

Effect of Inventory Management Practice on Organizational Efficiency: In Case Hawassa Tabor Ceramic Factory

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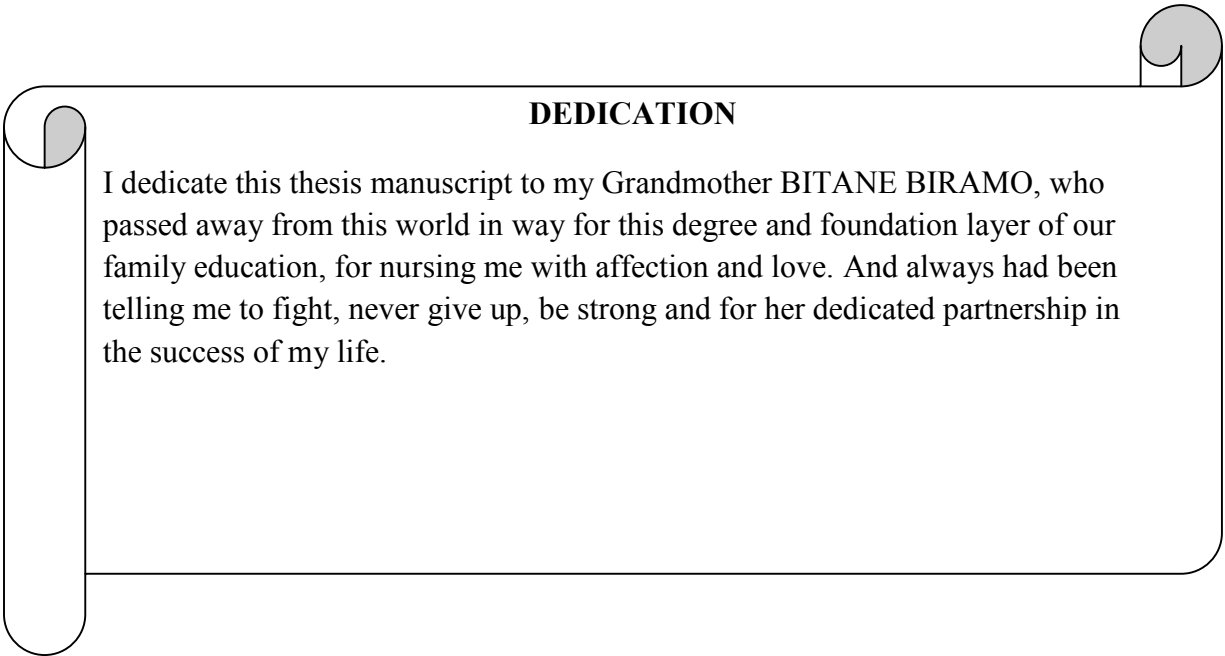
I, Natnael Hailemariam, declare that this thesis is my original work and all sources of materials used for this thesis have been duly acknowledged. I hereby declare that this thesis is not submitted to any institution anywhere for the award of any academic degree, diploma or certificate.

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DEDICATION

I dedicate this thesis manuscript to my Grandmother BITANE BIRAMO, who passed away from this world in way for this degree and foundation layer of our family education, for nursing me with affection and love. And always had been telling me to fight, never give up, be strong and for her dedicated partnership in the success of my life.

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List of Acronyms

ECF- Ethio-Ceramic Factory

EOQ- Economic Order Quantity

ERP- Enterprise Resource planning

FR-Forecasting

JIT- Just in Time

ICM- Inventory Cost Management

LDT- Lead-Time

MAM-Major Activity Management

MRP-Material Resource Planning

PDD-Procurement Decisions

TBCF- Tabor Ceramic Factory

ABSTRACT

This paper entitled as effect of inventory management practice on organizational efficiency. The general objective of the study is to investigate the practice of inventory management and its effect on organizational efficiency. The investigator of this study used quantitative approach of study especially descriptive and casual type of research. The investigator used random sampling specifically simple random one. The data collected from both primary and secondary sources. Method of data collection for primary research is survey and the data collected analyzed with the use of both descriptive and inferential statistics. Among the inferential statistics Pearson product moment correlation and multiple regressions used to show the relationship and effect between variables. The result from the study revealed that the practice of inventory management is not sufficient in the case company, inventory management has positive effect on organization efficiency and the extent variation it causes is 18.1%. Lastly, what the researcher recommended for the company is better if it manage inventory with consideration of all determinant variables with their specific techniques of management in detailed manner.

Key words: Inventory management, organizational efficiency

CHAPTER ONE

INTRODUCTION

This section of study provide us the comprehensive impression of the study, organization background, statement of problem, research questions, objective of the study, significance, limitation and delimitation of the study. It also contains organization of paper and operational definitions.

1.1 Background Of the Study

Inventory is a collection of any material or product, not in work, usually kept in warehouse or storeroom and being used in future for production or sales (William and Mehran, 2011).

Inventories are basically stocks of resources held for the purpose of future production and/or sales. Inventories may be viewed as an idle resource which has an economic value. Better management of inventories would release capital for use elsewhere productively, (Ghosh and kumar, 2003).

Inventory emerges in various forms which may include stock of raw materials, sub-assemblies, semi-completed goods (work in progress), finished goods and consumables depending upon the type of enterprise(Juul, 2002; Waters, 2003; Garrison & Noreen, 2003).

Inventory of goods has many reasons why organization should maintain it. The direction of activity with the purpose of getting the right inventory in the right place at the right time and in the right quantity is inventory control and it is directly linked to production function of any organization. This implies that efficiency of any organization directly and indirectly is affected by the inventory management system operated (Miller, 2010).

Historically, inventory management has been referred to as excess inventory and inadequate and adequate management practice. Several penalties could be apportioned to excesses in either direction. Inventory problem has escalated as progress in technology

increases the ability of organizations to produce goods faster in multiple design variation and greater quality (Letinkaya and Lee, 2000). Since the mid-1980's inventory management, production planning and scheduling has become the obvious strategic benefit (Larsson et al.,1995).

Japanese firms earned more deserved attention in the mid-to late 1980s due to their notable performances on quality and inventory management. The constant alert of the bar code being scanned at a checkout lane shows a pillar of modern system of inventory management stock tracking. In the earliest days of shop keeping, merchants write down procurement or they looked at how many units were gone at the day's end and then did their best to forecast future needs (Miller,2010).

It is economically unsound and physical impossible to have goods arrive in a system exactly when demands for them occur. Without stock at hand customers would have to wait for long period before their orders are fulfilled. Inventory management is the control of materials used and stored in a company with the objective of providing exactly what is required where and when it is required employing a minimum of residual stock and thus incurring the least possible cost (Agha,2010).

Hollander (2000) reveals that many organizations are integrating the inventory system with the production system in an attempt to reduce the amount of idle inventory on hand. Inventory means stock at hand. It could be referred to an enterprise idle resource. Those item which are either stocked for sale or are in the manufacturing process or are in the form of materials which are yet to be utilized represents inventories.

An inventory system provides the operating policies and organizational structure for maintaining and controlling goods to be stocked. A proficient management of inventory system requires an appropriate way of making decisions about how much to order and when to order and a means of keeping track of items in inventory. Decision on inventory in any organization depends on facts about on-hand stock level, demand information with regards to the forecasted quantity(with consideration of the forecasted errors), lead time and lead time variation, inventory holding costs, ordering cost and shortage cost. This

information helps the manager in charge of controlling inventory to meet the competitive advantage desired by the organization (Jossop 1986).

Inventory management can be defined as a process planning and controlling materials. And it is cost-effectively acquiring the material desired by an organization, and effectively maintaining this equipment at the various levels of the organization's operations, while ensuring an efficient utilization of the materials in a way that enhances the profitability of the organization. Inventory control is the managerial activity performed to ensure that materials sufficient for uninterrupted organizational operations are available both in quality and in quantity. Requirements of inventory management are safely tracking and unloading inventories, storing and using them, forecasting demands and lead times, cost management and ABC and other model using (William and Mehran, 2011).

Organizational efficiency is the organization's ability to implement its plans using the smallest possible expenditure of resources. It is the organization's degree of success in using the least possible inputs in order to produce the highest possible outputs. It affected by many factors and inventory management is one of major (Alan, 2014).

As worldwide transactions amplify, intercontinental purchasing, inventory management, and logistics, all take on extra significance. Further, increased operations in international markets bring additional issues such as differences in government policies, quality of infrastructure and nature of supply base etc. to the forefront. To contend more effectively in a global marketplace, it is important that organizations understand these issues and align their purchasing, management of inventories, and distribution systems to the varied environments in which they activate. Proper administration of these systems can help strategically convert firms into world-class competitors (Babber, 1998).

Generally in manufacturing company there is flow of inventory from beginning to end and how to use those materials efficiently is major issue. At the very beginning the investigator assured the existence of inventory practice in case organization and as it is

one of manufacturing firm there is inventory flow in every part of operation. So it is easy to predict how vital the concept inventory management is to the company. In addition many firms and offices in developing countries give less attention to it i.e. less practicality of inventory management with consideration of all determining factors rather they do simple monitoring in a traditional way (Wilfred and Ogbo 2014). The critical importance and less practicality of it are the major factors that motivated the researcher. It is against this background that the researchers seeks to critically assess the effect of inventory management practice on organizational efficiency with reference to Hawassa Tabor Ceramic Factory

1.2 Statement of the Problem

Inventory management is the supply of goods and services at the right time with the right quality and quantity. It is a reliable means in which businesses are been managed to ensure customers are satisfied and organization remains in operations via minimization of losses. Inventories provide a significant link between production and sales of product, and constitute a large percentage of the cost of production. It is one of the most expensive and important assets of many manufacturing companies representing a considerable percentage of the total invested capital. At any level of a firm, inventory is among the largest investment made and therefore logically deserves to be treated as a major policy variable, highly responsive to the plans and style of top management. However, to date in most organization, both analysts and managers have been relatively unsuccessful in convincing top management to give this area the due consideration that it logically deserves (Ogbo, 2011).

Healthy and correct inventory can meet customer demand and enhance sales (Langley, Coyle, Gibson, Novack & Bardi, 2009).

In ideal means the firms with perfect inventory management which is to mean management of inventory with consideration of all factors affecting it is assumed to be able to satisfy both consistent and inconsistent demand and expected to be efficient from time to time as of many literatures proves if other factors remain constant. However, what is expected and what on the ground are different when the investigator refer to

literatures and observe situations on reality. Many studies have been made around the topic and let us see some of them below:

For many companies the root cause of underproduction, stoppages and high production cost could be easily traced to unscientific method of arriving at a general inventory policies and crucial inventory decisions. The situation is more acute in a developing country like Nigeria, where the practical application of operation research techniques in industry and business enterprise is in its infancy. Moreover, the bulk of raw material inventory and the finish goods inventory used by companies in developing countries have to be imported from the industrial nations of Europe, America and Asia, which gave rise to higher cost of procurement and higher uncertainty in the availability of such basic raw materials (Wilfred and Ogbo 2014).

In our country case, the inventory management practice assessment study by (Shimels 2011) stated that inventory management practice is very poor in many business and manufacturing companies in Adama.

Goonatilake (1984) in his article examined inventory control problems in developing countries using the results of a field study conducted in the industrial sector of a developing country. It is shown that ineffective inventory control is a major problem faced by industries in developing countries and that even the very basic inventory control concepts and techniques are not used by the majority of the companies studied.

Robert and Charles (1992) the researchers here see quantitative forecasting techniques as their greatest application as part of production and inventory systems. The article discusses how recent developments in forecasting methodology can improve accuracy for better management of inventory.

Dimitiros (2008) the effect of inventory management on firm performance, the study reveals that the higher the level of inventories preserved (departing from lean operations) by a firm, the lower its rate of returns.

Ruankaew and Williams (2013) the impact of inventory inaccuracy in an organization, this study revealed that inaccuracy at inventory affects the organizations resources and performances in terms of time, cost and risk.

The researcher tried to see other studies too; and come up with major insights in inventory management and there are few studies in areas of ceramic factory and the study in inventory management reveal that the practice of it is poor and some company does not familiar with basic techniques and knowhow of managing it in developing countries.

The research gap identified here even if many studies have been taken there is a difference between what is principally expected and what is on the ground in relation to inventory management. In addition relationship between inventory management and organizational efficiency is an expanded concept by investigator because some of other researchers focused with the increased or decreased level of inventory and its impact on performance of organization and some of them focused on only assessing the existing situation.

However, the investigator has seen inventory management as a whole concept not the reduced or increased material stock and in addition to assessing the phenomena determined the relation and effect of inventory management on organizational efficiency.

Generally the main problem of the study is, what does the practice of organization looks like in relation to major determinants of inventory management and mainly what is the relation and extent contribution of inventory management towards organizational efficiency.

1.3 Basic Research Questions

Based on the identified problems the researcher developed basic research questions as follows:

- i. What does the practice of organization looks like in relation to major inventory management determining factors?

- ii. What is relationship between inventory management and organizational efficiency?
- iii. To what extent inventory management brought effect on organizational efficiency?

1.4 Objectives of the Study

The research contains both the general and specific objectives as discussed below;

General Objective the Study

To investigate the practice of inventory management and its effect on organizational efficiency

Specific Objectives

-  To assess the organizational practice of inventory management in line with major determinants of inventory management
-  To identify the relationship between inventory management and organizational efficiency
-  To measure the extent of contribution of inventory management towards organizational efficiency

1.5. Significance of the Study

The importance of the study has two major divisions; the first is its significance to the organization and the other is to the academicians. When we look at the benefits of the study to organization: it helps the company to review the practice of inventory management, it shows which determining factors are contributing more to the organization and which are not; it gives clue for the organization to redesign their inventory management practice. The second benefit area is that the study fills the literature gap in the area and it can be used by other researcher as a reference.

1.6. Delimitation of Study

The research area is limited to tabor ceramic factory which is located in Hawassa (Ethiopia) as a case study. Among the many determining factors of organizational

efficiency, the investigator here focuses on the effect of inventory management on it. And major determinants of inventory here are: forecasting, lead-time, procurement, and inventory cost management and managing major activities within firm. In addition the time issued to finish the work is one semester. The above are the scope of research determined by the investigator.

1.7. Limitation of the Study

When we see the limitations of the study, the major ones are: the researcher focused only in the quantitative approach of the research due to that some issues that can be traced by qualitative one has given less attention, this study is done by using the practice of inventory management in Tabor ceramic factory in Hawssa; as result it may not generalized that the outcome is similar to other organizations too in different area with different function, the designed questionnaire is close-ended so respondents feeling and idea cannot be exhaustively addressed by the method and all the respondents may not have equal knowhow about the concept that may affected the quality of study results.

1.8 Operational Definition

The operational definitions designed by investigator are jot down here below:

- **Inventory management:** - is the administration of not only materials but also the use of concepts to manage them like forecasting, lead-time, procurement decisions and inventory cost management.
- **Organizational efficiency:** is success of organization achieved when there is attainment of objective, return on investment, satisfaction of customers and smooth operation with optimum utilization of resources but not only least cost of production.
- **Excess stock** defines as the quantity in stock that exceeds the excess limit (Synchron, 2006).
- **Healthy stock** consists of parts for which current stock is not considered in excess or obsolete (Synchron, 2006).

- **Obsolete stock** is parts for which there has been no demand over the last 24 months or at least 24 periods of historical demand is available (Synchron 2006).

1.9 Organization of the Paper

This study totally contained five chapters. And chapter one of the research give us the detailed view of the study and organization background, statement of problem, research questions, objective of the study, significance, limitation and delimitation of the study. It also contains organization of paper and operational definitions. The next chapter brought for us the review of related literature. In this chapter the concepts of inventory management, empirical review of similar studies and conceptual frame work model are discussed in detail. The third chapter is all about methodology that includes research design, sample and sampling procedure, data collection analysis method and ethical consideration. The 4th is about analysis of the study here the primary data collected are presented, analyzed and interoperated. And the 5th chapter is about the conclusions and recommendations based on the findings.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

In this chapter the concepts of inventory management, empirical review of similar studies from secondary sources like books journals, articles etc, and conceptual frame work model which is developed by the researcher in reference to different sources are discussed in depth.

2.1. Concept of Inventory

‘Inventory’ and ‘stock’ are often used to relate to the same thing (Wild, 2002); yet when inventory management is mentioned, there is however a slight difference with stock. Stock is usually an amount of goods that is being kept at a specific place (in a warehouse for example), sometimes referred to as inventory. Conversely, inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is necessary at different locations within an organization or within multiple locations of a supply chain, to protect (the production) from running out of materials or goods.

The scope of inventory management is broader than stock. Basically inventory management can be defined as the “management of materials in motion *and* at rest” (Coyle et al., 2003). The following activities all fall within the range of inventory management (Heck, 2009): control of lead times, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting.

Inventory management basically serves two main goals (Reid & Sanders, 2007). First of all good inventory management is responsible for the availability of goods. It is important for running operations that the required materials are present in the right quantities,

quality and at the right time in order to deliver a specific level of service. The second goal is to achieve this service level against optimal costs. Not all items can be held in stock against every cost for example and therefore choices have to be made.

Inventory generally refers to the materials in stock. It is also called the idle resource of an enterprise. Inventories represent those items which are either stocked for sale or they are in the process of manufacturing or they are in the form of materials, which are yet to be utilized. The interval between receiving the purchased parts and transforming them into final products varies from industries to industries depending upon the cycle time of manufacture. It is, therefore, necessary to hold inventories of various kinds to act as a buffer between supply and demand for efficient operation of the system. Thus, an effective control on inventory is a must for smooth and efficient running of the production cycle with least interruptions (Kumar and Suresh, 2009).

A. Reasons for Keeping Inventories

To stabilize production: The demand for an item fluctuates because of the number of factors, *e.g.*, seasonality, production schedule etc. The inventories (raw materials and components) should be made available to the production as per the demand failing which results in stock out and the production stoppage takes place for want of materials. Hence, the inventory is kept to take care of this fluctuation so that the production is smooth.

To take advantage of price discounts: Usually the manufacturers offer discount for bulk buying and to gain this price advantage the materials are bought in bulk even though it is not required immediately. Thus, inventory is maintained to gain economy in purchasing.

To meet the demand during the replenishment period: The lead time for procurement of materials depends upon many factors like location of the source, demand supply condition, etc. So inventory is maintained to meet the demand during the procurement (replenishment) period.

To prevent loss of orders (sales): In this competitive scenario, one has to meet the delivery schedules at 100 per cent service level, means they cannot afford to miss the delivery schedule which may result in loss of sales. To avoid the organizations have to maintain inventory.

To keep pace with changing market conditions: The organizations have to anticipate the changing market sentiments and they have to stock materials in anticipation of non-availability of materials or sudden increase in prices. Sometimes the organizations have to stock materials due to other reasons like suppliers minimum quantity condition, seasonal availability of materials or sudden increase in prices (William and Mehran, 2011).

B. Benefits of Inventory Control

It is an established fact that through the practice of scientific inventory control, the benefits of inventory control are: Improvement in customer's relationship because of the timely delivery of goods and service, smooth and uninterrupted production and, hence, no stock out, efficient utilization of working capital, economy in purchasing and eliminates the possibility of duplicate ordering (Kumar and Suresh, 2009).

C. Objective of Inventory Management

The overall objective of inventory management is to achieve satisfactory levels of customer service while keeping inventory costs within reasonable limits. In this context, a decision maker must make two fundamental decisions: the timing of the order and size of orders (i.e., when to order and how much to order). The performance of inventory management can be measured in the following terms: Customer satisfaction that is measured by the number and quantity of backorders and/or customer complaints. If the customers' complaints are less, then the customer satisfaction is high and vice-versa and days of inventory on hand that expected number of days of sales that can be supplied from existing inventory. A balance is desirable: a higher number of days might imply excess inventory, while a lower number might imply a risk of running out of stock (Chase, Jacobs and Aquilano, 2009).

D. Inventory control techniques

i. Order cyclical approach (i.e cyclical ordering system):- This is a time based system involving scheduled periodic reviews of the stock level of all inventory items. Order

quantities vary for different materials. Time interval for ordering is constant. Stock levels can be monitored by physical inspection, by a visual review of perpetual inventory cards or by automatic computer surveillance. The system may lead to increase in inventory costs for each item (Joy, 2005).

ii. Economic order quantity approach (EOQ):-Undoubtedly, the best-known and most fundamental inventory decision model is Economic Order Quantity Model. Its origin dated back to the early 1900s. The EOQ has been previously defined by Ogbo (2011) as the ordering quantities which minimizes the balance of cost between inventory holding costs and re-order costs.

Ogbo (2011) stressed further that to be able to calculate a basic EOQ, certain assumptions are necessary:

- That there is a known, constant, stock holding costs;
- That there is a known, constant ordering costs;
- That the rate of demand are known
- That there is a known constant price per unit
- That replenishment is made instantaneously, that is, the whole batch is delivered at once.
- No stock-outs are allowed

It would be apparent that the above assumptions are somewhat sweeping and that they are a good reason for treating an EOQ calculation with caution. Also, the rationale of EOQ ignores buffer stocks, which are maintained to cater for variations in lead-time and demand. The above assumptions are wide ranging and it is unlikely that all could be observed in practice (William and Mehran,2011).

iii. Materials Requirement Planning approach (MRP):- is a computer based planning and control system designed to handle large volumes of data so as to produce more timely and accurate information for decision making purposes. MRP tackles the management of production inventories in an intermittent manufacturing concern. This

computer based system challenges the traditional system that production inventories need to be carried in inventory before actually required by the production. Conclusively inventory control is of vital importance in any business, large or small. The adequacy of such control may be a deciding factor in its success, inadequate inventory control might well lead to its failure (William, 1996)

iv. Just-in-time (JIT) purchasing philosophy:- is inventory control by ordering products to arrive just in time as it is needed for sale. JIT is a quality-control process aimed at reducing inventory costs. This method can benefit business by reducing average inventory and even improving customer satisfaction when stock outs do not occur. JIT inventory control is generally not sensitive to rapid changes in demand. While today's automated computer systems certainly facilitate a JIT system by maintaining a perpetual inventory, more information is needed to maintain an optimal inventory level and customer satisfaction. (Joy, 2005)

v. Selective inventory control (SIC) system:- That is the use of ABC or Pareto stock analysis (80/20 rules). That is, pay vigorous attention to 20% of items that consume 80% of materials bill than to 80% of items that consume 20% of material fund.

vi. Use of critical levels including reorder, minimum and maximum levels:- This is called the demand and supply approach.

vii. Use of perpetual inventory control system:- That is continuous checking of stock records especially bin cards and stores ledger records. Physical balance are usually valued in terms of FIFO, LIFO or moving average pricing.

viii. Use of periodic review system that is, periodic stock-taking. The internal audit often plays a vital role in this stock taking exercise.

E. Purchasing or Procurement Function

The purchasing department occupies a vital and unique position in the organization of an industrial concern because purchasing is key to the success of a modern manufacturing concern. Mass production industries, since they rely upon a continuous flow of right

materials, demand for an efficient purchasing division. The purchasing function is a liaison agency which operates between the factory organization and the outside vendors on all matters of procurement. Purchasing implies—procuring materials, supplies, machinery and services needed for production and maintenance of the concern. The objectives of purchasing department are: to procure right material, to procure material in right quantities, to procure material of right quality, to procure from right and reliable source, vendor and to procure material economically, i.e., at right or reasonable price to receive and deliver materials at right place and at right time (Joy, 2005).

F. Demand Forecasts and Lead-Time Information

Inventories are used to satisfy demand requirements, so it is essential to have reliable estimates of demand and the lead time (the time between submitting an order and receiving it). The greater the potential variability, the greater the need for additional stock, to reduce the risk of shortage between deliveries. Knowledge of actual sales from **point-of-sales (POS) systems** can greatly enhance forecasting and inventory management in real time (William, 1996).

G. Inventory Cost Management

Three basic costs associated with inventory management are: holding or inventory carrying cost, ordering or set-up cost, and shortage cost (Kumar and Suresh, 2009).

Holding or carrying costs: relate to having the items physically in storage. Costs include the cost due to interest, insurance, taxes, depreciation, obsolescence, deterioration, spoilage, pilferage, breakage, and warehousing costs (heat, light, rent, security). They also include opportunity costs associated with having funds which 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, although taxes, interest, and insurance are generally based on the dollar value of the inventory. Items that are easily concealed (e.g., pocket cameras, transistor radios, calculators) or fairly expensive (cars, TVs) are prone to theft. Fresh seafood, vegetables, meats and poultry products, and baked goods are subject to rapid

deterioration and spoilage. Dairy products, salad dressings, medications, batteries, and film also have limited shelf lives.

Ordering costs: are the costs of ordering and receiving inventory. They are the costs that vary with the actual placement of an order. These include determining how much is needed, preparing invoices, shipping costs, 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, the costs of machine setup (e.g., preparing equipment for the job by adjusting the machine, changing cutting tools) are analogous to ordering costs; that is, they are expressed as a fixed charge per production run or setup cost, regardless of the size of the run.

Shortage costs: result when demand exceeds the supply of inventory on hand. These costs can include the opportunity cost of not making a sale, loss of customer good will, late charges, and similar costs. Furthermore, if the shortage occurs in an item carried for internal use (e.g., to supply an assembly line), the cost of lost production or downtime is considered a shortage cost. Such cost can easily run into hundreds of dollars a minute or more. Shortage costs are sometimes difficult to measure, and they may be subjectively estimated (Kumar and Suresh, 2009).

H. Forecasting

Forecasting is necessary to anticipate on what is coming in order to maintain a continuous production or service level. Furthermore forecasting is closely related to scheduling and planning (Coyle et al., 2003). Forecasting is considered the most important process, because this is where the real money can be earned: if forecasts are wrong the stocks will be too high, which costs money or even worse if the stock become too low this may cause problems at the distribution. Distribution problems can eventually even cause a domino effect: production stops and clients do not get their products. This would mean major

loses in income. The forecasting process is thus a very important process step in inventory management.

Forecasts are almost never perfect, because there are generally too many uncertainties that need to be taken into account: it is not possible to incorporate all these uncertainties into the forecast (Ploos, 2008). Forecasting over a shorter period is often easier however and therefore more accurate as well. For instance when daily forecasts are being done, anticipation to sudden developments in the demand can be much faster. Several steps exist within forecasting. First one has to determine what has to be forecast (which items, what level of detail and over what time scope). Secondly available data has to be gathered (e.g. historical data). Next a forecasting model has to be selected. Accordingly the forecast has to be done and finally this forecast has to be monitored and evaluated.

Different forecasting methods are available to select from. First of all qualitative methods can be used: this incorporates forecasts generated subjectively by the forecaster. Some examples of these methods include: executive opinion, market research and the Delphi method (Reid & Sanders, 2007).

Secondly quantitative forecasting methods such as time series model and causal models can be used (Reid & Sanders, 2007). Causal models assume relations between different variables which lead to the eventual behavior. Time series typically assume that all the needed data can be found in historical series or events. Four basic patterns can be found in time series: level, trend, seasonality, and cycles. Methods to make an estimate of the upcoming time series (based on previous time series), may make use of simple mean, simple moving average, weighted moving average or exponential smoothing methods for example. The aim of forecasting is to estimate the upcoming need as good as possible; the mean squared error-method can be used afterwards to evaluate to what extent the forecast matched the actual demand. The forecast serves as input for the purchase process, which in this case will not be described in more detail. After purchase, the goods are delivered at a certain moment.

Arsham (2011) states that it is important to understand the interaction between forecasting and inventory control, because this interface influences the performance of the inventory system.

I. Major activity management

❖ Inbound and outbound logistics

Inbound logistics refers to the transport, storage and delivery of goods coming into a business or manufacturing firms. Out bound logistics refers to the same for goods going out of a business/ production firms. Inbound and outbound logistics combine within the field of supply-chain management, as managers seek to maximize the reliability and efficiency of distribution networks while minimizing transport and storage costs similar to the case of inventory management in manufacturing firms. Understanding the differences and correlation between inbound and outbound logistics can provide insight for developing a comprehensive inventory management strategy (William and Mehran, 2011).

❖ Operation and WIP (work in progress) stock

Operational material are the stocks which are in motion all the time during production and WIP stock are the material that help the smoothness of production stored for that purpose. Most non-accountants (and some accountants) think of work-in-process as a description of the physical state of inventory in a manufacturing operation. For example, you have something on the shop floor that you've done something to, but you still have more things to do to it before it is a finished item. If it weren't for computerized MRP/ ERP inventory systems and accountants, that simple description would probably hold true.

The reality is work-in-process (WIP) has two different meanings. One that describes the physical state of the inventory, and another that describes an account used to track the value of work-in-process. And this is where the confusion starts. You would think that the inventory we describe as WIP based on its physical state would be the same inventory represented by the WIP account. But that would be too easy. The WIP account represents

the value of materials, labor, machine time, and overhead reported as consumed to produce something that has not yet been reported as completed (Piasecki,, 2015).

The problem is, many businesses do not use actual cost for their finished goods. They instead use something called “standard cost”, which is the calculated cost of the finished item based on the “expected” costs. However, they often use actual costs to report into the production process (actual labor and machine time, and sometimes the actual labor rates of the specific individuals performing these tasks). Since the actual costs to produce something never exactly match the expected costs, you will always have variances in the WIP account because the value of goods produced coming out of the WIP account does not exactly match the value of materials, labor, machine time, and overhead going into the account (Piasecki, , 2015).

J. Organization Efficiency

Organizational efficiency is the organization's degree of success in using the least possible inputs in order to produce the highest possible outputs. Organizational efficiency essentially denotes how well a company uses money. Organizational efficiency is gauged using a number of quantitative figures such as production costs and production times because it is too broad of a concept to be encapsulated in a single figure (Alan, 2014).

○ Factors Contributing to Organizational Efficiency

Resources include both concrete items such as cash and more abstract concepts such as human capital. Factors that influence the efficiency of the organization's use of its resources can be both internal and external to the organization. Quality of management is perhaps the most influential factor on organizational efficiency since it is management that chooses how to implement strategic plans -- including selecting what methods and resources to use, and leading employees in order to make the most of their labor (Alan, 2014).

2.2. Empirical Review

In the operations management literature the question of how much inventory a firm should keep has been extensively studied but there is dichotomy in the views given that

inventory is both an asset and a liability. Too much inventory consumes physical space, creates a financial burden, and increases the possibility of damage, spoilage and loss. Further, excessive inventory frequently compensates for sloppy and inefficient management, poor forecasting, haphazard scheduling, and inadequate attention to process and procedures. In this context the lean production principle pioneered by Womack et al. (1990) has been linked with reduced level of inventories (Rajagopalan and Kumar, 1994; Herer et al., 2002; Wickramatillake et al., 2006) even if volatility of demand may limit the application of this principle. On the other hand, too little inventory often disrupts manufacturing operations, and increases the likelihood of poor customer service. In many cases good customers may become irate and take their business elsewhere if the desired product is not immediately available.

Empirical evidence in the inventory management-performance relationship produced also mixed results. Specifically, Milgrom and Roberts (1988) and Dudley and Lasserre (1989) indicated that timely and informative customer demand data can result in improved firm performance through reduced inventories.

Huson and Nanda (1995) proved that the improvement of inventory turnover (following JIT adoption) by a sample of 55 firms led to an increase in earnings per share. Deloof (2003) documents a significant negative relation between gross operating income and the number of inventories days for a sample of non-financial Belgian firms during the period 1992-1996, suggesting that managers can create value for their shareholders by reducing the number of inventories days to a reasonable minimum.

Additional evidence from Belgium is provided by Boute et al. (2004), who found no overall decrease of inventory ratios despite any increased focus on inventory reduction and Boute et al. (2006), who concluded that companies with very high inventory ratios have more possibilities to be bad financial performers. This is consistent with the findings of Shin and Soenen (1998), which reported a strong negative relation between the cash conversion cycle and corporate profitability for a large sample of public American firms.

Chen et al (2005) by examining how the market values the firms with respect to their various inventories policies, reported that firms with abnormally high inventories have

abnormally poor stock returns, firms with abnormally low inventories have ordinary stock returns while firms with slightly lower than average inventories perform best over time. Furthermore, in a more recent study, Shah and Shin (2007) examined the empirical associations among three constructs – inventory, IT investments and financial performance – using longitudinal data that span four decades, where they conclude that reducing inventories has a significant and direct relationship with financial performance.

Contrary to the findings of the aforementioned studies, Balakrishnan et al. (1996), with the use of a small sample size though (46 firms), reported that the accounting performance of JIT adopters declines slightly compared to a matched sample of non-adopters.

Blazenko and Vandezande (2003) who show a significantly positive coefficient on gross margin regressed as a determinant of finished goods inventories argue that their results are consistent with the fact that profitability is deterrent to stock outs. Further, Rotemberg and Saloner (1989) reported that a commonly identified positive association between corporate inventories and sales is greater for more concentrated industries. Yet, Vastag and Whybark (2005) by means of an international group of manufacturing companies found no significant relationship between inventory turnover and performance. Similarly, Demeter (2003) and Tunc and Gupta (1993) showed that inventory turnover did not affect return on sales and level of sales respectively.

All the above studies which is in Belgium, USA and others focused on the increased and decreased level of inventories and their impact on firms performances like sales return, profitability. However, this study is not only focus on the reduced or increased inventory impact rather the study is all about the general management of inventory and the effect of inventory management on firms efficiency. In addition to this the approach and design used in the studies above is not completely similar with this study one.

Despite the difference in approach of study, place of research and outcomes of the study; as the studies are about the inventories and its impact on firm's performance the studies have relationship or similarities with this study. Thus is because the determining factors of inventory are somehow similar, and they also see performance in terms different parameters to measure efficiency.

Given all the above studies view this study focus on analyzing the impact of inventory management on organizational efficiency in a differentiated means with the use of different parameters and with the use of statistical tools like regression and correlation analysis to identify the variables relationship.

2.3 Conceptual Framework

The researcher here developed the conceptualized framework which shows the general insight of paper and the variables relationship. As you see in figure forecasting of supply (S) and demand (D) affects both the knowledge of lead time and procurement decisions. And knowing the lead time influences the procurement or replenishment decisions like when to order and how much to order.

The decisions made by the procurement class with the knowhow of supply, demand and lead time have impact on inbound logistics. And little influence on supplier and the flow of raw materials and spare parts starts with decisions made by procurement. Then materials move from inbound to operation management. After the finishing of production; the finished goods move to out bound logistics where finally it going to be distributed directly to consumer(C) or indirectly through channels like wholesaler (W) and retailer(R).

The management of cost is the variable that has influence on all others. When decisions of procurement made they worry about cost of ordering and transportation cost to move materials to in bound logistics. And in case of inbound logistics the inventory management body can worry about cost of holding materials and building of warehouses to store raw materials. In case of operation and out bound logistics there are costs like holding cost and shortage costs if the materials are not produced on time the customer may lack them.

Generally, inventory flows from supplier to the final customer in any manufacturing organizations. And through the line there are many determinant variables that affect the process as discussed above. The combined effects of those determining variables give us the total inventory management concept and variables directly affect each other. Finally we will see the effect of inventory management on organizational efficiency.

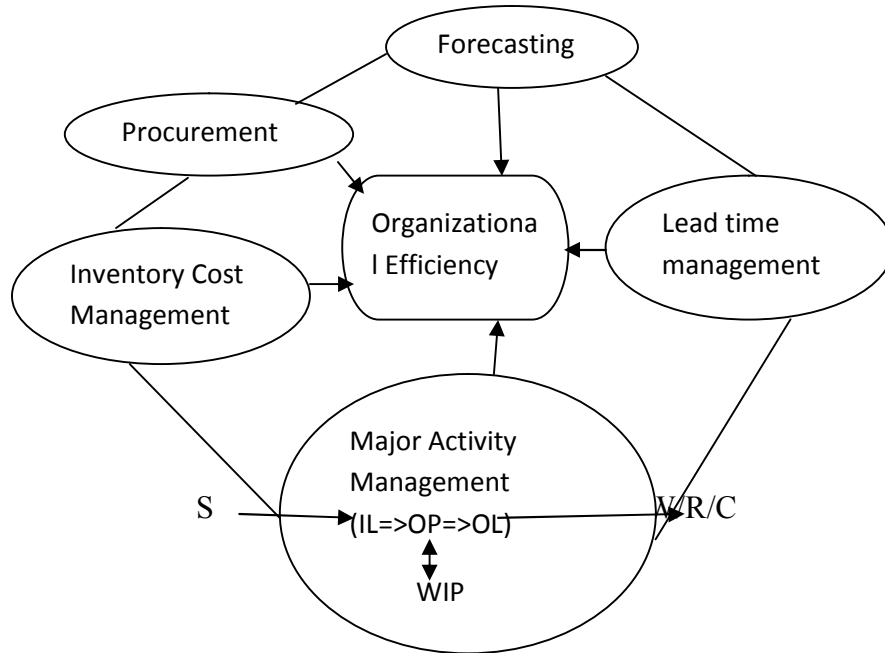


Figure 2.3 conceptual framework of inventory management from different literatures by investigator;

Source: Porter (2011) (William and Merhan, 2011) (Chase, Jacobs and Aquilano,2009), (Joy,2005),(Jacobsetal,2009),(KumarandSuresh,2009).

Keys: IL-inbound logistics; OP-operation management; OL-out bound logistic

WIP-work-in-progress

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY OF THE STUDY

The section of the research deals with the company profile, design used population under investigation, sampling technique, sampling frame and sample size determination. In addition the chapter also describes the sources of data, method of data collection and analysis in specific way.

3.1 Company related profile

The idea of ‘ceramics’ is come from the Greek ‘keramos’ meaning ‘burned earth’ and is used to describe materials of the pottery industry. Recent study shows that the processing of clay started around 19000 BC. The oldest findings of pottery in southern Japan are dated between 8000 BC and 9000 BC. As early as 4000 BC fired bricks were used for the construction of temple towers, palaces and fortifications. More than 2000 years ago the Romans spread the technique of brick-making into large parts of Europe. In Egypt, glazed ceramic plates were used as wall decorations for the pyramids in 2600 BC and in China, the art of china porcelain making has been known since 1000 BC(European commission, 2007).

During 1986 the government of Ethiopia conducted feasibility study where to locate the factory of ceramic. The two places compared at that time are Modjo and Hawassa and Hawassa selected because of the proximity to raw materials. The project is expected to start in 1986 and project implementation started in that year expecting to finish in two years, however, because of some problems the implementation completed in June 1996. The case company is the only functioning ceramic factory in the country at that time (ECF, 1996).

The products of the company are sanitary wares, tiles and table ware. The raw materials used to produce these products are: kaolin, feldspar, quartz, limestone, plastic clay and ball clay. Most of the above raw materials are found in local especially Kenticha and Bombawaha in oromia region. However ball clay is imported from United Kingdom. In addition there is an also auxiliary raw material used in the production these include Glaze and other host materials some are imported and used as spare parts of productions (ECF-1996).

The organizational structure shows that there is board of directors at top then general manger and under him four major department like finance, personal, commercial which includes sales, purchasing, store and distribution and technical operation departments. As of 2014 annual report, the total off staff in company is 308 currently working in it. The organization is at first established as public with name Ethio-cermaic factory and later in 2012 the government privatized it. Now the company is private and named Tabor ceramic products sher- Company or Tabor Ceramic factory (TBCF, 2014).

3.2 Research Design

Among the many type of the research design, for this study the researcher had chosen both descriptive and casual design. Because descriptive design is the best way to access and show the existing phenomena and causal is best for find out the relation and effect between variables. The investigator described the phenomena of inventory management of Hawassa Tabor ceramic Factory and showed the relationship and effect of it on organizational efficiency. Approach of the study the investigator used was quantitative one. And quantitative research is based on the collection of factual data that is measured and quantified through Likert scale.

3.3 Population, Sample and Sampling Procedures

The populations of the study are employee in the factory i.e. board of management office and four major departments like finance, personal, commercial which includes sales, purchasing, store and distribution and technical operation departments. And the total number of population for the study was 308.

From the two common types of sampling methods the investigator used random sampling method. Especially the study used the simple type of random sampling. The investigator took the list of population from the document class of the company decided it as the sampling frame for the study and with the use lottery system selected the sample population from the total population. The sample size of the study determined was 171 that were decided with the use of Kerjice and Morgan table (Kerjice and Morgan, 1970). The drawing of lottery method as like as follows; the list of all population has given representative numbers and put in one box packet and then picking up the subject until it reaches the determined sample size.

3.4 Data Collection Method and Sources

The study used both primary and secondary source of data. And the data collection instruments were questionnaires for primary data and books, articles, journals, organizational documents, websites and the related for the purpose of collecting secondary data. Primary source of data were used to generate primary data. These data were collected via primary methods of data collection; which was closed-ended questionnaire. The closed-ended questionnaires were answered by using five point Likert scale (1=Strongly Disagree, 2= Disagree, 3=Neutral 4=Agree and 5= Strongly Agree). During data collection as the request from respondents the researcher made third person intervention.

3.5 Validity and Reliability

Before the distribution of the questionnaires to the respondents, the investigator checked the validity with four individuals those have experience and specialized in the area approved the questionnaires. In order to be sure about reliability the investigator checked cronbach's alpha and the value of it is 0.741 which is above the standard value 0.700 most of the researchers use (zikmud, 2009).

3.6 Data Processing and Analysis Method

As of (Kothari, 1990) processing implies editing, coding, classification and tabulation of collected data so that they are amenable to analysis. After the collection of all relevant data from both primary and secondary sources, the data are coded, classified and processed using manual and computerized system. The data analysis method refers to the computation of certain measures along with searching for patterns of relationship that exist among variables. In this study descriptive and inferential data analysis were used. Statistical Package for Social Scientists (SPSS) Software was also used to analyze the data.

Data analysis techniques implemented for the purpose of this study was descriptive and inferential statistics. Descriptive statistics used to show the existing phenomena with use of the value of mean, standard deviation etc. based on the answer of respondents. The inferential statistics were applied to show the relationship and affection between variables. Both Pearson correlation and multiple regression used in this study.

Correlation coefficient is a numerical measure of the variation or relationship between two interval variables. The Pearson correlation coefficient is used to measure the degree of relationship between two variables, which is independent variable and dependent variable. A correlation coefficient, r , is a number between -1 and +1 that used to measure the degree of relationship between two variable i.e. inventory management and Organizational efficiency. The higher value of the correlation coefficient, the stronger the level of relationship between two variables. A positive value for the correlation coefficient indicates a positive relationship while, a negative value for the correlation coefficient indicates a negative relationship.

Multiple regression analysis is a statistical technique that used to analyze the relationship between the dependent variable and multiple independent variables, in which more than one independent variable is assumed to affect the dependent variable. In this multiple regression analysis, multiple independent variables of the study will be entered into the same types of regressions equation. A separate regression of each variable will calculated to define the relationship with the dependent variable. Multiple regressions will be calculated using the proposed formula to study the relationship between the independent variables and dependent variables. The researcher developed model for the relationship between the dependent and independent variables from primary data result as below:

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + \dots + e$$

Where, Y- for dependent variable (organizational efficiency)

$X_1, X_2, \dots$ for independent (inventory management determinant variables)

A- Constant

$B_1, B_2, \dots$ coefficients for beta

E... error

3.6 Ethical Consideration

This research was undertaken in accordance with Adama science and technology university ethics guidelines. The investigator was granted ethics approval letter from department of Management to conduct the research on title “Effect of Inventory Management Practice on Organizational Efficiency: In case Hawassa Tabor Ceramic Factory”. The rights of the study participants either to refuse participation or withdrawal from the study at any point was granted. All the data generated in due course were confidentiality kept.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

In this chapter the investigator presented, analyzed and interpreted the data collected from primary sources. This chapter presents and discusses the results of the data analysis that has been conducted to address specific objectives of the research. The section contains respondents background information, descriptive analysis of inventory management practice and organizational efficiency and inferential analysis of effect and relationship between the dependent and independent variables

4.1 Respondents Profile

Table 4.1.1 Questionnaires distributed and collected				
No.	Questionnaires distributed	Collection		Percent
1	171	Questionnaires Returned and valid	158	92.4%
		Questionnaires Unreturned	7	3.8%
		Questionnaires returned but invalid	6	3.7%

Source: Primary data, 2015

A total of 171 questionnaires are distributed and not all are collected back. Out of the total questionnaires returned are 164 (96.1%) but the valid ones are 92.4% (158), 6(3.7%) were invalid and 7(3.8) were unreturned. This indicates that the researcher distributed and collected it back with care and close supervision although few of them are not returned.

Table 4.2 Sex of Respondents

Item	Frequency	Cumulative Percent
Male	103	65.2
Female	55	34.8
Total	158	100

Source; Primary Data, 2015

When we see the above table the number of male participated in responding the questionnaires are 103(65.2%) and the number of female who responded the questionnaires are 55(34.8%). This indicates that the investigator give credit to the participation of females as the respondents of the questions.

Table 4.3 Education of respondents

	Frequency	Valid Percent	Cumulative Percent
Valid diploma	37	23.4	23.4
first degree	111	70.3	93.7
Master	10	6.3	100.0
Total	158	100.0	

Source: primary data, 2015

As it is shown in the above diagram out of the total respondents 37(23.4%) of respondents are diploma holders and almost all of them are more experienced workers in the company, 111(70.3%) of respondents are holders of first degree and some work in the position and 10(6.3%) of them are holders of second degree and all work in management position. Generally most of respondents the researcher chosen are educated and experienced.

Table 4.4 level of management

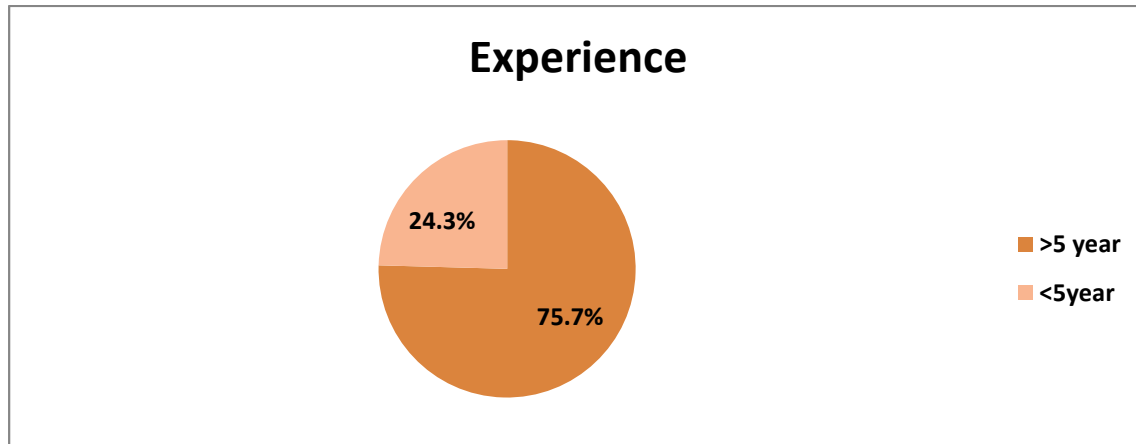
	Frequency	Percent
○ First Level	14	8.86
○ Middle Level	6	3.8
○ Top Level	2	1.25
○ Total	22	14%

Source; primary data, 2015

The above table contained information about the level of position for the respondents. Among the total respondents 14(10%) of respondents are first level managers, 6(3.8%) are middle level

managers and 2(1.25%) are top level managers. Totally about 13.93% of respondents are those are in position of management.

Figure 4.1 Experience



Source: primary data, 2015

As it illustrated in the above diagram among the total respondents (75.7%) are experienced more than five years in area they work and (24.3%) are less experienced or less than five years. The investigator benefited more from those more experienced respondents as it shown above.

4.2. Data Analysis

In this section the researcher describes inventory management practice of case company and organizational efficiency outcomes and their relation and affection with the use of SPSS version 16. The results were based on the likert scale value given by respondents and cumulative mean and standard deviation value were used for description. Here the researcher pre assumed the value of likert scale, mean and standard deviation as follows:

likert scale of 1 – 5; where 1 is strongly disagree 2 is disagree 3 is neutral 4 is agree and 5 is strongly agree and Where a mean score <1.5 means strongly disagreed, < 2.5 means Disagreed, < 3.5 means Neutral, < 4.5 means Agreed and ≥ 4.50 Strongly Agree. A standard variation of > 1.5 implies a significant variance in the responses while <1 shows there was no significant variance in responses.

4.2.1 Analysis of Inventory Management Practice in Relation to Determining Factors

Table 4.5 forecasting type analysis

Items	Mean	SD
○ Forecasting is practiced as important part of inventory management in the firm	3.27	.593
○ forecasting is in use to determine the market demand for the firm finished products	3.12	.471
○ forecasting is in use to determine the market supply of raw materials for the firm	2.97	.275
○ Quantitative forecasting techniques are continuously used in the company	2.95	.354
○ The company forecasting helps it to make appropriate procurement decisions	3.62	.624
Overall mean	3.18	0.220

Source: primary data, 2015

As of the above table, when we see the result of respondents for the first statement, majority of the respondents neutral that in their company forecasting is practiced as important part of inventory management. The mean value of respondents is 3.27 and when we see the dispersion of respondents for that idea it is 0.593, this value shows that all respondents gave almost similar response.

The second idea is about the importance of forecasting in the determination of market demand for firms finished products and in similar manner majority of respondents neutral with the statement. The mean value of the statement is 3.12 and the value for measure of dispersion is 0.471 that indicates that there is no significant difference among respondents’.

The other statement is forecasting help to identify the market supply of raw materials in the case company. As you see in the above table, few the respondents disagreed to the idea but the mean value for it is 2.97 and the dispersion of respondent is 0.275 which is again shows the similarity of response.

The fourth question is about quantitative forecasting is continuously used in the company. The mean value of this statement is 2.95 which imply that most of respondents are neutral about it and the value for dispersion is 0.354 which show that the response of respondents is almost similar.

The last statement in relation to forecasting is the decisions of procurement improved with the use of it. As expressed in the table the mean value for the idea is 3.62 which is very likely of the statement to be correct and the dispersion value of it is 0.624 which is implies that the responses are not dispersed.

When we see the overall forecasting mean it is 3.18 and this value show that majority of respondents are neutral about the practice of it and also imply that forecasting practice is slightly poor in the firm. The cumulative dispersion value is 0.299 which indicates there is no match difference in ideas between respondents.

Table 4.6 lead type analysis

Items	Mean	SD
○ Lead time information is one of essential element in inventory management of the firm	4.20	.514
○ The knowledge of lead time help in making right procurement decision like when to order, how much etc. in the organization.	4.33	.422
○ Perfectly determined lead time help the smooth flow of operation of business because there is neither shortage nor excess stock within the company	4.28	.624
○ Accurately determined lead time minimizes the cost related to inventory in the firm	4.12	.326
Overall mean	4.23	0.299

Source: primary data, 2015

As it expressed in the above table lead time contains four statements and let us see the result one by one. The first statement is in the firm lead time is very important element in inventory management. The mean value of the study is 4.20 and it is to say that almost all the respondents

agree with idea and the value of standard deviation is 0.514 and this value also implies that the answers of all respondents are very interrelated.

The other statement of lead-time is knowledge of lead time help the firm in making right procurement decision like when to order, how much etc. The mean value of this idea is 4.33 and it indicates that all the respondents agreed with the idea and the value of dispersion is 0.422 and it shows that the answers of respondents are interconnected or the difference in idea is not that much high.

The third question of lead-time is perfectly determined lead time in the company help the smooth flow of operation of business because there may be neither shortage nor excess stock. The mean value is 4.27 which also indicate that the idea is acceptable and the standard deviation of this statement is 0.624 and the value implies that the answers of respondents are somehow inter-related to each other.

Last statement of lead-time is accurately determined lead time in the firm minimizes the cost related to inventory. As expressed in the above table the mean value of the idea is 4.12 which similar to previous one that imply almost all the respondents agree with the idea. The value of standard deviation is 0.326 which is also show that the answers are closely related and there is no difference between the respondents.

When we see the cumulative mean of lead-time it is 4.23 which imply that the overall practice of lead time is acceptable and good in the case company and the overall idea dispersion for it is 0.229 which show less dispersed.

Table4.7 Procurement decisions type analysis

Statements	Mean	SD
○ The decisions of procurement help firms to have the right material with right quantity, quality and price at the right time in the firm	3.93	.462
○ Purchase decisions made with consideration of inventory control techniques like JIT and EOQ in firm	2.90	.459
○ In the company decisions of procurement assures the continuous flow of operation with uninterrupted supply of raw materials	3.27	.624

○ The function of procurement in organization help in enhancing link between the firms and stakeholders outside the organization	3.68	.266
○ The procurement budget set to purchase the raw materials with the reasonable price reduces the cost of production of the company	3.82	.471
○ Overall value	3.52	0.186

Source: primary data, 2015

When we see the above table, the result of respondents for the first statement show that most of the respondents agree that the decisions of procurement help firms to have the right material with right quantity, quality and price at the right time in the firm. The mean value of respondents is 3.93 and when we see the standard deviation of respondents for that idea it is 0.462 and this value shows that all respondents gave almost similar answers.

The second idea is about Purchase decisions made with consideration of inventory control techniques like JIT and EOQ in the firm. The mean value of the statement is 2.9 and it shows the idea is less acceptably correct. The value for measure of dispersion is 0.459 that indicates that there is no significant variation among respondents.

The other statement of procurement decision is procurement assures the continuous flow of operation with uninterrupted supply of raw materials. As you see in the above table, the mean value for it is 3.27 which indicate that most respondents are neutral about it and the dispersion of respondent is 0.624 which shows there is similarity between responses given by the respondents.

The fourth idea is about the function of procurement help as a link between the firm and stakeholders outside the organization. The mean value of it is 3.68 which imply that the statement has accepted as true. The value for dispersion is 0.266 which show that the response of respondents has almost no differences.

The last question is the procurement budget set to purchase the raw materials with the reasonable price reduces the cost of production of the firm. As expressed in the table the mean value for the idea is 3.82 which imply likely of the statement and the standard deviation value of it is 0.471 which implies that the responses are almost similar and there is no that much differences among respondents idea.

Generally, based on the respondent response, when we look at the cumulative mean it is 3.52 and overall dispersion is 0.186 which indicate that the practice of procurement sounds not nice but a kind of satisfactory and can be achieved more than the value and there is no significant variations among respondents.

Table 4.8 inventory cost management analysis

Items	Mean	SD
○ Cost minimization is one a vital strategy for the firm to be successful	2.95	.436
○ Cost management reduces the ordering cost of inventory in the organization	2.70	.220
○ Cost consideration minimizes the holding cost of inventory in the company	2.97	.220
○ Managing cost of inventory have positive influence on reducing the total operation cost of firm	3.62	.509
○ Management of cost helps the firm to rise the return on investment	3.41	.275
Overall Mean	3.13	0.186

Source: primary data, 2015

Accordingly the above table, the result of respondents for the first statement shows that almost all the respondents are neutral about cost minimization is a vital strategy for the firm to be successful. The mean value of respondents is 2.95 and when we see the standard deviation of respondents for that idea it is 0.436 and this value shows that all respondents gave almost same type answers which have no great differences.

The second idea is cost management reduces the ordering cost of inventory in the firm and the mean value of the statement is 2.70 and it shows the idea is less appealingly acceptable. The value for measure of dispersion is 0.220 that indicates that the respondents' answers are almost interconnected to each other.

The third statement of Cost is that consideration of cost minimizes the holding cost of inventory for the company. As it shown in the above table, most of respondents are neutral to the idea as the mean value for it is 2.97 and the standard deviation of respondent is 0.220 which is again shows the similarity between responses given by the respondents.

The fourth statement is about managing cost of inventory have positive influence on reducing the total operation cost of firm. The mean value of it is 3.62 which imply that the statement has accepted as somehow true. The value for dispersion is 0.509 which show that the response of respondents has almost no differences.

The last question is about management of cost help the organization to gain increased the return on investment. As shown in the table the mean value for the idea is 3.41 which imply likely of the statement and the standard deviation value of it is 0.275 which indicates that the responses are almost similar and there is not that much differences among respondents idea.

Generally, the value of cumulative mean for inventory cost management is 3.13 and the standard deviation value is 0.186. The values imply that inventory cost management is somehow poor at the company and there is no great variation among respondents as of standard value.

Table 4.9 major activity management type analysis

ITEMS	Mean	SD
○ Raw material handling and warehousing as inbound logistics is important for firm inventory management in the organization	4.58	.495
○ Appropriately handling and warehousing of raw materials prevents damages to stock in the company	3.74	1.02
○ The readily available work in progress stock facilitates the smooth operation of the firm	4.20	.398
○ WIP stock reduces time wastage during production in the company	4.22	.412
○ WIP stock helps for the optimal utilization of capacity in the firm	4.22	.470
○ Out bound logistics management is essential and important part of inventory management in the organization	4.13	.334
○ Finished goods warehousing and distributing them correctly to wholesaler, retailer and customers help the firm in improving its sales return	3.97	.422
○ The distribution of the right material to the right person at right time or perfect delivery help the firm in achieving customer satisfaction	2.97	.275
○ In the company inbound and outbound logistics management is in good manner that help in reducing the cost of operation	4.08	.349
OVERALL MEAN	4.01	0.174

As it jot down in the above table, the result of respondents for the first statement shows that all the respondents agree raw material handling and warehousing as inbound logistics is important

for their firm inventory management. The mean value of respondents is 4.58 and therefore; this shows that statement is accepted in very sounding manner. And when we see the standard deviation of respondents for that idea it is 0.495 and this value imply that all respondents gave almost interrelated answers which have no great differences

The second idea is appropriately handling and warehousing of raw materials prevents damages to stock to the firm and for this statement majority of respondents agreed with it. The mean value of the statement is 3.74 and it shows the idea is not reject rather accepted as correct. The value for measure of dispersion is 1.02 that indicates that the respondents' answers are a bit dispersed in relation to others but not above settled value.

The third statement related to flow of inventory within firm is that the readily available work in progress stock facilitates the smooth operation of firm. As it expressed in the above table, most of the respondents agreed to the idea from which and the mean value of it is 4.20 which show that idea totally accepted to be correct. The standard deviation of respondent is 0.398 which is also indicates the similarity between answers given by the respondents.

The fourth statement is about WIP stock reduces time wastage during production. The mean value of this idea is 4.2 which implies that the statement have mostly accepted to be very sounding. The value for dispersion is 0.412 which imply that the response of respondents have almost no differences.

The next statement is about WIP stock help for the optimal utilization of capacity. As shown in the table the mean value for the idea is 4.22 which imply very likely of the statement and the standard deviation value of it is 0.47 which indicates that the responses are almost similar and there is not that much differences among respondents idea.

As it expressed in the table the other idea of major activity management within firm is out bound logistics management is essential and important part of inventory management for the firm. The mean value of the study is 4.13 and it is to say that almost all the respondents agreed with statement and the idea is more valuable. The value of standard deviation is 0.334 and this value also implies that the answers of all respondents are very interrelated.

The proceeding statement is finished goods warehousing and distributing them correctly to wholesaler, retailer and customers help the firm in improving its sales return. The mean value of this idea is 3.97 and it indicates that most of the respondents agreed with the idea. The value dispersion is 0.422 and it indicates that the answers of respondents are interconnected or the difference in idea is not that much high.

The next statement of managing major activity of firm is the distribution of the right material to the right person at right time or perfect delivery help firm in achieving customer satisfaction. The mean value is 2.97 which indicate that the idea is somehow acceptably correct. The standard deviation of this statement is 0.275 and the value implies that the answers of respondents are very inter-related to each other and there is no difference in idea of them.

Last statement is inbound and outbound logistics management in good manner help in reducing the cost of operation. As expressed in the above table the mean value of the idea is 4.08 which similar to previous one that imply all the respondents agree with the statement. The value of standard deviation is 0.349 which is also imply that the answers are closely related and there is no difference between the respondents in the idea.

The cumulative mean and dispersion for managing major activity within the firm is 4.01 and 0.174 respectively. And the value indicates that overall practice of the issue is nice for the company and there is no significant variation among respondents.

4.2.2 Analysis of Organization Efficiency Due To Inventory Management

Table 4.10 Organizational Efficiency type analysis

TEMS	Mean	SD
○ Well managed inventory with the consideration of major determinants helps the company to operate with minimal production cost which enhances organizational efficiency	3.62	.462
○ The organization efficiency improved by management of inventory in good manner that increase the return on investment or profitability of organizations	3.32	.378
○ The management of inventory facilitate the smooth flow of operation	3.87	.417

with the optimal utilization of resources that have positive impact on organizational efficiency		
○ The efficient management of inventory increases the probability of achieving organizational objective	3.42	.624
○ Inventory management helps firms to do the perfect delivery of goods that increases the satisfaction of customers which enhances organizational efficiency	3.92	.417
○ Cumulative mean	3.64	0.348

Source: primary data, 2015

According to the above table, the result of respondents for the first statement indicate that, more of the respondents agree that well managed inventory with the consideration of major determinants helps the company to operate with minimal production cost which enhances organizational efficiency. The mean value of respondents is 3.62 which indicate that statement is appealing to be very correct. When we see the standard deviation of respondents for that idea it is 0.424 and this value shows that all respondents gave almost similar answers which have not that much differences.

The second idea is about the organization efficiency improved by management of inventory in good manner that increase the return on investment or profitability of organizations and majority of respondents neutral with the statement. The mean value of the statement is 3.32 and it shows the idea is less acceptably thought as true. The value for measure of dispersion is 0.378 that indicates that the respondents' answers are almost inter-related to each other.

The next statement of organizational efficiency related issue is the management of inventory facilitates the smooth flow of operation with the optimal utilization of resources that have positive impact on organizational efficiency. As you see in the above table, most of the respondents agreed to the idea and the mean value for it is 3.87 which indicate that idea more of accepted. The dispersion of respondent is 0.417 which is again shows the similarity between response given by the respondents.

The proceeding idea is about the efficient management of inventory increases the probability of achieving organizational objective. The mean value of it is 3.72 which implies that the statement

have moderately accepted as true. The value for dispersion is 0.624 which show that the response of respondent have almost no or little differences.

The last statement is that inventory management helps firms to do the perfect delivery of goods that increases the satisfaction of customers which enhances organizational efficiency. As expressed in the table the mean value for the idea is 3.67 and the standard deviation value of it is 0.417 which implies that the responses are almost similar and there is not that much differences among them.

The cumulative mean and dispersion for managing flow of inventory within the firm is 3.64 and 0.417 respectively. And the value indicates that the firm's efficiency gained a little from inventory management.

4.3 Analysis of Relationship and Effect between Inventory Management and Organizational Efficiency

In this section we see that the relationship and effect of one variables on the other mainly the independent variables relationship and /effect with dependent with the help of inferential statistics like Pearson moment correlation and multiple regression. The data are calculated with the use Statistical software SPSS and here below it presented and interpreted by the researcher.

In this section analysis, before interpreting the outcome from SPSS, the researcher checked all parametric statistics assumptions of Pearson correlation and regressions as discussed below:

 **Sample size:-**Sample size the researcher used is 171 and it fulfilled the law of sample

 **Randomness:** Data were collected through randomly specifically through simple random sampling.

 **Normality of distribution:** the researcher checked normal distribution through histogram

Chart i.e. found chart is bell shape and looks normal .In addition, the researcher proved normality through skewness and kurtosis found that both fall in between -1 and +1 for all variable specifically below 0.5 which is approximately normal. Lastly, PP plot was also checked and found to be normal diagonal (see appendix).

- 📊 **Linearity:** linearity among Independent and dependent variables was checked by Pearson product moment Correlation and in addition through scatter plot
- 📊 **No multi-collinearity among independent variables:** This were checked from coefficient of correlation and found that there is no strong correlation among independent variables (R is found below 0.7).
- 📊 **Tolerance:** degree of tolerance among independent variables is above 0.5
- 📊 **No significant outliers, high leverage points or highly influential points:** result from scatter plot show that merged around center this implies there are no outliers/unusual point.

4.3.1 Correlation Analysis

Table 4.11: Pearson's product moment correlation between study variables

Variables	1	2	3	4	5	6
1. FR	-					
2. LDT	0.01*	-				
3. PDD	0.253**	0.37**	-			
4. ICM	0.095*	0.053*	0.132*	-		
5. MAM	0.176*	0.162*	0.166*	0.141*	-	
6. OE	0.085*	0.407**	0.187*	0.028*	0.166*	-
Sig.(2-tailed)	0.029	0.000	0.019	0.031	0.037	-

Correlation significant at the 0.05level and 0.01 (2-tailed), NB: variables are transformed

Source: primary data, 2015

Keys: FR-forecasting, LDT-lead time management, PDD-procurement decisions, ICM- inventory cost management, MAM- major activity management; which are independent and OE-organizational efficiency is dependent variable:

The table above shows the correlation and level of significance between the dependent and independent variables as of the value processed with the use of SPSS. Let us see them one by one as discussed below:

As of the value in the table $\{r=0.085, n=158, p <0.05 \text{ or } 0.029\}$ there is relationship between forecasting and organizational efficiency in the case company and the direction of relation is positive. So that it can be inferred that building good forecasting technique will enhance the organization working efficiency.

The second independent variable is lead time which the value of $\{r=0.407, n=158, P<0.05 \text{ or } 0.00\}$. This variable has medium scale and direct correlation with the dependent variable organizational efficiency and their relationship is also positive and significant.

The third independent variable is procurement which has the value of $\{r=0.187, n=158, P<0.05 \text{ or } 0.019\}$. Procurement and organizational efficiency have direct and small scale Pearson moment correlation and there is significant relationship between them.

There is again direct and small scale Pearson product moment correlation between organizational efficiency and inventory cost management as of the table with the value $\{r=0.028, n=158, p=0.031\}$. The values imply that working well with inventory management can improve organizational efficiency.

Lastly, as the value on the table above $\{r=0.166, n=158, P<0.05 \text{ or } 0.037\}$, there is direct and small scale Pearson moment of correlation between managing major activity and organizational efficiency and there is also direct and significant relationship between them. This implies that major activity management is valuable in increasing organizational efficiency.

4.3.2 Multiple Regression Analysis

The investigator used multiple regression analysis to determine the effect between independent variables (forecasting, lead time management, procurement decisions, inventory cost management, major activity management) and dependent variable (organization efficiency).

Table 12 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.426 ^a	.181	.154	.226

a. Predictors: (Constant), MAM, ICM, LDT, FR, PDD

b. Dependent Variable: OE ; source primary data, 2015

According to the model summary table above, the correlation coefficient (R value) for this research is 0.426. This means that there is a positive and significant relationship between dependent variable and independent variable because R is positive and fall under coefficient range 0.3 to 0.70

The R Square (0.181) indicates the extent or percentage the independent variable can explain the variations in the dependent variable. In this research, independent variable can brought 18.1% (0.181) of variations in dependent variable according to respondent's perception. However, it is still leave 81.9% (100% - 18.1%) unexplained in this study. This implies that investing on inventory management can enhance organizational efficiency and there are other additional variables that are important in affecting organizational efficiency that have not been considered in this study.

Table 13 ANOVA test of independent variables

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	14.200	5	2.343	27.520	.000 ^a
Residual	42.901	152	.051		
Total	57.001	157			

a. Predictors: (Constant), MAM, ICM, LDT, FR, PDD

b. Dependent Variable: OE source: *primary data, 2015*

As of the ANOVA table above shows that the F value of 27.520 and the p-value is 0.000 which is less than 0.05 ($p < 0.05$) that imply it is significant at 0.05 level. And the overall multiple regression model shows that cumulative independent variables effect is statically significant in explaining the variation they create in organizational efficiency.

Table 14 multiple regression coefficients

Model	Unstandardized Coefficients		Sig.
	B	Std. Error	
1 (Constant)	2.953	.886	.001
FR	.073	.087	.040

LDT	.319	.066	.000
PDD	.012	.110	.047
ICM	.017	.100	.051
MAM	.130	.109	.034

a. Predictors: (Constant), MAM, ICM, LDT, FR, PDD

b. Dependent Variable: OE

source: *primary data, 2015*

The coefficients table above shows the effect of each and every independent variable on the dependent variable. The coefficient beta for FR is 0.073, LDT is 0.319, PD is 0.012, ICM is 0.017 and MAM is 0.130. And when we see the significance level of effect for FR ($P=0.040$), for LDT ($p=0.00$), for PDD ($P=0.047$), for ICM is ($P=0.051$) and for MAM is ($P=0.034$).

The above result imply that forecasting effect on organizational efficiency is significant and the variation it cause is 7.3% (0.073), the variation lead time management brought to organizational efficiency is 31.9% (0.319) and the effect it has is significant, the variation procurement decision cause is 1.2% (0.012) and it has again significant effect, the influence cause by inventory cost management is 1.7% (0.017) and again it has significant effect and finally major activity management cause variation on explaining organizational efficiency is 13% (0.13) and the effect it has on organization is significant.

Therefore, by using R-square, constant and coefficient value the researcher got the model below:

$$OE = 2.953 + 0.073FR + 0.319LDT + 0.012PDD + 0.017ICM + 0.130MAM$$

The model above show that all independent variables play significant role in explaining the variation in organizational efficiency.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

In this section the researcher finalized the study and the section includes conclusions and recommendations. Conclusions are derivated from results of study and lined with study objectives in the beginning and recommendations are again lined with findings.

5.1. Conclusions

Inventory management is typically a key feature of almost every manufacturing and/or distribution or operation business. The ultimate success of the businesses is often dependent on its ability to provide customers with the right goods, at the right place, at the right time and with the right price. For many companies the basic cause of underproduction, stoppages and high production cost could be easily traced to unscientific method of arriving at a general inventory policies and crucial inventory decisions.

Depending on the result of survey and literature the researchers come up with the following conclusions about inventory management. Investigator line conclusions with the objective and research questions developed in the beginning. In relation to that the conclusions are discussed as follows:

Forecasting, lead-time, procurement decisions, inventory cost management and managing major activity are inventory management determinants developed by investigator from different literature. As the survey result show that the cumulative mean value for determinants are: FR (3.18), LDT (4.23), PDD (3.52), ICM (3.13) and MAM (41.3). Based on the result the researcher draw conclusion as follows:

- Forecasting practice of the company on ground is it is not good because majority of respondent neutral and some disagree with it.
- As majority of respondents agree that Lead-time consideration of the company sounds nice.
- The practice of procurement decisions are not achieving the objective of it very well and this show a kind of not enough practice.
- The cost management practice of organization is again not sufficient enough.

- Managing the major activity within firm is good.

The last part of conclusion related to the effect and relationship of variables. The relationship is between independent and dependent variable which is shown by correlation and the effect by multiple regression analysis.

Firstly, correlation value for FR ($r=0.085$, $n=158$, $p=0.029$), LDT ($r=0.407$, $n=158$, $p=0.00$), PD ($r=0.187$, $n=158$, $p=0.019$), ICM ($r=0.028$, $n=158$, $p=0.031$) and MAM($r=0.166$, $n=158$, $p=0.037$). The results from correlation show that the entire variables except LDT have weak Pearson correlation and all including LDT have direct relationship. And the level of significance by p value shows that all independent variables have significant relation with dependent variable organizational efficiency. So based on this the investigator conclude that change in one variable cause variation on dependent variable directly.

The second issue is the result prediction from independent variables show that R-square =0.181(18.1%) and the coefficient beta for each independent variable are: FR (0.073, LDT=0.319, PDD=0.012, ICM =0.17 and MAM=0.130. And ANOVA test shows that $P=0.000$ that implies the overall independent variables effect on organizational efficiency is significant. From, the above result the researcher conclude that all independent variables, as there BETA value multiplied by hundred to show in percent, cause variation on dependent variable and R square value 18.1%(0.181) which is to mean that 1% variation in inventory management explain 18.1% variation in organizational efficiency.

Generally, the investigator concludes that the overall practice of inventory management is not sufficient in the case company, the relationship between inventory management and organization efficiency is direct and the extent of inventory management contribution is 18.1%. However, it is still wide open because it leaves 81.9% (100% - 18.1%) unexplained in this study. This implies that there are other additional variables that are important in affecting organizational efficiency that have not been considered in this study.

5.2 Recommendations

In the section the researcher brought some suggestion of the study based on the result. Depending on the outcome jot down in conclusion section and the literature reviewed, the investigator here below developed the major recommendations of the study for the case company and future study as follows:

- ✓ The organization should have to review the practice of forecasting in the way like with the use of quantitative forecasting techniques (time series which is based on the past trend of demand, supply, economic conditions etc. and casual method which can be considered by which factors cause the other).
- ✓ For better lead-time management the organization has to improve the use of JIT(just in time or making a purchase that arrive exactly in time of need)because the mean value from respondents shows that it is given less attention.
- ✓ The company should have to give more attention to procurement practice which they have less satisfying practice and better if they use EOQ (economic-order-quantity or making economical viable purchase which can reduce holding to re-order time cost and JIT purchase approach which can avoid totally holding cost.
- ✓ Cost of inventory is very critical issue and it is advisable for the company if they use ABC analysis, inventory valuation mechanisms and better purchase strategy as of in procurement decisions.
- ✓ Another important thing the company should have to take care in management of major activity within the firm which includes inbound logistics, operation, WIP and outbound logistics where they acting in good manner and better if they use inventory valuation mechanisms like ABC, FIFO, LIFO and WAC for better achievement and latest methods like MRP (material resource planning) and ERP (enterprise resource planning) which are computerized means of inventory management.
- ✓ Lastly, suggestions for future researchers is that as this study is quantitative better if considered qualitative approach of study ,will make questionnaire in both closed and open ended ways and will make comparative study by taking more than one organization.

References

- Agha,N.C. (2010), Inventory Management and Cost Control in Manufacturing Industries in Nigeria. The Nigeria Journal of Management Research, 5(2): 173-188.
- Alan. L (2014), The factors affecting organizations efficiency in the US, Journal of Operations Management, Vol. 22, pp. 27-30.
- Balakrishnan, R., Linsmeier, T. and Venkatachalam, M. (1996), “Financial benefits from JIT adoption: effects of customer concentration and cost structure”, Accounting Review, Vol. 71, No. 2, pp. 183-205.
- Blazenko, G. and Vandezande, K. (2003), corporate holding of finished goods inventories, Journal of Economics and Business, Vol. 55, pp. 255-66.
- Boute, R., Lambrecht, M. and Lambrechts, O. (2004), “Did just-in-time management effectively decrease inventory ratios in Belgium?”, Tijdschrift voor Economie en Management, Vol. XLIX No. 3, pp. 441-56.
- Boute, R., Lambrecht, M., Lambrechts, O. and Sterckx, P. (2006), “An analysis of inventory turnover in the Belgian manufacturing industry, wholesale and retail and the financial impact of inventory reduction”, in Proceedings of the 14th 2006 Euroma Conference, Strathclyde, June.
- Chase,R, Jacobs F and Aquilano(2009) Operation management for competitive advantage 11th edition, New York, USA
- Colling, D. (1990), Industrial Safety, Management and Technology, Englewood Cliffs, NY: Prentice Hall.
- Coyle. J, Bardi, E.J. & Langley Jr., C.J., (2003), The Management of Business Logistics: A Supply Chain Perspective 7th edition. Ohio: South-Western.
- C. R. Kothari (1990). Research Methodology: Methods & Techniques University of Rajasthan, Jaipur. India.
- C.R. Kothar,(2004), Research Methodology 2nd edition, New Delhi , Age International publishers PLC)
- Deloof, M. (2003), “Does working capital management affect profitability of Belgian firms?”, Journal of Business Finance & Accounting, Vol. 30 No. 3&4, pp. 573-87.
- Demeter, K. (2003), Manufacturing strategy and competitiveness, International Journal of Production Economics, Vols 81/82, pp. 205-13.

- Dimitrios P. Koumanakos, (2008), "The effect of inventory management on firm performance", International Journal of Productivity and Performance Management, Vol. 57 Iss 5 pp. 355 – 369
- Dudley, L. and Lasserre, P. (1989), Information as a substitute for inventories, European Economic Review, Vol. 33, pp. 67-88.
- European commission, (2007) Reference Document on Best Available Techniques in the Ceramic Manufacturing Industry
- ECF, (1996), Ceramic industry market survey and plant location, Addis Abeba(Ethiopia)
- Garrison, R.H., & Noreen, E.W. (2003). Managerial accounting. (10th ed.). New York: McGraw-Hill.
- Ghosh A.K. & Kumar P. (eds.) (2003), Production Management, New Delhi: Anmol Publication Pvt. Ltd.
- Hollander, T. (2000), Accounting Information Technique and Business Solutions, London: McGraw-Hill.
- Heck, T. & Dul, J., (2009), Pattern matching, ERIM Report Series: Research in Management. Rotterdam: Erasmus University, Erasmus Research Institute of Management (ERIM).
- Herer, Y.T., Tzur, M. and Yucesan, E. (2002), "Transhipments: an emerging inventory recourse to achieve supply chain leagility", International Journal of Production Economics, Vol. 80- No. 3, pp. 201-12.
- Huson, M. and Nanda, D. (1995), The impact of just-in-time manufacturing on firm performance in the US, Journal of Operations Management, Vol. 12, pp. 297-310.
- Jossop, D. (1986), Storage and Control Stock. London: Pitman.
- Juul, I. (2002). The small business survival handbook. Cape Town: ABC Press.
- Krejcie R.V and Morgan D.W., (1970), determination of sample size for research activities, educational and psychological measurement
- Langley, C.J., Coyle, J.J., Gibson, B.J., Novack, R.A., & Bardi, E.J. (2009). Managing Supply Chain: A Logistics Approach (8th ed). Canada: South Western Cengage Learning.
- Larrison, S. E. (1995), Inventory System and Control Handbook, London: McGraw-Hill.
- Letinkaya, S. & Lee, C.Y. (2000). Stock Replenishment and Shipment Scheduling for Vendor-Management Inventory System Management Science, 46(2): 26-32.
- Miller, R. (2010). Inventors Control: Theory and Practice. New Jersey: Prentice Hall.

- Milgrom, P. and Roberts, J. (1988), Communication and inventories substitutes in organizing production, *Scandinavian Journal Economics*, Vol. 90, pp. 275-89.
- Ogbo, A.I. (2011). *Production and Operations Management*. Enugu: De-verge Agencies Ltd.
- Ploos van Amstel, W., 2008. *Logistiek*. Pearson Education Benelux.
- P.C.L. Goonatilake, (1984) "Inventory Control Problems in Developing Countries", *International Journal of Operations & Production Management*, Vol. 4 Iss: 4, pp.57 – 64, <http://dx.doi.org/10.1108/eb054726>
- Rajagopalan, S. and Kumar, K.R. (1994), "Retail stocking decisions with order and stock sales", *Journal of Operations Management*, Vol. 11 No. 4, pp. 397-410.
- Ram Naresh Joy, (2005), *A Modern Approach to Operation Management*, New Delhi , Age International publishers PLC)
- Robert Fildes, Charles Beard, (1992) "Forecasting Systems for Production and Inventory Control", *International Journal of Operations & Production Management*, Vol. 12 Iss: 5, pp.4 – 27, <http://dx.doi.org/10.1108/01443579210011381>
- Rotemberg, J. and Saloner, G. (1989), "The cyclical behavior of strategic inventories", *Quarterly Journal of Economics*, Vol. 104, pp. 73-97.
- Reid, R. & Sanders, N.R., 2007. *Operations Management: an integrated approach* 3rd edition. New York: John Wiley & Sons.
- S.Anil Kumar, N.Suresh, (2009), *Operations Management*, New Delhi , Age International publishers PLC)
- Shimels .G, (2011), *Assessment of inventory management practice in Hawassa city*, Hawassa Ethiopia
- Shin, H. and Soenen, L. (1998), "Efficiency of working capital and corporate profitability", *Financial Practice and Education*, Vol. 8 No. 2, pp. 37-45.
- Synchron S (2006), *Manual to Supply Chain Concept of Inventory Management System*.
- Sunil Babbar Sameer Prasad, (1998), "International purchasing, inventory management and logistics research", *International Journal of Operations & Production Management*, Vol. 18 Iss 1 pp. 6 – 36 ,
- Tabor ceramic factory (2014), *Annual report*, Hawassa, Ethiopia
- Thanasak Ruankaew, Patricia Williams (2013), the impact of inventory inaccuracy in an organization, *Business Management Dynamics* Vol.2, No.10, Apr 2013, pp.28-34

- Tunc, E.A. and Gupta, N.D. (1993), "Is time a competitive weapon among manufacturing firms?", *International Journal of Operations & Production Management*, Vol. 13 No. 3, pp. 4-13.
- Vastag, G. and Whybark, C. (2005), "Inventory management: is there a knock-on effect?", *International Journal of Production Economics*, Vol. 93-94, pp. 129-38.
- Waters, C.D.J., 2003, *Inventory Control and Management* 2nd Edition. Chichester: John Wiley & Sons Ltd.
- Wickramatillake, C.D., Koh, S.C.L., Gunasekaran, A. and Arunachalam, S. (2006), "Measuring performance within supply chain", *Supply Chain Management: An International Journal*, Vol. 12 Nos 1/2.
- Wilfred I. Ukpere(2014),*The Impact of Effective Inventory Control Management on Organizational Performance*, *Mediterranean Journal of Social Sciences* MCSER Publishing, Rome-Italy Vol 5 No 10
- William G. Zikmund, Barry J. Babin, Carr Mitch,(2009), *business research methods*-8th edition, South Western.
- Wild, T.,2002. *Best Practice in Inventory Management* 2nd edition. Oxford: Butterworth-Heinemann (imprint of Elsevier).
- William .J(1996), *production/ operation management*,McGraw Hill, NewYork. USA
- William .J and Mehran H (2011) *operation management*, 4th edition, McGraw Hill, New York USA
- Womack, J.P., Jones, D.T. and Roos, D. (1990), *The Machine Changed the World*, Rawson Associates, New York, NY.

APPENDIX

Appendix I
Questionnaire

Adama Science and Technology University

School of Business and Economics

Department of Management

Introduction

The researcher would like to express his deep gratitude for sharing your valuable time and effort for responding to this questionnaire. This is a part for the MBA program toward the completion of the regained master degree in business administration. The senior research project is entitled as **“Effect of Inventory Management Practice on Organizational Efficiency: The Case of Hawassa Tabor Ceramic Factory”**. The purpose of the questionnaire is completely to gather data for this research purpose only and the information will be kept confidential.

➤ **General Guidelines**

- 📊 The questions are developed in structured manner with the use of likert scale from strongly disagree to strongly agree (1-5 value) will be given to the responses. And please indicate your response by marking “X” for the questions provided in each section with attention and consideration.
- 📊 The success of the study depends up on your earnest and sincere response.

Thank you for your cooperation!

No	Personal information (tick, X on the information below)		
1	Sex	M	
		F	
2	Level of education	Certificate	
		Diploma	
		First degree	
		Master	
		PhD	
3	Management position	Line management	
		Middle management	
		Top management	
4	Experiences	Below five years	
		Above five years	

1. Practice in Line with Determinants of Inventory Management

1.1 Forecasting

No	Statements	Degree of agreement				
		Strongly disagree	disagree	undefined	agree	strongly agree
1	Forecasting is practiced as important part of inventory management in the firm					
2	Forecasting is in use to determine the market demand for the firm finished products					
3	Forecasting is in use to determine the market supply of raw materials for the firm					
4	Quantitative forecasting is continuously used in our company					
5	The company forecasting helps it to make appropriate procurement decisions					

1.2 Lead Time

No	Statements	Degree of agreement				
		Strongly disagree	disagree	undefined	agree	strongly agree
1	Lead time information is one of essential element in inventory management of the firm					
2	The knowledge of lead time help in making right procurement decision like when to order, how much etc in the organization.					
3	Perfectly determined lead time help the smooth flow of operation of business because there is neither shortage nor excess stock within the company					
4	Accurately determined lead time minimizes the cost related to inventory in the firm					

1.3 Procurement Decision

No	Statements	Degree of agreement				
		Strongly disagree	Disagree	Undefined	Agree	Strongly agree
1	The decisions of procurement help firms to have the right material with right quantity, quality and price at the right time in the firm					
2	Purchase decisions made with consideration of inventory control techniques like JIT and EOQ in the firm					

3	The company decisions of procurement assures the continuous flow of operation with uninterrupted supply of raw materials					
4	The organization function of procurement help in enhancing link between the firms and stakeholders outside the organization					
5	The procurement budget set to purchase the raw materials with the reasonable price reduces the cost of production of the company					

1.4 Inventory Cost Management

No	Statements Questions/ statements	Degree of agreement				
		Strongly disagree	Disagree	Undefined	Agree	Strongly agree
1	Cost minimization is one a vital strategy for the firm to be successful					
2	Cost management reduces the ordering cost of inventory in the organization					
3	Cost consideration minimizes the holding cost of inventory in the company					
4	Managing cost of inventory have positive influence on reducing the total operation cost of firm					
5	Management of cost helps the firm to rise the return on investment					

1.5 Major Activity Management within Firm

No	Statements	Degree of agreement				
		Strongly disagree	Disagree	Undefined	Agree	Strongly agree
1	Raw material handling and warehousing as inbound logistics is important for firm inventory management in the organization					
2	Appropriately handling and warehousing of raw materials prevents damages to stock in the company					
3	The readily available work in progress stock facilitates the smooth operation of the firm					
4	WIP stock reduces time wastage during production in the company					
5	WIP stock helps for the optimal utilization of capacity in the firm					
6	Out bound logistics management is essential and important part of inventory management in the organization					
7	Finished goods warehousing and distributing them correctly to wholesaler, retailer and customers help the firm in improving its sales return					
8	The distribution of the right material to the right person at right time or perfect delivery help the firm in achieving customer satisfaction					
9	In the company inbound and outbound logistics management is in good manner that help in reducing the cost of operation					

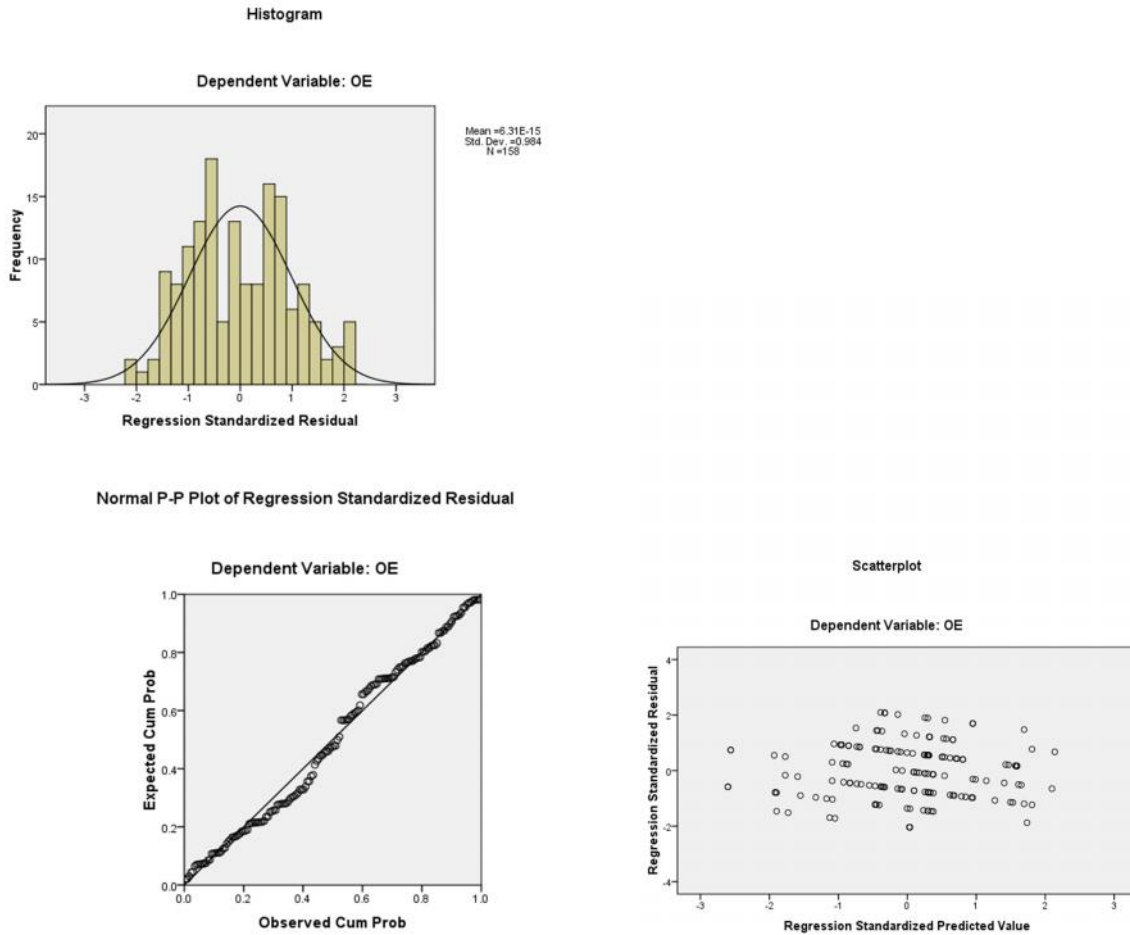
2. The Effect of Inventory Management on Organizational Efficiency

No	Questions/statements	Degree of agreement				
		Strongly disagree	Disagree	Undefined	Agree	Strongly agree

1	Well managed inventory with the consideration of major determinants helps the company to operate with minimal production cost which enhances organizational efficiency					
2	The organization efficiency improved by management of inventory in good manner that increase the return on investment or profitability of organizations					
3	The management of inventory facilitate the smooth flow of operation with the optimal utilization of resources that have positive impact on organizational efficiency					
4	The efficient management of inventory increases the probability of achieving organizational objective					
5	Inventory management helps firms to do the perfect delivery of goods that increases the satisfaction of customers which enhances organizational efficiency					

Appendix II. Statistical information

I. Histogram, PP Plot and Scatter Plot of Regression Standardized Residual



II. Skewness and Kurtosis Table

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
FR	158	-.376	.193	-.055	.384
LDT	158	-.555	.193	.245	.384
PDD	158	-.443	.193	.590	.384
MAFM	158	-.018	.193	.295	.384
OE	158	.074	.193	-.690	.384
ICM	158	-.843	.193	.806	.384
Valid N (listwise)	158				

III. Correlations and Reliability Table

		FR	LDT	PDD	ICM	MAM	OE
FR	Pearson Correlation	1	.001*	.253**	.095*	.176*	.085*
	Sig. (2-tailed)		.023	.001	.036	.027	.029
	N	158	158	158	158	158	158
LDT	Pearson Correlation	.001*	1	.370**	.053*	.162*	.407**
	Sig. (2-tailed)	.023		.000	.050	.043	.000
	N	158	158	158	158	158	158
PDD	Pearson Correlation	.253**	.370**	1	.132*	.166*	.187*
	Sig. (2-tailed)	.001	.000		.039	.037	.019
	N	158	158	158	158	158	158
ICM	Pearson Correlation	.095*	.053*	.138*	1	.141*	.028*
	Sig. (2-tailed)	.036	.050	.039		.047	.031
	N	158	158	158	158	158	158
MAM	Pearson Correlation	.176*	.162*	.166*	.141*	1	.166*
	Sig. (2-tailed)	.027	.043	.037	.047		.037
	N	158	158	158	158	158	158
OE	Pearson Correlation	.085*	.407**	.187*	.028*	.166*	1
	Sig. (2-tailed)	.029	.000	.019	.031	.037	
	N	158	158	158	158	158	158

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

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

Reliability Statistics

Cronbach's Alpha	N of Items
.741	33

IV. Multiple Regression Tables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.426 ^a	.181	.154	.226

a. Predictors: (Constant), MAM, ICM, LDT, FR, PDD

b. Dependent Variable: OE

ANOVA Test of Independent Variables

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	14.200	5	2.343	27.520	.000 ^a
Residual	42.901	152	.051		
Total	57.001	157			

a. Predictors: (Constant), MAM, ICM, LDT, FR, PDD

b. Dependent Variable: OE

Coefficients

Model	Unstandardized Coefficients		Sig.	Collinearity Statistics			
	B	Std. Error		Partial	Part	Tolerance	VIF
1 (Constant)	2.953	.886	.001				
FR	.073	.087	.040	.068	.062	.915	1.116
LDT	.319	.066	.000	.365	.356	.593	1.192
PDD	.012	.110	.047	.009	.008	.813	1.275
ICM	.017	.100	.051	.014	.012	.972	1.057
MAM	.130	.109	.034	.097	.088	.834	1.102

a. Predictors: (Constant), MAM, ICM, LDT, FR, PDD

b. Dependent Variable: OE