



“A Study On Optimizing Inventory Management Strategies In The Apparel Industry With Special Reference In Tirupur Garment Industry”

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ABSTRACT:

This study aims at optimizing inventory management tactics in the apparel industry to increase operational efficiency and profitability. The study takes a quantitative approach, analyzing inventory classification using ABC Analysis and proposing the use of Economic Order Quantity (EOQ) models to reduce ordering and carrying costs. The objectives include evaluating material classification, determining EOQ, and recommending adjustments for better inventory management. The analysis is based on primary data collected directly from apparel firms, which includes inventory levels, demand trends, lead times, and associated expenses. The study uses approaches such as ABC Analysis, EOQ determination, and establishing reorder points and safety stock levels to provide actionable insights for improving inventory management processes in the garment industry.

Keywords: Inventory management, Apparel industry, EOQ, Safety Stock, Optimization, Demand forecasting, Inventory control, Lead time, Cost reduction.

INTRODUCTION:

This study focuses on optimizing inventory management strategies for the apparel industry to meet consumer demands, minimize costs, and maximize profitability. It explores key strategies like Economic Order Quantity (EOQ) and ABC analysis, providing insights and practical recommendations for improving operational efficiency, reducing stockouts, and enhancing customer satisfaction. The study contributes to the knowledge of inventory management strategies in the apparel industry, offering actionable insights for companies seeking to streamline their control processes and achieve long-term success.

OBJECTIVE OF THE STUDY:

- To analyze the classification of materials in stock using ABC Analysis.
- To propose Economic Order Quantity (EOQ) for reducing the ordering and carrying cost in inventory.
- To make suggestions for possible improvements.

SCOPE OF THE STUDY:

The study analyzes inventory optimization techniques for apparel management at Rhythm Knit India (p) Limited, using primary data. It provides practical guidelines and recommendations to streamline inventory control processes, reduce costs, and improve competitiveness.

REVIEW OF LITERATURE:

Ascoly, Nina (2003) "Pricing in the Global Garment Industry" report on IRENE/CCC seminar held February 20th, Mülheim an der Ruhr, Germany. Includes comments by industry experts Scheffer, Zadek, and Siegele referred to in this bulletin.

CCC (2002) "In the Workplace: Standards in the Bulgarian Garment Industry," CCC Newsletter, no. 15, June. The CCC Newsletter, which presents news on the activities of the CCCs throughout Europe and research on working conditions in the global garment industry, is published several times per year by the International Secretariat of the Clean Clothes Campaign.

The study conducted by Mahendra Pratap and Harwinder Singh (2007), on the topic "Evaluation and Economic Selection of Raw Materials „Inventory Control Policy"" reveals that a proper inventory of raw materials is to be maintained in all organizations and as per proposed method, the shortage cost of the materials is eliminated with the introduction of buffer stock. Based on this proposed model, the total inventory cost determined by an economic selection is less than the existing system. In the study, inventory data of raw materials has been collected and a stochastic analytical inventory model has been economic selection of inventory control.

The study conducted by Gupta and Hira (2000), on the topic "Applicability of Forecasting Determination of Factors of Inventory Control" reveals that use of exponential smoothing method to ascertain the values of demand and lead time when these are stochastic variables. The study deals with when to order and how much to order.

Richard A. Lancioni & Keith Howard-1978 in their study considers the inventory management as an extremely important function to any business, the inadequacies in control can result in serious problems. If inventories are managed in an inefficient manner, it is likely to result in delays in production, dissatisfied customers, or curtailment of working capital.

PROBLEM STATEMENT:

The apparel industry faces challenges in efficient inventory management due to rapid changes in consumer preferences, short product lifecycles, and intense competition. This project aims to address supply chain complexity, seasonal variations, and trends by coordinating stakeholders and developing dynamic strategies to minimize stockouts and markdowns, while maximizing profitability.

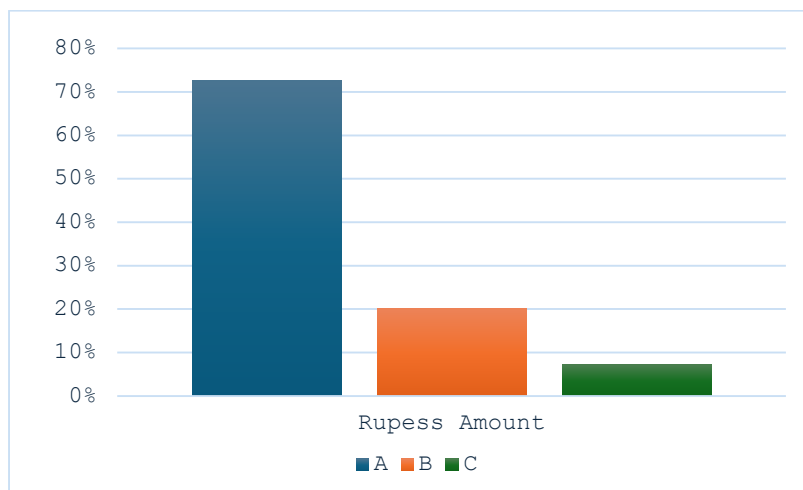
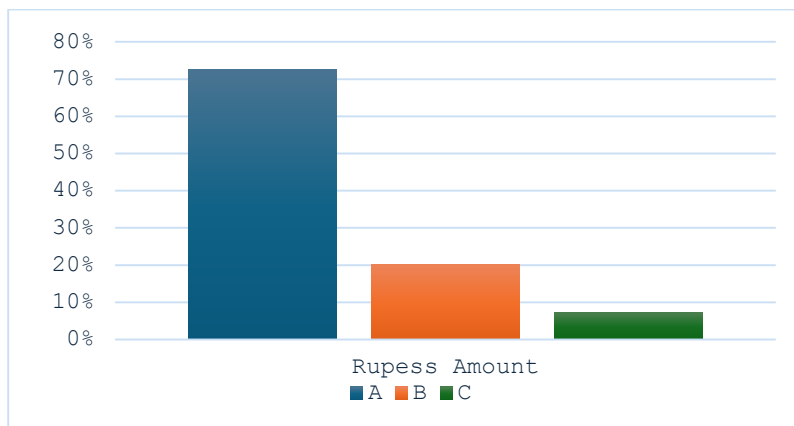
ANALYSIS AND INTERPRETATION:

1.ABC Approach:

ABC Analysis categorizes inventory items into high-value (A), medium-value (B), and low-value (C) items, with A goods requiring special attention, B items equally important, and C items less crucial for business success.

Class	Rupess Amount		Number of Items		Class
	Total	Percent	Total	Percent	
A	90,60,000	72.68%	2	20.00%	
B	25,00,000	20.06%	3	30.00%	
C	9,05,000	7.26%	5	50.00%	

Item	Usage	Qty units	Unit Cost	Rupess Amount	Class
cotton	8,500	Kg	360	30,60,000	A
wool	500	Kg	600	3,00,000	C
polyester	4,000	Kg	350	14,00,000	B
Rayon	1,500	Kg	400	6,00,000	B
Zipppers	5,000	Qty	15	75,000	C
threads	1,000	Kg	500	5,00,000	B
buttons	1,000	Gorss	80	80,000	C
Lables	1,00,000	Qty	2	2,00,000	C
Packing materials	10,000	Qty	25	2,50,000	C
Lycra	30,000	Kg	200	60,00,000	A



INTERPRETATION:

The manager can use the A-B-C analysis to prioritize inventory management, focusing on Category A items that require close monitoring, Category B items that require less attention, and Category C items that can be managed with less scrutiny.

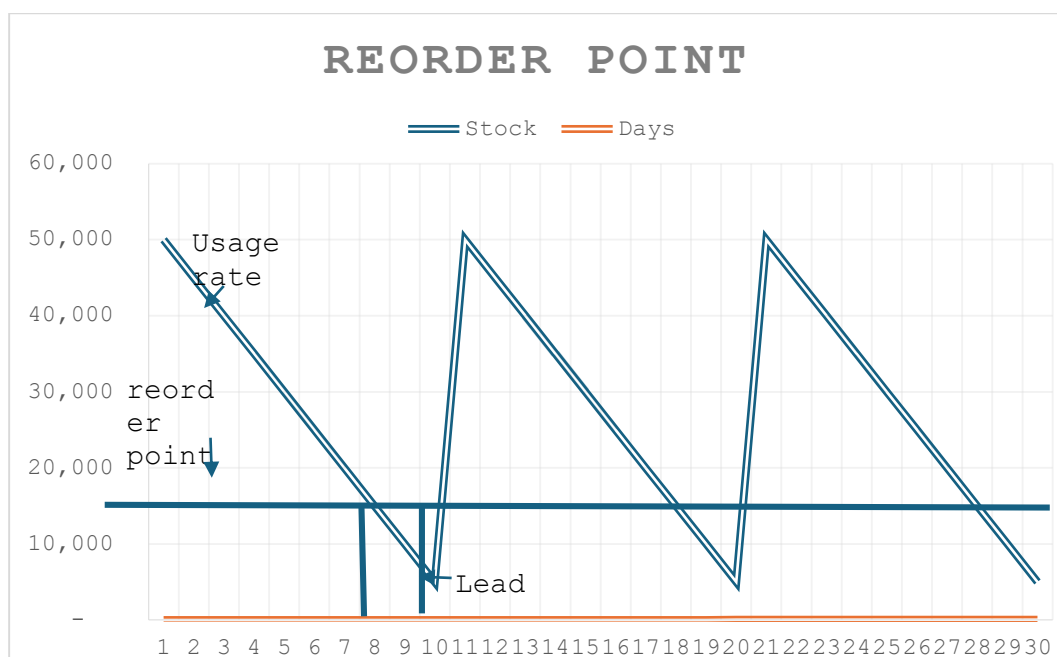
2.REORDER POINT:

The reorder point refers to the inventory level when a new order should be made to replenish stock before running out. It depends on elements including lead time, demand variability, and desired service level. The reorder point ensures prompt inventory replenishment, preventing stockouts and meeting customer demand.

REORDER POINT

$$\text{REORDER LEVEL} = ((\text{MAX. USAGE} * \text{MAX. LEAD TIME}) + \text{SAFETY STOCK})$$

Stock	Days	Stock	Days	Stock	Days
50,000	1	50000	11	50,000	21
45,000	2	45,000	12	45,000	22
40,000	3	40,000	13	40,000	23
35,000	4	35,000	14	35,000	24
30,000	5	30,000	15	30,000	25
25,000	6	25,000	16	25,000	26
20,000	7	20,000	17	20,000	27
15,000	8	15,000	18	15,000	28
10,000	9	10,000	19	10,000	29
5,000	10	5,000	20	5,000	30



INTERPRETATION:

The data analyzes the Reorder Point for one product, indicating the inventory level for replenishment. If the current level falls below the Reorder Point, the manager initiates a restock order, ensuring optimal inventory management, minimizing stockouts, and maintaining supply chain operations.

3.SAFETY STOCK:

Safety stock Extra inventory carried to reduce the probability of a stockout due to demand and/or lead time variability.

SAFETY STOCK

$$\text{SAFETY STOCK} = ((\text{MAX.LEAD TIME} - \text{NORMAL LEAD TIME}) * \text{DEMAND})$$

$$\text{Demand} = (\text{Annual consumption} / \text{Quantity})$$

Item	Demand per day	Lead Time	Safety Stock	Max Lead Time Demand	Avg Lead Time Demand
cotton	250	5	625	1,250	625
wool	100	6	300	600	300
polyester	500	3	750	1,500	750
Rayon	50	7	175	350	175
Zippers	5,000	2	5,000	10,000	5,000
threads	500	2	500	1,000	500
buttons	5,000	1	2,500	5,000	2,500
Lables	5,000	3	7,500	15,000	7,500
Packing materials	5,000	5	12,500	25,000	12,500
Lycra	100	5	250	500	250

ZIPPERS:

Item	Demand per day	Lead Time	Safety Stock	Max Lead Time Demand	Avg Lead Time Demand
Zippers	5,000	2	5,000	10,000	5,000



INTERPRETATION:

The manager can confidently manage Zippers' inventory levels with calculated safety stock, setting appropriate policies for replenishment and minimizing stockout risks. Regular monitoring of demand and lead times allows adjustments to safety stock levels.

4.EOQ(economic order quantity):

Item	Demand	Ordering Cost per order	Holding Cost per unit	EOQ
cotton	8,500	30,60,000	250	14424.98
wool	500	3,00,000	450	816.4966
polyester	4,000	14,00,000	200	7483.315
Rayon	1,500	6,00,000	150	3464.102
Zippers	5,000	75,000	3	15811.39
threads	1,000	5,00,000	250	2000.00
buttons	1,000	80,000	30	2309.401
Lables	1,00,000	2,00,000	1.5	163299.3
Packing materials	10,000	2,50,000	5	31622.78
Lycra	30,000	60,00,000	80	67082.04

INTERPRETATION:

The manager can use EOQ calculations to determine cost-effective order quantities for each item in the company's inventory, minimizing total costs. This ensures optimal inventory levels and avoids excessive capital or ordering costs. Automated systems or reorder points can streamline replenishment. Regular review and adjustment of EOQ values improves efficiency and profitability.

FINDINGS:

- The study emphasizes the importance of comprehensive inventory management strategies in the apparel industry.
- These strategies include Economic Order Quantity (EOQ), the ABC Approach, Reorder Point, and Safety Stock. EOQ is calculated based on demand, ordering costs, and holding costs, ensuring efficient inventory management.
- The ABC Approach categorizes inventory items into high-value, moderate-value, and low-value groups, allowing companies to prioritize inventory management efforts. Reorder Point is the inventory level at which a new order should be placed to replenish stock before lead time. Safety Stock is crucial for ensuring product availability and customer satisfaction.
- By analyzing historical data, demand variability, and lead time fluctuations, companies can achieve greater control over their inventory, improve customer service, and gain a competitive advantage.

SUGGESTIONS:

To optimize inventory management, allocate resources to manage A items, which have higher costs and impact on profitability. Employ different strategies for each ABC category, monitor inventory levels and reorder points, and consider factors like seasonality and promotional activities. Adjust safety stock levels based on historical data and market conditions. Implement EOQ-based ordering policies and regularly review and adjust EOQ values based on demand patterns, supplier lead times, and cost factors. Automated systems or reorder points can streamline inventory replenishment and improve efficiency and profitability.

CONCLUSION:

The integration of inventory management techniques in the apparel industry can lead to improved cost efficiency, enhanced customer service, streamlined operations, and better decision-making. By optimizing order quantities and focusing on high-value items, companies can minimize total inventory costs, reduce stockout risks, and make informed decisions about inventory levels, replenishment timing, and resource allocation.

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