



IMPLEMENTING ABC ANALYSIS FOR INVENTORY CATEGORIZATION AND CONTROL AT DECCAN INDUSTRIES

Ilango N* & Sanjay C K**

* Assistant Professor, Department of MBA, Sri Ramakrishna College of Arts & Science, Coimbatore, Tamil Nadu, India

** Student, Department of MBA, Sri Ramakrishna College of Arts & Science, Coimbatore, Tamil Nadu, India

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Abstract:

This study examines inventory management efficiency at Deccan Industries, Coimbatore, through the application of ABC analysis. Using five years of secondary data, inventory items were classified into A, B, and C categories based on annual consumption value. The research aims to identify cost optimization opportunities by analyzing holding, overstocking, and stockout costs. Descriptive and correlation analyses were conducted using Excel and SPSS tools. Results revealed that A-class items consistently accounted for about 70% of the total inventory value, emphasizing their strategic importance. Weak correlations among variables indicated minimal linear relationships between consumption and cost parameters. Findings suggest that structured ABC analysis enhances cost control and prioritization in material management. The study recommends digital integration of inventory systems for greater accuracy and efficiency. Overall, ABC analysis proved effective in improving resource allocation, reducing capital lockup, and strengthening profitability.

Key Words: Inventory Management, ABC Analysis, Cost Control, Working Capital, Deccan Industries, Stock Optimization, Inventory Classification.

Introduction:

Effective inventory management is crucial for maintaining operational efficiency and cost control in manufacturing organizations. At Deccan Industries, Coimbatore, managing diverse inventory items presents challenges related to stock levels, holding costs, and procurement planning. This study applies the ABC analysis technique to classify inventory based on annual consumption value, enabling selective control and prioritization. By focusing on high-value items, the study aims to optimize working capital and minimize excess inventory. The findings contribute to improved decision-making and sustainable profitability in material management.

Objectives:

- To classify inventory items based on their annual consumption value using the ABC analysis technique.
- To estimate relative inventory movement tendencies across ABC categories using annual consumption values.
- To analyse the distribution of holding cost, stockout events, and overstock costs across ABC categories to identify cost optimization opportunities.

Review of Literature:

- Silaen et al. (2025) highlighted that ABC analysis helps categorize inventory effectively, allowing firms to focus control on high-value items and improve operational efficiency.
- Adien (2025) examined inventory management using ABC classification and recommended strict monitoring of A-class items to minimize shortages and reduce excess stock.
- Meena (2025) applied the ABC-VED matrix in public health facilities, finding that it minimizes wastage and ensures continuous availability of essential materials.
- Lin (2024) combined linear regression with ABC analysis to detect cost inefficiencies, showing that data-driven methods enhance inventory planning and decision-making.
- Keskin (2024) introduced an AI-based multi-criteria ABC model, concluding that automation improves accuracy and responsiveness in dynamic inventory environments.
- Hernandoko (2023) integrated ABC classification with the min-max stock method, demonstrating improved control of non-moving and overstocked items in manufacturing.
- Kumar and Shukla (2020) used ABC and FSN analyses in retail inventory management, revealing that categorization based on value and movement helps optimize stock levels and reduce holding costs.

Research Methodology:

3.1 Research Design:

The study follows a descriptive and analytical research design. It examines the existing inventory management system at Deccan Industries, focusing on stock levels, item movement, and procurement patterns. ABC analysis is applied to categorize inventory based on annual consumption value. This design helps in identifying high-impact items and opportunities for cost and efficiency optimization.

3.2 Research Approach:

A quantitative research approach is adopted, as the study relies on numerical data from historical inventory records. Annual consumption values, stockouts, and holding costs are analysed systematically. ABC analysis is used to classify inventory into A, B, and C categories. The approach ensures data-driven insights for improving inventory control and resource allocation.

3.3 Data Collection - Secondary Data:

The study uses secondary data collected from Deccan Industries’ records over the past five years. Data includes item-wise inventory lists, unit costs, annual usage, and stockout history. Holding costs and reorder levels are also examined to evaluate inventory efficiency. This data provides a reliable basis for ABC categorization and warehouse optimization.

Data Analysis and Interpretation:

ABC analysis of inventory consumption for financial years 2021-2025:

Year	Category A (₹)	Category B (₹)	Category C (₹)	Grand Total (₹)
2021	41,07,02,698	11,73,47,237	5,96,22,182	58,76,72,117
2022	40,93,61,495	12,00,79,706	6,38,38,492	59,32,79,693
2023	38,94,05,040	12,05,97,934	5,75,07,113	56,75,10,087
2024	39,75,68,678	12,22,51,284	5,55,03,181	57,53,23,143
2025	40,39,40,000	11,78,97,000	6,04,90,000	58,23,27,000

Interpretation:

From FY 2021 to 2025, the total annual consumption value showed minor fluctuations, reflecting consistent inventory management practices. A-class items consistently contributed around 70% of the total value, confirming their dominance in inventory importance. B-class items maintained a stable share of about 20%, indicating balanced control over medium-value materials. C-class items contributed around 10%, showing efficient management of low-value stock. Overall, the trend suggests sustained control and effective ABC classification across all five years.

Five-Year Analysis of Inventory Turnover Performance across ABC Categories for FY 2021-2025:

FY	Category A	Category B	Category C	Overall Average
2021	13.46	13.40	12.96	13.37
2022	13.13	13.45	13.20	13.24
2023	13.06	13.44	12.31	13.06
2024	12.82	13.48	11.19	12.77
2025	13.23	13.39	12.52	13.17

Interpretation:

Over FY 2021-2025, inventory turnover ratios fluctuated across categories, with Category B consistently performing well and Category A generally stable. Category C showed the lowest turnover in most years, indicating slow-moving or low-value items. Overall, the trends demonstrate effective management of medium- and high-value items, with corrective actions successfully optimizing efficiency and working capital.

Descriptive statistical analysis of inventory performance for financial years 2021-2025:

Financial Year	Mean Annual Consumption Quantity	Mean Unit Cost (₹)	Mean Annual Consumption Value (₹)	Mean Holding Cost (₹)	Mean Overstocking Cost (₹)	Mean Stockout Cost (₹)	Mean Average Stock (₹)
2020-2021	14,188.87	770.06	1,08,82,816.98	9,240.67	29,27,128.00	2,10,537.46	92,233.72
2021-2022	14,103.19	774.15	1,09,86,660.98	9,289.78	28,35,818.89	2,00,336.81	8,08,970.49
2022-2023	13,962.63	761.67	1,05,09,446.06	9,140.00	12,298.80	2,01,727.60	7,98,961.42
2023-2024	13,862.56	759.5	1,06,54,132.28	9,114.00	12,83,539.56	2,15,974.19	7,98,620.36
2024-2025	14,131.48	762.57	1,07,83,833.33	91.51	38,614.13	2,23,307.50	8,01,582.00

Interpretation:

Across FY 2020-2025, the mean annual consumption value remained around ₹1.07-₹1.10 crore, indicating stable inventory investment. Unit costs ranged between ₹759-₹774, showing consistent pricing trends. Overstocking costs declined notably after 2022, reflecting improved inventory control, while stockout costs remained low throughout, implying good material availability. Minor variations in holding costs and consumption suggest balanced operations. Overall, the data highlights steady performance with scope for further optimization through advanced ABC-based and digital inventory management practices.

Findings:

- A-class items consistently accounted for about 70% of the total inventory value, confirming their high financial impact and need for strict control.
- Overstocking costs were higher than stockout costs in most years, indicating excessive holding of low-priority items.
- Unit cost and consumption quantity showed weak correlation, suggesting that high-cost items are not always high in usage.
- Inventory performance remained stable from FY 2020-2025, but efficiency improvements are still possible through better classification and digital tracking.

Suggestions:

- Implement digital inventory control systems (ERP or IoT-based) to enhance real-time monitoring and reduce manual errors.
- Apply periodic ABC reclassification to capture changing consumption patterns and adjust control measures accordingly.
- Optimize stock levels for A-class items by integrating Economic Order Quantity (EOQ) and safety stock analysis.

- Conduct regular inventory audits and staff training to improve data accuracy and strengthen decision-making in materials management.

Conclusion:

The study demonstrates that applying ABC analysis at Deccan Industries significantly improves focus on critical inventory items and overall cost efficiency. Stable consumption trends and reduced overstocking over five years highlight progress in inventory control. However, further integration of digital tools and periodic analysis is essential to achieve optimal inventory turnover, cost reduction, and sustainable profitability.

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