



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.512

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Application of EOQ for Inventory Management Study

Pradeep. J. Gaikwad¹, Prof. Rahul. D. Shinde²

M. E. Civil Construction Management, R.M.D. Sinhgad School of Engineering, Pune, Maharashtra, India ¹

Assistant Professor, R. M. D. Sinhgad School of Engineering, Pune, Maharashtra, India²

ABSTRACT:- The rapid growth and development in housing as well as in infrastructure sector from last one decade continuously take place in India. electronic The cost of construction materials increased significantly in recent years and accounts for 50% to 60% of the total project cost. For the speedy constructions to be satisfy the management has to think about material procurement to its efficient supply management. As per the research its show that nearly 30-35% of increased efficiency of overall material management by implementing different modules. Now days in construction industry uses different types of materials various admixture as per their specification. Hence proper storage and supply the requisite material is important. Which can be easily achieved by material management. This paper aims to study different methods used for inventory control of materials presently practiced and used for control material waste. As material management shows direct impact on cost of project hence material management shows a major concern of overall project budgeting. In now days there are various types of Inventory Modules and policies are present in construction industry like ABC analysis, EOQ. This study is going to find out the use of EOQ for efficient management of materials.

KEYWORDS: Material management; Inventory management; EOQ; Construction projects.

I. INTRODUCTION

Materials Management is a key function that is responsible for coordination of planning, sourcing, purchasing, moving, storing, and controlling materials in an optimum manner so as to provide a pre decided service to the customer at a minimum cost. Thus, materials management is an important element in project management. The materials on a project shows nearly 50% to 60% of the cost of the work, so minimizing procurement costs improve opportunities for reducing the overall project costs.

One of the most important aspects of any business is inventory management. Those who have never worked in the business sector may not understand the importance of efficient inventory management. But, the reality of it is if we don't have control of our inventory, we will be unable to ascertain you will have enough inventories on hand to handle the needs of our customers. Even worse than that, we will not have enough supplies on hand to produce the products we need to meet the needs of our customers. This requires the inventory. The main aim of EOQ is to improve management control by reducing inventory holding costs by reducing loss of customer service. EOQ is the most popular inventory module currently practiced. Order quantity derived from this model is known as economic order quantity. So Large order at once is less expensive than number of small orders as it saves as a discount means as well as transportation efficiency is achieved.

Opposite to this if large size order is placed which results in ample amount of inventory and holding cost of inventory increases. The EOQ model helps to attempt a balance between these opposing costs. Inventory management is defined as the function responsible for the coordination of planning, sourcing, purchasing, moving, storing and controlling inventories in an optimum manner so as to provide a pre-decided service to the customer at a minimum cost

II. LITERATURE WORK

The paper research done by Harsh Soni, Dr. Jayeshkumar Pitroda, Prof. J.J. Bhavshar. [1]. This research paper gives the idea about the current methods of Material Management. Paper is based on the Inventory Control Techniques



which includes Always Better Control (ABC), Scare, Difficult and Easy to obtain (SDE) Analysis and also cumulative approach based on quantity approach like Economic Order Quantity (EOQ).

This research is considering the selected inventory control technique and to take care about to maintain sufficient stock of raw material at the time of short supply, to give protection to the inventory against degradation and to control investment in inventories. To keep it at an optimum level by different inventory control technique such as ABC, SDE and EOQ analysis. The paper shows ABC analysis gives idea about most important material where as SDE analysis gives idea about scarcity or rarity of materials.. [2]The study by Wisam AL-Dulaime, Walid M. Emar is conducted for Inventory control of laptop sale company. The paper shows the more amount of inventory and thus excess amount of inventory lead to high holding costs. The purpose of the research paper is to specify limitations of the current systems of inventory management and to show the lack of proper regulation of different spare parts using most basic manual methods to rectify them in inventory. This research was conducted on Laptop sale company known as UPS company and electrical instrument supply Company in Amman, Jordan as a case study. The survey of researchers shows that the factors affecting inventory are setup cost, holding cost, carrying cost, selling prices of laptop spare parts and reorder point rather than this transport cost required during the maintenance or delivery duration.

They considered EOQ cost management model and XYZ analysis were implemented using a software system. [3] The authors considered S-curve method based analysis to measure the fluctuated demand between estimated materials cost and different market materials cost based on present cost. Research considered Inventory control techniques such as ABC classification as well as EOQ analysis. ABC and EOQ analysis are studied and used which is helpful to maintain sufficient stock of different inventories. [4]. the research conducted by the journal shows various perspective of material management and its need in the construction industry. On the other half they used questionnaire survey to consider different needs and mistakes that have to be corrected using different methods and ways of efficient management. By considering questionnaire survey, they have used efficient EOQ method for analysis.

III. METHODOLOGY

The methodology of the study includes consideration of analysed structure of EOQ. The result obtained from literature study are compiled with the case study named as Shapoorji Pallonji, Residential Project At Hingewadi, Pune. Which includes consideration for its waterproofing aspects. By calculating requirement of all the materials required for waterproofing and required questionnaire surveys. By finding current rates of materials and finding total cost of materials and project.

Using EOQ by an equational method its calculated the EOQ ordering quantity of each material.

Name of Site - SHAPOORAJI PALLONJI, JOYVILLIE, HINJEWADI PHASE 1, PUNE.

Name of Contractor - M/S Datar Traders

Designation of site - 18 floor residential project. Per floor 10 flats.

Per floor area for waterproofing = Toilet area+ Attach Terrace + Dry Balcony =1200 sqft

EOQ Analysis - Total cost = Ordering costs + Carrying cost

The terms considered – D – Demand Rate no of units / year

A – Ordering Cost, Rs/ Year

C- Unit cost

I - Inventory Carrying charges

Q- order quantity per lot

$EOQ = \sqrt{(2 * \text{Order Cost} * \text{Demand}) / (\text{Inventory Carrying cost} * \text{unit price of item})}$



IV. CALCULATION & RESULTS

By considering site details and calculating the total requirement of materials for fulfilment of project requirements.

$$EOQ = \sqrt{(2 * \text{Order Cost} * \text{Demand}) / (\text{Inventory Carrying cost} * \text{unit price of item})}$$

$$1\text{-M-sand} = \sqrt{(2 * 6000 * 36) / (1 * 6000)} = 8.485 = 8.5 \text{ bras}$$

$$\text{Cement} = \sqrt{(2 * 300 * 990) / (1 * 300)} = 44.5 \text{ i.e} = 45 \text{ bags}$$

Sr.no	Type of material	Ordering rate	Total requirement
1	M-Sand (artificial sand)	6000 Rs /bras	36 bras
2	Cement (opc-43)	300Rs/bag	990 bags
3	Bricks	6.5 Rs/brick	36000 Brick
4	Geotextile Role	1m*10 m	1150 Rs
5	Bath seal tape	1150 Rs/ role	12 roles
6	Repair mortar	242 Rs/bag	216 bags
7	Micro concrete	202Rs/bag	90 bags
8	MP (multipurpose polymer)	113 Rs/lit	18
9	General purpose grout	203 Rs/bag	144 bags
10	Damp Block 2K(15kg)	892/box	450 boxes

Table no. I (Rates are mentioned in front of rates)

The tables no. I shows different types of materials required for waterproofing and the current available market rates.

sr. no.	Material	material cost without eq	total material cost without eq	material cost with eq	total material cost with eq	% material cost withlout eq	% material cost with eq
1	Damp Block 2K(15kg)	4,01,400	1,323,264	26760	127741	30.33	20.94
2	M-Sand (artificial sand)	2,16,000	1,323,264	51000	127741	16.32	39.92
3	Cement (opc-43)	2,97,000	1,323,264	13500	127741	22.44	10.56
4	Bricks	2,34,000	1,323,264	19500	127741	17.68	15.26
5	MP (multipurpose polymer)	40,680	1,323,264	678	127741	3.07	0.53
6	Geotextile Role	20,700	1,323,264		127741	1.56	
7	Bath seal tape	13,800	1,323,264	5750	127741	1.04	4.5
8	Repair mortar	52,272	1,323,264	5082	127741	3.95	3.9
9	Micro concrete	18,180	1,323,264	2020	127741	1.37	1.58
10	General purpose grout	29,232	1,323,264	3451	127741	2.2	2.7

Table no.II- total cost is in rupees.

The table shows the total cost required for the material ordering purpose initially without considering the EOQ. It also shows the relatives % of cost decrease while ordering by consideration of effective EOQ method.



V. CONCLUSION

The study with EOQ provide us adequate amount of material so that inventory wont overflow with excess amount of material or there won't be shortage of materials. The result also helps the managing authority for financial management. Which ultimately reduce overburden of heavy costs and effective handling of project.

REFERENCES

- [1] Harsh Soni, Dr. Jayeshkumar Pitroda, Prof. J.J. Bhavshar ANALYZING INVENTORY MATERIAL MANAGEMENT CONTROL TECHNIQUE ON RESIDENTIAL CONSTRUCTION PROJECT Vol-2 Issue-3 2016
- [2] .V. Rathina Kumar, K. Lalitha Priya, Prasannakumar. I, C. Ravekumar. Construction Material Management through Inventory Control Techniques IJO&T 7(3.12) 2018
- [3] Deepak Karoriya1, Dr. Mukesh Pandey Efficient Techniques of Construction Material Management in Construction Projects. irjetvol 05-2395-0056
- [4] Wisam AL-Dulaime, Walid M. Emar Analysis of Inventory Management of Laptops Spare Parts By Using XYZ Techniques And EOQ Model - A Case Study, may-2017



INNO  **SPACE**
SJIF Scientific Journal Impact Factor

**Impact Factor:
7.512**

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 **9940 572 462**  **6381 907 438**  **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details