ABC Analysis - A Case Study of Vehicle Spare Parts Based on Deccan Vehicles

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Abstract - In an industry it is essential to perform the operation in smooth, continuous and on regular basis. The process which is adopted by the managers to get the regular and continuous running operations is done without any interruption. The list of items, parts, components are arranged and managed them time to time, which is the responsibility of managers. The required items purchased and stocked in advance. But, how much should be purchased, how to stock it, when to release it, what costs are there and how to control it. All these issues are faced and controlled by the managers to design a frame with the help of techniques which is known as the "selective inventory control techniques for inventory management" Effective management technique is key to perform firm's profitability.

Keywords - ABC Analysis, Inventory Management, Selective Inventory Control Techniques

1. INTRODUCTION

A selective inventory control technique is the inventory control techniques of any industrial organization which consists of number of items with their varying cost, usage and procurement with technical problems. The management is responsible to pay attention of their higher usage value to the lower usage value items. The organization select an approach and the technique used towards inventory control is known as selective inventory control techniques.

· **Different Types of Techniques**

ABC Analysis - Based on annual consumption.

VED Analysis - Criticality for production.

SDE Analysis - Availability.

HML Analysis - Weight / cost permit.

FSN Analysis - Consumption rate.

ABC ANALYSIS: Always Better Control {ABC} or Alphabetical Approach is a popular and effective method used to classify inventory items into specific categories that can be managed and controlled separately. This method aims to draw managers' attention on the critical few (A-items) not on the trivial many (C-items).ABC analysis is one of the most important approaches of stock-control. It is discovered by a 19th century economist, Vilfredo Pareto, and is recognized today as Pareto's Law. When ABC analysis is applied to an inventory situation, it determines the Importance of items and the level of controls placed on the item. By dividing a company's inventory into different classifications- A, B, C; managers can focus on the items that account for the majority of the inventory. The adaptation of Pareto's Law of the vital few and trivial many follows a pattern: Category 'A' consists of items of high value but small in numbers. Category 'B' kept in between A and C-items. 'B' items have similar controls to 'A' items but review are less frequent. Category 'C' items have the simplest controls. They are only important if there is a shortage of one of them. Thus, 'C' items can be ordered in large quantities and have higher safety stocks. This paper proposed a case study on ABC Analysis.
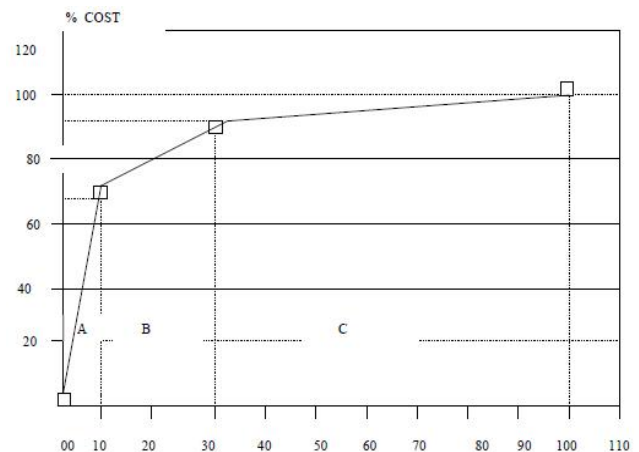

Figure No.1: Graphic analysis of annual usage cost

2. PREVIOUS WORK / LITERATURE SURVEY

"An ABC-Analysis for the Multiple-Products Inventory Management-Case Study of Scooters India Limited" [1].Inventory constitutes the most significant part of current assets of large majority of Indian manufacturing industries. The main objective of the study is to determine whether or not multiple products in the manufacturing company can be evaluated and understood using inventory management techniques. The data collection with managers

and other staff involved in inventory control operations, and secondary data obtained from information system to provide the annual reports, sales reports, purchasing reports of the company and the related journals.

The study thus suggests some recommendations to improve certain things in the company inventory policy. If these recommendations considered, the company management inventory situation will rise a lot. (a) Review of stock levels. (b) Cycle counting. (c) Identifying items for potential consignment.

"ABC Classification for Inventory Optimization" [2].To manage inventory, inventory classification is very important. Concept importance and Exception (CIE) is employed to ensure that efficiency is maximized with least effort. The various methods used for categorized the items in inventory. Most efficient classification for analysis is the Pareto Analysis. The focus of this paper is to check if some assumptions for ABC Analysis are taken for granted.

"Application of Selective Inventory Control Techniques for Cutting Tool Inventory Modeling and Inventory Reduction-A Case Study"[3].The study showing the need of inventory control as well as inventory reduction in industries. In this study the work is applied on ABC and VED selective inventory control techniques for cutting tool inventory modeling in an industry. The study helped them to examine their inventory more effectively and hence later it also helped to reduce the inventory which added increased productivity, business growth and reduce the losses.

This study shows that the company was not operating with maximum efficiency. It was suggested to increase their efficiency, it is used the inventory control techniques. Then a case study was carried out in the industry in which cutting tool inventory modeling and inventory reduction was achieved by using ABC and VED analysis.

(Makram Ben Jeddou) [4] Proposed "Multi-Criteria ABC Inventory Classification- A Case of Vehicles Spare Parts Items", The ABC classification of inventory items splits them into three different classes to which we will assign specific monitoring and control rules. The usual ABC classification is based on a single criterion, namely the value of annual use. Single criterion classification can also be done according to other criteria but considered separately. Inventory managers need more than one factor to take into account simultaneously in classification.

This methodology of inventory multi-criteria classification either change of classification criteria or integration new criteria according to the needs of each manager.

"Use and Application of Selective Inventory Control Techniques of Spares for a Chemical Processing Plant" [5].This paper presents the implementation of an improved inventory management and control system of a chemical processing industry. Data are collected from various sources like ledgers, annual financial statements and published articles of the company.

The study was conducted in a chemical industry located at Ernakulum district. The major problems are adopting new technologies in the inventory management system. To identify the inventory management problems of the chemical company and few suggestions to improve the existing inventory management system.

3. PROPOSED METHODOLOGY

In ABC Analysis, the items are classified into A, B, C category in which:

A-items are which annual consumption value is the highest; the top 70-80% of the annual consumption of the company typically accounts for only 10-20% of the total inventory items.

B-items are the interclass items, with medium consumption value; that 15-25% of annual consumption value typically accounts for 30% of the total inventory items.

C-items are on the contrary items with the lowest consumption value; the lower 5% of the annual consumption value typically accounts for 50% of total inventory items.

- **Steps involved in ABC Analysis:**

To conduct ABC analysis, following six steps are necessary:

1. Prepare the list of items and estimate their annual consumption (units).

2. Determine unit price (or cost) of each item.

3. Multiply each annual consumption by its unit price (or cost) to obtain its annual consumption in rupees (annual usage).

4. Arrange items in the descending order of their annual usage starting with the highest annual usage down to the smallest usage.

5. Calculate cumulative annual usages and express the same as cumulative usage percentages. Also express the number of items into cumulative item percentages.

6. Graph cumulative usage percentages against cumulative item percentages and segregate the items into A, B and C categories.

4. CASE STUDY

In the case study of Deccan Vehicles, Tata Motors Pvt. Ltd, Agra-Bombay By Pass Road, we collect data of 10 items mentioned in the table no.1. Now we analysis the item according to the ABC Analysis and classify them in the A, B, C category.

Table No.1:   List of identical items.

Item	Item Name	Part No.	Unit Cost (Rs.)	Annual Usage	Annual Usage Value (Rs.)
1	Oil Filter	252718130145	1275	198	252450
2	Water Separator	278607989916	395	140	55300
3	Fuel Filter	278609119904	270	98	26460
4	Rod Bearing	252509120239	1430	46	65780
5	Air Filter	885409052516	2135	20	42700
6	Piston Set	278608123604	11500	26	299000
7	Piston Ring	278608123609	5300	56	296800
8	Head Gasket	278608124803	1750	333	582750
9	Main Bearing	252509120213	1130	124	140120
10	Bushing	885406080923	169	1177	198913

Table No.2: Ranking of items, using 30-30-40% ABC classification.

Items	Unit Cost	Annual Usage	Annual Usage Value (Rs.)	Cumulative Annual Usage (Rs.)	Cumulative Percentage Usage (%)	% of Items	Category
8	1750	333	582750	582750	29.72	10%	A
6	11500	26	299000	881750	44.98	20%	A
7	5300	56	296800	1178550	60.12	30%	A
1	1275	198	252450	1431000	73.00	40%	B
10	169	1177	198913	1629913	83.14	50%	B
9	1130	124	140120	1770033	90.29	60%	B
4	1430	46	65780	1835813	93.65	70%	C
2	395	140	55300	1891113	96.47	80%	C
5	2135	20	42700	1933813	98.65	90%	C
3	270	98	26460	1960273	100.00	100%	C

5. RESULT:

Table No.3: Result of case study

Category	Item Number	Percentage of items	Percentage of Annual usage	Action
A	278608124803, 278608123604, 278608123609	30%	60.12%	Close control
B	252718130145, 885406080923, 252509120213	30%	30.17%	Regular review
C	252509120239, 278607989916, 885409052516, 278609119904	40%	09.71%	Infrequent review

From Table No. 3, we can conclude that the first three Items No. [278608124803, 278608123604, 278608123609] have need more attention as well As close control of A items for inventory records. The next three items No. [252718130145, 885406080923, 252509120213] have moderate priority of B items and less control as compared to A items and review regularly. The last four items belong to lowest priority of C items. They should review infrequently and it should be ordered in bulk quantity to maintain safety stocks.

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Figure No. 2: Graphical representation of ABC analysis

6. CONCLUSION

After the case study, we have the conclusion that, the purpose of this classification is to ensure that purchasing staff use resources to maximum efficiency by concentrating on those items that have the greatest potential values to improve all the aspects; and hence get the position strong.

7. REFERENCES

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