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Applications of Inventory Management in Construction Industry

Jyoti Sanjeev Mohopadkar[1]* Dipak Prakash Patil[2]

[1] PG-Scholar, Department of Civil Engineering, Imperial College of Engineering and Research, Wagholi, Pune-412205, India

[2] Assistant Professor, Department of Civil Engineering Imperial College of Engineering and Research, Wagholi, Pune-412205, India

Abstract – Inventory management is the soul of Materials Management, aims at optimisation of inventory investment to ensure continuity in availability of materials. Around 60% of the firm's working capital is normally joined up in its different forms of inventory. Inventory management is the main constituent of any construction industry therefore the organization need to be familiar with the repercussions of proper material management techniques on the success of project execution. Inventories represents collection of selected items which are either held for sale in the normal track of industry or are in the process of production for sale or are yet to be utilised in the construction of supplies & services, in the paper techniques for inventory management is given. Also few studies have been carry out on the inventory organization techniques & its importance.

Keywords- Inventory Management, Investment, Techniques, Importance.

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INTRODUCTION

Inventories are the physical stocks of items that a manufacturing or service organisation keeps in hand for efficient running of its office or manufacturing activities. Inventory consists of raw resources, component parts, tools, spares, suppliers & finish goods. Inventories cost funds in way of storeroom, equipment, employees insurance, deterioration and all above, the price of the assets needed in financing stocks. Inventory management is crucial function in construction industry for better productivity. Material Management is defined as the process to provide right material at accurate place at exact time in true quantity so as to minimise the project cost.

A key component of inventory management is expenditure of supplies sold and also a key driver of profit, total property and tax liability. A correctly provided materials management system can reach the appropriate flow of resources and tools to the work place therefore it helps to smooth the progress of work face planning, increase labour productivity, better schedules and lower project costs.

Principal item for this are as follows:

Raw materials are those basic materials from which components, parts & product are manufactured by the company.

Finish Parts are those parts which are Manufacture Company's own plant from the fundamental unrefined material.

Work in progress includes items or materials in partially completed condition of manufacture. Raw Material becomes work in process at the conclusion of first operation and remains in that classification.

Finish Goods are the final products ready to be supplied. The system of inventory control needs to engineer to achieve the basic purpose for which the inventories are created. The fundamental objective of a good system of inventory control should be capable to determine What to order, when to order, in what quantity to order, and for what quantity need to carry in stock so as to gain cost-cutting measure in purchasing storing, manufacturing and selling. This fundamental objective may be amplified into following objectives, to be considered by the analyst, while designing the system.

- Continuity of industrious operation

- Efficient use of capital.
- Decrease of administrative workload.
- Facility to the consumers
- Financial system in ordering
- Lessening of loss in risk
- Practical system
- Zero discrepancy between physical stock and book balance

II. LITURATURE REVIEW

[1] Research Journal of Management Sciences, Vol. 2(4), 7-13, April 2013 "Study On Stock Management Practices In Construction Companies",

Author : Anuprakash.N. And Nadhini.N.

The paper states on study of stock management in various companies and also analyzes the data using various inventory analyzation techniques. The major purpose of the study is to analyze control in inventory practices adopted by small, medium or large scale companies. Various analysis such as ABC, FSN analysis are used. For various types of companies a questionnaire is applied in the methodology. The questionnaire is different for large, average also some small cale companies. Depend on the various questions the inventory is analyzed using various statistical approaches and representing the information in tabular format also graphical format. The tabulated and graphical data is applied for draw a conclusion which concludes that stock has to be maintained in all types of companies to achieve cost effectiveness. Almost all companies say that maintaining stock will fetch them profit and they also do documentation work stock maintenance.

[2] P.M.B 2002, Ago-Iwoye, Nigeria, Vol5, No.22, 2014 "Dynamics of Inventory Cost Optimization – A Review of Theory and Evidence"

Author: *Abayomi. T. Onanuga and Adeyemi. A. Adekunle.*

The paper is about the dynamics of inventory and the cost optimization. In this paper it is discussed that inventory control models are the estimation tool to minimize the cost of the inventory & inventory management. Conventional process of supervision for inventory such as accounting ratios analysis, two bin systems, perpetual inventory system and some others form part of this paper. An idle resource of inventory which is usable and has value. Then it may be men, materials or any other form of resource. In inventory management the important function is to achieve cost effectiveness through the inventory management using various statistical techniques according to the authors. Different models in inventory control are analyzed and studied using formulae. This paper reviews models in inventory control under deterministic and stochastic models. And some conventional way of inventory control methods. The traditional methods of inventory control tends to support loss of resources either through shortages of orders resulting into sales loss or over stocking resulting into loss of goods through obsolescence. This paper also proves application of modern techniques in inventory control are more relevant and beneficial.

[3] International Journal of Innovative Researching Science Engineering and Technology, Vol.3. Issue 1, January 2014 "Inventory Management",

Author: *Dr.G.Brindha*

The management and inventory control is a problem common to all organizations in any economy sector. This paper discusses the efficient use of resources available to the company and also to avoid the out of stock danger to supply the inventory materials at the right time. Also reduction of risk of avoidance of high obsolescence is discussed. The three main types of inventories are raw materials, work in progress and finished goods. The inventories are differentiated into high and low levels based on their use on site. Also periodic review system is used to monitor the inventory. Various tools of inventory management such as ABC analysis, Economic Order Quantity, FSN, VED, SDE, GOLF analysis are explained using the available data. Also the paper states on realistic commitments i.e. realistic delivery can enhance customer satisfaction. Hence to conclude the paper discusses the different inventory managing techniques to achieve the cost effectiveness through control of stock. Also it shows the profit of using the various techniques and displays their advantages separately.

[4] Shibamay Mitra, Sujit Kumar Pattanayak & Papiya Bhowmik, "Inventory control using ABC and HML", A case study on a manufacturing industry

Author: *Shibamay Mitra, Sujit Kumar Pattanayak & Papiya Bhowmik*

An unkempt inventory can take up to one-third of an organization's annual investment. Here we have applied the inventory analysis techniques on an EMU manufacturing industry. Now to understand the application of the analysis on this particular industry we should have some basic knowledge about the Electric Multiple Unit (EMU) coaches. An Electric Multiple Unit (EMU) is a multiple unit train powered by electricity. The cars that form a complete EMU set is categorized on the basis of their function into four

types – viz. Power Car that carries pantograph, transformers; Motor Car that carries traction motor; Driving Car that containing a drivers cab for controlling the train; Trailer Car that is similar to passenger car in a locomotive hauled train.

Also inventory control management techniques such as ABC analysis, HML analysis, FSN analysis are also used. The data is then compiled in a tabular as well as graphical format. The data is obtained from the case study. Inventory Analysis and Control has become inevitable for a manufacturing industry. In order to refrain from having an inventory go dead it is of utmost importance to stay abreast with the number and condition of items in that particular inventory. The authors have come to an conclusion from the above study that the priorities of the items changes according to different inventory analysis techniques. The management of the company decides which process to follow taking into account their budget, supply, demand, inventory carrying capacity etc.

III. PROBLEM STATEMENT

Many ongoing construction sites are facing various problems to keep up the regular supply of materials used in construction, Though most of the materials are easily available, few are scarce or difficult to procure due to various reasons such as; inflation, non-availability of material, Seasonal Supply, etc. This creates a problem of either haulting the construction activity which delays the completion of project work or compromises the quality of work.

Moreover if the materials are procured in excess quantity the price of their inventory increases the entire price of the project.

IV TECHNIQUES IN INVENTORY MANAGEMENT

[1] ABC Analysis (Always Better Control)

ABC analysis segregates all items into three categories: A, B & C on the basis of their annual usage.

- A items are 5-10% of the total items account for 70-75% of the total money spent on the materials.
- B items are generally 10-15% of the total items & represent 10-15% of the entire on the materials.
- C items are 70-80% of the all items & hardly 5-10% of the entirel annual expenditure on materials.

[2] FSN Analysis (Fast Moving, Slow Moving & Non Moving)

FSN analysis is depend upon the consumption figures of the items. The items under this analysis are categorised into three group : F (Fast moving), S (Slow moving) N (non-moving).

[3] SDE Analysis (Scarce, Difficult, Easy)

S-D-E analysis differentiate the items into three groups called "Scarce", "Difficult" and "Easy". The information so developed is then used to decide purchasing strategies.

- Scarce group comprises of items which are in less supply, imported or canalised from government agencies.
- Difficult group includes items which are available indigenously but are not easy to get.
- Easy classification covers those items which are readily available. Items produced to commercial standards, items where supply exceeds order & others which are locally available fall into this group.

[4] HML Analysis (High, Medium, Low)

H-M-L analysis is same as ABC analysis apart from the difference that instead of "usage value", "Price" criterion is used. The items under this investigation are classified into three categories which are called "High", "Medium" and "Low". To classify, the items are listed in the descending command of their unit price.

[5] GOLF Analysis

GOLF analysis is like SDE analysis depend on the nature of the suppliers that determine superiority, lead period, conditions of payment, stability or otherwise of supply and administrative work occupied.

- "G" group includes material purchased from "Government" suppliers.
- "O" group contains of material purchased from "Non-Government" suppliers.
- "L" group includes materials procure from "Local suppliers".

- "F" group includes items which purchased from "Foreign suppliers".

IV CONCLUSION

This is concluded that on the bases of research papers, Materials account for 60-70% of the entire expenditure for construction project. Therefore, it will possible to reduce overall price of the project with the help of solution given for the project & also avoid the same difficulties for next project.

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Corresponding Author

Jyoti Sanjeev Mohopadkar*

PG-Scholar, Department of Civil Engineering, Imperial College of Engineering and Research, Wagholi, Pune-412205, India

E-Mail – jyotimohopadkar32@gmail.com