

## STUDY OF INVENTORY SUPPLY ANALYSIS

Mr. Kunal Mangaonkar<sup>1</sup>, Mr. Shardul Waingankar<sup>2</sup>, Mr. Sahil Vichare<sup>3</sup>

Prof. Pratik Kamble<sup>4</sup>, Ms. Shraddha Mane<sup>5</sup>

<sup>1,2,3</sup> Graduate student, Mechanical Engineering, Finolex Academy of Management Technology, Ratnagiri (MH), India

<sup>4</sup> Assistant Professor, Mechanical Engineering, Finolex Academy of Management Technology, Ratnagiri (MH), India

<sup>5</sup> Graduate student, Mechanical Engineering, SSPM Engineering College, Kankavli(MH), India

\*\*\*\*\*

### Abstract:

Inventory management is a critical issue area in supply chain management which uses a variety of data to keep track of the goods as they move through the process, including lot numbers, serial numbers, cost of goods, quantity of goods and the dates when they move through the process. Almost 60% of company cash is allocated for the stock in an undertaking. Companies need to have stock availability in warehouses in order to fulfil customer demand, meanwhile these inventories have holding costs, and this is frozen fund that can be lost. The biggest challenge in inventory management is efficiency. By performing a performance measurement, companies may figure out how effective and efficient their inventory management. Therefore, the task of inventory management is to find the quantity of inventories that will fulfil the demand, avoiding overstocks. This paper presents a case study in a manufacturing industry (Small Scale Industry) on inventory management. The relationship between the inventory management and company performance was determined based on Lead time and ROA analysis. The research found that company X had a few inventory problems such as unorganized inventory arrangement, large amount of inventory days / no cycle counting and no accurate records balance due to unskilled workers. The study also proved that there was a significant relationship between return on asset (ROA) and inventory days. This paper also provides recommendation to the company and for further research.

**Keywords** —return on asset, unorganized inventory, inventory management, avoiding overstocks.

\*\*\*\*\*

### I. INTRODUCTION

Inventory is the supply of unprocessed materials, partially finished product called work-in-progress and final product, an company maintains to meet its workable needs. Inventory Management is how you track and control your business' inventory as it is bought, manufactured, stored, and used. It governs the entire flow of goods — from procuring right through to sale — ensuring that you always have the right quantities of the right item in the right location at the right time. It represents a compatible investment and a potential amount of waste that needs to be carefully regulated. Inventory is defined as a stock of goods that is maintained by a business in anticipation of some future demand. The amount to which inventory must drop in

order to indicate that an order must be placed to reload a product.

The optimal cycle time is the amount of time a team spends working on a manufacturing an item, up until the product is finally ready for delivery. The OCT is largely consisted by the conventional trade-off between ordering and carrying costs, whereas the Re-order point (ROP) relates to a promotions-oriented cost effectiveness perspective. The optimal policy gains significantly larger profits than cost-based inventory policies, emphasize the importance of profit-driven inventory management. Using a supplement of a standard inventory-dependent demand model provide a convenient characterization of products that require early replenishment. To work towards efficient order standards, there has to be aggressive inventory management, revamping of supply chain operations, and

upgrading lower standards to the perfect standard. When improving the standards, this would include the cases delivered vs. the orders on-time delivery, data integration, damages and unusable products, DOS, the ordering time cycle, and shelf level of service.

## **II. RESEARCH METHODOLOGY**

- A. The assortment of information is done through the conversation with floor supervisors and some senior specialists.
- B. Some indispensable data is taken through the yearly re-ports of the organization and magazines.
- C. Exploration Papers and significant books are utilized for the wellspring of auxiliary information

## **III. STATEMENT OF THE PROBLEM**

Inventory expenses largely affect the productivity of the firm and its development. Everything relies upon the ID of key achievement factors and ideal choices at right second for a productive stock administration and its upgraded choices. In a powerful market climate, it is important to zero in on the dynamic and the variables affecting dynamic to improve the aftereffects of stock capacity. The review approach can welcome a light on the factors, and these have part of one-sided data. Subsequently, the current exploration is cantered around the measurements in particular ID of Factors impacting stock advancement among SMEs in steel sec-peak through an organized and unstructured survey and gathering them into two sets as inside factors and outer factors and enhancement by gathering the data for proper choice

## **IV. SOURCES OF DATA**

The current review utilizes both essential and optional information. Essential information is gathered through the conversation with floor administrators and some senior laborers. Now and again, to miti-entryway the profundity of the issue and the efficiency of the factors in the review, the researcher actually met specialists in the business having proficient experience and had an individual meeting utilizing both organized and unstructured meeting plan. This aides in understanding the issue at wide forthcoming and to dissect something

similar in the exploration perspective. The auxiliary information is gathered from both print and electronic media. The print media incorporates reports, magazines, diaries, distributed examination papers, postulation works, unpublished indus-attempt reports, paper reports and different course readings. The electronic media sources incorporate advanced information bases, web portals, listed diaries in open access entryways, industry association reports and so on

## **V. DATA ANALYSIS AND INTERPRETATION**

- a. Technique of Inventory Management:
- b. Main problems in inventory management are to answer:
  - What are Indus problems in managing inventories?
  - Which inventory policy optimum for Indus? Why? Show calculations.
  - What should be the over level?
- c. To answer these following techniques are used:
  - ABC analysis
  - Economic Order Quantity
  - VED Analysis
  - Re-Order Level
  - Safety stock
  - Inventory Turnover Ratio
  - d. ABC Analysis
    - It is based on proposition that
    - Managerial items and efforts are scare and limited.
    - Some items of inventory are some important than others.
  - e. ABC Analysis

ABC analysis classifies various inventory into three sets or groups of priority the allocates managerial efforts in

proportion of  
The priority the most important item are classified into “class – A”,

Those of intermediate importance are classified as “class – B”

And remaining items are classified into “class – C”.

The financial manager has to monitor the items belonging to monitor the items belonging to different groups in

that order of priority and depending upon the consumptions.

The items with the highest values is given priority and soon and are more controlled then low value item. The rational limits are as follows.

Category	% of items	% of total cost of materials
A	5-15	60-75
B	15-25	15-25
C	60-75	5-15

#### VI. ABC Analysis

##### a. Raw Material (At Closing Stock)

YEAR	AMOUNT OF RAW MATERIALS
2017	135.25
2018	92.15

##### b. Interpretation:

The above table shows the measure of natural substances at cost. In 2017 the expense of material is 135.25Rs diminished in this year and in 2018, It is diminished to 92.15Rs.

##### c. Stock in Process (At Closing Stock):-

YEAR	AMOUNT OF STOCK IN PROCESS
2017	165
2018	102.10

##### d. Interpretation:

The above diagram shows the measure of unrefined components at cost. In 2017 the expense of material is 165Rs expanded in this year and in 2018, It is diminished to 102.10Rs

##### e. Finished Goods (at Closing Stock): -

YEAR	AMOUNT OF FINISHED GOODS
2017	160.87
2018	192

##### f. Interpretation:

The above diagram shows the measure of unrefined components at cost. In 2017 the expense of material is 160.87Rs de-wrinkled in this year and in 2018.It is expanded to 192Rs.

##### g. Stores, Spares & Consumables (Closing Stock):-

YEAR	AMOUNT OF COST OF STORES AND SPARES
2017	152.81
2018	131

##### h. Interpretation:

The above diagram shows the measure of unrefined components at cost. In 2017 the expense of material is 152.81Rs de-wrinkled in this year and in 2018.It is diminished to 131Rs.

##### i. Raw Material Consumed: -

YEAR	AMOUNT
2017	74
2018	41

##### J. Interpretation:

The above diagram shows utilization of unrefined components.The utilization of natural substance in the year 2017 is Rs 74 the utilization of natural substance expanded in the year 2018 in the Rs 31.

#### VII. Economic Order Quantity

##### EOQ During 2016-2017

The firm needs beneath given units of material for assembling of steel. Coming up next are the subtleties of their activity during 2016-2017.

PARTICULARS	
Billets/Blooms	3,696Qty (Mt)
Ordering cost per order	2800
Carrying cost	12.5%
Purchase price per unit	520

Calculation of EOQ: -

Total units required (A) =3696mt

The ordering cost per order (O) = Rs.2800

Carrying cost per unit (C) = 12.5%

(i.e.) 12.5% of Rs.520 =Rs.65

$$EOQ = \sqrt{2AO/C}$$

$$= \sqrt{(2 \times 3696 \times 2800) / 65}$$

$$= \text{Rs.}564.291$$

$$= 3696/564.291$$

$$= 6.54$$

Total annual cost = carrying cost + ordering cost

$$= 159,685.95 + 17493.3$$

$$= \text{Rs.}171505.8$$

Carrying cost = order size × average inventory

$$\text{order size} = A/\text{no of orders}$$

$$= 3696/6.54$$

$$= 565.13$$

Average inventory = order size/2

$$= 565.13/2$$

$$= \text{Rs.}282.565$$

Carrying cost = 565.13 × 282.565

$$= \text{Rs.}159,685.95$$

$$= 2800 \times 6.54$$

$$= \text{Rs.}18312$$

### EOQ During 2017-2018

The firm needs beneath given units of material for assembling of steel. Coming up next are the subtleties of their activity during 2017-2018.

PARTICULARS	
Billets/Blooms	2,100,Qty (Mt)
Ordering cost per order	Rs 2850
Carrying cost	14%
Purchase price per unit	540

Calculation of EOQ: -

Total units required (A) =2100mt

The ordering cost per order (O) = Rs.2850

Carrying cost per unit (C) = 14%

(i.e.) 14% of Rs. 540 =Rs.75.6

$$EOQ = \sqrt{2AO/C}$$

$$= \sqrt{2 \times 2100 \times 2850 / 75.6}$$

$$= \text{Rs.}397.999 \sim 398$$

Number of orders for the year = A/EOQ

$$= 2100/398$$

$$= 5.27 \sim 6 \text{orders}$$

Total annual cost = carrying cost + ordering cost

$$= 61,250 + 17,100$$

$$= \text{Rs.}78,350$$

a. Carrying cost = order size × average inventory

b. Order size = A/no of orders

$$= 2100/6$$

$$= 350$$

c. Average inventory = order size/2 = 350/2  
= Rs.175

d. Carrying cost = 350 × 175 = Rs.61,250

e. Ordering cost = cost per order × no of orders = 2850 × 6  
= Rs.17,100

### IX The Re-Order Level

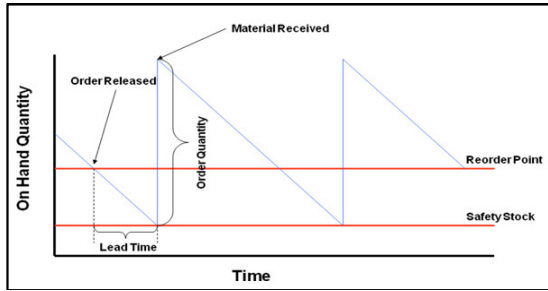
The re-order level is the overconservative level at which an organization would put in another request or start another assembling run

1. Company's work-request lead time
2. The use pace of the thing and furthermore its interest during that time the rate at which the stock is being spent. The rate at which the stock is being spent is known as the use rate.

The Reorder Level can be Determined as Follows:

$$\text{Reorder Level} = \text{Average Demand} \times \text{Lead Time} + \text{Safety Stock}$$

The reorder level and inventory patterns have been shown in following figure: -



**X. VED Analysis**

VED analysis is a stock administration procedure that orders stock dependent on its practical significance. It arranges stock under three heads dependent on its importance and need for an association or any of its different exercises. VED examination represents Indispensable, Essential, and Attractive.

As the name proposes, the classification "Crucial" remembers for inventory, which is essential for creation or some other favourable to cess in an association. On the off chance that any of such inventories are unavailable, the whole creation chain might stop. Additionally, a missing fundamental part might be of need at the hour of a breakdown. Along these lines, request for such stock ought to be before-hand. The fundamental class incorporates stock, which is close to being essential. These, as well, are vital for any association since they might prompt a stoppage of creation or hamper another cycle. Be that as it may, the misfortune because of their inaccessibility might be impermanent, or it very well may be feasible to fix the stock thing or part, which can't go on without serious consequences for in excess of a couple of hours daily. The positive classification of stock is the most un-significant among the three, and their inaccessibility might bring about minor stoppages underway or different cycles, which are required, yet their nonappearance for even a week or thereabouts will prompt stoppage of creation.

MATERIAL	CLASS	VALUE	PRIORITY	MATERIAL
10%	"A"	70%	V 10%	70%
			E 20%	10%
			D 70%	10%
20%	"B"	20%	V 10%	70%
			E 20%	20%
			D 70%	10%
70%	"C"	10%	V 10%	70%
			E 20%	20%
			D 70%	10%

**XI.Safety Stock:**

The safety stock a degree of additional stock that is kept up with to mitigate hazard of stockouts (deficit in unrefined substance or bundling) brought about by vulnerabilities in organic market. Wellbeing level is discovered in stock as a section on the grounds that there is consistently an un-unquestionably engaged with delay use rate or assimilate the inconstancy of client interest.

Security stocks are for the most part utilized in a "make-to-stock" fabricating methodology, which is utilized when the lead season of assembling is too long to even think about fulfilling the client interest at the right expense/quality/holding up time. Notwithstanding, stock inflows and surges are capricious or lesser unsurprising it becomes to convey extra security to prevent surprising stockouts, so utilization rate is assessed whenever cost is low then no wellbeing stock is required.

**XII. Inventory Turnover Ratio**

What it is?

Stock turnover is a monetary proportion showing how often an organization has sold and supplanted stock during a given period A low turnover suggests frail deals and potentially abundance stock, otherwise called overloading. It might show an issue with the products being offered available to be purchased or be a consequence of too little advertising.

A high proportion, then again, infers either solid deals or inadequate stock. The previous is attractive while the last could prompt lost business.

When to Use it?

In case a company's business has huge resources restricted in stock, following its turnover is basic to fruitful arranging. In case stock is turning too leisurely, it could show that is might be hampering the company's income.

Since this proportion judge's yearly stock turns, it is normally directed one time per year.

The formula: Cost of Goods Sold/Average Value of Inventory

YEAR	Cost of products sale	Avg value of material	Inventory Turn Over Ratio
2017	3240.56	571.29	5.67
2018	2280.35	420.77	5.41

### XIII. Findings & Suggestions

1. The organization is having acceptable deals for their pushouts during every one of the early long periods of the review.

2. The stock turnover proportion is on a declining pattern quite a long time after year in the time of the review.

3. It demonstrates failure of the executives in transforming of their stock into deals.

4. The organization ought to embrace refined techniques to deal with its stock in a superior way.

5. The EOQ determined is recommending that the company ought to get its stock prerequisites by placing orders every now and again to its providers instead of one-time recharging.

6. Company should go to lengths for upkeep of legitimate stores and extras in order to keep away from the successive breakdown of the hardware.

7. There is a need to foster great correspondence framework between different divisions like showcasing, arranging, acquirement, and creation and distributions capacities.

8. The organization ought to follow Without a moment to spare technique, their get it can get rid of sitting tight an ideal opportunity for a receipt of materials.

### XIV. Conclusion and Future Work

#### Conclusion

Stock administration has to do with keeping precise records of completed products that are prepared for transparent. This regularly implies posting the creation of recently finished merchandise to the stock aggregates just as subtracting the latest shipments of completed products to purchasers. At the point when the organization has a merchandise exchange set up, there is typically a sub-classification contained in the completed products stock to represent any returned products that are renamed or 2nd grade quality.

Precisely keeping up with figures on the completed products stock makes it conceivable to rapidly pass on information to deals staff regarding what is accessible and prepared for shipment at some random time.

The return on initial capital investment of Stock administration will be found in the types of expanded income and benefits, positive utilize environment, and on by and large increment of client satisfaction. The subsequent stage of the current examination will be the utilization of accomplished consequences of interest conjectures, security stock and reorder focuses into re-enactment programming to accomplish more exact outcomes.

#### Future Work

I. Detail learn pretty much all the material was unrealistic in light of time limit.

II. Some of the data was kept private by the steel enterprises office.

III. Study was restricted distinctly to the chose parts in the stores branch of steel organization.

IV. Comparative review might be new examination issue for the future work.

#### References

[1] L. Ling, Store network the executives: ideas, tech-niques and works on upgrading the worth through

joint effort. NJ: World Logical, 2007. 372 p.

[2] M. Leseure, Key Ideas in Tasks Man-agement, 2010.

[3] D. Plinere, L. Aleksejeva, "Specialist framework applica-tion as a device for stock administration im-

provement," in eighth Int. Conf. on Delicate Figuring, Processing with Words and Insights in Sys-tem Examination, Choice and Control, 3–4 Sep., 2015. Antalya, Turkey, pp. 157–166.

[4] D.S. Plinere, A.N. Borisov, L. Ya. Aleksejeva, "In-teraction of Programming Specialists in the Issue of Planning Requests," Programmed Control and PC Sciences, 2015, vol. 49, no. 5, pp. 268–276. <http://dx.doi.org/10.3103/S0146411615050089>

[5] D.C.U. Cadavid, C.C. Zuluaga, "A structure for choice emotionally supportive network in stock overseement region," 10th LACCEI Latin American and Caribbean Conf., LACCEI'2011, Aug. 3–5, 2011, Medellin, Colombia.

[6] D. Dhoka, Y.L. Choudary "ABC Grouping for Inven-conservative Enhancement," IOSR Diary of Business and Man-agement, vol. 15, Issue 1, Nov. – Dec. 2013, pp. 38–41. <http://dx.doi.org/10.9790/487X-1513841>

[7] Life cycle designing [Online] Accessible: <http://www.lce.com/pdf/abcclassification.pdf> [Accessed: Sept. 25, 2015]

[8] ABC investigation (Stock) By Joffrey Collignon, JoannesVermorel, Feb. 2012 [Online] Accessible: <http://www.lokad.com/abc-investigation> (stock)-definition [Accessed: Sept. 25, 2015]

[9] ABC Stock Investigation utilizing Dominate. Posted on Oc-tober first, 2014. [Online] Accessible: <http://chandoo.org/wp/2014/10/01/abc-stock> investigation utilizing dominate [Accessed: Sept. 25, 2015]