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ABC and HML Analysis for Material Management – Case Study of Commercial Building Project

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Abstract: Materials management is an important element in project planning and control. Materials represent a major expense in construction, so minimizing uncontrolled material cost presents important opportunities for reducing costs. It can be very effective for a company with commercial building projects as it accounts for about 50-60% of the project cost. There are various Methods used by company like ABC, EOQ, FSN, HML, XYZ, SOS, VED, GOLF, SDE. In this study we focused on the HML and ABC analysis. The data collected is for the 6 months of the project work from the Vardhaman infra works commercial building site. In this study only the general and important items are used for the case study.
Keywords: Material management, HML & ABC matrix.

I.   INTRODUCTION

Material management is defined as the process to provide right material at right place at right time in right quantity so as to minimize the cost of project". The use of HML and ABC is considered for the case study of the commercial building site. The material management had played an important role in terms of cost saving and time saving project. In an commercial building project there are various materials in use which can be classified differently by their use, rate, importance etc. the HML and ABC analysis helps in categorizing materials on the basis of their unit price and the value of the item. In this study we will concentrate on HML and ABC methods.

II.   OBJECTIVE

To categories the inventory items into HML class And ABC class.

III.   METHODOLOGY

A.   HML analysis

Materials vary in terms of their prices which can be categorize by HML into three categories High price, Medium price and Low price. The managing criteria differs with the change in category. The analysis is to be carried out in the following manner:
First calculate the annual demand and annual usage with the help of unit cost of the item.
Than Calculate percentage of unit cost, cumulative of unit cost and then categories the inventory item.
The criteria for categorizing the item can be prepared on the basis of the organization reviews and voting.
An parameter is set by the organization for categorizing the item for example:
H- Item: Items whose unit price is ≥ 10000
M- item: Items whose price is ≥ 1000 & < 10000
L- item: Items whose price is < 1000

B.   ABC Analysis

The ABC analysis classifies the material item based on the Annual Usage Value of items in order to determine its priority among plenty of material items. The ABC analysis is used to identifying material items that has a highest impact on overall inventory cost. In this method materials are divided into three Groups i.e. A,B and C Group.
It is based on the Pareto Principle which states that "80% of the overall consumption value is based on only 20% of total items". This analysis was carried out in the following manner:
the unit cost and the annual demand is collected and then multiplying the unit cost with the annual demand will provide us the net cost.
Than the sum of the items is calculated and the sum of the usage from which the cumulative percentage is obtained and the items are categorized into

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 6 Issue III, March 2018- Available at www.ijraset.com

A-class items: items accounting about 60-70% of total consumption value and 10-20% of total items.
B-class items: items accounting about 20-30% of total consumption value and 20-25% of total items.
C-class items: items accounting about 10-20% of total consumption value and 60-70% of total items.

IV. CASE STUDY

A. Hml Analysis

Table 1
Shows unit cost, % unit cost, cumulative of % unit cost, category

Item no.(n)	Item	Unit cost	% Unit Cost	Cumulative of %unit cost	category
1	steel	30420	55.146	55.146	H
2	Submersible pump	10752	19.491	74.637	H
4	Water pump	7650	13.868	88.505	M
5	ELCB switch	4300	7.795	96.3	M
6	Sand	571	1.035	97.335	L
7	25mm Aggregate	477	0.865	98.2	L
8	Grit	357	0.647	98.847	L
9	cement	238	0.431	99.278	L
10	Sanitary pipes	186	0.337	99.615	L
11	PVC elbow & coupler	154	0.279	99.894	L
12	MS Wire	46	0.083	99.977	L
13	PVC tap role	9	0.016	99.993	L
14	Bricks	3	0.005	99.998	L

Table 2
Shows annual demand,% annual demand, Annual usage, % annual usage

Category	Annual demand	%annual demand	Annual usage	%annual usage
H	2	14.28	3407449.2	56.48
M	1	7.7	20550	0.34
L	11	78.57	2605173.5	43.18
Total	14	100	6033172.7	100.00

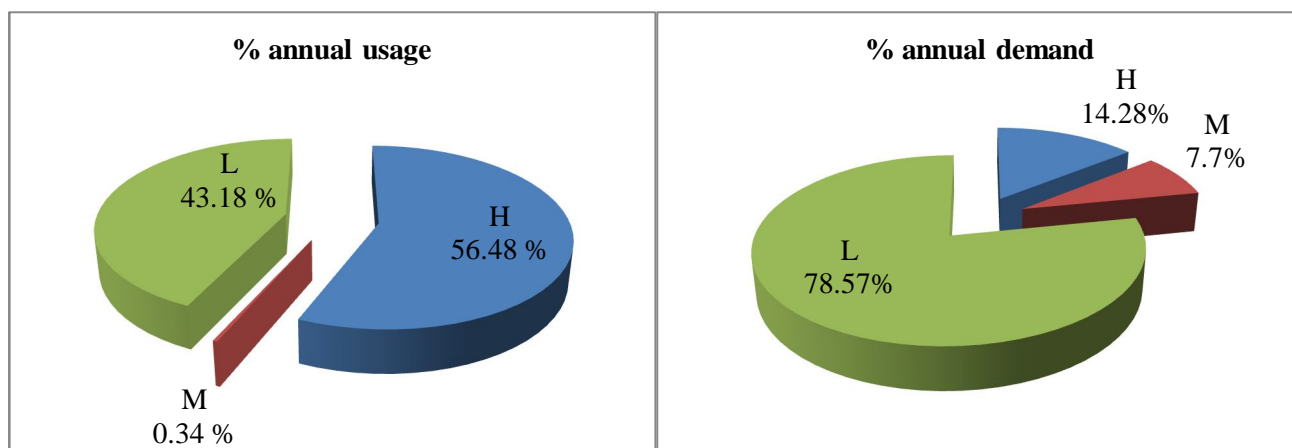Plot the pie chart on the basis of % annual demand and % annual usage.

Fig.1 shows pie chart of % annual usage and % annual demand based on HML analysis

B. *ABC analysis*

Table 3

Shows unit usage, unit cost and annual usage.

Sr no.	item	unit usage	unit cost	annual usage
1	Steel	111.66	30420	3396697.2
2	Cement	7695	238	1831410
3	25mm aggregate	857.2	447	383168.4
4	Bricks	45000	3	135000
5	Sand	203.97	571	116466.87
6	MS wire	756.83	46	34814.18
7	Sanitary pipes	106	186	19716
8	Grit	124.65	257	32035.05
9	PVC elbow coupler	90	154	13860
10	PVC tape role	58	9	552

Table 4

Shows cumulative % usage, cumulative % item, class of item, % total cost and % total item

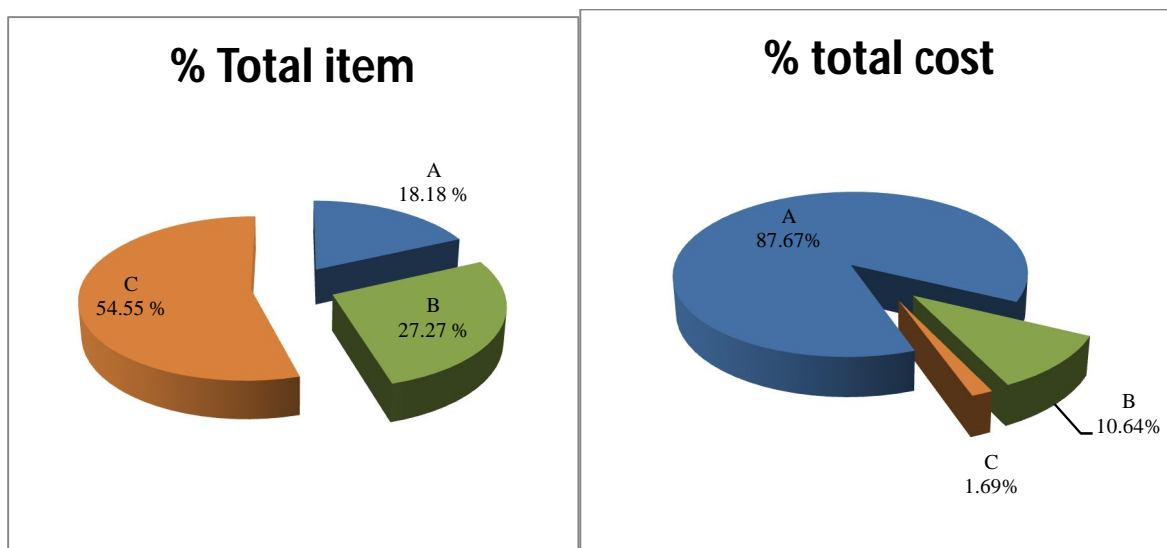| Sr no.	item	annual usage	cumulative % usage	cumulative % of items	Class and % total cost	% total item
1	Steel	111.66	56.96	9	A 87.67%	18.18
2	Cement	7695	30.71	18		
3	25mm aggregate	857.2	6.43	27	B 10.64%	27.27
4	Bricks	45000	2.26	36		
5	Sand	203.97	1.95	45		
6	MS wire	756.83	0.58	55	C 1.69%	54.54
7	Grit	124.65	0.54	64		
8	Sanitary pipes	106	0.33	73		
9	PVC elbow coupler	90	0.23	82		
10	PVC tape role	58	0.01	100		

Fig.2 shoes pie chart of % total item and % total cost based on ABC analysis.

V. CONCLUSION

A company or firm can reduce the cost of its project with the help of material management by identifying materials which effects the total cost of the project if not properly managed. From this study we found that this methods could help the company to manage the most valuable material and the various price varied materials and can maintain the optimal stock and investment on this materials. It will also help in the planning and purchasing process of the material.

VI. ACKNOWLEDGEMENT

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