

ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
MBA PROGRAM



**ASSESMENT ON INVENTORY MANAGEMENT PRACTICE AND ITS
CHALLENGES IN CASE OF ADDIS PHARMACEUTICAL FACTORY S. C.IV-
SOLUTION ADDIS ABABA**

BY: ABEBA GEBRETSADIK

DECEMBER, 2021G.C.

ADDIS ABABA, ETHIOPIA

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**BY: ABEBA GEBRETSADIK
ID NO. SGS/0033/2011B**

**A THESIS SUBMITTED TO THE DEPARTMENT OF BUSINESS ADMINISTRATION
ST. MARY'S UNIVERSITY, IN PARTIAL FULFILLMENT FOR THE
REQUIREMENTS OF MASTER OF BUSINESS ADMINISTRATION**

ADVISOR: SHOA JEMAL (Asst. Prof.)

**DECEMBER, 2021G.C.
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DECLARATIONS

I Abeba Gebretsadik; registration number/ ID NO. SGS/0033/2011B, do hereby declare that this thesis is my original work and that it has not been submitted partially; or in full, by any other person for an award of MBA degree in any other university/institution.

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STATEMENT OF AUTHOR

First, I declare that this thesis is my actual work and that all sources of material used for this thesis have been dully acknowledged. This thesis has been submitted in partial fulfillment of the requirements for an advanced (MSc) degree at Saint Mary's University, Department business administration of Saint Mary's University. I solemnly declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

Brief questions from this thesis are allowable without special permission provided that accurate acknowledgement of source is made. Requests for permission for extended question from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the College when in his or in her judgment the proposed use of the material is in the interest of scholarship. In all other instances, however permission must be obtained from the author.

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ACKNOWLEDGMENTS

First of all, I would like to thank God and Mary for their reliable and unchanged love and unlimited help in every movement of my way.

My special thanks also go to my advisors Asst. Prof. Shoa Jemal for his constructive comments and supports in my work.

Moreover, apart from my advisor I like to say very thank you for my families for their moral support and everything supply in my work.

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LIST OF ABBREVIATIONS

APFIV	Addis Pharmaceutical Factory S. C.IV-Solution
DGM	Deputy General Manager
GMP	good manufacturing practice
ISO	International certification organization
MP and WH	Material planning and ware housing
EFMHACA	Ethiopian Food, Medicines, and Healthcare administration
ECA	Economic Commission for Africa
EOQ	Economic order quantity
EPQ	Economic production quantity
FSN	Fast, Slow and Nonmoving
HML	High cost, Low cost, Medium cost,
J-I-T	Just- in- time
LIFO	Last-In-First-Out
FIFO	First-In-First-Out
ROP	reorder point

ABSTRACT

Cross-sectional study was conducted to assess inventory management practice in case of Addis pharmaceutical factory iv-solution which is present in Addis Ababa. The study was conducted on stuffs of planning and warehousing, finance department and procurement departments. The study was conducted using document analysis and survey of respondents of staff who have relevance in the inventory management directly or indirectly. Descriptive analysis was conducted to identify main challenges created in the inventory management process; current practices of inventory management in APFIV; techniques of inventory control the company use; policies, manual and procedure established in regard to inventory management practice and the company controls for identified gaps in regard to inventory management. During the research most of the respondent 68.2% of them were agree on APFIV materials management function has workable organizational structure and from these only 8.2% of them were not agree on this. Also the result shows most of the respondents 55 (64.7%) of them stands for agree on the department has integrated inventory and storage policy and 12(14.1%) of them said that they were strongly agree on this. But only 4(4.7%) of them were disagree on this. Thus we can see the department has integrated inventory and storage policy. As a result shows; the main challenges in the company identified during the study includes inventory process of reorder take longer period of time and during reorder there may be shortage of raw materials so it may cause delay of time for these orders. There were also system or software challenges means there were inadequate software and use manual documentation in the company. There were also Procedural problems in the company, supply chain complexity, insufficient order management, challenges of replenishment and damage and dead materials removal from warehouse is not taken place timely. Then the results of correlation and regression analysis shows that the above independent variables which have relation during analysis with dependent variable (inventory management) were at less than 0.05 significant levels.

Key words: APFIV, Challenges, Company, Inventories, Reorder

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Inventories are stock of materials of any kind stored for future use, mainly in the production process. However, semi-finished goods awaiting use in the next process or finished goods awaiting release for sale are also included in the broad category of inventories, which are nothing but idle resources. Therefore, inventories are materials or resources of any kind having some economic value, either waiting conversion or use in future. Apart from these, there are also many indirect materials, such as maintenance materials, fuels and lubricants, etc. which are used in a manufacturing organization. They are also classified as inventories of materials for future use. But they differ only in their use and classification from raw and other direct materials. All of them earn nothing, yet they are badly required to be stocked and to be used as and when the need arises (Arnold *et al.*, 2008).

Inventory management is the integrated process that operationalizes the firm's and the value chain's inventory policy. Every organization, big or small, depends on materials and services from other organizations to varying extents. Thus, materials and services are obtained through exchange of money. The various materials used as inputs, such as raw materials, consumables and spares, are required to be purchased and made available to the shops/users and when needed to ensure uninterrupted production (Donald J. and David J. 2000).

Addis Pharmaceutical Factory Sh. Co. is the largest pharmaceutical manufacturing company headquartered at Adigrat, Tigray regional state of Ethiopia; which was established on 1988 E.C. The plant was equipped with high tech production facilities. The company has been manufacturing more than 91 high quality pharmaceutical products of different therapeutic categories. The company has more than 9 (nine) production lines and fully equipped laboratories as well as utilities capable of producing tablets, capsules, Syrups/Suspensions, dry powders for reconstitution, injectable vials, liquid injectable ampoules, creams and ointments. Addis Pharmaceuticals Factory S.C, IV-Solutions; a subsidiary plant of Addis pharmaceutical factory S.C.is located in Akaki-kality sub city of Addis Ababa 10 kilometers

from the city center & 500 meters from the main road to Djibouti. The factory was established in 1997 as "Lifeline S.C" with a capital of 24 million Birr. After the company was bankrupt, in 2008 Addis Pharmaceuticals Factory S.C, had purchased the company from development bank and in august 2009 it started manufacturing of four of the essential Intravenous Infusions (0.9% sodium chloride, dextrose 5%, dextrose 5% with 0.9% sodium chloride and ringer lactate).

The factory has a production line with a laboratory and a utility system fully equipped with European technology and all the testing of Raw, Intermediate and Finished Goods are done in the laboratory. The facilities also include Raw, Packing materials and Finished Goods warehouses for the manufacture of large volume parental. Manufacturing processes are controlled and regularly monitored as per GMP recommendations; APF-Company Quality Manual and directions of local Regulatory Authorities. A team of experienced professionals manages the company to produce quality medicines utilizing advanced technology of production, quality control, utility equipment and skilled personnel.

The factory currently employs 145 staff including Pharmacists, Chemists, Biologists, Engineers and of technicians and skilled personnel. The company has gained different quality certifications including local GMP certificate issued by Food, Medicines, and healthcare administration and control authority of Ethiopia (EFMHACA). Also, the company has been working to acquire international GMP certification of its products to supply worldwide. In line with the quality assurance practices, the company experiences materials management manual, procedures and policies for its efficient and smooth production operation (source: Site Master File, APFIV/SMF/05).

1.2. Statement of the Problem

Inventories hold a lion's share of working capital in most manufacturing and merchandizing companies and has important role in any type of organization thus, it directly affects materials/logistics management. The inventory controlling system can even, to a certain extent: determine the type of materials/ logistics management operation a company requires. Therefore, efficient inventory control is vital for a successful operation.

Inventories provide a rational approach to operations by adding the smooth flow of materials; effective utilization of facilities, and efficient materials handling, all to better serve customers. Various operations, both manufacturing and service businesses, involve the inventory process. Inventories allow each unit enough independence to operate efficiently. With adequate inventories, suppliers can be ordered and shipped, and operations can be performed without excessive costs for setups and /or ordering. This allows more efficient handling of optimum quantity lots. Various techniques of inventory control, such as the JIT (Just-in-time) technique, try to achieve those benefits without maintaining large inventories (Hurlbut, 2003).

There are three basic reasons for keeping and inventory including Time which is present in the supply chain, from supplier to user at every stage, requires that you maintain certain amounts of inventory to use in this lead time. The second one is Uncertainty in which inventories are maintained as buffers to meet uncertainties in demand, supply and movements of goods. The other is Economics of scale bulk buying, movement and storing brings in economics of scale (Padmanava, 2015).

Inventory is always dynamic and inventory management requires constant and careful evaluation of external and internal factors and control through planning and review. Most of the organizations have a separate department or job function called inventory planners who continually monitor and control and review inventory and interface with production, procurement and finance departments.

In case of Addis Pharmaceutical Factory S.C.IV-Solution, variety of raw materials, packing materials, semi-processed materials finished items (medicines) and different items which can facilitate the production process are purchased and inventoried at warehouse. Moreover, almost all except minor excipients of the input materials are purchased from abroad. And major working capital expenditure of the company is dedicated to purchase those input materials. For their material handling, the company has developed policies, manuals and procedures. Moreover, a separate department entitled MP and WH is formed in the organogram and with the help of purchase and supply department, the department manages smooth flow of materials within the company. However, despite the fact that there are reliable manuals, procedures and policies and skilled staffs in the department, there is order quantity management problem for which un programmed purchase demand is occurred and leads to unnecessary ordering costs. Thus, as if huge investment is there, the research study will assess the actual practices of inventory management and its challenges and will propose possible solution to the company (Source: company manual: 2009 G.C).

1.3. Basic Research Questions

Based on the above statement of problem, the study was assessing the following questions:

- What are the main challenges that affect the inventory management process in the company?
- What are the current practices of inventory management in APFIV?
- What techniques of inventory control the company in use?
- What are the policies, manual and procedure established in regard to inventory management practice?
- How the company controls for identified gaps in regard to inventory management?

1.4. Objectives of the Study

This research study has general and specific objectives part. The general objective part will present the overall objective of the study and the specific objective part outlines the list of detailed objectives through which the general objective will be attained.

1.4.1. The general Objective

The general objective of the study is to assess the inventory management practices and challenges being faced by Addis Pharmaceutical Factory S.C.IV-Solution.

1.4.2. The Specific Objectives

The specific objectives of the research were:

- To identify the main challenges of inventory management in the company;
- To assess the current inventory management practices;
- To identify inventory control techniques that hinders smooth flow of operation in the company;
- To assess established company manuals, procedures and policy is appropriate for inventories management and;
- To assess whether the company has established controlling mechanisms for identified gaps in inventory management.

1.5. Significance of the Study

The output of the research study will help to identify the current challenges of inventory management in the company. And it will be an initiator for reviewing the inventory management practice in the company. Once the study is finalized and brings the practical findings of the study, the company management can thoroughly review it and site for either to implement the recommendations going to indicate in the study or place their way-out to solve the identified gaps and area of exploring knowledge to the researcher on how to manage

inventories efficiently. Furthermore, the research output will serve as a reference material to those people who in need of it in the organization.

1.6.Scope of the Study

In addition to input materials and finished products, due to the size and nature of the company different indirect materials (chemicals, laboratory items, spare parts of machines, supplies and appliances and fixed items) are stored at warehouse but most of the time those items are classified under direct use purpose hence such items aren't included in the inventory policy thus will not consider in the study. The researcher knows that better research outputs will be obtained if the research is planned to be included the entire inventory management of the organization other than focusing on few of them. But time and budget limitation forced the researcher to narrow the scope of the research and it will only address the issue of inventory management practice of direct input materials and finished products. Besides due to distance barrier APFIV plant which is located in Addis Ababa Akaki Kaliti has selected in the study. Based on the above limitations the research report will be open for future study.

1.7. Limitation of the study

APFIV is one of the private owned parenteral pharmaceutical factories located in Addis Ababa. The company has been executing different types of inventories in its operations. Besides it has current finished product whole sale distribution offices in three regions of the Country. Hence due to inconvenience to visit, finished product management practices in those branches are not included in the study. In addition, due to scares documents and company privacy the Joint venture merged with the company is not explained in the study.

1.8. Organization of the Research Report

The research study report will be presented in five chapters. Furthermore, which is sub divided in to sub sections. The first chapter will present the introduction part of the paper which comprises the introduction, background of the company, statement of the problem, basic

research questions, objectives of the study, hypothesis of the research, definition of terms, significance of the study, and scope and limitation of the study. The second chapter will provide the relevant theoretical, conceptual and empirical evidences obtained from reviewed literatures pertaining to the topic under the study.

The third chapter will present the research methodology part used to carry out the research activities. This part of the research report comprises the type and design of the research, the participants of the study, data sources and data collection instruments used, the data collection procedures, the data analysis and presentation methods used. Whereas the fourth chapter will show the summarized findings, the interpretation and discussion parts of the research findings. Finally, the fifth chapter will present the summary, conclusion and recommendation part of the study.

1.9. Definitions of Terms

Below are definitions of terms to be used in the research study:

Inventory: Are the commodities, supplies, equipment, and other materials those are available in stock in an institution (Ministry of Medical Services, 2016).

Perpetual review: A perpetual inventory control process reviews inventory status daily to determine replenishment needs;

Periodic review: periodic inventory control reviews the inventory status of an item at regular time intervals;

Modified control systems: to accommodate specific situations, variations, and combinations of the basic periodic and perpetual control systems have been developed;

Reactive method: the reactive inventory system as the name implies responds to a channel member's inventory needs by drawing the product through the distribution channel;

Purchase cost: is the amount paid to a vendor or supplier to buy the inventory;

Holding or carrying: costs relate to physically having items in storage;

Ordering costs: are the costs of ordering and receiving inventory;

Shortage costs: result when demand exceeds the supply of inventory on hand;

ABC approach: classifies inventory items according to some measure of importance;
Cycle stock: Inventory that is intended to meet expected demand;
Safety stock: inventory that is held to reduce the probability of experiencing a stock out;
FSN Analysis: classifies inventory based on quantity, the rate of consumption and frequency of issues and uses;
VED Analysis: classification is dependent on the user's experience and perception;
HML Analysis: classifies inventory based on how much a product costs/its unit price;
SDE Analysis: classifies inventory based on how freely available an item or scarce an item is.

CHAPTER TWO: LITERATURE REVIEW

2.1 Definition of Inventory

Inventories are materials or resources of any kind having some economic value, either waiting conversion or use in future. Apart from these, there are also many indirect materials, such as maintenance materials, fuels and lubricants, etc. which are used in a manufacturing organization. (Arnold *et al.*, 2008).

Inventories are materials and supplies that business or institutions carries for sale or provide input or supplies to the production process. All a business and institutions requires inventories, often they are substantial part of total assets.

Inventories are stock of materials of any kind stored for future use, mainly in production process. (Donald J. and David J.)

Inventories are materials of any kind having some economic value, either waiting conversation or use in future. There are also many indirect materials, such as maintenance materials,(spare parts),fuels and lubricants, etc.,which are used in a manufacturing

organization. They are also classified as inventories of materials for future use but they differ only in their use and classification from raw and other direct materials.(A.K Datta,2003)

2.2. Inventory management

Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory. This process usually involves controlling the transfer of units in order to prevent the inventory from becoming too high, or dwindling to level that could put operations of the company in to jeopardy. It is the integrated process that operationalizes the firm's and the value chain's inventory policy.

Inventory management is defined as a framework employed in firms in controlling its interest in inventory. It includes the recording and observing of stock level, estimating future request, and setting on when and how to arrange. (Stevenson etal., 2010)

Every organization, big or small, depends on materials and services from other organizations to varying extents. These materials and services are obtained through exchange of money. The various materials used as inputs, such as raw materials, consumables and spares, are required to be purchased & made available to the shops /users as and when needed to ensure uninterrupted production (Donald J. and DavidJ. 2000).

Inventory management is vital for the successful operation of most organizations due to the cost inventory represents. Effective management of inventory is a major concern for firms in all industries.(Mentzer etal.,2007)

2.3. Concepts of inventory management

Different definitions of inventory have been given by various scholars, but they all have the same meaning. Inventory is basically tangible asset that encompass, raw materials, work-in-process goods, component parts and completely finished goods that are considered to be

portion of a business asset and to be as input for a business operation or ready for sale. (Alexander and Emelia, 2016)

Most companies consider inventory the most important asset because their revenue is generated from it and subsequently increase stockholder's wealth. The material held by an organization makes up for most of the organization assets. Most organization invests so much money in materials and it is important for the organization to put in place a good material management system in order to manage the stock properly (Nzuza, 2015).

Using different inventory management techniques organizations can achieve cost efficiency and trade off balance between the costs of acquiring and holding inventory. As a result, they can smooth supply to intended customer and obtain their objectives.

According to (Nzuza, 2015) it conceptualizes whether the company captures efficient inventory management through using reliable techniques and models. And its result on achieving predetermined company objectives. Most of the time inventory management decisions have been laid on main deficits of obtaining materials as demanded. Those are time and inventory size for which focused determination of reliable controlling techniques are in need.

2.4. Empirical Framework of the study

In this section of study will assess what comments, finding, improvements were given in last researches about the specific area of study. In one field of study inventory management research was done by examining work from the field of logistics. Logistics researches have made a unique and significant contribution to the inventory management theory. Examination of such work stands to produce increased awareness and develop inventory management models within the field of logistics. It tends to incorporate issues not significantly addressed in other fields. Those issues are transportation and warehouse considerations.

Thus, the two issues are important part of supply chain and it has its own contribution for smooth flow of inventory to processing area and supplying to customer. Thus, this issue will include during assessment of the identified gaps in the organization. The inventory control model says that a firm place orders whenever its inventory position reaches a reorder point.

But the logistics literature has extended the reorder size and reorder point approach is several additional factors. Such as, transportation factors, buyer/seller relationships, quality considerations, different lead time materials and emergency conditions had to be considered. In this study in addition to optimal order quantity it will assess the supply chain of the company.

2.4.1. Objective of inventory management

The overall objective of inventory management is to achieve satisfactory levels of customer service while keeping inventory costs within reasonable bounds and to supply the required materials continuously and to maintain the required inventory to run the production and sales process smoothly. Toward this end, the decision maker tries to achieve a balance in stocking. That is the timing and size of orders (William, 2012).

Inventory management manages to minimize the risk caused due to under and overstocking of the material and its associated cost. Efficient management of input materials is of paramount importance in a business organization for maximizing materials productivity, which ultimately adds to the profitability of the organization. And the main concern of any Business management is to maximize the Return on Investment (Donald J. and David J. 2000).

2.4.2. Inventory management approaches

There are three types of inventory management approaches. *The reactive or pull inventory approach* which uses customer demand to pull product through the distribution channel. An alternative philosophy is a *planning approach* that proactively schedules product movement and allocation through the channel according to forecasted demand and product availability. A third or hybrid logic uses a combination of the first two approaches resulting in an *inventory management philosophy* that responds to product and market environments (William, 2012).

2.4.3. Functions of inventory management

Management has two basic functions concerning inventory. One is to establish a system to keep track of items in inventory and the other is to make decisions about how much and when to order. To be effective, management must have a system to keep track of the inventory on hand and on order; a reliable forecast of demand that includes an indication of possible forecast error; knowledge of lead times and lead time variability; reasonable estimates of inventory holding costs, ordering costs, and shortage costs and a classification system for inventory items.

2.4.4. Aim of inventory management

The aim of inventory management is to provide the required service level for both internal and external customers' in terms of quality and quantity.

2.4.5. Need for inventory

Inventories of materials are needed by all manufacturing organizations big or small for some of the following reasons. This includes: Time which is the time lags present in the supply chain, from supplier to user at every stage, requires that you maintain certain amounts of inventory to use in this lead time. Uncertainty in which inventories are maintained as buffers to meet uncertainties in demand, supply and movements of goods. The other is Economics of scale which is bulk buying, movement and storing brings in economics of scale (Padmanava, 2015).

2.4.6. Types of inventory

There are many types of inventories, such as Raw materials, components and service parts, work in process and finished goods inventories. Therefore, management policy with regard to each may also differ according to their types and need in different types of industries. However, in general, their treatment follows from their needs and cost benefit analysis. Thus broadly, inventories may be classified under:

- Raw/input material inventory: which is used in manufacturing the demand a rise they are drawn from other and misused or use value is added during the process and finally finished product come out.
- Semi-finished good: when the material is known as small finished good material or work in process.
- Finished goods inventories: these are complete finished products ready for sale. Transit inventory is arising because of the time necessary to move stocks from one place to another.
- MRO inventories: Maintenance, repairs, and operating supplies which are consumed during the production process and generally don't form part of the product itself (eg. Oils and lubricants machinery parts, tools and fixtures etc.,) are referred to as MRO inventories.
- Components: the parts used in assembly of product are known as components. When their components are purchased from outside it is known as bought out component or bought out material.
- Spare parts inventory: when manufacturing servicing facility of the machine is to be replaced by new. These new parts of the machine are known as spare parts (Datta, 2003).
-
- Absolute inventory: which any facility became serviceable and it is to be replaced by a new one after replaying the old machine facility is to be disposed such machine which have become useless are termed as absolute inventory (Roma Murthy Mur, 2002).

2.4.7. Cost of Inventory

Firms typically stock hundreds or even thousands of items in inventory, ranging from small things such as pencils, paper clips, screws, nuts, and bolts to large items such as machines, trucks, construction equipment and airplanes. Naturally, many of the items a firm carries in inventory relate to the kind of business it engages in. Thus, manufacturing firms carry supplies of raw materials, purchased parts, partially finished items, and finished goods, as well as spare parts for machines, tools, and other supplies inventories are used to satisfy demand requirements. So, it is essential to have reliable estimates of the amount and timing of demand.

Similarly, it is essential to know how long it will take for orders to be delivered. In addition, managers need to know the extent to which demand and lead time the time between submitting an order and receiving it might vary, greater the potential variability, estimate the need for additional stock to reduce the risk of a shortage between deliveries. Thus, there is a crucial link between forecasting and inventory management. Four basic costs are associated with inventories: purchase, holding, transaction (ordering) and shortage costs.

- Purchase cost: is the amount paid to a vendor or supplier to buy the inventory. It is typically the largest of all inventory costs.
- Holding or carrying costs: relate to physically having items in storage. Costs include interest, insurance, taxes (in some states), depreciation, obsolescence, deterioration, spoilage, pilferage, and breakage, tracking, picking, and warehousing costs (heat, light, rent, security). They also include opportunity costs associated with having funds that could be used elsewhere tied up in inventory. Note that it is the variable portion of these costs that is pertinent. The significance of the various components of holding cost depends on the type of item involved. It can be expressed in percentage or as a dollar amount per unit.
- Ordering costs: are the costs of ordering and receiving inventory. They are the costs that vary with the actual placement of an order. Besides shipping costs, they include determining how much is needed, preparing invoices, inspecting goods upon arrival for quality and quantity, and moving the goods to temporary storage. Ordering costs are generally expressed as a fixed dollar amount per order, regardless of order size. When a firm produces its own inventory instead of ordering it from a supplier, fixed charge per production run is the associated cost.
- Shortage costs/Stock out cost: result when demand exceeds the supply of inventory on hand. These costs can include the opportunity cost of not making a sale, loss of customer goodwill late charges, backorder costs, and similar costs. Furthermore, if the shortage occurs in an item carried for internal use the cost of lost production or downtime is considered a shortage cost (Source: company manual: 2009 G.C).

2.4.8. Inventory control

Inventory control may be said to be planned method whereby investment in inventories held in stock or maintained is such a manner that it insures proper and smooth flow of material needed for production.

Inventory control system is core component of inventory management and a mechanical procedure for implementing on inventory policy. The accountability aspect of control measures units on hand at a specific location and tracks additions and deletions to the base quantity. Accountability and tracking can be performed by manual or computerized techniques. In order to implement the desired inventory management, *policies and control procedures* must be devised. Those define how often inventory levels are reviewed and compared against the inventory parameters defining when the order and how much to order.

Inventory control system can be characterized as either perpetual or periodic. A modified approach is also presented.

- Perpetual review: A perpetual inventory control process reviews inventory status daily to determine replenishment needs.
- Periodic review: periodic inventory control reviews the inventory status of an item at regular time intervals such as weekly or monthly.
- Modified control systems: to accommodate specific situations, variations, and combinations of the basic periodic and perpetual control systems have been developed.
- Reactive method: the reactive inventory system as the name implies responds to a channel member's inventory needs by drawing the product through the distribution channel.
- The two-bin system: is one of the easiest systems of inventory control which is a simple method of control exercised but two simple rules. One is when the order should be placed and the other what quantity should be covered.
- Max-Min system: Under this method, max level and min level are fixed. Re-ordering is done after a period of review and order or re-order is placed when the quantity touches a certain level (DonaldJ. and David J. 2000).

2.4.9. Inventory Costing

Inventory costing is the process of assigning value to inventory and thus to the cost of goods sold. Though all inventory costing involves assigning a value to goods sold, there are a number of common costing methods. These include First -In- First out (FIFO), Last-In-First-Out (LIFO), Average cost Method and Specific cost method (Datta, 2003)

2.4.9.1. First-In-First-Out (FIFO) method

An operation following a FIFO inventory costing methodology operates under the assumption that the cost of inventory on hand at any given time should represent the cost of the inventory that has been most recently purchased. This means that when inventory is sold, the oldest costs (the cost of goods for the oldest inventory) are associated to the sale.

2.4.9.2. Last-In-First-Out (LIFO) Method

An operation following a Last- In-First out inventory costing methodology works in the exact opposite way from first in first out with LIFO. When a sale is made, the most recent inventory costs are associated with the sale.

2.4.9.3. Average cost method

In order to provide realistic basis for inventory evaluation and the cost of goods sold, the average cost method is used. This method of costing does not take in to account which item went out of inventory first or last, rather determine the average cost for each item during a period in time (Datta, 2003)

2.4.9.4. Specific cost method

Specific method provides the most specific valuation of inventory as well as flow of cost. Cost flow and physical flow are identical under this method but require maintenance of proper records. The inventory costing strategy that you choose to implement in your operation will

depend on a number of key factors involving how your operation and industry work, how inventory is handled, how orders are processed and the specific characteristics of your product itself (Datta, 2003).

2.4.10. Stock taking

It refers to the process of testing or checking the store record with actual items stocked in the stores. This means identifying every item on hand, count it and summarizing these quantities by item. There may also be a verification step, where the count results are compared to the inventory unit counts in a company's recording system.

2.4.11. Reorder Point

Orders are placed for the same quantity of material for each inventory cycle. This is often referred to as the reorder point (ROP) system. This technique allows inventories to be used until a critical inventory level is reached. The quantity ordered is constant, but the time interval between orders is allowed to vary.

2.4.12. Inventory Classification System

An important aspect of inventory management is that items held in inventory are not of equal importance in terms of dollars invested, profit potential, sales or usage volume, or stock out penalties. For instance, a producer of electrical equipment might have electric generators, coils of wire, and miscellaneous nuts and bolts among the items carried in inventory. It would be unrealistic to devote equal attention to each of these items. Instead, a more reasonable approach would be to allocate control efforts according to the relative importance of various items in inventory.

The A-B-C approach: Classifies inventory items according to some measure of importance, usually annual dollar value (dollar value per unit multiplied by annual usage rate), and then allocates control efforts accordingly. Typically, three classes of items are used: A (very important), B (moderately important) and C (least important).

FSN Analysis: is also analysis classifies inventory based on quantity, the rate of consumption and frequency of issues and uses. Here is the basic depiction of FSN Analysis: F stands for Fast moving, S for Slow moving and N for Nonmoving items. *Fast moving*, items that are frequently issued/used, *slow moving*, items that are issued/used less for a certain period and *non-moving*, items that are not issued/used for more than certain duration.

VED Analysis: is an analysis whose classification is dependent on the user's experience and perception. This analysis classifies inventory according to the relative importance of certain items to other items, like in spare parts. In VED Analysis, the items are classified into three categories which are: *Vital*, inventory that consistently needs to be kept in stock. *Essential*, keeping a minimum stock of this inventory is enough. *Desirable*, operations can run with or without this, optional.

HML Analysis: HML Analysis classifies inventory based on how much a product costs/its unit price. The classification is as follows: *High cost*, Item with a high unit value. *Medium cost*, Item with a medium unit value. *Low cost*, item with a low unit value.

SDE Analysis: This analysis classifies inventory based on how freely available an item or scarce an item is, or the length of its lead time. This is how the inventory is classified: *Scarce*, imported items and require longer lead time. *Difficult* items which require more than a fortnight to be available, but less than 6 months lead time. *Easily available* items which are easily available (Anon). Most of the time companies are use combined classification method in order to solve material control difficulty diversely (Company inventory policy, 2016 G C.).

2.4.13. Inventory ordering policies (Inventory decision)

Inventory ordering policies address the two basic issues of inventory management, which are *how much to order* and *when to order*. In the following sections, a number of models are described that are used for these issues. Inventory that is intended to meet expected demand is known as *cycle stock*, while inventory that is held to reduce the probability of experiencing a

stock out (running out of stock) due to demand and/or lead time variability is known as *safety stock*. The discussion begins with the issue of how much to order.

2.4.14. Inventory management models

There are three model of inventory management. These are: Deterministic inventory model, Probability inventory model and Just- in- time. The purpose of the discussion on inventory model is to show how quantity model can assist in making the decision of how much to order and when to order.

2.4.14.1. *Deterministic inventory management model (Economic order quantity model)*

The basic EOQ model is the simplest of the three models. It is used to identify a *fixed* order size that will minimize the sum of the annual costs of holding inventory and ordering inventory. The unit purchase price of items in inventory is not generally included in the total cost because the unit cost is unaffected by the order size unless quantity discounts are a factor. If holding costs are specified as a percentage of unit cost, then unit cost is indirectly included in the total cost as a part of holding costs.

The assumptions to the basic EOQ model include the following only one product is involved; annual demand requirements are known; demand is spread evenly throughout the year so that the demand rate is reasonably constant; lead time is known and constant; each order is received in a single delivery and there are no quantity discounts.

2.4.14.2. *Inventory cost in the economic order quantity*

When the quantity on hand is just sufficient to satisfy demand during lead time, an order for Q units is submitted to the supplier. Because it is assumed that both the usage rate and the lead time do not vary, the order will be received at the precise instant that the inventory on hand falls to zero. Thus, orders are timed to avoid both excess stock and stock outs.

As order size varies, one type of cost will increase while the other decreases. Such that if the order size is relatively small, the average inventory will be low, resulting in low carrying costs. However, a small order size will necessitate frequent orders, which will drive up annual ordering costs. Conversely, ordering large quantities at infrequent intervals can hold down annual ordering costs, but that would result in higher average inventory levels and therefore increased carrying costs. The optimal order quantity reflects a balance between carrying costs and ordering costs:

Annual ordering cost = (No of order per year) X (ordering cost per year)

$$\text{Annual ordering cost} = D/Q \times S$$

Where: D = Demand, usually in units per year

S = Ordering cost per order

Q = Units per order

Annual carrying cost = (Average inventory) x (carrying cost per year)

$$\text{Annual carrying cost} = Q/2 \times H$$

Where: Q = Units per order

H = holding (carrying) cost per unit per year

The total annual cost (TC) associated with carrying and ordering inventory when Q units are ordered each time is: Total Cost = Annual carrying cost + Annual ordering cost

2.4.14.3. Finding economic order quantity

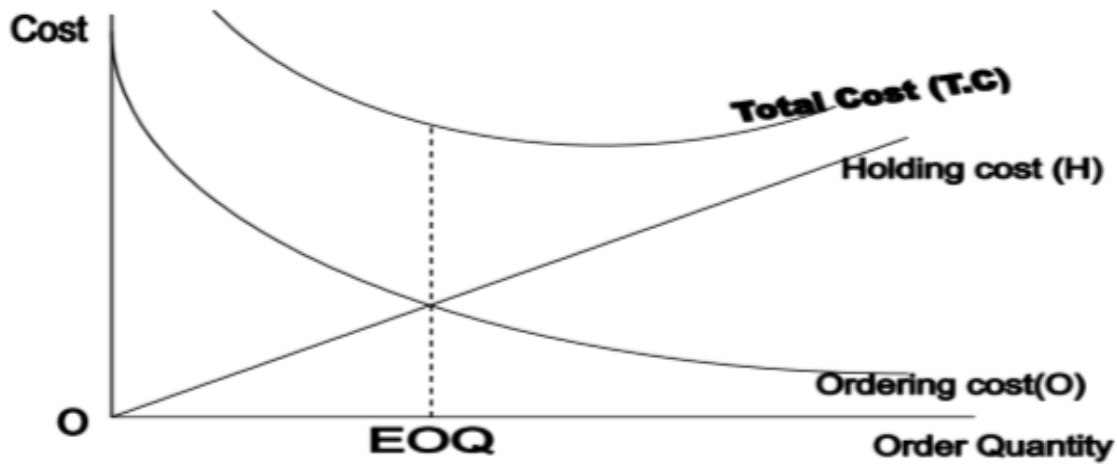
The total annual cost reaches its minimum at the quantity where carrying and ordering costs are equal. An expression for the optimal order quantity, Q_o , can be obtained using following formula,

$$Q_o = \frac{\sqrt{2DS}}{H}$$

Thus, given annual demand D , the ordering cost per order S , and the annual carrying cost per Unit H , one can compute the optimal economic order quantity (EOQ).

The length of an order cycle (i.e., the time between orders) is,

$$\text{Length of order cycle} = Q/D$$



Source: Arnold, *et al* (2008)

Figure 1: Economic Order Quantity (EOQ)

2.4.14.4. Finding the ROP (Re-Order point) Reorder Point

Orders are placed for the same quantity of material for each inventory cycle. This is often referred to as the reorder point (ROP) system. In order to determine the question of when to order, we should know the lead time first. Lead time, L , (or delivery time) means the time between the placing order and receiving order. This could be few days, or few weeks and inventory must need the demand during these days. Therefore:

$$\text{ROP} = \text{Expected demand during lead time (units per order)} + \text{Safety stock}$$

This means, an order is placed when inventory level reaches the ROP and the new inventory arrive at the same instant the inventory is reaching 0.

2.4.14.5. Economic production quantity (EPQ)

The batch mode is widely used in production. Even in assembly operations, portions of the work are done in batches. The reason for this is that in certain instances, the capacity to produce a part exceeds the part's usage or demand rate. As long as production continues inventory will continue to grow. In such instances, it makes sense to periodically produce such items in batches, or lots, instead of producing continually. The assumptions of the EPQ model are similar to those of the EOQ model, except that instead of orders received in a single delivery, units are received incrementally during production. Because the company makes the product itself, there are no ordering costs as such.

2.4.14.6. Inventory cost in the EPQ

With every production run (batch) there are setup costs, the costs required to prepare the equipment for the job, such as cleaning, adjusting, and changing tools and fixtures. Setup costs are analogous to ordering costs because they are independent of the lot (run) size. They are treated in the formula in exactly the same way. The larger the run size, the fewer the number of runs needed and, hence, the lower the annual setup cost.

The number of runs or batches per year = D/Q

The annual setup cost = the number of runs per year x the setup cost, S , per run = $(D/Q) S$

2.4.14.7. Finding economic production quantity

As long as production occurs, the inventory level will continue to build. When production ceases, the inventory level will begin to decrease. Hence, the inventory level will be maximum at the point where production ceases. When the amount of inventory on hand is exhausted, production is resumed, and the cycle repeats itself. Hence economic production quantity is optimum when,

$$TC \text{ min} = \text{Carrying cost} + \text{Setup cost} = (I_{\text{max}}/2) \times H + (D/Q) S$$

Where: I_{max} = Maximum inventory

2.4.15. Quantity discount model

The previous inventory model considered have been develop under the assumption that the unit cost of an item was independent of quantity product or ordered. However, in many business and industry quantity discount are provided as incentive for the purchase of large quantity of product. When quantity discount is available and all the EOQ assumption are let, it is possible for us to find the quantity that minimize the total annual inventory cost. As the discount are usually lowering the material cost or unit cost of a product, based on the order quantity we have to calculate the total cost based up on the order quantity in determining the optimal order quantity.

2.4.16. Probabilistic model

In practice, a large number of inventory situations can't be described by deterministic model. In this case, the demand is not large constant and deterministic; but probabilistic.

2.4.17. JIT (Just- In-Time)

JIT service can be a major competitive advantage for companies that can achieve it. An important key to JIT service is the ability to provide service when it is needed. That requires flexibility on the part of the provider, which generally means short setup times, and it requires clear communication on the part of the requester (William, 2012).

2.4.18. Inventory Store/ Storage

Store is defined as a specified area that quantity or supply of something kept for use as needed. Storage is defined as an activity or management of storehouses or stockyards and safe custody and protection of stocks through operation of storage equipment. Storage is a management activity that involves the planning, organizing and controlling of man, machine and money towards the execution of the custodial, controlling, and supply of materials functions for the accomplishment of the overall objectives of the organization.

2.4.18.1. Objectives of Stores Management

The primary objectives of the stores function is to provide a service to the operating functions by making available a balanced flow of raw materials, components, tools, equipment and any other commodities necessary to meet operational requirements. Besides to ascertain that proper Inventory System is implemented and frequent inspection is made.

Storage activity is the linking station between all other materials management functions and the operating units of an organization. Knowing to the above objectives to be achieved, it is a necessity to have well organized and operated storage that provides:

- Easy access to materials with in short time,
- Optimum use of storage space and flexibility of arrangements,
- Minimum use of materials handling equipment,
- Reduce deterioration and loss of materials, and
- Simplify the end of year physical count.

2.4.18.2. Stores Management Activities

Receiving: the receiving activity is the first activity within the company that is physically involved with any incoming materials. Therefore, it is the first “line of defense” in assuring that the materials received are what the company ordered. This activity normally does not include product quality assurance; in most companies, product quality determination is the responsibility of the inspection or quality assurance department.

Issuing and delivering: Issuing involves distribution of stored materials to users. Issuing process ascertains that store requisition(s) is (are) correctly filled out and authorized by appropriate official. It is basically a transfer of responsibility for items from the store to the user. Therefore, the issuance should insure that the items are being the right type, condition, quality, and at the right time to the right person and place. Like receiving process, the issuing process equally affects store’s efficiency. Thus, it is essential to have a proper issuing procedure that is clearly understandable by the store personnel.

2.4.18.3. Storage Methods

Companies institute various methods to control stockroom materials and maximize resource utilization. One of these methods is *addressing systems*, also commonly called *location-numbering systems*. A good addressing system is essential for control of materials in a stockroom. The number of different addressing systems varies only with the imagination of individuals developing them. One good system locates materials in storage by identifying, in sequence: (1) aisle, (2) slot or floor storage section, and (3) elevation or shelf level. Other form of addressing is also acceptable so long as it will facilitate identification of location for an item.

2.4.18.4. Types of Stores

The factors that have been considered when designing storage are the types of materials to be stored depending upon their characteristics and use, the volume of transactions, the reporting, accounting and verifying system. Stores could be arranged based on nature of materials for which those needed extensive care and safety-controlled temperature, and standard items store. Geographical location also considered in storage management. Based on warehouse building there are three types of storages. These are:

Shades: shade storage is a roofed structure without complete sidewalls. Such stores are used to handle goods in transit, materials that require maximum ventilation or to keep materials not prone to theft or of any damage.

Open storage: used to store many of the materials that do not lend themselves to covered storage such as big trucks, heavy construction equipment etc.

Covered storage: a storehouse within roofed structure and complete sidewalls (Datta, 2003).

2.4.18.5. Store layouts and materials handling

Efficiency in the storeroom layout and in materials handling is essential to the achievement of overall stores function objectives. Many of the problems of both new and existing storerooms can be attributed to faulty layout and poor materials handling. Development of an efficient storage facility depends directly on the prior study of all operations. This requires an in-depth

analysis of all store's activities for both present and future time periods (Company manual, 2009G.C).

2.4.18.6. Relationships of Stores Management with Other Management Functions

Because receiving and stores handle incoming materials first, their performance affects all other management functions. Simply, the effectiveness of other company functions impacts upon receiving and stores operations. Some common interdepartmental relationships are,

Marketing: Stores management can aid marketing through efficient performance of operations. The prevention of material damage by receiving and stores will facilitate on-time deliveries to customers. Accurate records help provide customers with desired quantities of materials and proper credits for returned goods. Stores activities play essential roles in the total materials management effort to minimize product costs. Success here helps marketing to maintain a competitive position through lower and/or consistent product pricing.

Finance: Stores activities are directly related to the finance function through control of company assets. Accurate record keeping by receiving and stores personnel provides finance with the factual information (such as assets included in balance sheets) required for management of company financial activities.

Manufacturing: Manufacturing depends upon receiving and stores for the uninterrupted flow of materials in order to maximize operational requirements. They need to receive the right material, in the right quantity, at the right time, at the right place. Any shortcoming here will result in manufacturing losses, involving employee productivity, machine capacity, and schedule maintenance. Stores should provide the manufacturing group with continuous communications about expedited hot list materials and any potential problems.

Quality Assurance: Quality assurance relies on receiving to check incoming shipments for materials that were not ordered and for obvious transportation damage as well as quality assurance of produced items. These checks will reduce the inspection workload. Careful handling by both receiving and stores personnel will reduce damage to materials and the

number of rejects by inspectors. Receiving personnel should cooperate with incoming inspection in planning the sequence of processing materials, allowing both groups to maximize employee productivity.

Purchasing and supply: Purchasing can support receiving and stores activities by obtaining materials in unit loads conducive to internal operations. This will eliminate the time required to re-handle materials and improve space utilization. Receiving and stores can benefit from improved scheduling of purchased-materials deliveries: the more uniform receipt of materials reduces employee and equipment workload problems.

Inventory Control: Inventory control assists receiving and stores operations by ordering materials in quantities related to standard unit load capacities. This is essential for effective materials control, reduced materials handling, and maximum space utilization for both purchased and manufactured materials. Inventory control can help to reduce stores problems by maintaining constant control of inventory levels (Company manual, 2009G.C).

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1. Description of the Study Area

The study was conducted on Addis Pharmaceutical Factory S.C. iv-Solution which is present in Addis Ababa, the capital and largest city of Ethiopia with a population (as of 2021) of 5,005,524 inhabitants (https://kids.kiddle.co/Addis_Ababa). It lies on a plateau in the country's geographic center at an altitude of about 8,000 ft (2,450 m). The city was founded as the capital in 1887 because of the unsatisfactory location of the former capital, Entoto, Addis Ababa has become the national center for higher education, banking and insurance and trade services. Several international organizations have their headquarters there, including the Organization of African Unity/ African Union (OAU) has based. It also hosts the headquarters of the United Nations Economic Commission for Africa (ECA), as well as various other continental and international organizations. The city is divided into 10 sub-cities and now a day's including lemmi kura sub city and 99 weredas/ kebeles. The plant is dedicated for the manufacturing of large volume Parenterals. In August 2009 G.C, it started manufacturing of four of the essential Intravenous Infusions (0.9% sodium chloride, dextrose 5%, dextrose 5% with 0.9% sodium chloride and ringer lactate).

3.2. Research Design

There are three types of research design Exploratory, Descriptive and Causal. So, the descriptive type of research design was used in the study in order to assess the inventory management practice and challenges that affect performance of APF. A descriptive method of research approach was also used to assess whether the theoretical aspects concerning inventory management are followed or not and helps to clearly describe relevant aspects of phenomenon about individual, group or situation.

3.3. Population and sample size

The total population of the study comprises staff of planning and warehousing, finance department and procurement departments those who have relevance in the inventory

management directly or indirectly. Except few clerks the entire staffs in the three departments are minimum BA degree holders thus it helps to get relevant data in the course of study. The total number of the staff is 85 including department managers and DGM commercial. Thus, the number of the population is manageable in executing census study, the researcher was include the whole population and considered all were fill and return back the questionnaires. As far as the employees of the enterprise are concerned, only the managers of the three departments and the DGM commercial were interviewed to collect first hand data.

3.4. Data sources and data collection methods

The study was using both primary and secondary data which were obtained from primary and secondary data sources respectively. The data collection methods and the type of data collection instruments are stated below.

3.4.1. Data Sources

Both primary and secondary data were used in the study. The primary data was collected directly from the staff and in addition to the primary data sources other documents like company's manuals, policies, procedures books, different journals and research papers on similar topics were used as secondary sources of data to enrich the study.

3.4.2. Data Collection Methods

As far as the data collection methods are concerned structured questionnaire, interview and checklists were used to gather the primary data. Interview method was used only for top management so as to obtain reliable and valid data used the assessment of inventory management at APFIV. Questionnaire was prepared and distributed to the other group of respondents who are believed to fill and return it. The other third method that the researcher was used to collect primary data jointly with the above two is personal observation. The third method help the researcher to be part of the operational environment and look at and understand what is really going on in the due course of inventory management.

3.5. Method of Data Processing and Analysis

3.5.1. Data Processing

In processing the data, filled and completed questionnaires was carefully checked to assure that the data is accurate and uniformly entered and arranged to facilitate percentages and tabulation systems. Coding data was made by assigning symbols to the response of the population and group into limited number of categories. The collected data was entered to Excel spreadsheet and then exported to SPSS version 22 for further analysis.

3.5.2. Descriptive Statistics

The analysis is limited to the cross-sectional data from the respondents. In this study descriptive statistics was used to describe the general characteristics of the APFIV and the respondents. Frequency distribution tables, measures of central tendency (the mean), measures of variability (standard deviation), percentage, tabulation and others) were used to describe profiles of respondents and the company.

3.5.3 Regression Analysis

The correlation analysis shows whether or not there is relation between different variables including different independent variables with dependent variables during the research. The relation between the dependent variable i.e. inventory management and the explanatory variables including Age, Educational background, Experience, Gender, Current position, Reordering process, Inventory control process, software used in the company, Inventory Replenishment, Purchasing process of raw materials, Procedural practices of organization, Waste disposal and Logistics management were analyzed using correlation. So, on correlation result **. Shows Correlation is significant at the 0.01 level and *. Shows Correlation is significant at the 0.05 level. Also the regression analysis shows whether or not the relation during correlation found on the enclosed table is significant or not. During the regression analysis significant level below 0.05 shows the relation is at significant level. So if the relation

between the dependent variable and explanatory variables was at less than 0.05 we can conclude that their relation was at significant or the explanatory variable can affect the dependent variables.

3.5.3.1 . *Definition of Variables*

Dependent variable: the determinant of the organization that was hypothesized as this factor has direct impact in the company on its performance. So, the dependent variable in this thesis was inventory management.

Independent variables: These variables were hypothesized to influence the dependent variable in the organization. Also the independent variables in the study were as listed below.

Inventory management and current inventory control practices of Addis Pharmaceutical Factory S.C (APFIV) were dependent variables. Inventory Management is defined and points out that Management is the whole process of planning, organizing and controlling are the organic functions of management (Arnold *et al.*, 2008). According to him, an organic function is a function which is invariably basic to and inherent in, managerial activity whenever and wherever it is performed. These functions are performed in each and every situation. However, staffing and directing are also important functions of management. Inventory Management is responsible for planning and controlling inventory from the raw material stage to the customer. Since inventory either results from production or supports it, the two cannot be managed separately and therefore must be coordinated. Inventory must be considered at each of the planning levels and is thus part of production planning, master planning with end items and materials requirements planning with components, parts and raw material (Arnold *et al.*, 2008).

The following explanatory variables were hypothesized to influence the dependent variable in the study area.

Age: It is measured in a number of years. Age of employee can influence the inventory management system. However, there are mixed results as to the direction of

influence. It is hypothesized that adults that have better experience, management of cost and decisions on risks better may have better involvement in inventory management.

Educational background: It is true to say education gives the key to solving most of our problems. So, education can affect the inventory management practice.

Experience: is measured by the number of years staying in the company. Having better experience in the same company means having more experience in the work. Experienced person knows their current customers but also professionals, therefore make better inventory management in the company. They know their input and product market, slack and peak season alert to them in response to it; collect and handle customer better by developing service fit to their customer individual's differences; make better decision in purchasing of input in terms of quality and quantity and identify better watch to making cost benefit analysis.

Gender: the gender of employee whether they are male or female it may not affect the inventory management.

Current position: respondents include officer, division head, line manager and top managers. All these have impact on the inventory management.

Reorder: Rearrangement in different orders

Inventory control software: accurate and up to date inventory management software is a crucial to business successes due to its ability to reduce costly inventory errors, improve your ability to meet customer demands and lower your operational cost. It is software installed on the computer systems that enables a firm to keep a check on the inventory levels by performing the automatic counting of inventories, recording withdrawals and revising the stock balance

Inventory Replenishment: otherwise known as stock replenishment, refers to the process of inventory moving from reserve storage to primary storage then on to picking locations. It is important to note that inventory replenishment is sometimes used to define both ready to sell inventory as well as raw material received from suppliers.

Purchasing process of raw materials: executing purchase and track its logistics process touch's different departments within the company and different externalities within the country. Hence there is dalliance of materials reaching at warehouse, the

research study will examine the actual practices of logistics management and its challenges and will propose possible solution to the company.

Procedural practices of organization: most of pharmaceutical input materials are bought from abroad except minor excipient and packaging materials). Moreover, on average more than 60% of yearly expenditure is laid in purchasing of different input materials from abroad. However, despite the fact that there are reliable manuals, procedures and policies and skilled staffs in Warehousing department, there is order quantity management problem for which frequent purchase demand is occurred. Thus, as if huge investment is there, the research study will assess the actual practices of inventory management and its challenges and will propose possible solution to the company. In case of Addis Pharmaceutical Factory Sh. Co., variety of input materials which can facilitate the production process are purchased and transported to the company. In the other side finished products (Medicines) are distributed to different locations of the country from warehouse.

Waste disposal: Due to the pharmaceutical nature of the input materials that needs regulatory authority approval and regulated and recycled nature of disposal, damage and dead materials removal from warehouse is not taken place timely. Hence it leads difficult to compute the ware house costs within the company.

Logistics management: is the part of supply chain management that plans, implements and controls the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption to meet customer requirements. Since the company major purchases are from abroad, significant cash outlay is spent to transport different materials using different mode of transportation (sea or air mode of transport).

3.5.3.2 Regression equation

In this study measure of correlation and regression analysis were used in identifying factors that influence the inventory management which was the dependent variable of the company. Inferential statistics with a 95% confidence interval (CI) and p-value less than 5% was used to identify variables associated with the inventory management in the company.

Table 1. Links between specific objectives and methods to achieve them

Specific Objective	Dependent variable	Explanatory variables	Type and source of data	Data collection	Data analysis method
To assess the main challenges of inventory management in the company;	Inventory-management	Age, Gender, Education background, Experience, Job classification, current position, Reorder, Inventory control software, Inventory Replenishment, Purchasing process of raw materials, Procedural practices of organization, Waste disposal, Logistics management	Primary data from staff Point in time data (quantitative and qualitative data on the dependent and explanatory variables)	Survey questionnaire	Descriptive statistics, Linear-regression
To identify challenges of the current inventory control practices;	Current inventory control practices	Age, Gender, Education background, Experience, Job classification, current position, Reorder, Inventory control software, Inventory Replenishment, Purchasing process of raw materials, Procedural practices of organization, Waste disposal Logistics management	Primary data from respondents	Survey questionnaire	Descriptive statistics

To identify inventory control techniques that hinders smooth flow of operation in the company	Smooth flow of operation	Inventory control techniques	Primary data from respondents	Survey questionnaire	
To assess the company manuals, procedures and policy established is accordance with the frameworks can safeguard inventories management			Primary data from respondents and secondary data from manuals	Survey questionnaire	
To assess whether the company established mechanisms for identified gaps in inventory management			Primary data from respondents and secondary data from manuals	Survey questionnaire	Descriptive statistics, synthesis of open-ended question results

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1. Demographic and personal profile of respondents

A total of 85 staffs which were present in AFPIV office were participated in the survey during the study period. Thus, the overall information about the office based on the questionnaire was as in the table below.

Table 2. Demographic and personal profile of respondents

No.		Frequency	Percentage	
1	Age	19 up to 25	3	3.5
		26 up to 30	9	10.6
		31 up to 35	12	13.1
		36 up to 40	22	25.9
		41 up to 45	27	31.8
		Above 45	12	14.1
		Total	85	100.0
2	Gender	Male	51	60.0
		Female	34	40.0
		Total	85	100.0
3	Job	Permanent	62	72.9
		Contract	23	27.1
		Total	85	100.0
4	Education (completed level)	10 complete	5	5.9
		TVET level 1 and level 2	7	8.2
		Diploma	10	11.8
		Degree	38	44.7
		2 nd degree and above	25	29.4
		Total	85	100.0

5	Experience	< 2 years	4	4.7
		2 - 5 year	13	15.3
		6- 10 years	42	49.4
		> 10 years	26	30.6
		Total	85	100
6	Current work position	Officer	74	87.1
		Division head	3	3.5
		Line manager	4	4.7
		Top management	4	4.7
		Total	85	100

Source: Own survey data (2021)

Table 2 above shows that the respondents were at different age; from these 3.5% was at 19-25 years while 10.6% were in the age group of 26-30 years. Also, the other 31.1% of the respondents were at the age of 31-35 and the other respondents were at 25.9%, 31.8% and 14.1% frequency including 36 up to 40, 41 up to 45 and above 45 respectively. Most of the respondents are at the productive stage range hence they can offer their talent and can support the company as well. As the study shows most of the respondents were at age of 41 up to 45.

Where as in table 2, most of the respondents are male 60%, and 40% are female.

As we can see above Table 2 shows the educational background of the study population which revealed that operators were in the range of 10 complete to 2nd degree and above. Therefore, from the total respondents 38 (44.7%) of them were at first degree graduate. It shows the department has skilled man power. Therefore, the result shows AFPIV office is mostly employing people who graduate first degree. Also the result shows much of the respondents 42 (49.4%) were at experience of 6 up to 10 years and the other 4.7%, 15.3% and 30.6% of the respondents were at less than two years, 2 up to 5 year and above 10 years respectively. It shows us about 80% of the employees have more than 5 years work experience. More over about 44.7% of them are 1st degree holders.

4.2. Functional structure/general overview

The result during the study shows all respondents stands for strongly agree for APFIV has a separate materials/inventory management function. So, we can conclude that in this office have separate material/ inventory management.

Table 3. Functional structure/general overview

No.		Frequency	Percentage	
1	APFIV has a separate materials/inventory management function	Strongly agree	85	100
		Total	85	100
2	The department has a coherent communication between the divisions under it (Material planning and warehousing)	Disagree	5	5.9
		Normal	22	25.9
		Agree	49	57.6
		Strongly agree	9	10.6
		Total	85	100
3	APF IV materials management function has workable organizational structure	Disagree	7	8.2
		Normal	17	20.0
		Agree	58	68.2
		Strongly agree	3	3.5
		Total	85	100.0
4	The department has integrated inventory and storage policy	Disagree	4	4.7
		Normal'	17	20.0
		Agree	55	64.7
		Strongly agree	12	14.1
		Total	85	100
5	The function has workable operating system	Strongly	2	2.4
		Disagree	24	28.2
		Normal	24	28.2
		Agree	47	55.3
		Strongly agree	4	4.7
		Total	85	100

Source: Questionnaire 2021

From the above table 3 showed most of the respondent 55.3% of them were agree on APFIV materials management function has workable operating system and 28.2% of them are normal. 4.7% of them are strongly agreed. And only 28.2% of them were not agree on this and 2.4% of them are strongly disagree. 57.6% of respondents were agree on coherent communications between the divisions under it (Material planning and warehousing). Also, the other 22 (25.9%) of the respondents stands for normal. 9(10.6%) of the respondents were strongly agree and 5(5.9%) of them are disagree.

The above Table 3 showed that most of the respondents 68.2% of them were agree on APFIV materials management function has workable organizational structure and from these only 8.2% of them were not agree on this. Also, the result shows most of the respondents 55 (64.7%) of them stands for agree on the department has integrated inventory and storage policy and 12(14.1%) of them said that they were strongly agree on this. But only 4(4.7%) of them were disagree on this.

But in general, the company used different package software's in different departments. Like in Finance they use Peachtree, in MP and WH, marketing, QA/QC, production they use different customized software. In organizational level, there is no integrated package like ERP supports. ERP (Enterprise resource planning) it is the integrated management of main business process supported by software which is installed company wise. And the whole process of the company will be integrated, and it ease the organizational operating system adds efficiency in every level of operation.

4.3. Inventory classification techniques implémentations

Table 4. Inventory classification techniques implementation

No.		Frequency	Percentage	
1	The inventory re-order level has controlled in line with each physical inventory	Strongly Disagree	2	2.4
		Disagree	4	4.7
		Normal	72	84.7

		Strongly agree	7	8.2
		Total	85	100
2	There is a classifying procedure of slow moving, damage, and obsolete materials.	Normal	44	51.8
		Agree	33	38.8
		Strongly agree	8	9.4
		Total	85	100
3	The company uses more than one inventory classification techniques (ABC and VED)	Normal	21	24.7
		Agree	59	69.4
		Strongly agree	5	5.9
		Total	85	100
4	There is lead time consideration procedure	Normal	6	7.1
		Agree	63	74.1
		Strongly agree	16	18.8
		Total	85	100
5	The Economic order quantity model accounts optimum level during the operation	Normal	16	18.8
		Agree	50	58.8
		Strongly agree	19	22.4
		Total	85	100

Source: Questionnaire, 2021

From the above table, 72 (84.7%) of respondents says the function re-order level has controlled in line with each physical inventory. 7(8.2%) of them says strongly agree. 4(4.7%) of them are said disagree and 2 (2.4%) of them says strongly disagree. Thus from the analysis we can say that the function uses the reorder level in line with physical inventory.

As per the analysis, 44 (51.8%) of respondents says normal for the function uses classifying procedure of slow moving, damage and obsolete materials. 33 (38.8%) says agree for it. And 8(9.4%) of them says strongly agree. Besides, 59(69.4%) of respondents has agree for the function implements more than one inventory classification techniques. 21 (24.7%) respondents says normal and the rest 5(5.9%) of them are strongly agree.

As far as the company is pharmaceutical manufacturing, it has standard classifying procedure called “SOP” which inculcated accordance with EFMHACA guidelines (Source: Interview). The company uses mixed inventory classification systems. For which ABC and VED classification system is used. In addition to EOQ inventory classification model, they considered ABC and VED classification system. Moreover, the company inventory policy includes packaging size and adapted minimum order quantity of reliable suppliers (mostly sole) while raw and packing materials are purchased from abroad. Hence that is considered while computing Reorder quantity. Lead time is incorporated according to the mode of transport and nature of materials being purchased and included in the inventory policy.

But due to complexity of materials being purchased and different stakes involved in the due course, moreover dynamics, the lead time framed in the policy is not revised (Company inventory policy, 2009-2010).

4.4. Inventory controlling system

As we can see from below Table 5, 54(63.5%) of the respondents were agree on there were stock record and inventory controlling system. 25(29.4%) of the respondents were strongly agree on it. And 6(7.1%) of them are normal. And 54 (63.5% of the respondents says the company has used perpetual inventory controlling system. 10(11.8%) of them are says normal. And 21(24.7%) of the respondents are strongly agree on it.

Table 5. Inventory controlling system in the company

No.	Inventory controlling system	Frequency	Percentage	
1	Stock record and inventory controlling system	Normal	6	7.1
		Agree	54	63.5
		Strongly agree	25	29.4
		Total	5	100

2	Inventory controlling system (perpetual) is used to control the stocks	Normal	10	11.8
		Agree	54	63.5
		Strongly agree	21	24.7
		Total	85	100.0
3	There is segregation of duets among physical stocks and stoke record keeping	Disagree	2	2.4
		Normal	8	9.4
		Agree	64	75.3
		Strongly agree	11	12.9
		Total	85	100.0
4	There is a reporting mechanism for slow moving, obsolete or damaged items	Normal	2	2.4
		Agree	60	70.6
		Strongly agree	23	27.1
		Total	85	100
5	Physical stock count and stock record reconciliation are carried out by independent personnel	Normal	15	17.6
		Agree	51	60.0
		Strongly agree	19	22.4
		Total	85	100

(Source: Own questionnaire survey)

From the above table, 64(75.3%) of the respondents agree on segregation of physical stock and stock record keeping. 8 (9.4%) of respondents are normal and 2 (2.4%) of respondents are disagree. Moreover, 60 (70.6%) of the respondents agrees there is a reporting mechanism for slow moving, obsolete or damaged items whereas 2(2.4%) of them says normal for it. And the rest 23(27.1%) of them are strongly agree on it. Finally 19(22.4%) of the respondents strongly agree on Physical stock count and stock record reconciliation are carried out by independent personnel. 51(60%) of them are agreed on it and the rest 15(17.6%) of them are normal on it.

4.5. Timely Response on identified gaps

Table 6. Timely Response on identified gaps in the company

No.			Frequency	Percentage
1	Timely replenishment of shortage materials in the BOM (Bill of material) Planning for production.	Normal	65	76.5
		Agree	16	18.8
		Strongly agree	4	4.7
		Total	85	100
2	There is Stock out notification procedure accordance with the reorder level.	Normal	5	5.9
		Agree	46	54.1
		Strongly agree	34	40.0
		Total	85	100
3	There are clear wastage and obsolete materials disposal practice	Normal	56	65.9
		Agree	27	31.8
		Strongly agree	2	2.4
		Total	85	100
4	There is stock variation(overage or shortage) handling procedure	Normal	2	2.4
		Agree	60	70.6
		Strongly agree	23	27.1
		Total	85	100.0
5	The inventory warehouse has supportive controlling devices (camera)	Normal	3	3.5
		Agree	57	67.1
		Strongly agree	25	29.4
		Total	85	100.0

(Source: Questionnaire 2021)

In the table 6, 65(76.5%) of respondents are say normal, 16 (18.8%) of the total respondents are say agree and 4(4.7%) strongly agree on Timely replenishment of shortage materials in the BOM (Bill of material) Planning for production.

And 56(65.9%) of the respondents says normal for the company has clear wastage and obsolete materials disposal practice. 27(31.8%) of them were agree on it. and 2(2.4%) of the were strongly agree on it.

As per the above table, 60(70.6%) respondents says agree with the function has stock variation handling procedure. 23(27.1%) says strongly agree on it. And the other two says normal for it. Based on it, the company has stock variation controlling procedure. And in case of security of the storeroom, 57(67.1%) of the respondents are agree with It. 25(29.4%) of them are strongly agree as there is security camera. And 3(3.5%) says normal. Thus the storeroom has safeguarded from unnecessary theft and mischief.

4.6. Factors affecting the inventory management of the company

As we can see from the Annex 2 the correlation analysis result shows there is relation between different variables including different independent variables with dependent variables during the research. **. Shows Correlation is significant at the 0.01 level and *. Shows Correlation is significant at the 0.05 level. So, age of respondents, educational level of respondents and years of experience of respondents have relation with inventory management of Addis pharmaceutical factory at different levels. Also, as we can see above Reorder process, Inventory control software used in the company, Inventory Replenishment procedure, purchasing process of raw materials, procedural practices of organization, waste disposal process of the company, logistics management, inventory management and current inventory control practices have relation with the dependent variables.

The regression analysis shows whether or not the relation during correlation found on the Annex 2 is significant or not. So as we can see from Annex 3 below the regression analysis shows the above independent variables which had relation on correlation analysis were at significant level of relation. When we see the significance level of all of the independent variables which have correlation with the dependent variables were at less than 0.05 levels so we can say the independent variables were significantly related

with the dependent variable. On this research the dependent variable was inventory management of Addis pharmaceutical company IV-Solution.

4.7 Open questions result from respondents

Inventory management considers economics of scale. The company purchases variety of impute materials in the production process. Different raw and packaging materials are used to produce a single product. Thus, materials are classified according to their importance and movability and included in the inventory policy of the company. Besides most common materials uses as ingredient for different products having relatively low value has decided to purchase for 6 (six) month's consumption. And most excipients (colorants) having small usage has decided to purchase yearly and included in the inventory policy.

As we can see from the response by respondents there is procedural interaction among supportive functions (Synergy). As usual practice the departmental interaction is there. One department's report (final output) can use an input to the other department. Example. Purchasing department report can assist to material planning and warehousing department to classify which material is transiting to factory, ready to purchase, under quotation collection, etc. In line with the stocks on hand, they arrange the storage space and report to production department for production arrangement.

Besides, the finished product report (monthly or weekly) produced through material planning and warehousing is circulated to different departments especially to marketing and finance departments so as to inform their customers for open market and to distribute medicines for different institutes with supply agreement. But Except for tenderized markets which is supported by agreements, open tender markets are not supported by procedures. It is exercised according to the market situation.

Thus, as a synergy, there is no procedural practice. But sum up works of departmental functions are flowed to achieve the organization's objective, the line managers have

scheduled meeting every two weeks and take their assignment to improve the interdepartmental communication.

The department considers storage management as strategic cost reduction. The company has a storage room within the company and rented stores outside the factory. Different items are separated according to their nature and direct use to production. But due to the pharmaceutical nature of the input materials that needs regulatory authority approval and regulated and recycled nature of disposal, damage and dead materials removal from warehouse is not taken place timely. Hence it leads difficult to compute the ware house costs within the company.

The logistics practice has integration with the inventory management and purchasing practice. The inventory control division has scheduled reconciliation with purchase and supply department regarding materials requested for purchase and purchased items. In between they specify for defect materials purchase and short shipped and overage during purchase materials and forward to the managerial meeting for further decision.

The inventory management considers related indirect costs (Handling costs, ordering costs, storage costs). Based on the yearly forecast, the inventory control prepares yearly stock demand. They converted to the unit of purchase quantity. Based on the reorder level, they specify the purchase demand quantity. With the advice of production department most of input materials purchases has initiated 2(two) times a year. That can earn economics of scale, lowers handing and ordering costs

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of findings

Based on the analysis results, findings of the study is summarized as follows,

The result shows that most of the respondents were male so we can say in the office most of staffs are male. In case of the job classification, 72.9% is permanent whereas the remaining is contract. Hence the company can manage the employee idle time and reduce other employee related costs. And most of the respondents are male hence the company has to work to increase the women participation through women empowerment.

From the total respondents 38 (44.7%) of them were at first degree graduate. It shows the department has skilled man power. As the result shows the department (material planning and warehousing) is mostly employing people who graduate first degree. And also much of the respondents 42 (49.4%) were at experience of 6 up to 10 years. It shows us about 80% of the employees have more than 5years work experience. Moreover, about 44.7% of them are 1st degree holders and most of the respondents were at the position of officer which were at the percentage of 87.1 and the other were at division manager, line managers and top managers.

In cumulative the department has skilled manpower hence they can contribute better performance to the department.

In regard to functional structure, the result during the study shows APFIV has a separate materials/inventory management function. So, the office have separate department titled Material planning and warehousing department.

Regarding workable operating system of the function, the result says above half of the respondents has agree and 28.2% of them are normal on it even though 28.2% of them were not agree and 2.4% of them are strongly disagree.

The results on coherent communication between the divisions under material planning and warehousing says that 57.6% of the respondents were agree on it .And except few majority of them were agreed on it.

Findings shows that, APFIV materials management function has workable organizational structure. And the department has integrated inventory and storage policy as well. So, based on the respondent's view, we can say that the department has operating system for their practice even though there were deficiencies and challenges of operations. In addition to hard document they use mini-software to track and control stocks.

But in general, the company used different package software's in different departments. Like in Finance they use Peachtree, in MP and WH, marketing, QA/QC, production they use different customized software. In organizational level, there is no integrated package like ERP supports. ERP (Enterprise resource planning) it is the integrated management of main business process supported by software which is installed company wise. And the whole process of the company will be integrated, and it ease the organizational operating system adds efficiency in every level of operation.

From the result of the analysis reorder- level of the function has controlled in line with each physical inventory. And it implements more than one inventory classification techniques.

The result during the research shows there is stock record and controlling system in the company. There were stock records are reconciled with physical count periodically even though there were some of the respondents that were responding to normal. So as a result, there were stock records reconciled with physical count periodically. Also, there were inventory controlling system (perpetual) is used to control the stocks. Besides the function has classifying procedure of slow moving, damage and obsolete materials and uses more than one inventory classification techniques.

From the analysis, there is segregation of physical stock and stock record keeping even though there are few respondents were disagree on this.

Moreover, from the functional organogram, there is segregation of duties hence it has designed two divisions stock control and warehouse division and. And separate store

room has specified for dead, slow moving materials in the warehouse. Besides, obsolete and damaged items are transported to general store than stored in the main warehouse with tagged its history.

Physical stock count is held yearly as company level and reconciled with stock record in stock control division and finance department cost and budget division. In case of finished product inventory, in addition to the scheduled count, there is surprising count.

As per the analysis, there is independent personnel involvement in the checking and cross checking of presence of stocks. It has checked by external Auditors once a year.

The finding shows that most of the respondents say normal to shortage materials is provided timely. Hence the replenishment is not occurring as per required time. In conclusion there is dalliance in providing shortage materials. And the function has clear procedure of stock out notification. Most scheduled purchase is exercised twice a year for major raw and packing materials considering existing materials at store. During purchase EOQ, reorder quantity, reorder point is considered. But seldom minor materials have been out of the frame due to packaging and minimum sales quantity of suppliers. In this case purchase has decided by top management and excess quantities are flowed to warehouse. In some time, there could create differences and disturb the inventory compilation. In addition, hence the inventory controlling model are done for individual materials, but single finished product has different input raw and packing materials, in the ground it is complex to compute an exact figure has to purchase and store. As per the analysis result, the company has clear wastage and obsolete materials disposal practice.

As far as the company is pharmaceutical manufacturing, it has standard classifying procedure called "SOP" which inculcated accordance with EFMHACA guidelines (Source: Interview). The company uses mixed inventory classification systems. For which ABC and VED classification system is used. In addition to EOQ inventory classification model, they considered ABC and VED classification system. Moreover, the company inventory policy includes packaging size and adapted minimum order quantity of reliable suppliers (mostly sole) while raw and packing materials are purchased from abroad. Hence that is considered when computing Reorder quantity. Lead time is

incorporated according to the mode of transport and nature of materials being purchased and included in the inventory policy.

But due to complexity of materials being purchased and different stakes involved in the due course, moreover dynamics, the lead time framed in the policy is not revised

Findings from open questions says that the company considers economics of scale while purchasing input materials as far as the required quantity doesn't significantly harm the inventory policy of the company. But there is some materials being out of the frame of the policy.

In regard to the interdependence and synergy of departments, there is customized operational relationship among them. Rather it doesn't supported by procedures. Thus, as a synergy, there is no procedural practice. But sum up works of departmental functions are flowed to achieve the organization's objective, the line managers have scheduled meeting every two weeks and take their assignment to improve the interdepartmental communication.

Findings says that the department didn't efficiently consider storage management as strategic cost reduction. The company has a storage room within the company and rented stores outside the factory. But due to the pharmaceutical nature of the input materials that needs regulatory authority approval and regulated and recycled nature of disposal, damage and dead materials removal from warehouse is not taken place timely. Hence it leads difficult to compute the ware house costs within the company.

As per findings, the logistics practice has integration with the inventory management and purchasing practice so that the inventory control division has scheduled reconciliation with purchase and supply department regarding materials requested for purchase and purchased items. Thus there weren't provided timely decision for materials specified as defect materials purchase, short shipped and overage.

The findings from open question says, the inventory management considers related indirect costs (Handling costs, ordering costs, storage costs). But hence those costs are

associated with different practices in the inventory management, deficiencies in the other practices can lower its efficiency.

5.1. Conclusion

Inventories play an important role in any type of organization and it hold significant amount of the organization's working capital. Since APFIV is pharmaceutical manufacturing firm, it stores different types of inventory (Raw material, packing material, work-in-process, finished products, repair and maintenance parts, etc...) In its operation. Thus effective and efficient inventory management practices can aid a competitive advantage through providing optimum working capital utilization and cost efficiency.

The study can be concluded that APFIV is good at managing their inventory since they have separate function supported by two divisions and with workable organizational structure. This was predicted in their higher means of efficiency levels in inventory management and their widely application of theories of inventory management in their operations. The study revealed that this manufacturing organization has integrated inventory and storage policy and good operating system. In addition to hard document they use mini software to track and recording stocks.

But in company wise, they use different software packages in different departments. In Finance department, they use Peachtree software, in MP and WH, Marketing, QA/QC, and production they use different customized software's. In organizational level, there is no integrated package like ERP (Enterprise Resource Planning) it is the integrated management of main business process supported by software which is installed company wise. And whole process of the company will be integrated and ease the organizational operating system and adds efficiency at company level.

The study found that classification of materials was important in improving performance of this company. An improved classification system would have a positive effect on

inventory management and consequently the organizational performance. The company uses mixed inventory classification system. In addition to EOQ inventory management model, they considered ABC and VED classification system. Moreover, the company inventory policy considers packaging size and adapted minimum order quantity of reliable suppliers while raw and packing materials are purchased from abroad. Hence that is considered during computing reorder quantity. But in long run the variation brings complexity in computing quantity demand.

The study concludes that effective and efficient storage procedures have positive effect on inventory management. The organizations which do monitoring stock levels would minimize stock costs. The study further concluded that effective coding of all materials acquired would result to effective inventory management. That is to say, the materials which are strategically coded according to the class the material belongs would enhance inventory management at APFIV. But there is delay of disposal, damage and dead materials removal from warehouse due to the pharmaceutical nature of the input materials that needs regulatory authority approval and regulated and recycled nature.

Also, the study concludes timely supply of shortage materials can smooth the production operation. But as per the findings, there is dalliance of providing shortage materials. In contrast the company has clear procedure of stock out notification. Most scheduled orders are held twice a year. But seldom have some materials been out of the frame due to packaging and minimum sales quantity of suppliers. In this case purchase has decided by top management and excess quantities are flowed to warehouse. And it creates conjunction on it. And there is complexity of materials being purchased and the lead time framed in the policy is not revised which was issued on 2006 G.C.

From open questions conclude that the company considers economics of scale while purchasing input materials as far as the required quantity doesn't significantly harm the inventory policy of the company. But there is some materials being out of the frame of the inventory policy.

From the findings, we can conclude that the company has interdependence and synergy that were customized for operational tasks among them. Rather it doesn't supported by procedures. Thus, as a synergy, there is no procedural practice. But sum up works of departmental functions are flowed to achieve the organization's objective, the line managers have scheduled meeting every two weeks and take their assignment to improve the interdepartmental communication.

Findings says that the department didn't efficiently consider storage management as strategic cost reduction. Thus we can conclude that The Company weren't consider it as a cost reduction area even though the company has storeroom in the factory and rented stores outside the factory. But due to the pharmaceutical nature of the input materials that needs regulatory authority approval and regulated and recycled nature of disposal, damage and dead materials removal from warehouse is not taken place timely. Hence it leads difficult to compute the ware house costs within the company.

From the result of the analysis, the logistics practice has integration with the inventory management and purchasing practice so that the inventory control division has scheduled reconciliation with purchase and supply department regarding materials requested for purchase and purchased items. Thus there weren't provided timely decision for materials specified as defect materials purchase, short shipped and overage.

The company considers related indirect costs (Handling costs, ordering costs, storage costs). But hence those costs are associated with different practices in the inventory management, deficiencies in the other practices can lower its efficiency.

5.2. Recommendations

Based on the above conclusion, the following recommendations are forwarded:

- The study revealed that APFIV is good at managing their inventory since they have separate function supported by two divisions and with workable organizational structure. This was predicted in their higher means of efficiency levels in inventory management and their widely application of theories of inventory management in their operations. Besides the company has integrated inventory and storage policy and good operating system. But hence different software packages are used in different departments that couldn't gain the highest efficiency in their operation. Thus standing from the study integrated software package (ERP) is recommended so as to improve its efficiency.
- The company uses different inventory classification system to control major raw and packing materials. Besides packaging size and adopted minimum order quantity of pertinent suppliers in its inventory policy. But minor input materials like colorants are being out of the frame of the inventory policy. And in the long run it creates deficiency thus the researcher recommends each input materials to incorporate in the classification system and EOQ determination.
- Effective and efficient storage procedures have positive effect on inventory management. And the materials in the company are strategically coded according to the classes the material belongs would in hence inventory management at APFIV. Thus the researcher recommends that improvement on communication with concerned bodies that can facilitate timely disposal of damage and dead materials from the warehouse.
- Timely supply of shortage materials can smooth the production operation. But findings revealed that there is dalliance of providing shortage materials hence it recommend that all input materials has to incorporate in the policy and managed through buffer stock and reorder point placed in the inventory policy of the company.
- The company exercises economics of scale but it didn't show the cost breakeven of materials that incorporated in the scheme. Hence the researcher recommends that to

- segregate materials that have economic advantage of the scheme and treat in line with the other inventory management tools implemented in the company.
- Apart the operational practice of departments, the researcher recommend to develop procedure for smooth interdepartmental communication so as to in hence timely decision making.
 - The study revealed that the department didn't efficiently consider storage management as a strategic cost reduction. Thus we recommend that the company to give focus and put way out on efficient storage management.
 - In the study, logistics and purchasing practices are indicated as influence to inventory management. But in the due course of operation it has an effect on determining inventory management techniques, such as re-order point for which it will affect lead time of a given purchase of items. Thus it is recommended to give emphasis and study the logistics practice and lead time determination. Besides providing timely decision on defective, short shipped and overage materials can enhance storage management.
 - The company considers related indirect costs separately. Thus the researcher recommends that the company can develop controlling procedure of identified costs holistically other than departmental wise. It can provide better performance.
 - To this end the study used as the reference for other organizations and researchers and recommend those stakeholders and other organizations, to relook into their inventory management procedures seriously as their source of better performance.

REFERENCES

A. K Datta, (2003). *Materials Management* 2nd Edition New Delhi, Rai Technology University, *Materials Management*. Bangalore, 11a purtaluk.

Alexander, F., Emelia D. Adzimah, I. (2016). *Inventory Management Practices*. Ghana: published by ISDS LLC., 5(3) 105-119 www.isdsnet.com/ijds.

Arnold J. R.T., Chapman S.N and Clive L.M. 2008. *Introduction to Materials Management*, 6th edition, Pearson Prentice Hall.

Brent, D. and Travis, T. (2016). *Inventory Management Research in Major Logistics*. USA: <http://www.researchgate.net/publication/240259211>.

Daniel, A. and Assefa B. (2018). *The impact of inventory management practice on firms' competitiveness and organizational performance*. Ethiopia: 5(1) (<http://www.barcodesinc.com/articles/what-is-inventory-managment.html>).

Donald, J. and David, J. (2000). *Logistical Management*. New Delhi: Tata McGraw-Hill Publishing Company Limited.

Hong¹, Qilang², Dend³, Simon Wu⁴ (2017). *Inventory Management in a Manufacturing Company*. China: published by Nang Yan Business Journal 5 (1).

https://kids.kiddle.co/Addis_Ababa.

<https://www.conveyco.com/inventory-costing-methods/>.

Company Inventory policy 2014 G.C, Manual, and Procedure

- Hurlbut, T. (2003). *The Full Cost of Inventory: Exploring Inventory Carrying Costs*. Retrieved 11/17/04. <http://hurlbutassociates.com/FullCostOtlInv.html>.
- Martin, (2011). *Logistics and Supply Chain Management*. England: Pearson Education limited.
- Muller, M (2003). *Essentials of Inventory Management*. New York: AMACOM American Management Association.
- Nazar, S. Tariq, H. (2018). *Inventory Management System*. 10 (10).
- Pratap, C. and Gomathi, S. (2017). *Inventory Management and Control*. India: 3 (5) 2395-4396, www.ijariie.com.
- William, J. (2012). *Operations Management* 11th edition. New York: McGraw-Hill book Companies Tnc.
- Williams, M. (2003). *Reducing Inventory Levels through ABC Inv. Mgmt. Techniques* Retrieved 10/5/04. <http://proxy.library.eiu.edu:2067/itw/infomark/276/694/57926373w5/purl=rc1E>.

APPENDICES

Appendix 1. Questionnairesurvey to assess information on inventory management
Practice of Addis Pharmaceutical Factory S. C. IV-Solution

ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
MBA PROGRAM

Research questionnaire to be filled by APFIV Stuff members

Dear Respondents,

The purpose of this questionnaire is to gather adequate information on inventory management Practice of Addis Pharmaceutical Factory S.C IV-Solution. The study is conducted for academic partial fulfillment of the requirements of the Master's degree in Business Administration (MBA). Therefore, this questioner is designed to the senior members of APFIV who has direct or indirect influence with the Warehouse department of the company and believed to provide sufficient feedback on each question. Hence you are kindly requested to fill the questionnaire carefully and return to me within the specified time frame.

General directions:

No need of writing your name.

Please put your answer tick mark (✓) in the provided box in the number your choice from the given alternatives. Kindly returns your completed questionnaire within three days. If you need further clarification or details, please contact me by the following address: E-mail: asuye159@gmail.com

Part I: Personal data

1. Gender: a. Male b. Female
2. Age: a. 19-25 b. 26-30 c. 31-35
 d. 36-40 e. 41-45 f. 46 and above
3. Job classification : a. permanent b. contrat

4. Educational background:

a. $\leq 10^{\text{th}}$ complete		b. TVET graduate	
c. College diploma		d. First degree	
e. 2 nd degree and above			

5. Year of experience in the company (total year)
 a. Less than 2 year b. 2-5-year c. 6-10 year ≥ 10 year

6. What is your current position/job title in this company?

a. Officer		d. Top manager	
b. Division head			
c. Line manager			

7. Do you face constraints when you *Logistics management* in your company? a. yes b. No

8. If your answer to questions number 7 is yes, please mention the main problems that affect *Logistics management*?

9. Do you face constraints during inventory management practice? a. yes b. No

10. If your answer to question number 9 is yes, please mention the main problems that affect your company negatively? _____

11. *Logistics management*:

25. Please list in order of importance, the most important factors that affect organization inventory management practice?

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____

Part II: Indicate the extent to which you agree with the following statements by using a

Scale of 5 to 1 where:

5 stands for strongly agree

4 for Agree

3 for Normal

2 for Disagree

1 For Strongly Disagree

S/N.	Questions	1	2	3	4	5
1	Functional structure/general overview					
1.1	APFIV has a separate materials/inventory management function					
1.2	The department has a coherent communication between the divisions under it (Material planning and warehousing)					
1.3	APFIV materials management function has workable organizational structure					
1.4	The department has integrated inventory and storage policy					
1.5	There is time framed plan and operational forecasts					

2	Inventory classification techniques implementation					
2.1	The inventory re-order level has controlled in line with each physical inventory					
2.2	There is a classifying procedure of slow moving, damage, and obsolete materials.					
2.3	The company uses more than one inventory classification techniques (ABC and VED)					
2.4	There is lead time consideration procedure					
2.5	The Economic order quantity model accounts optimum level during the operation					
3	Inventory controlling system					
3.1	Stock records are reconciled with physical count periodically.					
3.2	inventory controlling system (perpetual) is used to control the stocks					
3.3	There is segregation of duets among physical stocks and stoke record keeping					
3.4	There is a reporting mechanism for slow moving, obsolete or damaged items					
3.5	Physical stock count and stock record reconciliation are carried out by independent personnel					
4	Timely Response on identified gaps					
4.1	Timely replenishment of shortage materials in the BOM (Bill of material) Planning for production.					
4.2	There is Stock out notification procedure accordance with the reorder level.					
4.3	There are clear wastage and obsolete					

	materials disposal practice					
4.4	There is stock variation(overage or shortage) handling procedure					
4.5	The inventory warehouse has supportive controlling devices (camera)					

Part III: Open questions

1. Does the inventory management consider economic of scale?
2. Is there procedural interaction among supportive functions (Synergy)?
3. The department considers storage management as strategic cost reduction.
4. Does logistics practice has integration with the inventory management and purchasing practice?
5. Being inventory management considers related indirect costs (Handling costs, ordering costs, storage costs)?

Thank you

Appendix 2. Correlation of different variables during the research

Correlations

		age	gender	job classification	educational level	years of experience	current work position	Reorder	Inventory control software	Inventory Replenishment	Purchasing process of raw materials	Procedural practices of organization	Waste disposal	Logistics management	Inventory management	Inventory-control practices;
age	Pearson Correlation	1	-.105	.035	.926**	.891**	-.262*	.592**	.525**	.596**	.576**	.617**	.410**	.548**	.326**	.097
	Sig. (2-tailed)		.337	.749	.000	.000	.016	.000	.000	.000	.000	.000	.000	.000	.002	.376
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
gender	Pearson Correlation	-.105	1	.097	-.138	-.060	.089	.072	.072	.043	.097	-.011	.114	.072	-.013	.047
	Sig. (2-tailed)	.337		.376	.208	.586	.419	.512	.512	.694	.376	.922	.297	.512	.904	.669
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
job classification	Pearson Correlation	.035	.097	1	.090	.087	-.043	-.106	.026	-.013	.046	-.073	-.077	-.040	.035	-.056
	Sig. (2-tailed)	.749	.376		.413	.427	.698	.335	.810	.904	.674	.507	.483	.718	.747	.608
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
educational level	Pearson Correlation	.926**	-.138	.090	1	.945**	-.170	.522**	.522**	.636**	.589**	.636**	.403**	.522**	.444**	.206

	Sig. (2-tailed)	.000	.208	.413		.000	.120	.000	.000	.000	.000	.000	.000	.000	.000	.059
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
years of experience	Pearson Correlation	.891**	-.060	.087	.945**	1	-.162	.587**	.587**	.715**	.682**	.715**	.452**	.587**	.499**	.249*
	Sig. (2-tailed)	.000	.586	.427	.000		.139	.000	.000	.000	.000	.000	.000	.000	.000	.021
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
current work position	Pearson Correlation	-.262*	.089	-.043	-.170	-.162	1	-.179	-.218*	-.218*	-.218*	-.218*	-.138	-.179	-.152	-.147
	Sig. (2-tailed)	.016	.419	.698	.120	.139		.102	.102	.045	.045	.045	.209	.102	.166	.179
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Reorder	Pearson Correlation	.592**	.072	-.106	.522**	.587**	-.179	1	.779**	.689**	.556**	.755**	.771**	.853**	.360**	.245*
	Sig. (2-tailed)	.000	.512	.335	.000	.000	.102		.000	.000	.000	.000	.000	.000	.001	.024
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Inventory control software	Pearson Correlation	.525**	.072	.026	.522**	.587**	-.179	.779**	1	.821**	.689**	.821**	.771**	.926**	.605**	.461**
	Sig. (2-tailed)	.000	.512	.810	.000	.000	.102	.000		.000	.000	.000	.000	.000	.000	.000
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Inventory Replenish	Pearson Correlation	.596**	.043	-.013	.636**	.715**	-.218*	.689**	.821**	1	.821**	.940**	.633**	.821**	.698**	.527**

ment	Sig. (2-tailed)	.000	.694	.904	.000	.000	.045	.000	.000		.000	.000	.000	.000	.000	.000
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Purchasing process of raw materials	Pearson Correlation	.576**	.097	.046	.589**	.682**	-.218*	.556**	.689**	.821**	1	.821**	.554**	.622**	.624**	.462**
	Sig. (2-tailed)	.000	.376	.674	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Procedural practices of organization	Pearson Correlation	.617**	-.011	-.073	.636**	.715**	-.218*	.755**	.821**	.940**	.821**	1	.633**	.821**	.698**	.527**
	Sig. (2-tailed)	.000	.922	.507	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Waste disposal	Pearson Correlation	.410**	.114	-.077	.403**	.452**	-.138	.771**	.771**	.633**	.554**	.633**	1	.771**	.518**	.401**
	Sig. (2-tailed)	.000	.297	.483	.000	.000	.209	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Logistics management	Pearson Correlation	.548**	.072	-.040	.522**	.587**	-.179	.853**	.926**	.821**	.622**	.821**	.771**	1	.523**	.389**
	Sig. (2-tailed)	.000	.512	.718	.000	.000	.102	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Inventory management	Pearson Correlation	.326**	-.013	.035	.444**	.499**	-.152	.360**	.605**	.698**	.624**	.698**	.518**	.523**	1	.820**

ent	Sig. (2-tailed)	.002	.904	.747	.000	.000	.166	.001	.000	.000	.000	.000	.000	.000	.000	.000
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
inventory control practices;	Pearson Correlation	.097	.047	-.056	.206	.249*	-.147	.245*	.461**	.527**	.462**	.527**	.401**	.389**	.820**	1
	Sig. (2-tailed)	.376	.669	.608	.059	.021	.179	.024	.000	.000	.000	.000	.000	.000	.000	
	N	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85

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

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

Appendix 3. The regression analysis of dependent and independent variables of the research

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.424	1	1.424	12.323	.001 ^b
Residual	9.588	84	.116		
Total	11.012	85			

Predictors: (Constant), Reorder

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4.026	1	4.026	47.843	.000 ^b
Residual	6.985	84	.084		
Total	11.012	85			

Predictors: (Constant), Inventory control software

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5.360	1	5.360	78.704	.000 ^b
Residual	5.652	84	.068		
Total	11.012	85			

Predictors: (Constant), Inventory Replenishment

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4.289	1	4.289	52.948	.000 ^b
Residual	6.723	84	.081		
Total	11.012	85			

Predictors: (Constant), Purchasing process of raw materials

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5.360	1	5.360	78.704	.000 ^b
Residual	5.652	84	.068		
Total	11.012	85			

Predictors: (Constant), Procedural practices of organization

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.953	1	2.953	30.411	.000 ^b
Residual	8.059	84	.097		
Total	11.012	85			

Predictors: (Constant), Waste disposal

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3.012	1	3.012	31.247	.000 ^b

Residual	8.000	84	.096		
Total	11.012	85			

Predictors: (Constant), Logistics management

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	7.401	1	7.401	170.101	.000 ^b
Residual	3.611	84	.044		
Total	11.012	85			

Predictors: (Constant), inventory control practices;

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.169	1	1.169	9.854	.002 ^b
Residual	9.843	84	.119		
Total	11.012	85			

Predictors: (Constant), age

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.169	1	2.169	20.359	.000 ^b
Residual	8.843	84	.107		
Total	11.012	85			

Predictors: (Constant), educational level

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.736	1	2.736	27.447	.000 ^b
Residual	8.275	84	.100		
Total	11.012	85			

Predictors: (Constant), years of experience

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.736	1	2.736	27.447	.000 ^b
Residual	8.275	84	.100		
Total	11.012	85			

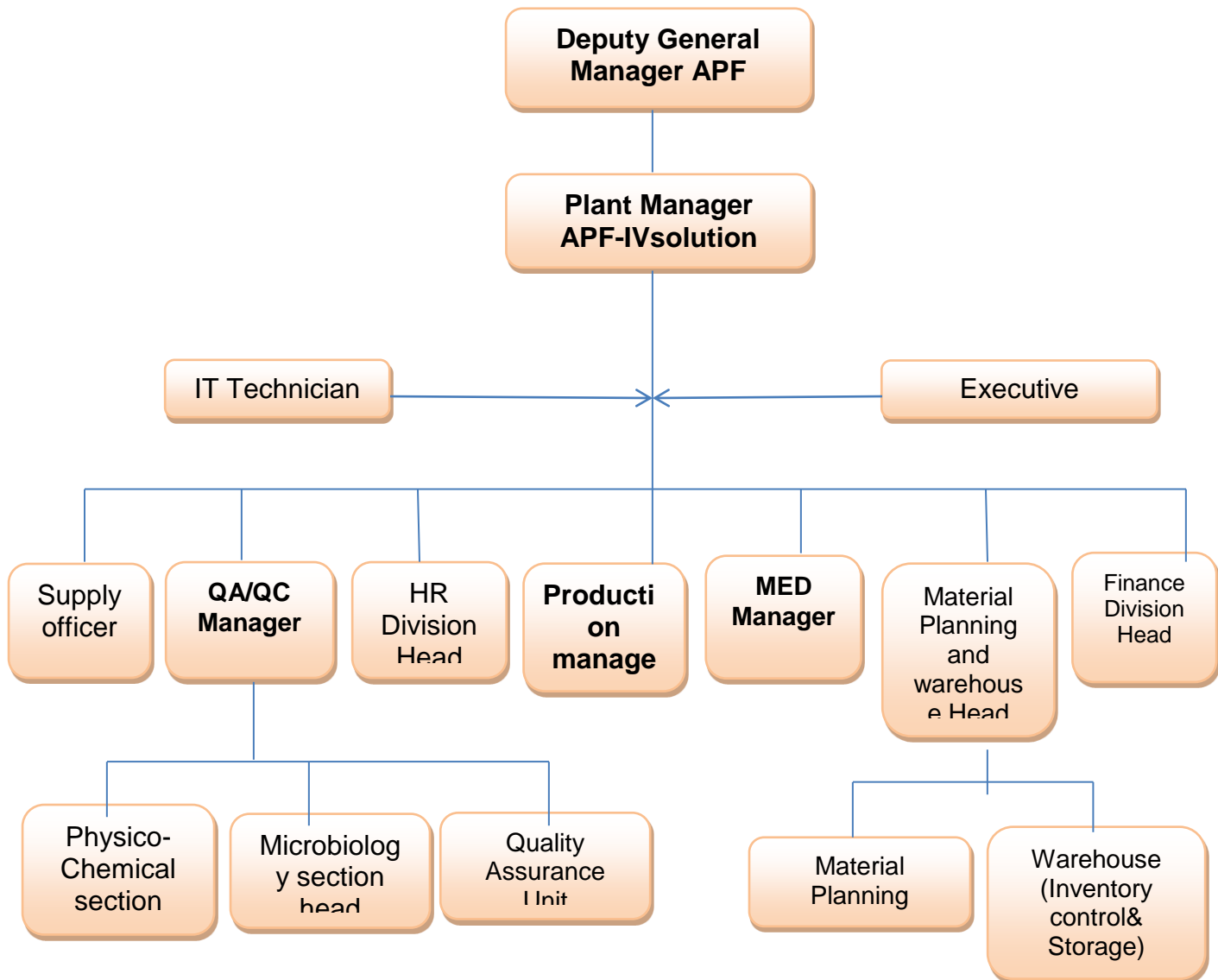
Predictors: (Constant), years of experience

Dependent Variable for all variables was: Inventory management

Appendix 4. Material planning and warehousing department functional structure



Title: Site Master File		Document No.: APFIV/SMF/05	
Department: QA/QC	Issue Status: 06	Page 69 of 86	
Date of Issue: 21-10-2020		Effective date: 24-10-2020	
Issued to: See Controlled Stamp		Valid Until: 23-10-2021	



Appendix 5: Layouts of production areas including material and personnel flows.

Author: <i>Designation: QA/QC Manager</i>	Name:	Signature:
Approved By: <i>Designation: Plant Manager</i>	Name:	Signature:

	Company Name: Addis Pharmaceutical Factory S.C. IV	Document No: EMS/APFIV/WI/002
		Effective Date: 21/November/2016
Issue No: 01	Title: Work Instruction for Collecting, Storage, & Disposal of Solid Wastes	Page No: 70 of 86

Revisions History						
Issue Number	Effective Date	Changes			Prepared by	Approved by
		Summary	Section	Page		
01	21/November/2016	Initial Release	--	--		

CONTENTS	PAGE	FOR DCC USE ONLY
1. Purpose		
2. Scope		
3. Responsibility		
4. Definition		
5. Frequency		
6. Instruction		
7. Procedure		
8. Abbreviation		
9. Related Documents		

	Initiated by	Reviewed By	Approved By
Name			
Designation	EMS – RT Member	HR department Manager	EMSR
Signature			
Date			

Appendix 7. Sample stock bin card.

<p>NAME OF COMPANY STOCK BIN CARD</p> <p style="text-align: right;">ADDRESS: ----- ----- ----- -----</p>						
<p>CLASSIFICATION</p> <div style="border: 1px solid black; padding: 2px; text-align: center;">000000000000</div>		<p>CODE</p> <div style="border: 1px solid black; padding: 2px; text-align: center;">000000000000</div>				
<p>LOCATION</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>			<p>PARTS OF</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>			
<p>DESCRIPTION ----- ----- -----</p>						
Date	Units measure	of	In	Out	Balance	Initials