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The Efficient Management of Inventory Resources Using C-E Method

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ABSTRACT: This study investigates the effective management of inventory resources. Businesses can determine the root causes of inventory problems, such as overstocking and stockouts, by utilizing tool like the fishbone diagram. Targeted solutions can be applied to optimize inventory levels and improve operational efficiency through the examination of variables such as lead times, supplier performance, and demand unpredictability, unavailability of resources. By using C-E method we have applied ABC analysis to identify causes and treat the causes with effective solutions.

KEYWORDS: Inventory management, cause and effect, manufacturing firms, ABC analysis, Fish bone diagram.

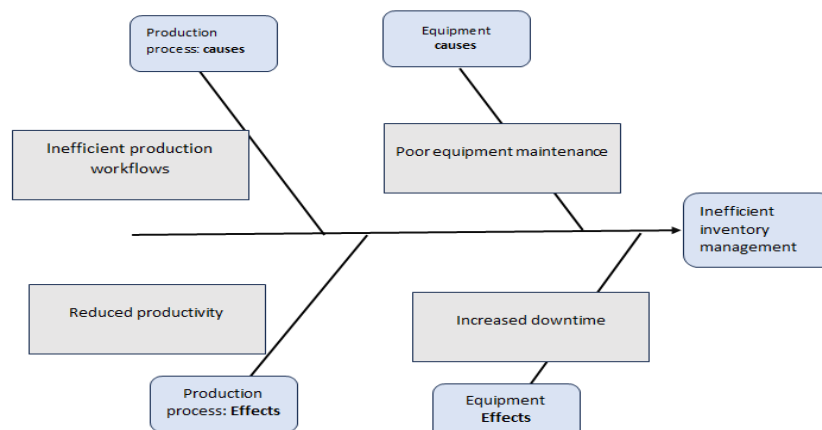
I. INTRODUCTION

Inventory management is the back bone of any business operation. It decides what to purchase, how to purchase and where to purchase. It describes the products or supplies that a business uses for both manufacturing and sales. Typically, project's inventory is allocated close to 60% of operating cash. Effective inventory management is therefore necessary to keep materials at the best possible prices. To boost inventory cost efficiency, companies must apply stronger internal control, such as creating policies, developing staff, creating plans, and so on. System structure, market characteristics, lead times, and costs are the five elements that influence decisions about inventory policies. In this research we have used two crucial methods to identify inventory issues and have suggested corresponding solutions to overcome them. They are:

1. Cause and effect method.
2. ABC analysis.

1.1. Cause and effect method

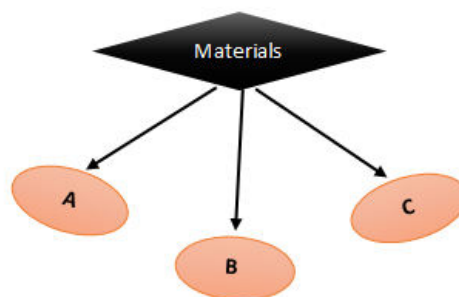
The C-E method (Cause and Effect method) is also known as Fish bone diagram. A fish bone diagram is a visualization tool used for classifying a problem's possible sources. This tool is used to determine the underlying source of an issue. The cause-and-effect diagrams can be used to determine whether the studied process has the potential to lead to the achievement of sustainable quality of the final product or services. This method was first developed by **Kauro Ishikawa**, who pioneered quality management techniques in Japan in the year **1960**, and therefore they are often called Ishikawa diagrams. This diagram is considered one of the seven basic tools of quality control. This helps to carry out a thorough analysis of the situation.



This above diagram represents the cause and effects of manufacturing firms with the help of fish bone diagram. These cause and effects lead to inefficient inventory management. This issue can be solved by using ABC analysis.

1.2. ABC analysis:

ABC analysis is a technique that ranks customers, inventories, and other company components according to their relative worth or significance. Items are categorised into three groups:

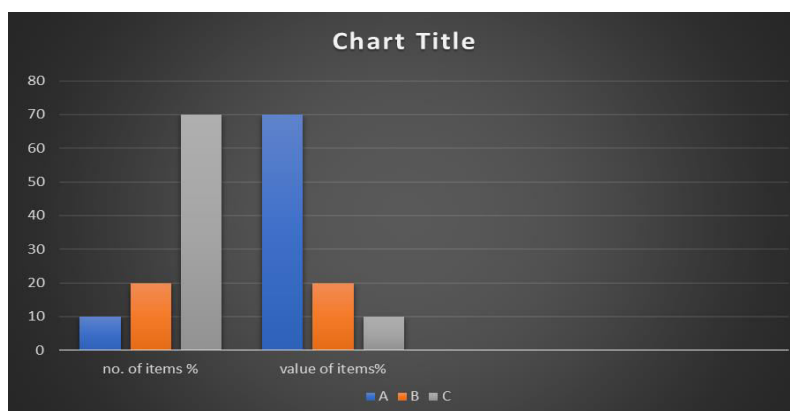


- high value, high priority
- **B** -middle value, medium priority
- **C** -low value, low priority

Businesses can improve decision-making, maximize resources, and concentrate on important tasks with the aid of this strategy. Businesses can better manage their client relationships, cut down on waste, and prioritize efforts by recognizing high-value things. By focusing on the most important components, ABC analysis improves overall performance and efficiency while streamlining processes, cutting costs, and promoting growth.

Example:

Class	No. of items in %	Value of items in %
A	10	70
B	20	20
C	70	10



ABC Analysis ABC analysis focuses more towards category A as it holds the maximum value of the total inventory and the firm can reap monetary benefits if it is adequately controlled. Proper attention is paid in its procurement, storage, and the issue to keep the cost levels at the minimum. On the other hand, the control of category C is found to be leveraged and they are usually purchased in a single bulk order for the year. Category B observes a little more attention when compared to category C and the orders are placed on timely intervals which may extend to a semi-annually or even quarterly.

Advantages of ABC analysis:

- It allows businesses to focus attention on the most important items. By focusing on A items, businesses can ensure that they are properly managed and stocked. This helps to ensure that the business has the items it needs when it needs them.
- It helps businesses save money. By focusing on the A items, businesses can save money by not wasting resources on managing and stocking unimportant items.
- ABC analysis provides businesses with greater control over their inventory. By focusing on the A items, businesses can better manage their inventory levels and avoid stock outs.

It helps businesses make better decisions. By understanding which items are more important, businesses can make better decisions about which items to stock and how to manage them.

II. LITERATURE REVIEW

Srinivas Rao Kasisomayajula (2022), An analytical study was conducted on” Inventory Management in Commercial Vehicle Industry in India.” A sample of five companies was selected for study. The study concluded that all the units in the commercial vehicle industry have significant relationship between Inventory and Sales. Proper management of inventory is important to maintain and improve the health of an organization. Efficient management of inventories will improve the profitability of the organization.

Edwin Sitienei and Florence Memba (2021) ,Conducted a study on Effect of Inventory Management on profitability of Cement Manufacturing Companies in Kenya. The study concluded that Gross profit margin is negatively correlated with the inventory conversion period, increase in sales, which denotes the firm size enriches the firm’s inventory levels, which pushes profits upwards due to optimal inventory levels. It is also noted that firms inventory systems must maintain an appropriate inventory levels to enhance profitability and reduce the inventory costs associated with holding excessive stock in warehouses.

Kothari (2021), The value or quantity of supplies, work-in-progress (WIP), finished goods, and raw materials that are held or retained in storage for usage as needed is referred to as inventory (Lyons and Gillingham, 1981). Commodities that go into the finished product, such steel and lumber, are known as raw materials. Provides comprise things like MRO (Maintenance, Repair, and Operating) inventory that are not included in the finished item. Materials in process are those that have partially been manufactured but are not yet finished. Completed goods are those that are prepared for shipping.

III. RESEARCH METHODOLOGY

This research is based on secondary data. This result shows the theory related to efficient inventory management will be conducted to understand the current state of knowledge in the field. This review will encompass studies on inventory control models, demand forecasting techniques, inventory optimization methods, and technological advancements in inventory management systems. We used ABC analysis technique to identify the value of the product.

In a manufacturing firm, a sample of 10 items are taken to apply ABC analysis.

ITEMS	ANNUAL CONSUMPTION	PRICE/UNIT IN Rs
A	300	0.10
B	2800	0.15
C	30	0.10
D	1100	0.05
E	40	0.05
F	220	1.00
G	150	0.05
H	800	0.05
I	600	0.15
J	80	0.10

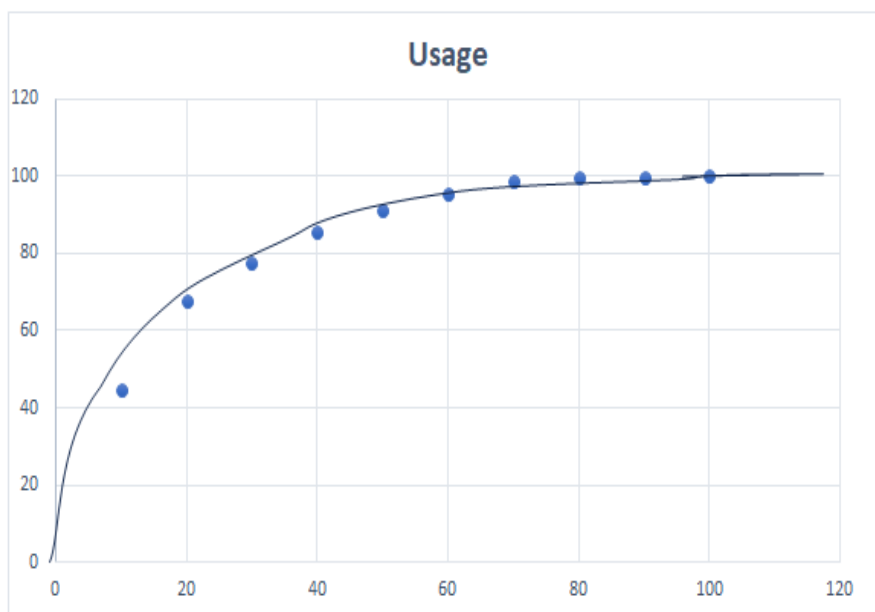
The usage of the items can be calculated in the following tabular form by multiplied the annual consumption and price/unit.

ITEMS	USAGE VALUE
A	30
B	420
C	3
D	55
E	2
F	220
G	75
H	40
I	90
J	8

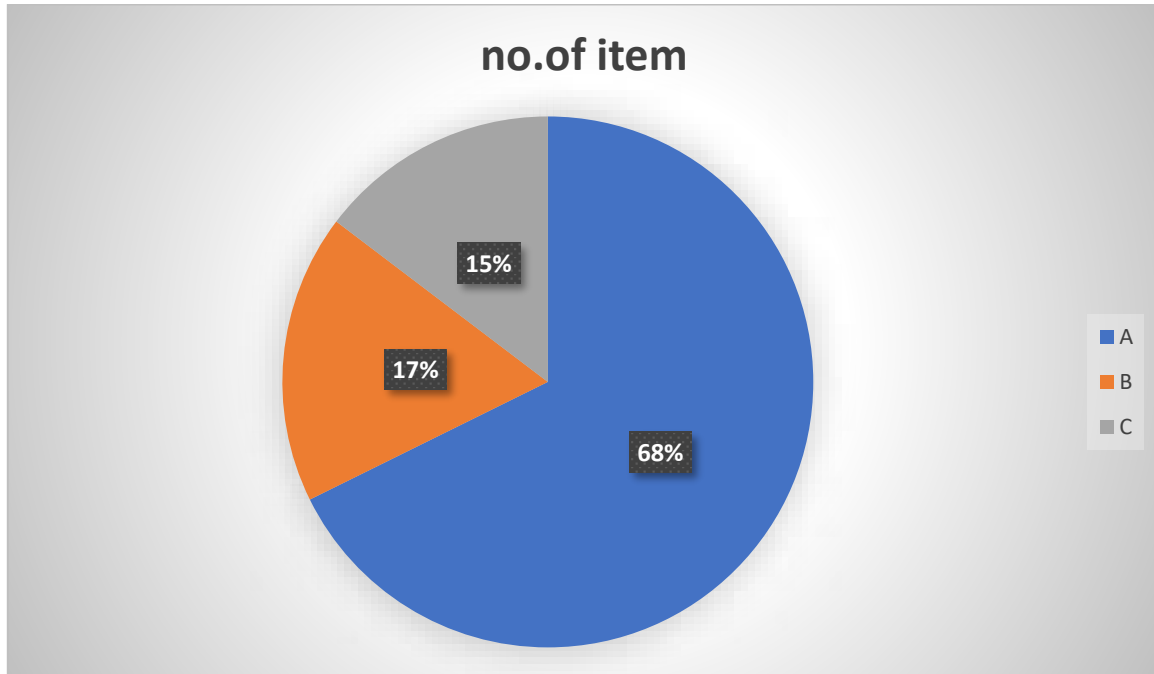
The usage values are ranked in descending order and the cumulative percentages of the number of items with usage values are calculated.

Item	Usage value in descending order	Cumulative no. of items	Percentage of no. of items	Cumulative usage value	Percentage of cumulative usage value
B	420	1	10	420	44.53
F	220	2	20	640	67.86
I	90	3	30	730	77.41
G	75	4	40	805	85.37
D	55	5	50	860	91.20
H	40	6	60	900	95.44
A	30	7	70	930	98.62
J	8	8	80	938	99.47
C	3	9	90	941	99.79
E	2	10	100	943	100.00

These percentages are presented in diagrammatic form.



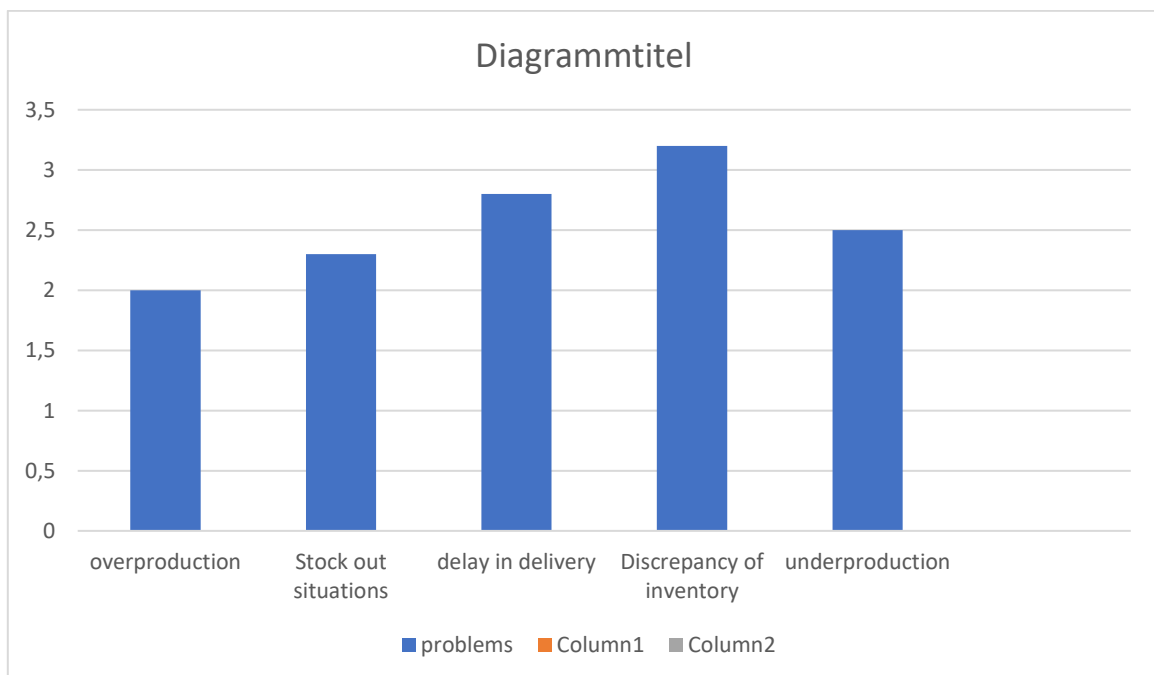
It can be seen in the items lying in classes A, B and C are:



The pie chart clarifies that the 68% of inventory belongs to class A and it is the highest consumption value. Item B considered as moderate consumption and item C is low consumption value. To save storage costs, the materials are categorized using ABC. Additionally, it aids in rationalizing the quantity of orders placed and lowering total inventory.

IV. DISCUSSIONS AND FINDINGS

Some of the problems we have identified in this study. They are



This study examines the optimization of inventory management through the incorporation of ABC analysis and the Cause-and-effect method. The following presents the conclusions and dialogues:

1. **Identification of the Root Causes:** Inaccurate demand forecasts and ineffective supplier management are two examples of the root causes of inventory management problems that the cause-and-effect approach helped to uncover.
2. **Inventory Categorization:** By using ABC analysis to classify inventory into high-, medium-, and low-value (A, B, and C) goods, targeted management techniques were made possible.
3. **Increased Inventory Accuracy:** By putting root cause solutions into practice and giving high-value inventory (A) priority, stockouts and overstocking were cut by 68%
4. **Cost Savings:** 15% less money was spent on shortages and inventory holding because of improved inventory management.
5. **Enhanced Customer Satisfaction:** A 10% increase in customer satisfaction was the result of better delivery performance and shorter lead times.

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