iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 **Issue:** I **Month of publication:** January 2017

DOI:

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Volume 5 Issue I, January 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

ABC & HML Analysis for Inventory Management– Case Study of Sponge Iron Plant

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Abstract: An inventory management is most commonly used technique to manage inventory efficiently in company. The company wants to control their inventory cost, so they used to different type's inventory techniques to control this. There are several techniques such as ABC, HML, VED, XYZ and S-OS. In this study we shall focus on ABC &HML analysis. In ABC analysis the items are categories into A, B, C category based on total cost usage. In HML analysis the items are categories into H, M, L category based on unit cost. Data collection is mainly of 6 month through the general store manager and other staff involved in inventory control operation of steel plant.
KeyWords: ABC & HML analysis, inventory management, inventory control.

I. INTRODUCTION

Reference [1] shows, In any industry today inventory optimization is such a vital function. Excess and Shortage of inventory in all levels of the supply chain can affect the availability of products and/or services to consumers. Several monitoring systems and processes can be employed to check inventory imbalances to minimize the supply and demand dynamics. To simply these monitoring systems and process items/materials/products are classified into different groups".

"Reference [2] shows, Effective inventory Management has played an important role in the success of supply chain management. For organizations that maintain thousands of inventory items, it is unrealistic to provide equal consideration to each item. Managers are required to classify these items in order to appropriately control each inventory class according to its importance rating".

There are various types of inventory control analysis techniques such as ABC, HML, VED, S-OS etc. Here we shall focus on the HML analysis techniques

II. OBJECTIVE

A. General objective

1) To categories the inventory items into A, B, C class.

2) To categories the inventory items into H, M, L class

B. Main objectives

The main objective of this analysis is to minimize the inventory cost.

III. METHODOLOGY

There are various types of inventory control analysis techniques such as ABC, HML, XYZ, VED, S-OS and GOLF etc. Here we shall focus on the ABC & HML analysis techniques

A. Abc analysis

An inventory classification scheme ABC is based on Pareto principle, or 80/20 rule. In ABC analysis the items are categories into A, B, C category based on total cost usage.

A-class items are generally 10-20 percent (%) of total item & 70-75% money spent on total inventory items.

B-class items are generally 25-30 percent (%) of total item & 30-35% money spent on total inventory items.

C-class items are generally 70-75 percent (%) of total item & 5-10% money spent on total inventory items.

B. Procedures for ABC analysis

To conduct the ABC analysis, following four steps are necessary;

Prepare the list of items and calculate their unit price, annual demand, annual usage and percentage of annual usage.

Arranging items in the decreasing of their annual usage.
Calculate cumulative of annual usage and then categories the inventory item.
Plot the graph on the basis of "cumulative of annual usage" and then categories the inventory items.

C. HML analysis

An inventory classification scheme HML is based on Pareto principle, or 80/20 rule. In ABC analysis the items are categories into H, M, L category based on unit cost.
In this analysis cut-off-lines are then fixed by the management of the company to classify the inventory items. The cut-off-lines are based on their unit cost such as
H-class items: - (1500-10000) Rs.
M-class items: - (1000-1500) Rs.
L-class items: - (0- 1000) Rs

D. Procedure For HML Analysis

To conduct HML analysis, following steps are necessary:
Prepare the list of items and calculate their unit cost, annual demand, annual usage and percentage of unit cost.
Arranging items in the decreasing order of their unit cost.
Calculate cumulative of unit cost and then categories the inventory item.
The cut off lines are then fixed by the company for deciding three categories.
Plot the graph on the basis of "cumulative of unit cost" and then categories the inventory items.

IV. CASE STUDY

A. Cash study for ABC analysis

Step1. Prepare the list of items and calculate their unit price, annual demand, annual usage and percentage of annual usage.*)*
*Step2.*Arranging items in the decreasing order of their annual usage.
Step3. Calculate cumulative of annual usage and then categories the inventory item.

TABLE 1
Shows name of item, unit cost, annual demand annual usage, % annual usage, cumulative of annual usage and ABC classification of inventory items

Item no.	Item	Unit cost(Rs.)	Annual demand(units)	Annual usage(Rs.)	% Annual usage	Cumulative of annual usage	Category
1	Diesel	49.27	9700LTR	477919	33.009	33.009	A
2	Conveyor belt	1000	325	325000	22.44	55.449	B
3	SP 320 oil	147.65	1360LTR	200804	13.86	69.309	B
4	Cement	270	460BAG	124200	8.57	77.879	B
5	G.I. sheet 10 x 4	1066.66	70NO	74666.2	5.16	83.039	C
6	Zest EP-2 grease	158	460LTR	72680	5.01	88.049	C
7	Ceramic blanket	1824	35	63840	4.41	92.459	C
8	Supratech WR-2 grease	131.88	365LTR	48136.2	3.3257	95.784	C
9	Welding electrode E310-16	1239	25KG	30975	2.14	97.924	C
10	Becktol red	845.6	35	29596	2.0753	100	C

Step4. Plot the graph on the basis of "cumulative of annual usage" and then categories the inventory items.

Volume 5 Issue I, January 2017
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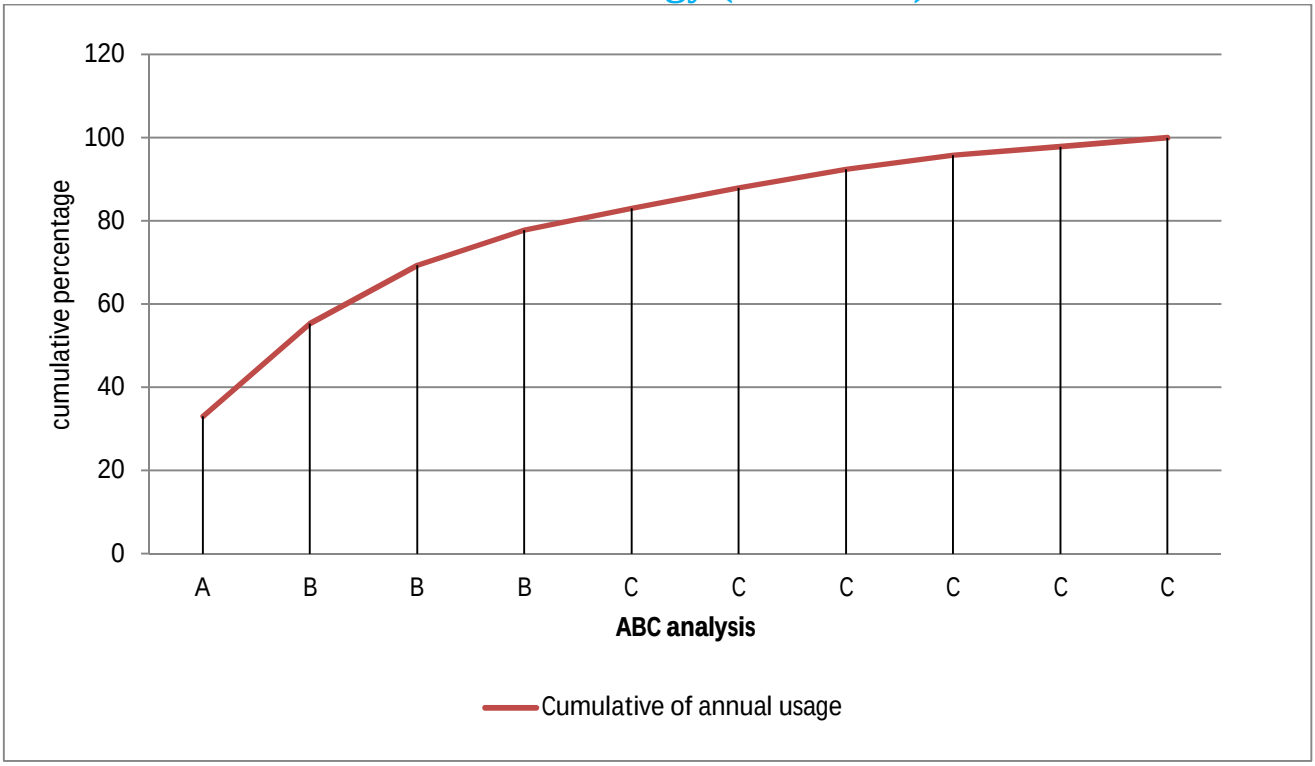

Figure1. Shows ABC analysis on the basis of cumulative of annual usage

B. Cash study for HML analysis

Step1. Prepare the list of items and calculate their unit cost, annual demand, annual usage and percentage of unit cost.

Step2. Arrange items in the decreasing order of their unit cost.

Step3. Calculate cumulative of unit cost and then categories the inventory item.

Step4. The cut off lines are then fixed by the company for deciding three categories.

TABLE 2

Shows name of item, unit cost, annual demand, and annual usage, % unit cost, cumulative of unit cost and HML classification of inventory items

Item no.	Item	Unit cost(Rs.)	Annual demand(units)	Annual usage(Rs.)	%Unit cost	Cumulative of unit cost	Category
1	Ceramic blanket	1824	35	63840	27.094	27.094	H
2	Welding electrode	1239	25KG	30975	18.404	45.498	M
3	G.I. sheet 10x4	1066.66	70NO	74666.2	15.844	61.342	M
4	Conveyor belt	1000	325	325000	14.85	76.192	M
5	Becktol red	845.6	35	29596	12.56	88.752	L
6	Cement	270	460BAG	124200	4.0106	92.7626	L
7	Zest EP-2 grease	158	460LTR	72680	2.3479	95.1096	L
8	SP 320 oil	147.65	1360LTR	200804	2.193	97.3026	L
9	Supratech WR grease	131.88	365LTR	48136.2	1.9589	99.2615	L
10	Diesel	49.27	9700	477919	0.7376	100	L

Step5. Plot the graph on the basis of “cumulative of unit cost” and then categories the inventory items.

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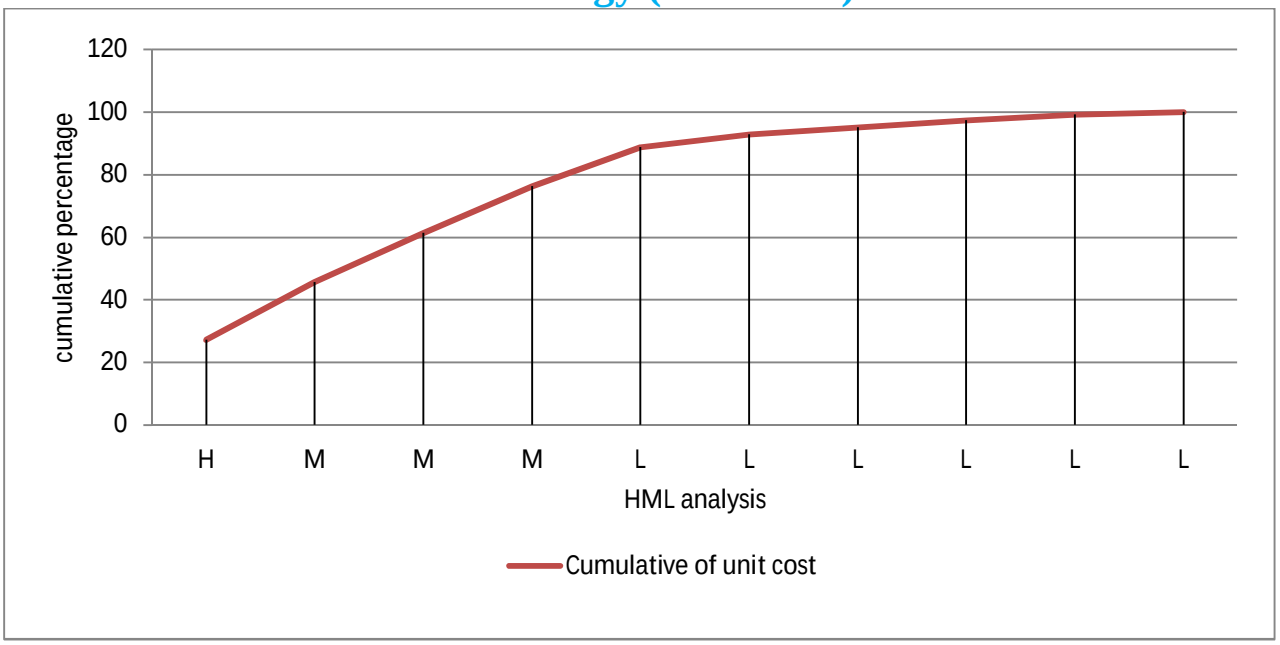

Figure2. Shows HML analysis on the basis of cumulative of annual usage

V. RESULTS

A. Result for ABC analysis

TABLE 3
Figure 3. Shows the result of ABC analysis

Category	Annual usage	%Annual usage	Annual demand	%Annual demand
A	802919	55.45	2	20
B	399670.2	27.6	3	30
C	245227.2	16.95	5	50
Total	1447816	100	10	100

ABC analysis on the basis of %annual demand is shown in figure 3

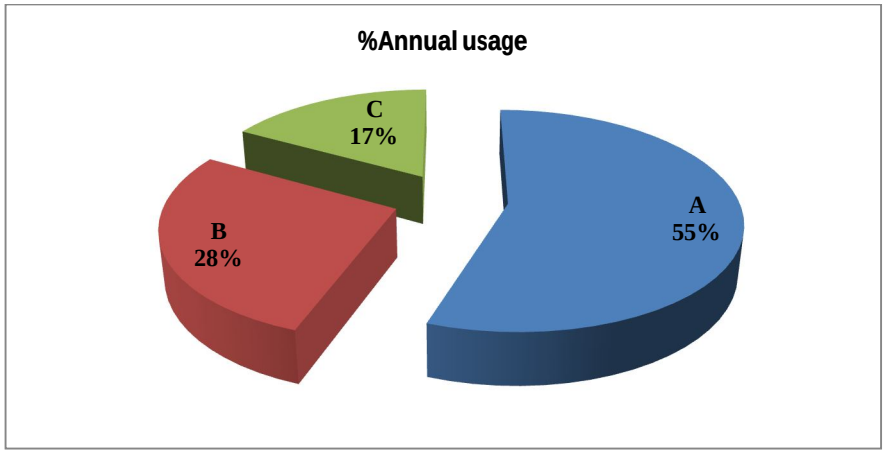

Figure 3.Shows percent item usage of ABC analysis

ABC analysis on the basis of %annual demand is shown in figure 4

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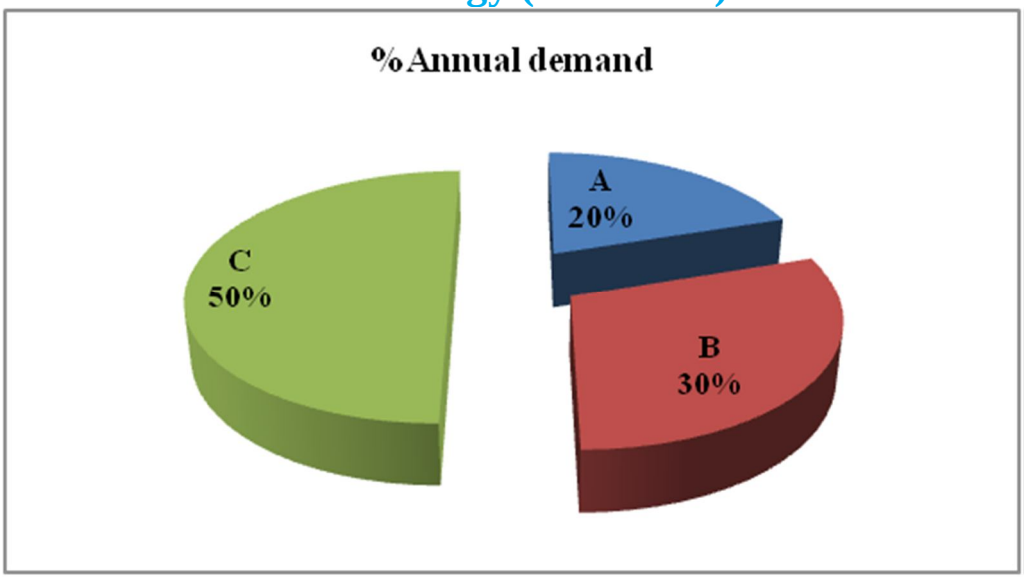

Figure 4.Shows %annual demand of ABC analysis

B. Result for HML analysis

TABLE 4
Figure 4. Shows the result of HML analysis

Category	Annual usage	%Annual usage	Annual demand	%Annual demand
H	63840	4.4093	1	10
M	430641.2	29.7441	3	30
L	953335.2	65.8466	6	60
Total	1447816	100	10	100

HML analysis on the basis of percent annual usage is shown in figure 5

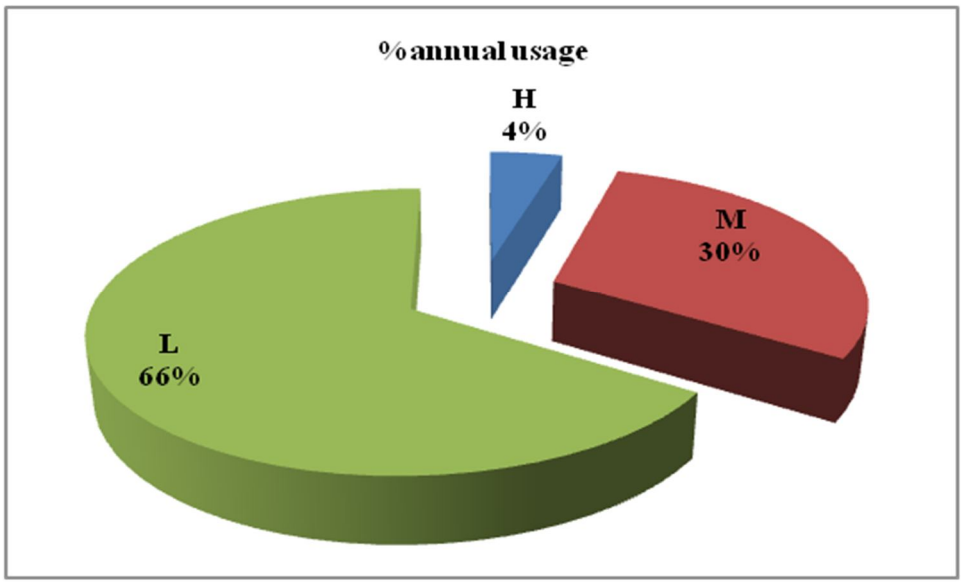

Figure 5 shows percent annual usage of HML analysis

HML analysis on the basis of %annual demand is shown in figure 6

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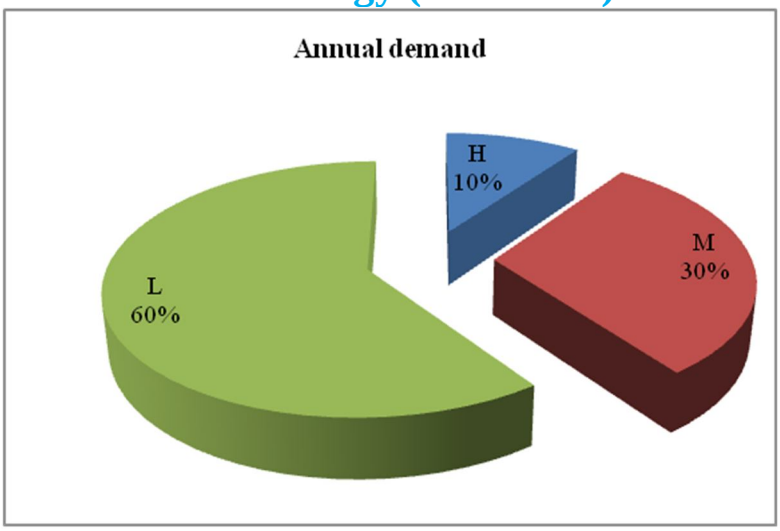

Figure 6 shows percent annual demand of HML analysis

VI. CONCLUSION

In manufacturing environment, company needs to maintain the balance between critical stock- outs and minimizing inventory costs material cost. From the above study we have found that this analysis help to the company to manage the inventory item effectively not only for raw material but also for finished goods. It will help to understanding of problems occurs due to purchasing of inventory material cost and safety stock.

VII. ACKNOWLEDGEMENT

We are thankful to Mr. Ashok lilhare, Associate Prof. & Head, Department of Mechanical Engineering Yugantar Institute of Technology & Management Rajnandgaon for their suggestion& cooperation. We also thank to our faculty of mechanical engineering department for providing us necessary information and guidance

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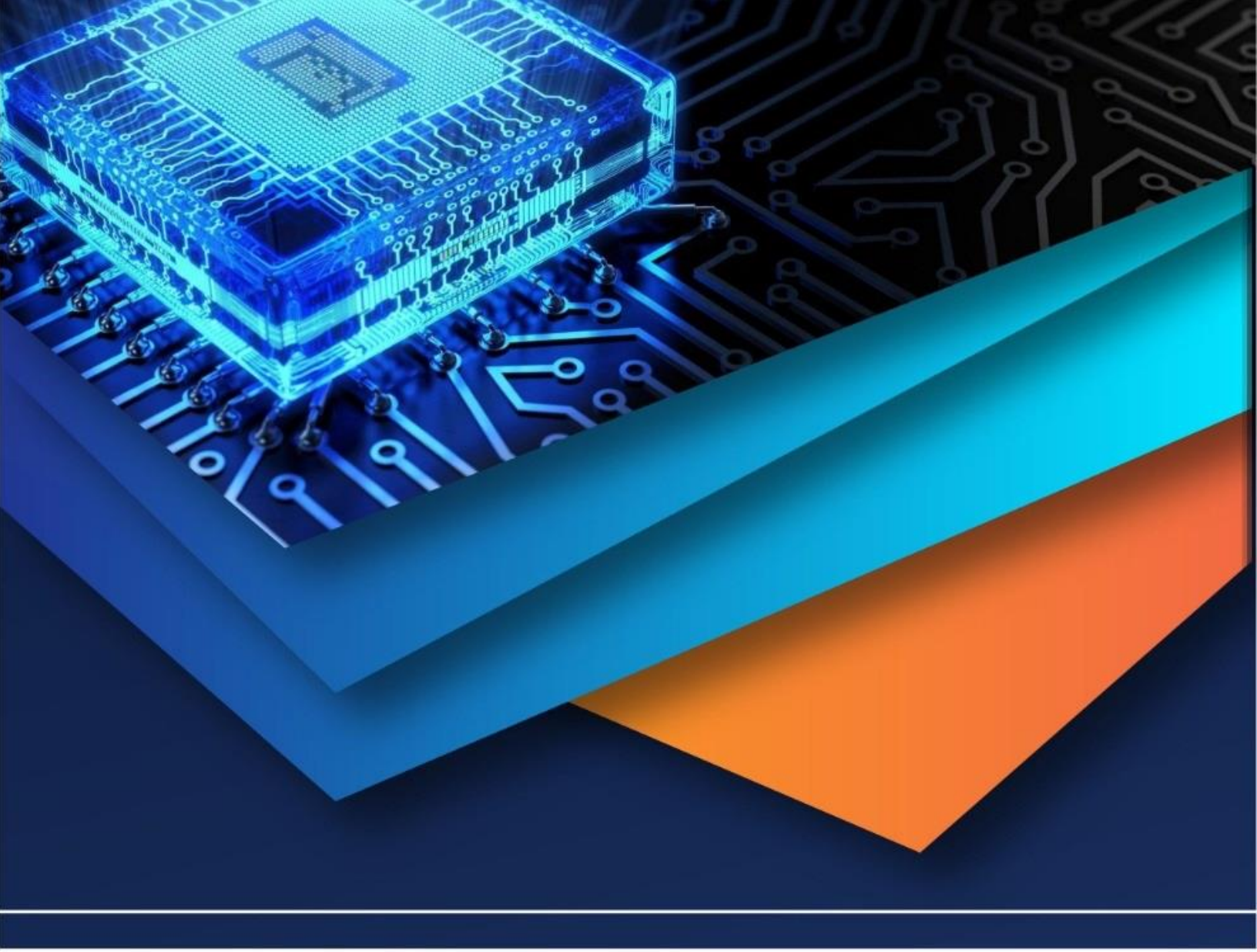

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