table 2, the researcher takes the above performance indicator to assess the corporation inventory management. These include interdepartmental relationships, using improved inventory system, having good relationship with its suppliers, evaluation of its system on time, and identifying the annual consumption of the corporation. Based on this concerning to the first indicator that is having good interdepartmental relationship out of the total 40 respondents 14(35%) of them agree with the existence of good interdepartmental relationship in the inventory management departments of the corporation but, 26 (65%) of the remaining one did not agree with the idea. This implies that the inventory management department of the corporation needs to improve its departmental relationship to improve its management status.

Concerning to the second indicator that is using inventory system to handle its inventory out of the total 40 respondents 16(40%) of them agrees with the existence of the indicator in the inventory management department of the corporation but, 24(60%) of the other ones did not agree with the stated idea. This implies that the inventory department of the corporation still needs to employ more modern inventory management system method to manage its huge inventory.

Concerning to the third idea that is having good relationship with its suppliers, 14(35%) of the respondents agrees with the existence of good relationship between the inventory management system and its inventory suppliers. But 26 (65%) of the remaining ones did not agree with the existence of the stated performance indicator in the inventory management department of the corporation. This implies that the inventory management department of the corporation did not have a good relationship with its suppliers.

Timely evaluation of the inventory management system is also taken as a one performance indicator in the inventory management department of the corporation. on this side out of the total 40 respondents 10(25%) of them agrees with the existence of timely evaluation of the inventory system but, 30(75%) of them did not agree with its existence. This indicates that the inventory system of the corporation did not evaluate on time and this can cause a big failure to the inventory system because timely evaluation is a critical issue to identify strength and weakness of the item and to take a measurable decision based on the out put.

On the other hand, identification of annual consumption of the corporation is also taken as one indicator to the status inventory management department of the corporation. According to this 8(20%) of the corporations agree with the existence of that annual consumption identification but 32(80%) of the remaining did not

agree with its existence. This implies that the departments have poor performance in identifying its annual consumption amounts.

3.4 Techniques of inventory valuation

Table 3 The types of inventory valuation method the corporation commonly use

Item	Response	Frequency	Percentage
Which type of inventory valuation method does the corporation commonly use?	FIFO method	26	65
	LIFO method	12	30
	Weighted average method	2	5
	Other	-	-
	Total	**40**	**100**

Source: survey 2010

According to the above table 3, there are three inventory management systems that implement in the corporations inventory department these are FIFO LIFO, weighted average method. Based on this, out of the total 40 respondents 26(65%) of them agrees with the commonly used FIFO method, 12(30%) of the other one said the commonly used inventory method is LIFO method 2(5%) of the other ones also response the commonly used one is weighted average method. This implies that the inventory of department widely implement FIFO method.

Table 4 Effectiveness of implementation the corporation guideline

Item	Response	frequency	Percent
Effectiveness of implementation the corporation's guideline	Good	8	20
	Fair	12	30
	poor	20	50
	Total	**40**	**100**

Source: Survey 2010

According to the above table 4, the inventory department have implemented the corporation guidelines based on this, 8(20%) of the respondents respond that the effectiveness of the implementation is good and 12(30%) of the major respondents respond that the effective implementation of the corporations, procedure in inventory management of the corporation is fair, but 20 (50%) of the remaining respondents respond that the implementation level of the inventory procedures of the corporation by the inventory department of the corporation is poor. This implies that, even if there are good manners and procedures of inventory in the corporation manuals, its practical implementation is poor.

Problems associated with inventory management of ETC inventory management, in its nature have different problems that relates with cost, time and supply side.

Table 5 Level of the problem associated with inventory management

Items	Level of the problem							
	High		Medium		Low		Total	
	f	% age	*f*	% age	*f*	% age	*f*	% age
High cost of inventory management	10	25	18	45	12	30	40	100
Poor managerial efficiency	18	45	12	30	10	25	40	100
Poor encoding of material identity	10	25	18	45	12	30	40	100
High misplacement	14	35	16	40	10	25	40	100

Source: Survey 2010

According to the above table 5, the main determinants that face the inventory management of the corporation are high cost of inventory management, poor managerial efficiency, poor encoding of material identity and high misplacement. Based on this, with regard to the high cost of inventory management problem out of the total 40 respondents 10(25%) of them responds with the high level of the problem in the department. 18(45%) of them respond medium level, 12(30%) of

them respond low level of high cost of inventory management. About managerial efficiency, 18(45%) of respondents respond that, on high level of the problem, 12(30%) of them respond that medium level and 10(25%) of them respond low level of poor managerial efficiency.

With regard to the problem of poor encoding of material identity 10(25%) of the respondents respond that this problem faces highly in inventory management department of the corporation and 18(45%) of the other ones agree with medium level determination of the problem but, 12(30%) of the respondents respond that the impact of the problem to the inventory department status of the corporations inventory system is low. This indicates that the problem is less to the performance of the inventory department of the corporation.

High misplacement is also taken as a problem to the inventory department of the corporation. According to this, 14(35%) of the respondents agrees with the idea that the stated problem is highly existed and 16(40%) of the other respondents respond that the problem is medium, but 10(25%) of the remaining respondents respond that the stated problem have low impact to the status of the inventory. This implies that, the inventory system of the corporation is influenced through high misplacement problem.

3.5 Analysis of interview held with ETC warehouse employees

According to the interview held with ETC warehouse employees, Ethiopian Telecommunication Corporation makes inventory once in a year always in June 30 at a given inventory period.

With regard to determining maximum inventory the respondents said that corporation's inventory department does not have maximum or minimum inventory stock. Only in some specific items such as A4 papers, different vouchers & forms (for internal use) and billing papers. They make a standard

maximum and minimum inventory of stock level with collaboration to stock control section.

Concerns to cost component for the inventory the respondents respond that the main cost components are time cost, holding cost the most common cost. That is holding cost is increase in terms of days and months, when high materials in the store is high much more inventory taking cost is also high. Additional payment cost is also the cost that need for additional time work for supervisors and labor wages.

Concerning to rid of obsolete, surplus and scrap materials in context to the corporation, obsolete and scrap material are occurred in all section of stores. Namely in network material, building and electric material, hand tools equipment, office furniture, stationary, power and satellite, and in exchange (PBX) material stores. Scrap materials for the corporation from the manufacturing section, metal, wood work, cement product, materials work shop peace of woods and metals fail of raw materials and sub standard materials. Obsolete (outdated) materials, such as old telephone, operator machine old phones, tower equipments, old typewriters, electrical typewriter, old fax machines, and others.

Mechanisms that the corporation uses to rid of obsolete, surplus and scrap materials are: according to the respondents, the corporation formed three teams namely material and stock control, warehouse administration and manufacturing. Those teams work at Akaki Cable and Jimma Ber pool stores. Some materials such as office furniture and computers donate to schools, and for different institutions. Others sell by auction/tender to rid those materials but the formed committees do not work properly to solve the existed problem because the formed committees do not give any consideration to collect those materials as needed.

Concerning to inventory planning the corporation does not use specific inventory forecasting method, rather it uses the following inventory planning system.

Management materials are purchased under working order base for example work order 02/088/46 for this specific work order it plans the necessary matter. Based on this procuring of items will be performed, the inventory does not plan for items therefore, it hold much inventories. The other system is project materials base (consumption base forecast) this is purchasing conduct base on the need of the project. For example for ALCATEL, NOKIA, ERICSON, and ZTE projects and so on. The other is based on stock item which forecasted only for stock purpose but the corporations have to use different plans in the future time.

According to the interviewed respondents, the corporation does to hedge against increase of price is, when materials are needed collect peroforma to purchase those items the collected peroforma have dead lines or amendment and the supplier who deliver materials with discount is acceptable.

The mechanisms to avoid inventory shortage in the corporation are material register planning, reorder point for stationary materials the company uses a periodic inventory recording system that records twice in a year at that time close manual inventory recording system is implemented.

According to the interviewed respondents of the satisfaction of user departments based in the right quantity, in the right quality, at the right time and at the right place are medium satisfaction.

CHAPTER FOUR

4. Summary of findings, Conclusion and recommendation

This part of the paper deals with the summary of findings, general conclusions and recommendation.

4.1 Summary of findings

According to the analysis part of the paper majority of 60% of the respondents are males, 40% of them have also an age range 18-30 with regard to their educational status majority or 57.5% of the respondents are degree holders. Concerning to the existence of performance indicators in the corporation inventory department to do of them agrees with the non existence of good interdepartmental relation ship 65% of the other ones agrees with non existence of good relation ship of the corporation with its suppliers.

Concerning to the inventory valuation methods that implemented in the department 65% of them responds the dominant one FIFO method the respondents also respond on the effective implementation of guidelines, method in the department based in this majority of 50% of them agrees with the poor effectiveness of its implementation.

The respondents also respond their idea on the main determinants of the corporation inventory department based on this 25% of the respondents agree with existence of high cost of inventory management. 45% of the others respond with medium level of the problem. On poor encoding of material identity in the inventory of department of the corporation 40% of the respondents also respond with the existence of medium level of high misplacement problem in the inventory department of the corporation.

4.2 Conclusions

Different organizations have different structured performed and organized inventory department based on their type, nature and amount. Based on this, Ethiopian Telecommunication Corporation inventory looks like as with low level of interdepartmental relationship, have medium level improved inventory system to handle its inventories and has no good relationship with its supplier, poor level of evaluation of its system on time and low level of capacity to identify its annual consumption.

There are different techniques in inventory valuation system of an organization the most common ones are FIFO, LIFO and weighted average method. Ethiopian Telecommunication Corporation implements FIFO method in its most activities but FIFO method the one method that can take into account by the corporation due to its nature of purchasing system.

The corporations have different manuals and procedures that need to purchase inventory materials for the day to day activity of these corporation, the manuals integrates the right quantity, the right quality, at the right time and at the right place peculiarity but their implementation by the inventory department is very low.

The main problems that face in the inventory department of the corporation are high cost of inventory management, poor encoding of material identity and high misplacement of inventories with medium status.

Planning is the determinant managerial input for the good performance of activity. Inventory planning also needs to implement good inventory technique in the department but, Ethiopian Telecommunication Corporation did not implement forecasting plan instead it uses work order base and other related use.

4.3 Recommendation

As indicated in the conclusion part of the paper, the inventory departments of the corporation have low level of interdepartmental relationship, medium level of using improved inventory methods, low level of evaluation and poor performance in identifying annual consumption. All the stated problems are internal problems that can be solve by the corporation management bodies with out taking additional external cost. So, the corporation should improve interdepartmental relationship through evaluating each department performance, integrate activities, assign stock controller for all stores. As the corporation is the technology corporation, it should implement and improve technological inventory techniques like electronic and automated.

Materials evaluation is a determinant factor for the success or failure for the organization's activity. So, the inventory system of the corporation should evaluate its day to day activity to identify its strength and weaknesses.

Lack of identifying annual consumption results for unnecessary cost such as capital tied up, excessive holding cost, obsolesces and the like. Therefore, the corporation should control these kinds of problems by knowing its annual consumption forecast, by controlling inventory sheet run out and stock card balance. And also the corporation should change the manual inventory system to technological modern one.

The inventory methods have their own advantages and disadvantages based on this different organization uses different methods of inventory system the corporations should implemented the FIFO but the other two methods have also implemented in inventory terms that relate to their nature like project base purchase should used LIFO.

Implementing the manuals of corporation should control through the departmental heads and general managers of the corporation.

As stated in the conclusion part of the paper, the dominant problems are cost of inventory management, poor managerial efficiency high misplacement of inventories and high encoding problem. These stated problems should improve through creating a committed management and implementing modern technological inventory system in the practice of the department.

The corporation’s inventory department should plan its each activities based on forecasting at the beginning of the work year. In this case, specific goals should forecast and their performance should evaluate monthly or quarterly.

ST. MARY'S UNIVERSITY COLLEGE
BUSINESS FACULTY
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BY
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JUNE 2010
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A SENIOR ESSAY SUBMITTED
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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

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APPROVED BY THE COMMITTEE OF EXAMINERS

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Chairperson	Signature
_____	_____
Advisor	Signature
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Examiner	Signature
_____	_____
Examiner	Signature

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LIST OF TABLES

ACRONYMS

ETC . . . . . Ethiopian Telecommunication Corporation

MRO . . . . . Maintenance, Repair and operating

EOQ. . . . . Economic Order Quantity

JIT . . . . . Just In Time

FIFO. . . . . First-in, First-Out

LIFO. . . . . Last-in, First-Out

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Inventory management is essential for all organizations. However, it's efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of the stock out, ordering or purchase, setup and the like.

Inventory means (stock of goods). Inventory may mean row materials, work in progresses, maintenance materials, processed and semi processed materials, oil, fuel and lubricants as well as finished and semi finished goods. They may be either in solid, liquid or gaseous form, required for the future use, manly in the production process as incase of finished goods for resale period. The need for this research arises from the existing situation of the Ethiopian Telecommunication Corporation.

1.2 Background of the Organization

The introduction of telecommunication services in Ethiopia dates back to 1894, seventeen years after the invention of telephone technology in the world. The Ethiopian Telecommunications Corporation is the oldest Public Telecommunication Operator (PTO) in Africa. Since its establishment, the corporation has managed to serve the public and the country by providing fast communication services such as land line telephone, wireless telephone technology, rural connectivity, school net, teleconference, internet service and other related services using modern technology.

The corporation's survival depends up on receiving, issuing, supplying and inventory, appropriate stores material management system which can integrate it

with its environment by identifying the opportunities, strength and weakness of its own and offered by the surrounding.

Material management is a basic tool in various organizations because inventory management system is required to plan, organize, direct and coordinate different activities from the point of their beginning to the point of their utilization and disposal. Moreover, it includes activities such as purchasing, inventory control, and store. Therefore, inventory management is necessary to balance materials which are on hand and already used.

This research is focus on assessment of inventory management practices taking place in Ethiopian Telecommunication Corporation.

1.3 Statement of the Problem

Inventory management is essential for all organizations. However, its efficiency differs from firm to firm mainly due to the size of the firm and the nature of inventory. In many organizations there is a lack of proper control of inventory because of stock out, ordering or purchase, setup and the like.

Most of the time, decide to have over stock inventory results in unnecessarily problems such as capital tied up, excessive carrying cost and the like.

- The Balance in the Inventory sheet run out is incorrect because of its bulk nature of materials and issue of incorrect quantity.
- The Stock Balance in the store and the Stock Card Balance are not the same and posting might be done in the wrong card
- Materials are stored for the long period and it leads to:-
  - Obsolesce,
  - Losing material identity their stock number might not be there,
  - Difficulty during inventory due to misplacement.

1.4 Basic research questions

Thus, from the identified problem this research try to address the following research questions.

- What does the inventory management practice of ETC look like?
- What inventory system ETC uses?
- What techniques are being used to determine annual consumption in ETC?
- What are the internal controls over inventory and stockholding procedure of the corporation?
- What problems are encountered in relation to inventory management in ETC?

1.5 Objectives of the Study

1.5.1 General objectives

The general objective of the study was to make an assessment of the inventory management practice of Ethiopian Telecommunication Corporation, so as try to show how to improve its performance.

1.5.2 Specific objective:-

- To assess the inventory management practice of ETC,
- To examine the type of inventory system ETC uses,
- To identify the techniques that is used ETC in exploring its annual consumption,
- To identify the internal control over inventory and stock holding procedures of the corporation,
- To identify the main problems encountered in relation to inventory management of ETC.

1.6 Significance of the study

- This study will have significant important regarding how maximum and minimum levels of stock are kept at their optimum lot, in ETC.

- How a good inventory management can improve the provision of materials when they are needed.
- How a well-structured storage system results in an efficient inventory reporting, which can facilitate accurate provision of information for the corporation's financial statement and management decisions.
- Regarding to pin point the possible solution to overcome the already existed problem.

1.7 Scope of the study

The scope of the research is delimited to the ETC inventory management system practices at the central warehouse level. The study does not cover inventory management practices in the regional warehouses.

1.8 Limitation of the study

Even though the intention is to investigate the problem of inventory management practices of Ethiopian Telecommunication Corporation, the researcher did not include regional warehouses due to time and financial resource.

1.9 Research Design and Methodology

1.9.1 Research Design

To asses the problem stated in the study, the researcher used the descriptive design method.

1.9.2 Population and sampling technique

The researcher used sampling unit selected from employees of ETC at central warehouse. The total populations are 141 (one hundred forty one). Among the total population for 40 (forty) employees questioner were given chance by using a non-probability convenience sampling method and interview were held with 6 (six) warehouse employees in order to get the right persons who are more concerned to the subject matter.

1.9.3 Types of data used

Types of data were both primary and secondary data. Primary data was collected from employees of the corporation and secondary data was collected from books, documents, and company reports to support the study.

1.9.4 Methods of data analysis

The collected data was analyzed using descriptive analysis techniques that were presented by tables. The study depends mainly on qualitative methods of data analysis as the project data sources are dominantly qualitative ones. Thus, for those data collected through interview and documentation review descriptive analysis is performed.

1.10 Organization of the study

The study is organized in to four chapters. The first chapter deals with introduction, the second chapter deals with related review of the study, the third chapter describes data presentation, analysis and interpret the general overview of inventory management activities and provides data analysis and finally the fourth chapter contains summary, conclusion and recommendation.

CHAPTER TWO

2. REVIEW OF RELATED LITRATURE

2.1 Definition of Inventory

Different authors define inventory management in different ways some of these are: -

Inventory can be defined as "Items held to ensure smooth plant operation, improve customer service, attain lot-size economies, or overcome timing or distance differences between operations. Overall objective (as with any investment): is to improve company's return on investment." **(Liman, 1981:191)**

Although inventories are classified in many ways, the following classification is convenient for use in further discussion of the topic:-

2.1.1 Production inventories:- Row materials, parts and components, which enter the firm's product in the production process. These may consists of two general types.

a. Special items manufactured to company specifications and

b. Standard industrial items purchased "off the shelf"

2.1.2 MRO inventories:- Maintenance, Repair, and Operating supplies which are consumed in the production process but which do not become part of the product.

2.1.3 In process inventories:- Semi finished products found at various stages of the production operation

2.1.4 Finished goods inventories:- completed products ready for shipment **(Dobler, 2001:519)**

2.2 Inventory Management

The inventory management activity is concerned with the planning and control of inventories. There are two general types of inventory. **(Edward M., 1997: 281)**

1. Dependent demand inventory and
2. Independent demand inventory

Dependent demand inventory:- Is made up of inventory items that are consumed with in an organization to produce a finished product.

Independent demand inventory:- Comprises inventory items consumed by customer's external to the organization.

2.3 Inventory control

The technique for ensuring availability of materials, which at the same time, holds in check, generally through a system, the tending to hoard larger amount of stock than is necessary. Citation

2.4 Inventory analysis:-

There are various types of analysis for different resource especially for control purpose one has to analyze various data. Analytical methods are useful in defining problems in order to strike at a solution.

Analysis is the first step for effective inventory control. Then we classify the items in to their importance experience has shown that relatively small portion of the items in the inventory accounting for a large portion of the value of the inventory investment.

2.5 Purposes of Inventory

All firms including just in time (JIT) operations keep a supply of inventory for the following reasons.

1. **To maintain independence of operations:-** A supply of materials at a work center allows that center flexibility in operations for example because there are for making each new production setup, this inventory allow management to reduce the number of setups.

Independence of workstations is desirable on assembly lines as well. The time that it takes to do identical operations will naturally vary from one unit to the next. Therefore, it is desirable to have a cushion of several parts with in the workstation so that shorter performance times can compensate for longer performance time. This way the average out put can be fairly stable.

2. **To meet variation in product demand:-** If the demand for the product is known precisely, it may be possible (though not necessarily economical) to produce the product to exactly meet the demand. Usually, however, demand is not completely known, and a safety or better stock must be maintained to absorb variation.
3. **To allow flexibility in production scheduling:-** A stock of inventory relieves the pressure on the production system to get the goods out. This causes longer lead times, which permit production planning for smoother flow and lower-cost operation through larger lot-size production. High setup costs, for example, favor producing a larger number of units once the setup has been made.
4. **To provide a safeguard for variation in raw material delivery time:-** When materials are ordered from a vendor, delays can occur for a variety of reasons a normal variation in shipping time, a shortage of material at the vendor's plant causing backlogs, an unexpected strike at the vendor's plant or at one of the shipping companies, a list order, or a shipment of incorrect or defective material.

5. **To take advantage of economic purchase order size:-** There are costs to place an order labor, phone calls, typing, postage, and so on. Therefore, the larger each order is the fewer the order that need be written. Also, shipping costs favor larger orders the larger the shipment, the lower the per-unit cost. **(Robert Jacbs, 1998: 513-515)**

2.6 The functions of inventories

Examining the functions of inventory clearly shows that they are the result of many interrelated decisions and polices within an organization as a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. (In the long term, of courses, all inventories are controllable). The following classification of inventory functions reveals the multipurpose roles played by inventories. **(Fraser Johnson, 2002: 204)**.

2.6.1 Transit or pipeline inventories:

These inventories are used to stock the supply and distribution pipelines linking an organization to its suppliers and customers as well as internal transportation points. They exist because of the need to move material from one point to another.

2.6.2 Cycle inventories:

These stocks arise because of management's decision to purchase, produce, or sell in lots rather than individual units or continuously. Cycle inventories accumulate at various points in operating systems. The size of the lot is a trade off between the cost of holding inventory and cost of marking more frequent orders and/or set-ups.

2.6.3 Buffer or uncertainty inventories or safety stocks:

These stocks exist as a result of uncertainties in demand or supply. Finished goods buffers protect against unforeseen demand or production failures.

2.6.4 Anticipation or certainty inventories:

These stocks are accumulated for a well-defined future need. Reasons for anticipation stocks may include strikes, weather, shortages, or announced price increases.

2.6.5 Decoupling inventories

The existence of decoupling inventories at major process linkage points makes it possible to carry on each side of the point relatively independently of each other.

Why classify inventories by function

By examining the functions of inventory, it is clear that they are the result of many interrelated decisions and polices with in an organization a particular item may serve many of the functions simultaneously. Why, then classify inventories by function? The answer lies in the degree of controllability of each class. Some inventories are essentially fixed and uncontrollable whereas others are controllable. In the long term, of courses, all inventories are controllable. **(Fraser Johnson, 2002: 207)**

2.7 The forms of inventory

The five commonly recognized forms of inventories are:

1. Raw materials purchased parts, and packaging;
2. Work in process;
3. Finished goods;
4. Maintenance, repair, and operating supplies (MRO)
5. Resale item.

For resource industries, service organizations, and public organizations, MRO inventories may be substantial.

2.8 Inventory function and form framework

Combining the five forms and five functions of manufacturing inventory gives the 25 types of inventory that make up the inventory profile of an organization. Presented with some of the managerial decision variables affecting each type. Not all inventory types will be present to the same extent in each organization; indeed some may be completely absent. The 25 types make inventory control a more complex but a more easily focused task. **(Fraser Johnson, 2002:208)**

2.9 Efforts of reduce inventories

Because of the high cost of carrying inventory, many systems have been developed to reduce stocks. Japanese manufactures have spearheaded such efforts in mass production industries. Suppliers often located very near the plant deliver items directly to the point of use in the plant at very frequent intervals. The uses of kabanas and variety of just-in-time inventory management schemes have revolutionized manufacturing thinking about all forms of inventories. Nevertheless, it is useful to understand the nature and costs of inventories so that appropriate polices and procedures can be developed for specific organizational needs.

Many purchases cover repetitive items often-held in inventory. Thus: inventory policy has a great influence on purchase quantity decisions. The question of how much to order, when, or how much to carry in stock are key decisions subject to continuous improvement examination along with the focus on quality and customer, employee, and supplier satisfaction. It is important in making delivery, inventory, or purchase order size decisions to understand why inventories exist and what they serve. **(Fraser Johnson 2002: 201)**

2.10 Key questions for the supply decision-maker

Should we:

- Change the way we forecast?
- Initiate a stockless purchasing system?
- Purchase the items differently?

How can we

- Improve our inventory management?
- Obtain supplier cooperation for JIT?
- Make lot-sizing decisions better?

Continuous improvement; speed to market; customer, employee, and supplier satisfaction; and global competitiveness require dedication to productivity and value-added activities. These organizational goals drive management attitudes to quality, quantity, and delivery, with profound impact on the acquisition process. With respect to quantity and delivery considerations, the most telling evidence comes from inventory reduction and the drive to increase frequency of deliveries, while decreasing the amount delivered at one time. Accompanying efforts in set up time reduction, just-in-time (JIT) system, stockless systems, order cost reduction, EDI and e-commerce are all part of the same drive.

2.11 Factors affecting quantity and delivery decisions

The decisions of how much to acquire and when, logically follow classification of what is required; the natural response is to say. “Buy as much as you need when you need it. “Such a simple answer is not sufficient, however.

First managers must make purchase decisions before, often a long time before, actual requirements are known. Therefore, they must relay on forecasts, not only of future demand, but of also lead times, prices, and other costs. Such forecasts are rarely, if ever, perfect.

Second, there are costs associated with placing orders, holding inventory, and running out of materials and goods.

Third, materials may not be available in the desired quantities without paying a higher price or delivery charge.

Forth, suppliers may offer reduced prices for buying larger quantities.

Fifth, shortages may cause serious consequences. **(Fraser Johnson 2002: 194)**

2.12 Main types of inventory cost

The relevance of cost elements in a given situation depends on the decisions to be made. Many costs remain fixed when the order size of only one item is doubled, but the same costs may well become variable when 5,000 items are under consideration. The main types of inventory costs are:- (Fraser Johnson 2002: 202)

1. Carrying costs
2. Stock out costs
3. Ordering or purchase costs
4. Setup costs

2.12.1 Carrying costs:-

These include handling charges; the costs of storage facilities or ware house rentals; the costs of equipment to handle inventory; storage labor, and operating costs, insurance premiums, breakage, pilferage, obsolescence, taxes, and investment or opportunity costs. In short, any cost associated with having, as opposed to not having, inventory is included.

The cost to carry inventory can be very high, for e.g. recent estimates of the annual cost to carry production inventory ranged from 25 to 50 percent of the value of the inventory: There are several methods for calculating inventory carrying costs, the basic elements are:

1. Capital costs,
2. Inventory service costs,
3. Storage space costs, and
4. Inventory risk costs.

Once the firm has estimated its carrying costs as a percentage of inventory value, annual inventory carrying costs can be calculated as follows:

(Carrying cost per year + (average inventory value) x (Inventory carrying cost as a % of inventory value)

Average Inventory value = (material unit cost) x (average inventory in units) **(Liman, 1981: 185).**

2.12.2 Stock out cost

These are the cost of not having the required parts or materials on hand when and where they are needed. They include lost contribution on lost sales (both present and future) change over costs necessitated by the shortage, substitution of less suitable or more expensive parts or materials, rescheduling and expediting costs, labor and machine idle and so on. **(Liman, 1981: 185).**

2.12.3 Ordering or purchase costs

These include the managerial, clerical, material, telephone, mailing, fax e-mail, accounting, transpiration, inspection, and receiving costs associated with a purchase or production order. **(Liman, 1981: 185-186).**

2.12.4 Setup Cost

These refer to all the costs of setting up a production run. Setup costs may be substantial. They include such learning-related factors as early spoilage and low production output until standard rates are achieved as well as the more common considerations, such as setup employee's wages and other costs, machine downtime, extra tool wear, parts (and equipment) damaged during setup, and so on.

How is it calculated?

The order points is based on the expected usage during the lead-time, that is during the time it takes for the new order to be written up, ordered, and received.

Considering L = Lead time

R = Annual Demand

The recorder point, p, is the lead-time, L, times daily demand

$$P = \frac{LR}{360}$$

What is an order point?

It is the point at which a replenishment order is placed, so as to prevent a run-out of stock while waiting for the replenishment order to come in.

Lead Time

The time interval needed to complete a portion or all of the activities in a replenishing cycle. It includes the time to identify a replenishment requirement, process the order, and receive the item in stock, ready for use. **(Liman, 1981:190)**

2.13 When to place an order

The "when to order" point is determined by the expected demand during the time it takes (called the "lead time") for the material to be ordered and received. The expedited demand (or the lead-time itself) may fluctuate: safety stock can be maintained to protect against such problems. **(Liman, 1981:33)**

Economic Order Quantity

Unlike lot-for-lot ordering, which uses actual period demands; other lot sizing model depend on demand forecasts, which re intern, often based on past average demand. The economic order quantity (EOQ) is such a model, and may be appropriate for management of a single inventory item.

EOQ is the number of units of a single item that should be planned whenever an order is placed so as to minimize the inventory management costs of that single item during a given time period, usually one year. **(Shniderjans, 1997:421)**

It is suitable for construction materials of Ethiopian Telecommunications Corporation.

When not to apply the EOQ approach

There are circumstances where the EOQ approach cannot be used, or must be adjusted to the exigencies of the business. Examples include; job shop operations; production cycling; erratic demand conditions; evaluation of price discounts; and space, capital and production capacity restrictions.

It is not appropriate for fixed items like furniture instruments, tools, and equipment of Ethiopian Telecommunications Corporation.

In situations where custom designed, randomly ordered, or low volume products are involved, a make-to-order approach is often most appropriate.

In addition, where detailed production planning necessarily dictates the basic timing and quantities of components, EOQ is a secondary consideration to the storage capacity, production, and material flow requirements **(Fraser Johnson, 1981: 60)**

2.14 Managing Independent Demand Economic Order Quantity models

2.14.1 Fifes Quantity Models

The objective of the model is to minimize the total annual costs. In the very simplest form of this model, annual demand (R), variable order or set up cost (S), Lead time (L), and holding cost percentage (K), are all constant now and in the future.

When inventory drops to the reorder point (P), a fixed economic order quantity (A) is ordered, which arrives after lead-time (L). Back orders and stock outs are not allowed.

Total cost is given as purchase cost, plus set up or order cost, plus holding cost, or:

$$TC = \frac{RC + RS + QKC}{A \qquad 2}$$

The minimum value of

Q (also known as the EOQ) is found at:

$$EOQ = \sqrt{\frac{2DCO}{Q}}$$

2.14.2 Fixed period model

In fixed period models, orders are placed only at review time. The inventory level must, therefore, be adjusted to prevent stock outs during the review period and lead-time.

2.15 Just-in-time (JIT) Inventory management system

The just-in-time (JIT) system is a Japanese philosophy that is used to manage all types of inventory, purchasing and production function in an organization.

The goal of JIT inventory system is to eliminate or reduce all types of inventory (raw materials, work-in process, and finished goods). Why do organizations want to eliminate inventory? By eliminating inventory, the cost of maintaining that inventory is eliminated as well. This is accomplished by using the following logic: **(Shniderjans, 1997: 316)**

1. Acquire raw materials just in time to have them manufactured into component parts.
2. Manufacture component parts just in time to have them assembled into finished products.
3. Assemble finished products just in time for their consumption in the market place.

2.16 Procedures for inventory taking

- All materials are listed in accordance with stock numbers.
- Record and post all documents and last receipt and issue vouchers
- Discontinue further posting until the result of stock taking is entered
- Verify bin card quantity against stock card quantity to trace and error
- Count all normal stock including scrap, residuals and items on loan.
- To keep stock sheets under control of one supervisor
- Hold record for damaged, deteriorated of issued with out document
- Stock taking should be made in orderly manner.
- When shortage and overages lists are prepared. The rechecking does not reveal discrepancies between the card balance and the physical count
- The inventory sheet should be prepared according to classification of the accounting system
- The stock sheet designed to contain the following information
    - ✓ The stock sheet are numbered
    - ✓ Date of stock taking
    - ✓ Location
    - ✓ Stock number
    - ✓ Description
    - ✓ Unit of stock found
    - ✓ Unit price
    - ✓ Value of stock found
    - ✓ Stock checker's signature
    - ✓ Remarks **(Ethiopian Telecommunication material Management directives)**

2.17 Scrap, Surplus and Obsolete Materials and Equipment

Scrap:- is a term used to describe recyclable materials left over from every manner of product consumption, such as parts of vehicles, building supplies, and surplus materials. Often confused with waste, scrap in fact has significant monetary value.

Surplus Materials and Equipment:- Shall be defined as material, equipment, or parts including capitalized equipment, which are in excess of normal operating or repair requirements.

Obsolete Materials and Equipment:- Shall be defined as material, equipment, or parts, which are no longer useable in the service for which they were purchased and which cannot be utilized safely or economically or any other purpose.

2.18 Methods of Inventory Valuation

Inventory has to be properly valued based on the following reason:-

a. **Determination of income**

The inventory valuation is mainly exterminating the true income earned by business during a particular period. Gross profit is the excess of sales over cost of goods sold Cost of goods sold is a curtained by adding opening inventory to and deducting closing inventory from purchases.

b. **Determination of financial position**

The inventory at the end of a period is to be shown as current asset in the balance sheet of the organization incase the inventory is not properly valued the balance sheet will not disclose the correct financial position of the business **(Maheshwari D., 1997:267)**

Traditional cost

Traditional cost of inventories is the aggregate of cost of purchase, costs of conversion and other costs incurred in bringing the inventories to the present location and condition. Thus traditional cost includes not only all the costs

incurred for bringing and making them fit for use in production but also the price paid for acquisition of inventories or for sale. Example the transportation cost, duties paid, insurance in transit, manufacturing expenses, wage paid or manufacturing expenses incurred for converting raw materials into finished products. However, selling expenses such as advertisement expenses, or storage costs should not be included. Inventory costing method is not based on physical flow of goods on the shelf's. For most organizations, the actual physical flow of goods in First-in-first-out (FIFO). Regardless of physical flow of goods, an organization can use any of the inventory costing methods. Generally Accepted Accounting Principles (GAAP) only requires that the inventory costing method used be rational and systematic, **(Short & W., 1990: 309)**

As they stated that, an organization is required to use the same inventory costing method for all inventory items and no particular justification is needed for the selection of one or more of the acceptable methods. However, a change in method is significant needs special disclosures in the notes to the financial statement. These methods are weighted over age inventory costing, first-in-first-out (FIFO) inventory method, last-in, first-out (LIFO) inventory costing method, and specific identification inventory costing method.

2.18.1 Weighted-Average Inventory method

The weighted average costing method is usually justified because it is simple to apply and is less subject to income manipulation. The inventory is priced on the basis Average prices paid for the goods.

The weight average method requires computation of the weight average unit costs of the goods available for sales or service. In a periodic inventory system the computed unit cost is multiplied by the number of units in inventory to derive the total cost of ending inventory cost of good sold is determined by subtracting the ending inventory amount from the amount of goods available for sale/service, **(Short G&W, 1990: 309)**

For example the weighted method would be applied as using a periodic inventory system.

Computation of the weighed average unit cost for the period

$$\frac{\text{Total goods available for sale at cost}}{\text{Total goods available for sale unit}} = \text{weighed average cost per unit for the period}$$

Generally, the weighted average cost method is representative of costs during the entire period including the beginning inventory rather than of the cost only at the beginning end, or at one point during the period. Representative costs are reported on both the balance sheet (ending inventory) and the income statement (cost of goods sold).

2.18.2 Firs-in, First-out inventory costing method

The first-in, first-out method frequently called (FIFO) assumes that the oldest unit i.e. the first cost in) are the first unit sold (i.e. the first cost out). The units in the beginning inventory are treated as if they were sold first. Then the units from the first purchase are sold next, and soon until the units left in the ending inventory all comes from the most recent purchases. FIFO allocates the oldest unit costs to cost of goods sold and the most recent unit cost the ending inventory.

Often, FIFO is justified because is consistent with the actual physical flow of goods. In most business the first goods placed in stock are the actual physical flow of goods. **(Short G. & Welsch, 1990: 310).**

2.18.3 Last-in, first-out inventory costing method

The Last-in, first-out method, often called LIFO; assume that the most recently acquired goods are sold first. Regardless of the physical flow of goods, LIFO treated the cost of the most recent units purchases as cost of goods sold. Therefore, the unit costs of the banging inventory and the earlier unit cost of beginning inventory and the earlier purchase remain in the ending inventory. The LIFO flow assumption is the exact opposite of the FIFO flow assumption.

LIFO can be manipulated by buying or not buying or not buying goods at the end of period when unit costs have changed. By this action, it is possible to manipulated costs of goods sold and hence reported income on the income statement LIFO cost of good sold based on the latest unit cost, which is realistic measurement of the current cost of items that where sold. In contrast, on the balance sheet the ending inventory amount is based on the oldest unit costs, which may be an unrealistic valuation.**(Short G. & W., 1990: 310-11)**

CHAPTER THREE

3. Data Presentation Analysis and Interpretation

3.1 Introduction

This chapter is intended to provide information gathered from the primary and secondary source as well as based on the researcher's observation from the organization. The primary data is a combination of questionnaire and interview, while the secondary data is obtained from the organization's unpublished documents.

The survey was conducted to assess the aspects of inventory management practices at Ethiopian Telecommunication Corporation. The aim of the assessment is going to provide the analysis and interpretation of the questionnaire's and interview data. The questionnaires were given to 40 respondents of the organizations employee. Additionally, interview was made with 6 selected employees of the organization.

Table 1 General Characteristics of the respondents

Item	Response	Frequency	Percentage
Age	18-30	16	40
	31-40	10	25
	Above 40	14	35
	Total	**40**	**100**
Sex	Male	24	60
	Female	16	40
	Total	**40**	**100**
Educational level	12 completed	5	12.5
	Diploma	12	30
	1st Degree	23	57.5
	Above 1st Degree	-	-
	Total	**40**	**100**
Work experience	1-5 years	21	52.5
	6-10 years	12	30
	11-15 years	5	12.5
	> 15 years	2	5
	Total	**40**	**100**

Source: Survey 2010

3.2 General background of the respondents

According to the above table 1, out of the total 40 respondents who respond to the questionnaire 16(40%) of them have an age range from 18-30 years, 10(25%) of the other ones have an age range from 31-40 years. Apart from this 14(35%) of the remaining one have an age greater than 40 years. This implies that the corporations have adult potential workers.

According to the above table out of the total 40 respondents 24(60%) of them are males but, 16 (40%) of the remaining one are females this implies that the corporation have more of male employees in its inventory management department.

According to the above table the educational status of the respondents is characterized that out of the total 40 respondents 5(12.5%) of them are 12^{th} completed, 12(30%) of the other ones are diploma holders, 23(57.5%) of the remaining ones are degree holders this indicates that the educational status of the corporations employees is some what good.

With regard to the work experience of the employees out of the total 40 respondents 21(52.5%) of the respondents have a work experience from 1-5 years. 12(30%) of the other have a work experience that amounts for 5 years that is 6-10 years, the other 5 and 2 respondents have a work experience 11 -15 years and greater than 15 years respectively.

Table 2 Performance indicator of the inventory management

Respondents						
Item	Yes		No		Total	
	f	Percentage	*f*	Percentage	*f*	Percentage
Do you have good interdepartmental relation ship	14	35	26	65	40	100
Do you uses improved inventory system to handle its inventories	16	40	24	60	40	100
Do you have good relationship with its suppliers	14	35	26	65	40	100
Is the organization evaluate system on its time	10	25	30	75	40	100
Is the organization identifies its annual consumption	8	20	32	80	40	100

Source: Survey 2010

3.3 Performance indicators of the inventory management in the corporation

Ones organization inventory management can indicate in different way. But the common one, are type of inventory, period of inventory and other related ones.

According to the above table 2, the researcher takes the above performance indicator to assess the corporation inventory management. These include interdepartmental relationships, using improved inventory system, having good relationship with its suppliers, evaluation of its system on time, and identifying the annual consumption of the corporation. Based on this concerning to the first indicator that is having good interdepartmental relationship out of the total 40 respondents 14(35%) of them agree with the existence of good interdepartmental relationship in the inventory management departments of the corporation but, 26 (65%) of the remaining one did not agree with the idea. This implies that the inventory management department of the corporation needs to improve its departmental relationship to improve its management status.

Concerning to the second indicator that is using inventory system to handle its inventory out of the total 40 respondents 16(40%) of them agrees with the existence of the indicator in the inventory management department of the corporation but, 24(60%) of the other ones did not agree with the stated idea. This implies that the inventory department of the corporation still needs to employ more modern inventory management system method to manage its huge inventory.

Concerning to the third idea that is having good relationship with its suppliers, 14(35%) of the respondents agrees with the existence of good relationship between the inventory management system and its inventory suppliers. But 26 (65%) of the remaining ones did not agree with the existence of the stated performance indicator in the inventory management department of the corporation. This implies that the inventory management department of the corporation did not have a good relationship with its suppliers.

Timely evaluation of the inventory management system is also taken as a one performance indicator in the inventory management department of the corporation. on this side out of the total 40 respondents 10(25%) of them agrees with the existence of timely evaluation of the inventory system but, 30(75%) of them did not agree with its existence. This indicates that the inventory system of the corporation did not evaluate on time and this can cause a big failure to the inventory system because timely evaluation is a critical issue to identify strength and weakness of the item and to take a measurable decision based on the out put.

On the other hand, identification of annual consumption of the corporation is also taken as one indicator to the status inventory management department of the corporation. According to this 8(20%) of the corporations agree with the existence of that annual consumption identification but 32(80%) of the remaining did not

agree with its existence. This implies that the departments have poor performance in identifying its annual consumption amounts.

3.4 Techniques of inventory valuation

Table 3 The types of inventory valuation method the corporation commonly use

Item	Response	Frequency	Percentage
Which type of inventory valuation method does the corporation commonly use?	FIFO method	26	65
	LIFO method	12	30
	Weighted average method	2	5
	Other	-	-
	Total	**40**	**100**

Source: survey 2010

According to the above table 3, there are three inventory management systems that implement in the corporations inventory department these are FIFO LIFO, weighted average method. Based on this, out of the total 40 respondents 26(65%) of them agrees with the commonly used FIFO method, 12(30%) of the other one said the commonly used inventory method is LIFO method 2(5%) of the other ones also response the commonly used one is weighted average method. This implies that the inventory of department widely implement FIFO method.

Table 4 Effectiveness of implementation the corporation guideline

Item	Response	frequency	Percent
Effectiveness of implementation the corporation's guideline	Good	8	20
	Fair	12	30
	poor	20	50
	Total	**40**	**100**

Source: Survey 2010

According to the above table 4, the inventory department have implemented the corporation guidelines based on this, 8(20%) of the respondents respond that the effectiveness of the implementation is good and 12(30%) of the major respondents respond that the effective implementation of the corporations, procedure in inventory management of the corporation is fair, but 20 (50%) of the remaining respondents respond that the implementation level of the inventory procedures of the corporation by the inventory department of the corporation is poor. This implies that, even if there are good manners and procedures of inventory in the corporation manuals, its practical implementation is poor.

Problems associated with inventory management of ETC inventory management, in its nature have different problems that relates with cost, time and supply side.

Table 5 Level of the problem associated with inventory management

Items	Level of the problem							
	High		Medium		Low		Total	
	f	% age	*f*	% age	*f*	% age	*f*	% age
High cost of inventory management	10	25	18	45	12	30	40	100
Poor managerial efficiency	18	45	12	30	10	25	40	100
Poor encoding of material identity	10	25	18	45	12	30	40	100
High misplacement	14	35	16	40	10	25	40	100

Source: Survey 2010

According to the above table 5, the main determinants that face the inventory management of the corporation are high cost of inventory management, poor managerial efficiency, poor encoding of material identity and high misplacement. Based on this, with regard to the high cost of inventory management problem out of the total 40 respondents 10(25%) of them responds with the high level of the problem in the department. 18(45%) of them respond medium level, 12(30%) of

them respond low level of high cost of inventory management. About managerial efficiency, 18(45%) of respondents respond that, on high level of the problem, 12(30%) of them respond that medium level and 10(25%) of them respond low level of poor managerial efficiency.

With regard to the problem of poor encoding of material identity 10(25%) of the respondents respond that this problem faces highly in inventory management department of the corporation and 18(45%) of the other ones agree with medium level determination of the problem but, 12(30%) of the respondents respond that the impact of the problem to the inventory department status of the corporations inventory system is low. This indicates that the problem is less to the performance of the inventory department of the corporation.

High misplacement is also taken as a problem to the inventory department of the corporation. According to this, 14(35%) of the respondents agrees with the idea that the stated problem is highly existed and 16(40%) of the other respondents respond that the problem is medium, but 10(25%) of the remaining respondents respond that the stated problem have low impact to the status of the inventory. This implies that, the inventory system of the corporation is influenced through high misplacement problem.

3.5 Analysis of interview held with ETC warehouse employees

According to the interview held with ETC warehouse employees, Ethiopian Telecommunication Corporation makes inventory once in a year always in June 30 at a given inventory period.

With regard to determining maximum inventory the respondents said that corporation's inventory department does not have maximum or minimum inventory stock. Only in some specific items such as A4 papers, different vouchers & forms (for internal use) and billing papers. They make a standard

maximum and minimum inventory of stock level with collaboration to stock control section.

Concerns to cost component for the inventory the respondents respond that the main cost components are time cost, holding cost the most common cost. That is holding cost is increase in terms of days and months, when high materials in the store is high much more inventory taking cost is also high. Additional payment cost is also the cost that need for additional time work for supervisors and labor wages.

Concerning to rid of obsolete, surplus and scrap materials in context to the corporation, obsolete and scrap material are occurred in all section of stores. Namely in network material, building and electric material, hand tools equipment, office furniture, stationary, power and satellite, and in exchange (PBX) material stores. Scrap materials for the corporation from the manufacturing section, metal, wood work, cement product, materials work shop peace of woods and metals fail of raw materials and sub standard materials. Obsolete (outdated) materials are such as old telephone, operator machine, old phones, tower equipments, old typewriters, electrical typewriter, old fax machines, and others.

Mechanisms that the corporation uses to rid of obsolete, surplus and scrap materials are: according to the respondents, the corporation formed three teams namely material and stock control, warehouse administration and manufacturing. Those teams work at Akaki Cable and Jimma Ber pool stores. Some materials such as office furniture and computers donate to schools, and for different institutions. Others sell by auction/tender to rid those materials but the formed committees do not work properly to solve the existed problem because the formed committees do not give any consideration to collect those materials as needed.

Concerning to inventory planning the corporation does not use specific inventory forecasting method, rather it uses the following inventory planning system.

Management materials are purchased under working order base for example work order 02/088/46 for this specific work order it plans the necessary matter. Based on this procuring of items will be performed, the inventory does not plan for items therefore, it hold much inventories. The other system is project materials base (consumption base forecast) this is purchasing conduct base on the need of the project. For example for ALCATEL, NOKIA, ERICSON, and ZTE projects and so on. The other is based on stock item which forecasted only for stock purpose but the corporations have to use different plans in the future time.

According to the interviewed respondents, the corporation does to hedge against increase of price is, when materials are needed collect peroforma to purchase those items the collected peroforma have dead lines or amendment and the supplier who deliver materials with discount is acceptable.

The mechanisms to avoid inventory shortage in the corporation are material register planning, reorder point for stationary materials the company uses a periodic inventory recording system that records twice in a year at that time close manual inventory recording system is implemented.

According to the interviewed respondents of the satisfaction of user departments based in the right quantity, in the right quality, at the right time and at the right place are medium satisfaction.

CHAPTER FOUR

4. Summary of findings, Conclusion and recommendation

This part of the paper deals with the summary of findings, general conclusions and recommendation.

4.1 Summary of findings

According to the analysis part of the paper majority of 60% of the respondents are males, 40% of them have also an age range 18-30 with regard to their educational status majority or 57.5% of the respondents are degree holders. Concerning to the existence of performance indicators in the corporation inventory department to do of them agrees with the non existence of good interdepartmental relation ship 65% of the other ones agrees with non existence of good relation ship of the corporation with its suppliers.

Concerning to the inventory valuation methods that implemented in the department 65% of them responds the dominant one FIFO method the respondents also respond on the effective implementation of guidelines, method in the department based in this majority of 50% of them agrees with the poor effectiveness of its implementation.

The respondents also respond their idea on the main determinants of the corporation inventory department based on this 25% of the respondents agree with existence of high cost of inventory management. 45% of the others respond with medium level of the problem. On poor encoding of material identity in the inventory of department of the corporation 40% of the respondents also respond with the existence of medium level of high misplacement problem in the inventory department of the corporation.

4.2 Conclusions

Different organizations have different structured performed and organized inventory department based on their type, nature and amount. Based on this, Ethiopian Telecommunication Corporation inventory looks like as with low level of interdepartmental relationship, have medium level improved inventory system to handle its inventories and has no good relationship with its supplier, poor level of evaluation of its system on time and low level of capacity to identify its annual consumption.

There are different techniques in inventory valuation system of an organization the most common ones are FIFO, LIFO and weighted average method. Ethiopian Telecommunication Corporation implements FIFO method in its most activities but FIFO method the one method that can take into account by the corporation due to its nature of purchasing system.

The corporations have different manuals and procedures that need to purchase inventory materials for the day to day activity of these corporation, the manuals integrates the right quantity, the right quality, at the right time and at the right place peculiarity but their implementation by the inventory department is very low.

The main problems that face in the inventory department of the corporation are high cost of inventory management, poor encoding of material identity and high misplacement of inventories with medium status.

Planning is the determinant managerial input for the good performance of activity. Inventory planning also needs to implement good inventory technique in the department but, Ethiopian Telecommunication Corporation did not implement forecasting plan instead it uses work order base and other related use.

4.3 Recommendation

As indicated in the conclusion part of the paper, the inventory departments of the corporation have low level of interdepartmental relationship, medium level of using improved inventory methods, low level of evaluation and poor performance in identifying annual consumption. All the stated problems are internal problems that can be solve by the corporation management bodies with out taking additional external cost. So, the corporation should improve interdepartmental relationship through evaluating each department performance, integrate activities, assign stock controller for all stores. As the corporation is the technology corporation, it should implement and improve technological inventory techniques like electronic and automated.

Materials evaluation is a determinant factor for the success or failure for the organization's activity. So, the inventory system of the corporation should evaluate its day to day activity to identify its strength and weaknesses.

Lack of identifying annual consumption results for unnecessary cost such as capital tied up, excessive holding cost, obsolesces and the like. Therefore, the corporation should control these kinds of problems by knowing its annual consumption forecast, by controlling inventory sheet run out and stock card balance. And also the corporation should change the manual inventory system to technological modern one.

The inventory methods have their own advantages and disadvantages based on this different organization uses different methods of inventory system the corporations should implemented the FIFO but the other two methods have also implemented in inventory terms that relate to their nature like project base purchase should used LIFO.

Implementing the manuals of corporation should control through the departmental heads and general managers of the corporation.

As stated in the conclusion part of the paper, the dominant problems are cost of inventory management, poor managerial efficiency high misplacement of inventories and high encoding problem. These stated problems should improve through creating a committed management and implementing modern technological inventory system in the practice of the department.

The corporation's inventory department should plan its each activities based on forecasting at the beginning of the work year. In this case, specific goals should forecast and their performance should evaluate monthly or quarterly.

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APPENDEX

St. Mary's University College

Interview question for administrative and department heads.

1. How do you control the corporation inventory
    a. Periodically
    b. Perpetually

2. How do you determine the level of maximum inventory?
    _____
    _____
3. What does the cost components of the inventory look like for the past four years?
    a. Ordering cost
    b. Carrying cost
    c. Shortage cost
    d. Purchase cost

4. What mechanisms are there to get rid of obsolete, surplus, and scrap materials?
    _____
    _____

5. What methods of inventory planning are there in the corporation?
    _____
    _____
6. What does the corporation do to hedge against increase of price?
7. What mechanisms of avoiding inventory shortage in use by the corporation?
8. What kind of inventory recording system does the company use?
9. If you have additional comment
10. What does the degree of satisfaction of user departments look like with the availability of materials

	Very High	**High**	**Medium**	**Very Low**	**Low**
In the right quantity					
In the right quality					
At the right time					
At the right place					

Thank you for your cooperative!!

St. Mary University College

Questionnaire on the Assessment of Inventory Management Practices in Central Warehouse in ETC

Dear respondents, this questioner is designed to assist in preparing a senior easy research paper for B.A. Degree in management at St. Mary's University College. It will be used to gather an overview ideas and insights on the assessment of inventory management of central warehouse practices in Ethiopian Telecommunication Corporation.

Your honest, accurate and clear response will be highly appreciated. I would like to express my gratitude and appreciation for devoting your precious time.

Enclosing your name in not necessary.

Make a thick (✓) in the box(s) provided.

Write your answers on the space provided for those questions which have not available choices.

1. Age

   18 – 30 ☐ 31 – 40 ☐ above 40 ☐

2. Sex

   Male ☐ Female ☐

3. Work Position _____

4. How many years experience do you have in ETC?

   A. 1-5 ☐ B. 6-10 ☐ C. 11- 15 ☐ D. Above 15 ☐

5. Education Level

   A. 12 ☐ B. Diploma ☐ C. Degree ☐ D. Master ☐

6. Is there good inter departmental relationship?

   A. Yes ☐ B. No ☐

7. Do you use improved system to handle inventories?

   A. Yes ☐ B. No ☐

8. Does your company has good relationship with suppliers?

A. Yes ☐ B. No ☐

9. Do you feel annual consumption is known?

A. Yes ☐ B. No ☐

10. Which type of inventory method does the Corporation use?

A. FIFO method ☐ B. LIFO method ☐

C. Weighted average ☐

If any other specify _____

_____

11. There are directives issued for explaining the aims and objectives of inventory management activates. In your corporation directives and guidelines are applied or not?

A. Good ☐ B. Fair ☐ C. Poor ☐

12. Do you think the company has an efficient inventory management system?

A. High ☐ B. Medium ☐ C. Low ☐

13. Do you believe that the method you used for conduction inventory is correct and up to date?

A. High ☐ B. Medium ☐ C. Low ☐

14. Is encoding of materials identity of the corporation good?

A. High ☐ B. Medium ☐ C. Low ☐

15. What is the level of high misplacement of materials of the corporation?

A. High ☐ B. Medium ☐ C. Low ☐

Thank you for your co-operative!!

SUBMISSION APPROVAL SHEET

The senior research paper has been submitted to the department of the management in partial fulfillment for the requirements of BA Degree in Management with my approval as an advisor.

NAME: Merga Mekuria

SIGNATURE: _____

DATE OF SUBMISSION: _____

Declaration

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

Name Addisie G/Medhin

Signature _____

Place of Submission Addis Ababa (St. Mary University College)

Date of Submission June 2010

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St. Mary's University College

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