

Inventory Management in Large Scale Industry- A Review

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Abstract- Main objective of inventory management is to maintain stock levels of raw materials, finished goods, work in process, current assets etc. It's very essential for large scale industry to improve process with reduce lead time, uncertainty and cope up with demand. Inventory management is one of the important logistics of supply chain management. it maintains level of inventory with different models like ABC analysis, EOQ model, XYZ analysis etc. Buffer stock also a key aspect in inventory management. It will helpful in emergency conditions like, tandem demand, new unit installation etc. It helps to minimize the risk of production interruption due to stock out conditions. Inventory management consists cost related asset, raw material, handling etc.

Keywords- Inventory, ABC analysis, VMI, VED analysis, Inventory costs.

I. INTRODUCTION

Inventory management is significant for effective and efficient organization. It is also important in the control of inventories that have to be stored for later use in case of production. According to S.L.Adeyemi and A.O.Salami (2010), the principal goal of inventory management involves having to balance the conflicting economics of unwanted stocks.

For a manufacturing company, there must be some inventory of raw materials, work-in-process, and finished products stored to confront with stochastic demand, breakdown, lead time etc. In distribution, inventory is classified as in transit, meaning that it is being moved in the system, and warehouse, which is inventory in a warehouse or distribution centre. Retail sites carry inventory for immediate sale to customers. In services, inventory generally refers to the tangible goods to be sold and the supplies necessary to administer the service.

II. PURPOSE OF INVENTORY MANAGEMENT

- To maintain independence of operations.
- To meet variation in product demand.
- To allow flexibility in production scheduling
- To provide a safeguard for variation in raw material delivery time

- To take advantage of economic purchase order size etc.

III. INVENTORY COSTS

A. Holding (or carrying) costs

This broad category includes the costs for storage facilities, handling, insurance, pilferage, breakage, obsolescence, depreciation, taxes, and the opportunity cost of capital. Obviously, high holding costs tend to favour low inventory levels and frequent replenishment.

B. Setup (or production change) costs

To make each different product involves obtaining the necessary materials, arranging specific equipment setups, filling out the required papers, appropriately charging time and materials, and moving out the previous stock of material.

C. Ordering costs

These costs refer to the managerial and clerical costs to prepare the purchase or production order. Ordering costs include all the details, such as counting items and calculating order quantities. The costs associated with maintaining the system needed to track orders are also included in ordering costs.

D. Shortage costs

When the stock of an item is depleted, an order for that item must either wait until the stock is replenished or be cancelled.

IV. INVENTORY MODELS

A. ABC Analysis

ABC analysis is a basic analytical management tool which enables top management to place the effort where the results will be greatest. The techniques tries to analyse the distribution of any characteristic by money value of importance in order to determine its priority.

- The mechanics of classifying the items into ‘A’, ‘B’ and ‘C’ categories is described here ,
 - a) Calculate
 - b) Sort
 - c) Prepare A List
 - d) Compute A Running Total
 - e) Compute And Print

B. VED Analysis

The materials may be classified depending upon their criticality that is on functional basis. The degree of criticality can be stated as whether the material is vital to the process of production, or essential to the process of production or desirable for the process of production. This classification is known as VED analysis, V stands for vital, E stands for essential and D stands for desirable items.

- COMBINATION OF ABC &VED ANALYSIS

Table 1 ABC and VED matrix

	V	E	D
A	AV	AE	AD
B	BV	BE	BD
C	CV	CE	CD

C. XYZ Analysis

This classification is based on the value of inventory of materials actually held in stores at given time.

- ‘X’ items which are 10% of no. of items stored, but accounting for 70% of the total inventory value.
- ‘Y’ items are 20% of no. of items stored and account for 20% of total inventory value.
- ‘Z’ items are 70% of no. of items stored and account for 10% of the total value.
- This analysis focuses on efforts to reduce the inventory of these items.

D. Vendor Management Inventory

Vendor managed inventory (VMI) is a means of optimizing supply chain performance by having the supplier be responsible for maintaining the customer’s inventory levels, by relying on a demand driven replenishment model. VMI programs are implemented in order to streamline inventory management, improve the purchasing process for c-commodities, increase customer service levels and create collaborative partnerships with suppliers.

V. LITERATURE REVIEW

Table 2. Literature review

Journal name	Author and year	Title of paper	Remark
International Journal of Research in Engineering & Advanced Technology	Pramod Kumar, Mohd. Anas	An ABC-Analysis for the Multiple-Products Inventory Management - Case Study of Scooters India Limited	ABC analysis helps in company to utilize financial resources for finished inventories.
Proceedings of the Asia Pacific Industrial Engineering & Management Systems	Kuo-En Fu, Wei-Zhen Chen, Lon-Chen Hung	An ABC Analysis Model for the Multiple Products Inventory Control	For multiple products, inventory control models were use for more cost effective concerned and an automated inventory control implementation system for company
American Journal Of Business Education	Handanhal Ravinder, Ram B. Misra	ABC Analysis For Inventory Management: Bridging The Gap Between Research And Classroom	As per this method, companies will be able to manage their inventories better and be more competitive in the marketplace.
International Journal off Industrial Engineering & Production Research	Rasoul Haji,MohammadMohsen Moarefdost & S. Babak Ebrahimi	Inventory Cost Evaluation Under VMI Program with Lot Splitting	By increasing the replenishment Frequency, the cost will decrease. Since the transportation cost is negligible, it is a plausible conclusion

International Journal off Industrial Engineering & Production Research	Mona Ahmadi Rad & Farid Khoshalhan	An Integrated Production-Inventory Model with Backorder and Lot for Lot Policy	The optimum joint total cost of model with backorder is smaller than model without backorder.
International Journal off Industrial Engineering & Production Research	M. Mahootchi, T. Ahmadi & K. Ponnambalam	Introducing a New Formulation for the Warehouse Inventory Management Systems: with Two Stochastic Demand Patterns	According to the demonstrated results, the FP policy gives superior service level and annual cost than other policy
International Journal of Innovative Research in Science, Engineering and Technology	S.Sindh, Dr.K.Nirmalkumar, V.Krishnamoorthy	Performance Analysis of Inventory Management System in Construction Industries in India	Inventory management system is considered to perform a key role in an organization, which is responsible To complete the company's project in a specific budget within a certain period of time.

VI. RESULT AND DISCUSSION

- ABC-VED matrix analysis identifies optimal use of funds and avoid out-of-stock situations. Convexity condition of the cost function is established to ensure the existence of unique point of minimum.
- VMI improves the rational planning with partners of company.
- Supply chain management system concept along with lean production System will be suggested to overcome impacts in inventory management system to improve the productivity.

VII. CONCLUSION

Inventory management is important for keeping costs down, while meeting regulation. Supply and demand is a delicate balance, and inventory management hopes to ensure

that the balance is undisturbed. Highly trained Inventory management and high-quality software will help make Inventory management a success. The ROI of Inventory management will be seen in the forms of increased revenue and profits, positive employee atmosphere, and on overall increase of customer satisfaction.

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