

# Improved Inventory Management System for a Jute Mill -A Case Study

Md. Arafat Hossain<sup>1</sup>

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## Abstract

This project work has been carried out for investigating the existing Inventory Management system of the Eastern jute Mills Limited, Khulna, Bangladesh. Eastern Jute Mills Limited manufactures jute products such as hessian, sacks, and jute carpet backing clothes. It was founded in 1967 and is based in Khulna, Bangladesh. It also operates as a subsidiary of Bangladesh Jute Mills Corporation. For investigating the Inventory related data and information, the necessary data has been collected from this Jute Mill. By close look of the present inventory management system and discussing with the executive personals of the Eastern Jute Mills Limited, Khulna, A clear conception of the existing Inventory Management system has been gained. ABC analysis has been carried out for annual demand. Raw Jute purchasing procedure has been examined and storing procedure has been observed by close observation to find out the major drawback of the existing inventory management system. Finally it has been focused to suggest an improved Inventory Management system for the Eastern Jute Mills Limited, Khulna.

**Index terms**— inventory management, demand, lead time, holding cost, depreciation, ABC analysis.

## 1 Introduction

In Operations Management, inventory refers to any scarce resource that remains idle in anticipation of satisfying a future demand for it. [1] An inventory is a stock or store of goods. [1] Inventory management is an important concern for the managers in all types of businesses. Effective inventory management is essential for realizing the full potential of any value chain. [2] Inventory primarily arises because of differences in the timing or rate of supply and demand and is used to balance these. Inventory may also occur due to economic batch sizes for an operation, WIP, product seasonality and investment for new product ranges. [3] Holding inventory is often interpreted as carrying an asset but also means carrying risk in terms of obsolescence, deterioration and quality faults [4]. In financial terms inventory impacts the balance sheet, cash flow and profit and loss accounts. Operationally inventory affects production efficiencies and on-time delivery. In his book "The Goal" Goldratt [5] identifies inventory as a key component for measuring business performance in a manufacturing environment.

Inventory represents an important decision variable at all stages of product manufacturing, distribution and sales. [6] In the above sense, the term covers not only materials in various stages of processing one is likely to see in a factory but all the human and nonhuman resources maintained but not currently used by an organization in order to meet anticipated demand for its products and services. [1] II.

## 2 Objectives

The objectives of the project work were: a) To study the present inventory management system of the Eastern Jute mills, Khulna. b) To figure out the limitations and drawbacks associated with the existing inventory management system of the Eastern Jute mills, Khulna. c) To suggest some methods to prosecute the inventory management system of the Eastern Jute mills, Khulna.

### III. Why Inventory is Necessary for a Jute Mill

Jute is the main raw material in a Jute Mill. But Raw Jute is not available throughout the year. It is only available June to September. So the whole demand of the jute throughout the year is stocked by purchasing the Raw Jute in this time period. So an effective inventory management system can play a vital role in a jute mill to make the mill profitable.

## IV.

### 5 Objectives of Inventory Management

The objective of inventory management is to achieve satisfactory levels of customer service while keeping inventory costs within reasonable bounds. So inventory problem involves the formulation of decision rules that answer two important questions: a) When is it necessary to place an order (or set up for production) to replenish inventory? b) How much is to be ordered (or produced) for each replenishment [1]?

The decision rules must aim at satisfying anticipated demand minimum cost or maximum profit [1].

## I

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### 8 Functions of Inventory

The functions of inventory are described as follows: [7] a) To meet the anticipated customer demand. b) For smooth production requirements. c) To protect against stock outs: Delayed deliveries and unexpected increases in demand increase the risk of shortages. d) To hedge against price increases: Occasionally, a firm will suspect that a substantial price increase is about to be made and purchase larger-than-normal amounts to avoid the increase, the ability to store extra goods also allows a firm to take advantage of price discounts for larger orders. e) To permit operations:

The fact that production operations take a certain amount of time means that there will be generally being some work-in-process inventory. f) To prevent stock out. Stock out means running out of the inventory a stock keeping unit.

[9]

VI.

Steps Followed to Complete the Project Work a) At first, the rules and principle of the inventory management system was studied intensively to gain the proper managerial knowledge about inventory management. b) Secondly, a close look on the inventory management system of Eastern Jute Mills, Khulna was given by collecting data of purchasing goods for the production, having discussion with the concerned personnel and visiting the Eastern Jute Mills of Khulna to observe how goods are kept. c) Thirdly, the drawbacks associated with the inventory management system of Eastern Jute Mills of Khulna were figured out by means of case study. d) Lastly, some suggestions were given to meet the anticipated demand and to eliminate the drawbacks and to maintain the inventory management system of Eastern Jute Mills of Khulna with more efficiently. Holding Cost: The holding cost includes handling, insurance, taxes, carrying cost of goods or raw materials.

## VII.

### 10 Data Collection and Calculation

? Bank interest on the money invested in inventory = 9%

? Depreciation: Batching to batching = 0.50%, Preparing to winding = 0.95%, Beaming = 0.05%, Weaving = 4%, Finishing = 1%, Jute to jute = 0.5%? Insurance = 0%

? Expense of running mills = 14% So, Total holding cost  $C_H = 30\%$

Shortage cost: This cost arises when the Actual demand can't be met by the existing stock.

Lower ordering costs: If you buy a larger quantity of an item less frequently, the ordering costs are less than buying smaller quantities over and over again. (The costs of holding the item for a longer period of time, however, will be greater.) [8] In Case of Eastern Jute Mills, Shortage cost is Totally Zero. This is because the actual demand is always met by the existing stock.

Ordering cost: This cost takes place by ordering from outside supplier or by producing the items internally.

? Cost of publicity and advertisement = 95000 Taka Identifying Critical Inventory Items with ABC Analysis

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## 11 Equations of Optional Replenishment

## 12 Table 2 : ABC analysis for annual demand of Eastern Jute Mills

Total number of items = 10

## 13 Result

ABC analysis is obtained for the annual demand. In case of the annual demand, Class-A item is the raw jute which covers 10 percent of total raw materials and holds about 95 percent of total value. Class-B holds the 30 percent of total items and covers around the 3.5 to 4.5 percent of total value and Class-C holds 60 percent of total items and covers around the 0.5 percent of total value. The total incremental cost of the 1 year review period is 41148342 Taka. This incremental cost is the summation of the entire three units and it has been calculated based on the annual demand of the Eastern Jute Mills. d) In today's business environment, even small and mid-sized businesses have come to rely on computerized inventory management systems.

[10] So the inventory management of the mill should be relied on the computerized inventory management system. A computerized inventory management system is more accurate and reliable.

But if the inventory management system is estimated by 2 review period (July to December and January to June) in a year, it will be easier process and can be made many important decisions quickly.

XIV.

## 14 Discussion

For studying the entire inventory management system of the Eastern Jute Mills, the inventory related data has been collected from the Hessian unit, Sacking unit and CBC unit. Each unit has some individual needs and produces the individual products. The overall requirements of the annual demand of the Eastern Jute Mills have also been collected. The motive of this work is to adopt a suitable inventory management system which will serve as a model. From the presented data, total inventory costs for 1 year review have been figured out.

XV.

## 15 Conclusion

The Depreciation and wastage is high in Eastern Jute Mills which leads to a greater holding costs and finally greater incremental cost. By close observation, it is seen that the raw jute is under loose control that leads to the greater depreciation and wastage of raw jute. There are spaces to stock the raw jute. But the spaces are not sufficient. By close observation, it is seen that the Raw Jute is stored in more compactly that can lead to more wastage. Normally huge amount of jute is bought at a time because it is available in June to September. Technology used in jute manufacturing sector did not change much. Most of the machines in jute mills are old and have passed the usual functional period. Due to the use of extreme old machine, the operation can't be performed smoothly and the materials are being loosen at a considerable rate. The expense of running mill is about the 14 percent which also added with the holding cost. The old machineries take huge amount of power but can't provide sufficient performance. Because of this reason the expense of running mill is high. Eastern Jute Mills estimates its Inventory management system for every 1 year (July to June). It is more complex to estimate the total inventory at a time. value. If the wastage of the raw jute can be minimized, it will be possible to minimize the total holding cost.

## 16 References Références Referencias

b) It is necessary to provide the more space to store the raw jute. If more spaces are provided and are not stored more compactly, the wastage will <sup>1</sup>

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Figure 1: ?

$$\sqrt{\frac{t}{2}}+L$$

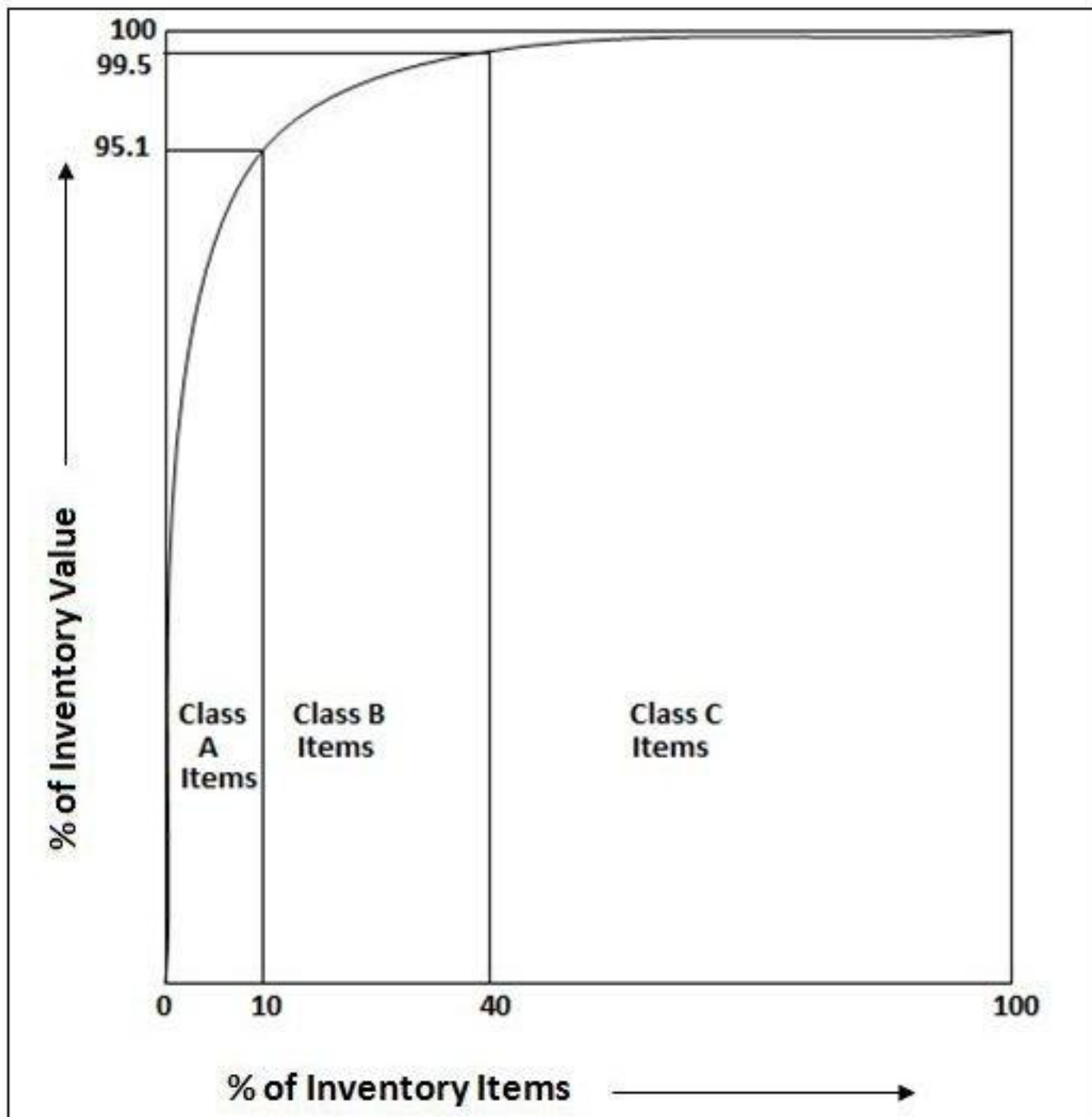
Figure 2: ?

$$_1\left(\frac{t}{2}+L\right)+$$

Figure 3: Figure 1 :

$$_2\left(\frac{M+B}{2}\right)$$

Figure 4: Figure 2 :



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Figure 5: Table 3 :

$$\frac{1}{10} \times 100$$

Figure 6:

$$\begin{array}{r} 315570420 \\ \hline 2331695120 \end{array} \quad \times$$

Figure 7: 2 ©

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X.

Figure 8: Table 1 :

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