ANJUMAN-I-ISLAM

KALSEKAR TECHNICAL CAMPUS NEW PANVEL

Project Title

"ABC ANALYSIS IN SIP TOOLS"

Submitted by

Shaikh Khizar	**16ME72**
Saiyed Saif Ali	**17DME137**
Shaikh Mehboob	**17DME144**
Naizam Salmani	**17DME138**

Under the Guidance of

PROF. DR. MOHD ASIF GANDHI

DEPARTMENT OF MECHANICAL ENGINEERING

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(Approved by AICTE, recg. By Maharashtra Govt. DTE,

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CERTIFICATE

This is to certify that the project entitled

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Submitted by

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To the Kalsekar Technical Campus, New Panvel is a record of bonafide work carried out by him under our s Supervision and guidance, for partial fulfillment of the requirements for the award of the Degree of Bachelor of Engineering in Mechanical Engineering as prescribed by **University Of Mumbai**, is approved.

Internal Examiner **External Examiner**

(Prof._____) (Prof.____)

Head of Department **Principal**

(Prof. _____) (Dr._____)

ANJUMAN-I-ISLAM

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APPROVAL OF DISSERTATION

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(Internal Examiner) **(External Examiner)**

_____ _____

Date: _____

ABSTRACT

According to what was mentioned, all the organizations need an appropriate inventory control and planning system in order to effectively manage their resources and inventories. Therefore, in order to create a perfect inventory control system, various inventory items should be classified into the significant categories based on appropriate criteria and standards. Various models and methods have been so far presented to classify inventory among which, ABC analysis approach is one of the most common methods which is widely used for planning andt5 inventory control.

Inventory classification based on ABC analysis allows the organization to classify its inventory into the significant categories. Generally, the above approach has been formed based on the Pareto Principle which is also known as "20-80" law. Regarding the organizations' inventory, this principle will be expressed as follows:

In the manufacturing organizations, there are only a few inventories which mostly contribute to the cost of the annual consumption of the organization's inventory system and there are only anew inventories which a little contribute to the dollar value of the annual consumption of the inventory system.

Given that the primary purpose of the inventory classification based on this approach is to create appropriate control levels for each inventory category, this question will be raised that whether the inventory classification based on single criterion ABC analysis will be able to meet all the needs of the organization's inventory control system.

As a result, the organizations can apply proper control policies by identifying the most effective criteria in their inventory classification. This study has also tried to present proposed ABC model for the hostel mess stores, in order to evaluate the inventory control system of the studied in that. For this purpose, first, the criteria affecting the evaluation of the inventory control system, classification of inventory and the priority of each One of the criteria in the studied mess stores and the priority of each one of the criteria in each inventory category (A, B, C) have been identified and model will be proposed

Table of Content

ACKNOWLEDGEMENT

We are grateful and would like to express our sincere gratitude to our supervisor Professor **Dr. Asif Gandhi** for his germinal ideas, invaluable guidance, continuous encouragement and constant support in making this research possible. We also sincerely thank him for the time spent proofreading and correcting our many mistakes. We really appreciate the consistent support from the first day we applied to this study to these concluding moments. We are truly grateful for his progressive vision about our training in science.

Our sincere thanks go to all my lab mates and members of the staff of the Mechanical Engineering Department, AIKTC, who helped us in many ways and made us stay at AIKTC pleasant and unforgettable. Many special thanks go to fellow engine research group members for their excellent co-operation, inspiration and support during this study.

We acknowledge our sincere indebtedness and gratitude to our parents for their love, dream and sacrifice throughout our life, which consistently encouraged us to carry on our higher studies in Mumbai University.

INTRODUCTION

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1. Problem Definition:

How much inventory should be added when inventory is replenished is a major problem in inventory management, i.e., how much to buy or produce at a time is really a problem to the management. If bulk quantities are purchased, the cost of carrying will be high and, on the contrary, if small quantities are purchased at frequent intervals, ordering cost will be high.

Therefore, the quantity to be ordered at a given time should be economic, taking mainly two factors into account, viz., ordering costs, and carrying costs. In short, it represents the most favorable quantity to be ordered at the reorder level.

2. Objective of the study:

>End of life management

>Supplier negotiation

>Inventory optimization.

> Strategic Pricing

> Resource Allocation

> Customer Service Levels

3. Scope of the study:

The main use of ABC analysis is to improve your ability to deal with large and complex data sets by breaking them down into three segments. These segments define the priority of the data within whatever area you are using them in.

Once the data is broken down into segments, it is easier to focus on the data and use it in a meaningful way. Breaking down the data into these segments makes specific issues in the data more obvious. It also helps in prioritizing the different segments.

4 Significance of the study:

ABC Analysis. The ABC inventory control technique is based on the principle that a small portion of the items may typically represent the bulk of total material usage of the total inventory in the construction process, while a relatively large number of items may from a small part of the money value of stores. The total material usage is ascertained by multiplying the quantity of material of each item by its unit price.

Chapter 2

Company Background:

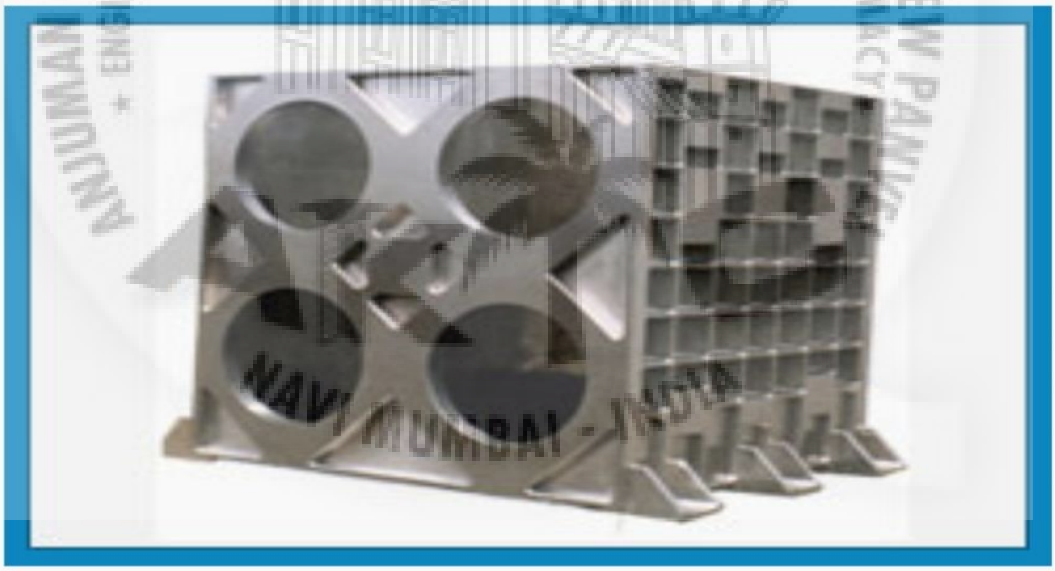
1 Introduction:

SIP TOOLS is a leading manufacturers and supplier of the industrial cnc made work piece located In **DOMBIVALI THANE INDIA.**
We have professional experience in lathe, cnc and vmc based work piece for major company

1979, ISO 9001: 2000 certified by RWTUV. We primarily manufacture Jigs, Fixtures, Gauges, Moulds, Dies, Press Tools, special purpose machines like Winding Machines,
Soap Cutting Machine, Soap Wrapping Machine, Cone Making Machine etc. We are also finding our ground as a mass production Unit. We manufacture as well as machine Motor Shafts, Magnet Hubs, Carbide Dies, Punches, Stator Stacks, Shut off Nozzles, Impellers etc.

2. The product made by sip tools:

Barrel for Space Application Center.

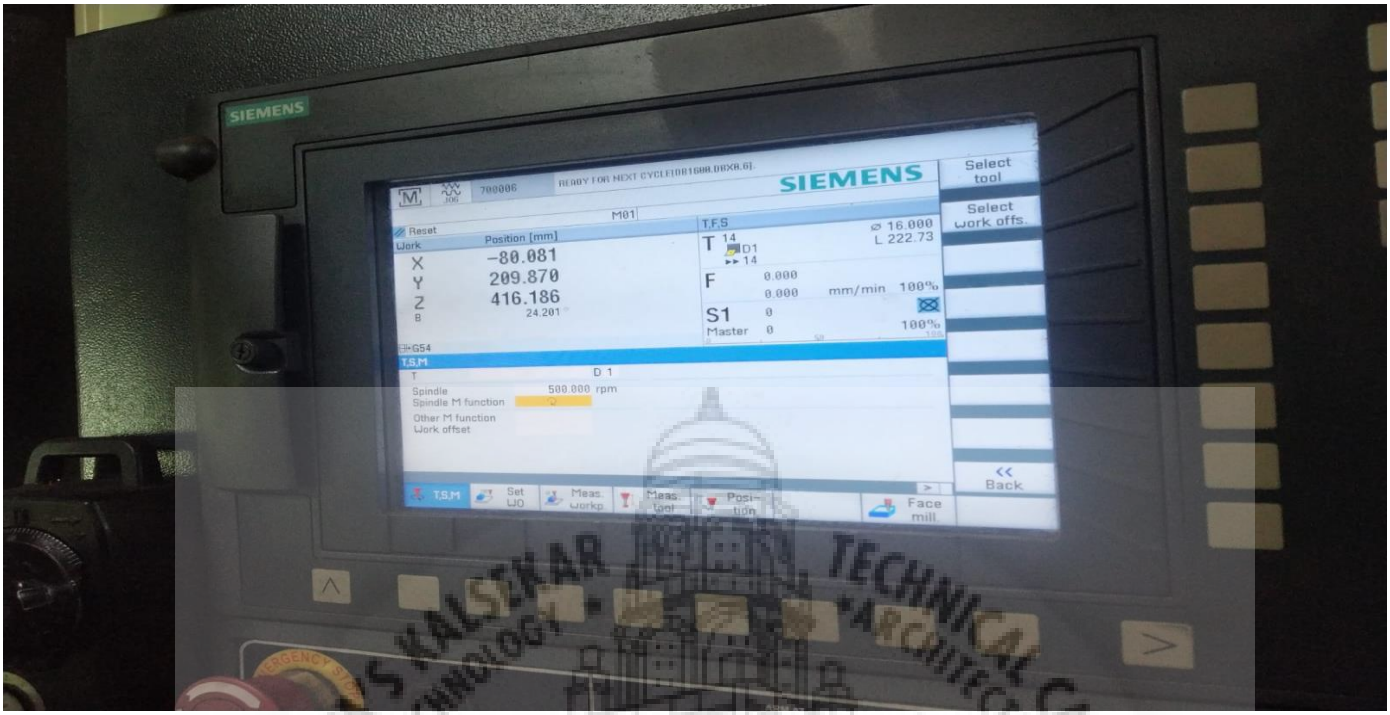


This photograph shows the Camera Housing for Space Application Center.

Face Plates

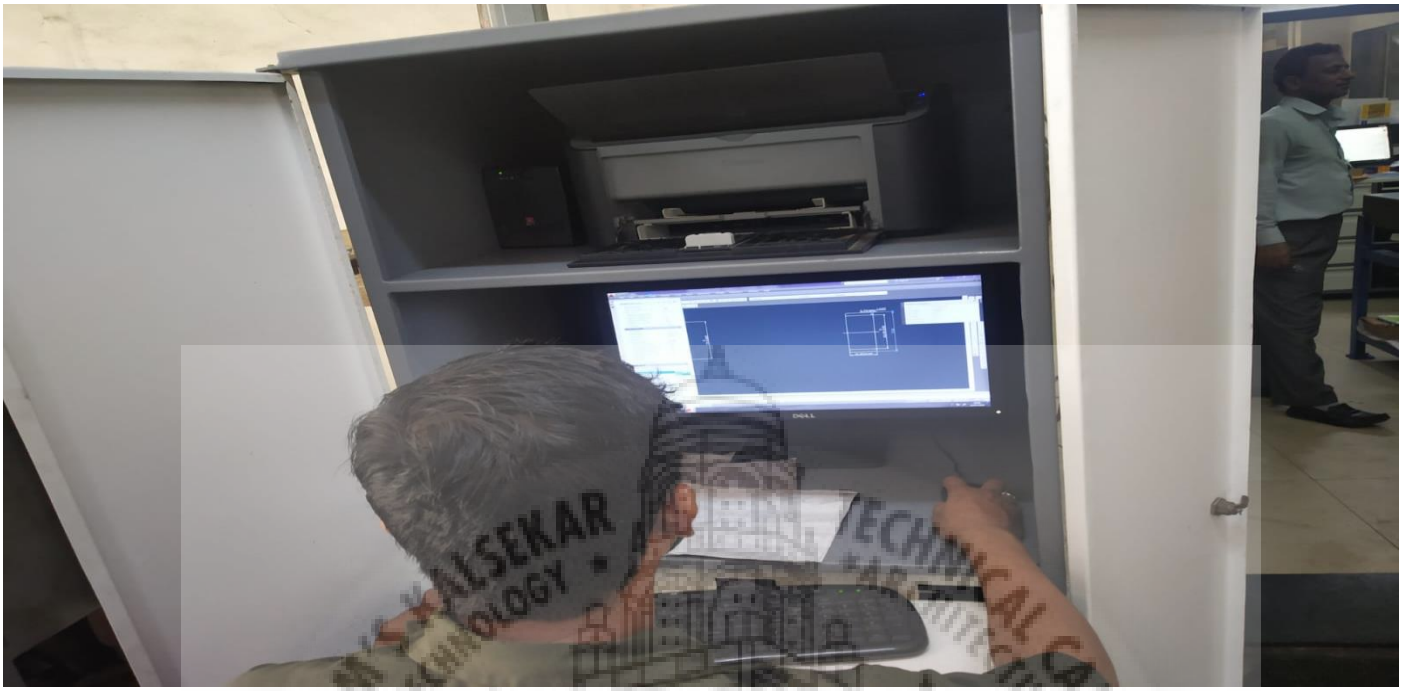
HMC CNC

Siemens Board



Cylindrical Pipe

Designing of products

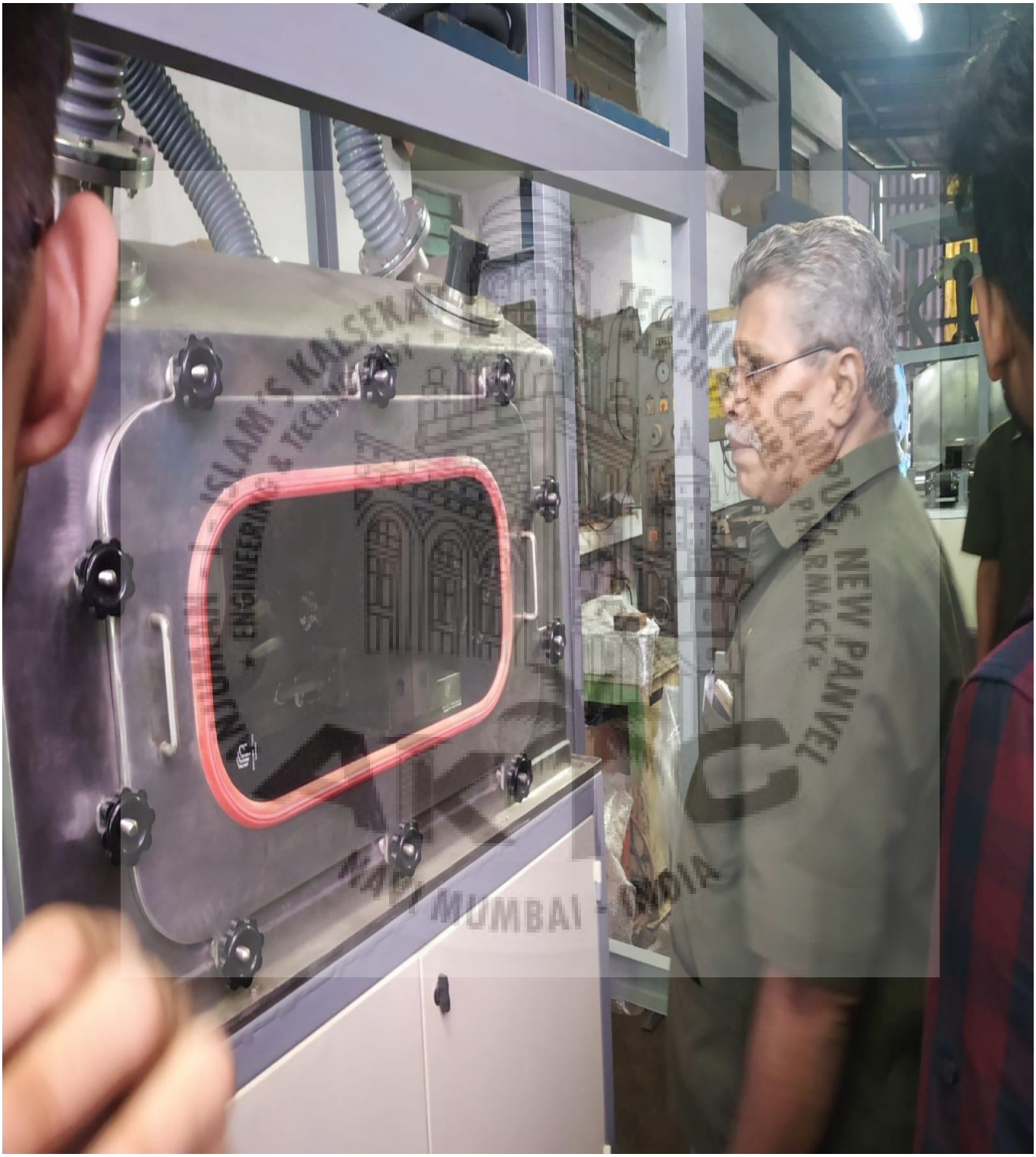


Training of Products

Training of Products

Training of Products

Training of Products



3. Mass Production of Sip tool

Telescopic parts for Space Application Center

Mass Production Jobs


Shut Off Nozle


Side Block

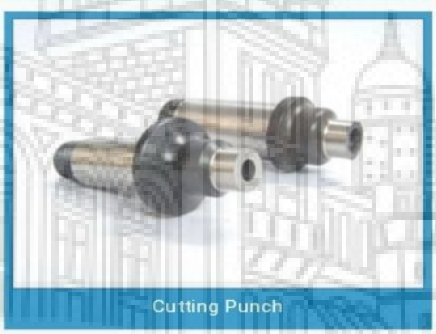

Lock Ring


Magnet Hub


Side Block


Motor Shafts

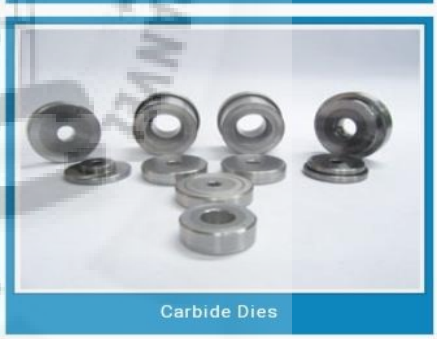

Impelier


Cutting Punch


Combustion Chamber


Guide Flange


T - Nut


Carbide Dies


Stator Stack

4. Conclusion:

In the beginning of this chapter, an overview of the facilities layout planning and its importance to existing companies is written to further enhance the importance for using it as the main principle for this project. The objectives are also defined to be linked to the deliverables in this case study. The boundary of this project is also defined based on the statement of problem. Some justifications of conducting this case study and its importance is also discussed.

Chapter 3

LITERATURE REVIEW:

Summary of work done for researches:

Sr. No.	Title and Author	Methodology	Findings
1.	"The application of multiple criteria ABC analysis"	In 1987, an article was presented entitled "The application of multiple criteria ABC analysis" in which the results of the use of multiple criteria ABC analysis have been provided to classify the storage inventory.	The studies conducted in this paper show that the managers can use both "cost criteria" and "non-cost criteria" in the classification of warehouse inventory and formulate specific policies by using different criteria to manage warehouse inventory.
2.	"Particle Swarm Optimization	In this study in 2008, an article was presented entitled "Particle Swarm Optimization "in order to classify the inventory in which an optimization approach is proposed regarding the inventory classification problems at the conditions	Inventory items should be classified based on a target or multiple targets, such as minimizing annual consumption costs, maximizing the rate of inventory turnover.
3.	"Classification for multiple criteria ABC analysis".	In 2007, an article was presented "classification for multiple criteria ABC analysis". In this paper a	The study conducted in this paper shows that by appropriate conversion of the scale model of different criteria

		simple model is proposed for multiple Criteria classification of the inventory. In fact, this model covers the criteria of all the criteria in a single criterion	of the inventory classification, The organizations can reach some criteria of the inventory items without need for linear optimization. The model presented in this paper can be widely used by the organizations with minimum experience in the optimization. The criteria reviewed in this article include: the dollar value of the annual consumption, the average cost of each unit, and lead time.
4.	"The use of techniques based on the artificial intelligence for multiple criteria ABC analysis" By" Maine-Chu-Yu".	In 2010, an article was presented entitled "The use of techniques based on the artificial intelligence for multiple criteria ABC analysis" by" Maine-Chun-Yu". In this paper, a study has been conducted to compare the classification techniques based on artificial intelligence and traditional classification techniques	
5.	"Fuzzy AHP-DEA approach for inventory classification based on	In 2010, an article was presented entitled "Fuzzy AHP-DEA approach for	

	Multiple criteria ABC approach". Hadi-vencheh, A., and Mohammad Ghasemi	Inventory classification based on multiple criteria ABC approach". In this article, two approaches of Data envelopment Analysis and fuzzy analytic hierarchy process are combined for multiple criteria ABC classification of inventory	
6.	"The inventory control by combining ABC approach and fuzzy classification"Liang, G. S. and Liao, C. T. 2008	In 2008, an article was presented entitled "The inventory control by combining ABC approach and fuzzy classification". The purpose of this study is to provide a new approach on the inventory control called "ABC fuzzy classification"	The purpose of this study is to provide a new approach on the inventory control called "ABC fuzzy classification"
7.	"The inventory classification based on multi criteria ABC using weighted linear optimization.		
8.	"Multi criteria classification approach to manage the spare parts inventory"		In this article, the best strategy has been reviewed to manage inventory in each category (A, B, C).

9.	Hill (2002)	According to Hill (2002), inventory is a significant asset in most organizations. Its effective management, therefore, is a key task within the auspices of operations. But controlling inventory is far from easy. It involves a complex set of decisions due to the many forms of inventory takes and functions it provides.	Inventories are the result of functional policies within an organization as well as the short and long term decisions in purchasing, operations and sales.

1. Review of Literature Survey:

The application of multiple criteria ABC analysis 1987

In 1987, an article was presented entitled "The application of multiple criteria ABC analysis" in which the results of the use of multiple criteria ABC analysis have been provided to classify the storage inventory. The studies conducted in this paper show that the managers can use both "cost criteria" and "non-cost criteria" in the classification of warehouse inventory and formulate specific policies by using different criteria to manage warehouse inventory.

Particle Swarm Optimization 2008

In 2008, an article was presented entitled "Particle Swarm Optimization "in order to classify the inventory in which an optimization approach is proposed regarding the inventory classification problems at the conditions when inventory items should be classified based on a target or multiple targets, such as minimizing annual consumption costs, maximizing the rate of inventory turnover.

Classification for multiple criteria ABC analysis.2007

In 2007, an article was presented "classification for multiple criteria ABC analysis". In this paper a simple model is proposed for multiple criteria classification of the inventory. In fact, this model covers the criteria of all the criteria in a single criterion. The study conducted in this paper shows that by appropriate conversion of the scale model of different criteria of the inventory classification, the organizations can reach some criteria of the inventory items without need for linear optimization. The model presented in this paper can be widely used by the organizations with minimum experience in the optimization. The criteria reviewed in this article include: the dollar value of the annual consumption, the average cost of each unit, and lead time

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Fuzzy AHP-DEA approach for inventory classification based on multiple criteria ABC approach". Hadi-vencheh, A., and Mohammad Ghasemi 2010

In 2010, an article was presented entitled "Fuzzy AHP-DEA approach for inventory classification based on multiple criteria ABC approach". In this article, two approaches of Data envelopment Analysis and fuzzy analytic hierarchy process are combined for multiple criteria ABC classification of inventory. (Hadi-vencheh, A., and Mohammad Ghasemi, 2010)

2. **The inventory control by combining ABC approach and fuzzy classification" Liang, G. S. and Liao, C. T. 2008**

In 2008, an article was presented entitled "The inventory control by combining ABC approach and fuzzy classification". The purpose of this study is to provide a new approach on the inventory control called "ABC fuzzy classification". (Liang, G. S. and Liao, C. T. 2008)

3. **Multi criteria classification approach to manage the spare parts inventory**

In 2004, an article was presented entitled "multi criteria classification approach to manage the spare parts inventory". In this article, the best strategy has been reviewed to manage inventory in each category (A, B, C).

4. **Conclusion: the ABC analysis is a very useful technique to inventory control, we'll get the proper product knowledge and their pricing**

And which product or raw material cost us more and which material cost us less. We can identified by ABC analysis

We should divide it into 3 section i.e. A, B, C

By applying ABC analysis we get to know that a material are less in no. But more in price and c are more in no. And less in cost

Chapter 4

Problem Identification

1 INTRODUCTION

This chapter discusses about the identification of area where ABC analysis should be applied .we collect all the required data for the ABC analysis from sip tools

2. Material data list

MATERIALS in inventory

Items	Qty	Unit price
Aluminum	1022.73	437
Brass Copper etc.	121.878	424.999
C-45 Round/Plate	9378.24	63
Carbide Materials	3845.68	450
Cone	1300.63	14
EN Bright Bars/EN	1334.85	80
M.S.	3746.36	58
Nuts and Bolts	280000	2
OHNS/HCHCR/D2	2312	72.7132
Other		
SAE	180	75.7333
Screw	150000	3.70665
Soap	918	140.1
Soap Wrapping material	1000.83	130
SS/Rods/Alloy Steels	6501.85	119.89

Items	Qty	Unit price
Other		
Carbide Materials	3845.68	450
SS/Rods/Alloy Steels	6501.85	119.89
C-45 Round/Plate	9378.24	63
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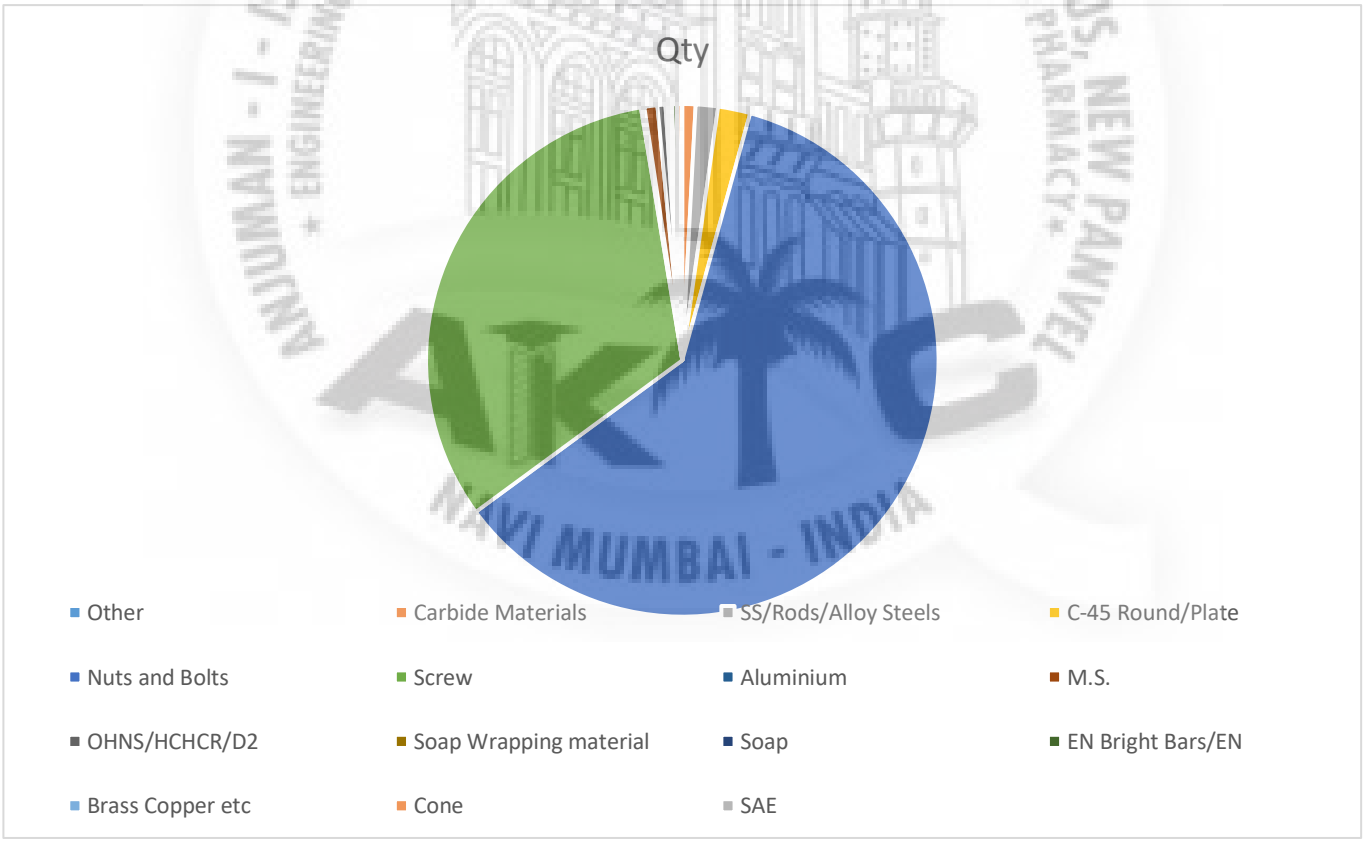


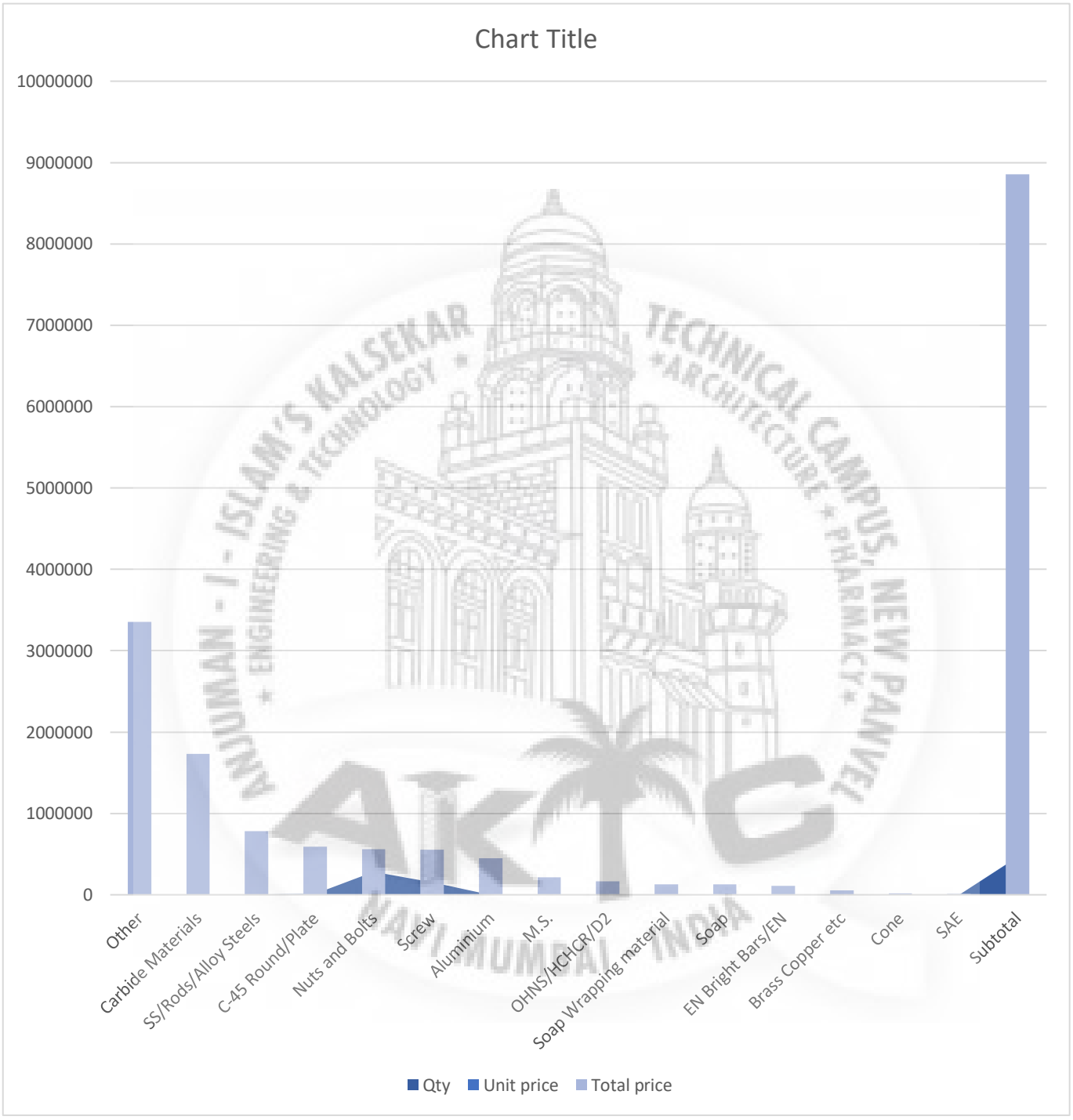
3. Items Available in Sip Tool:

These are the major raw material available in the inventory of the sip tools so we'll see the cost and the quantity of the material available in inventory

- **Carbide Materials**
- **SS/Rods/Alloy Steels**
- **C-45 Round/Plate**
- **Nuts and Bolts**
- **Screw**
- **Aluminium**
- **M.S.**
- **OHNS/HCHCR/D2**
- **Soap wrapping material**
- **Soap**
- **EN Bright Bars/EN**
- **Brass Copper**
- **Cone**
- **SAE**

4. The next step is product of qty and unit price so we'll get Total price

Items	Qty	Unit price	Total price
Other			3354692.73
Carbide Materials	3845.68	450	1730556
SS/Rods/Alloy Steels	6501.85	119.89	779506
C-45 Round/Plate	9378.24	63	590829
Nuts and Bolts	280000	2	560000
Screw	150000	3.70665	555997.5
Aluminum	1022.73	437	446931
M.S.	3746.36	58	217289
OHNS/HCHCR/D2	2312	72.7132	168113
Soap Wrapping material	1000.83	130	130107.25
Soap	918	140.1	128611.7
EN Bright Bars/EN	1334.85	80	106788
Brass Copper etc.	121.878	424.999	51798
Cone	1300.63	14	18208.82
SAE	180	75.7333	13632
Subtotal	461663	2071.142	8853060



5. The next step is very important we have to find the frequency and annual usage

	Items	Qty	Unit price	Total price	Cumulative Frequency	Annual usage%	
1	Other			3354692.73	3354692.73	37.89303055	37.89303055
2	Carbide Materials	3845.68	450	1730556	5085248.73	57.44057682	19.54754627
3	SS/Rods/Alloy Steels	6501.85	119.8898775	779506	5864754.73	66.2455098	8.804932984
4	C-45 Round/Plate	9378.238	63.00000064	590829	6455583.73	72.91923617	6.673726373
5	Nuts and Bolts	280000	2	560000	7015583.73	79.24473267	6.325496495
6	Screw	150000	3.70665	555997.5	7571581.23	85.52501881	6.280286138
7	Aluminium	1022.725	437.0001711	446931	8018512.23	90.57334108	5.048322275
8	M.S.	3746.362	58.00000107	217289	8235801.23	93.02773538	2.4543943
9	OHNS/HCHCR/D2	2312	72.71323529	168113	8403914.23	94.92666073	1.898925343
10	Soap Wrapping material	1000.825	130	130107.25	8534021.48	96.396291	1.469630275
11	Soap	918	140.0998911	128611.7	8662633.18	97.84902825	1.452737246
12	EN Bright Bars/EN	1334.85	80	106788	8769421.18	99.05525525	1.206226999
13	Brass Copper etc	121.878	424.9987693	51798	8821219.18	99.64034108	0.585085835
14	Cone	1300.63	14	18208.82	8839428	99.84601934	0.205678263
15	SAE	180	75.73333333	13632	8853060	100	0.153980658
				Subtotal	8853060		

6. Now the ABC analysis is done we have to just categories it into ABC

Category	Item No.	₹ of item in Category	% of item assuming	%₹ in Category
A	1,2,3	5864754.73	5	66.2455098
B	4,5,6,7,8	2371046.5	30	26.78222558
C	9,10,11,12,13,14 15	617258.77	65	6.972264618
Total	15	8853060	100	100

7. Conclusions

From the analysis, from the above t, it is obvious that the A products is a major contribution to the high cost and the low in quantity. This is further justified that the c item is more in quantity and less in cost and the b item occur in-between those.

Hence we should focus on the a item, we have to strict control should applied and for b item moderate

Chapter 5

Methodology

1. Introduction

In this chapter, the ABC Analysis is analyzed in detail **The** ABC inventory control technique is based on the principle that a small portion of the items may typically represent the bulk of total material usage of the total inventory in the construction process, while a relatively large number of items may from a small part of the money value of stores. The total material usage is ascertained by multiplying the quantity of material of each item by its unit price

2. The ABC analysis

In materials management, ABC analysis is an inventory categorization technique. ABC analysis divides an inventory into three categories—"A items" with very tight control and accurate records, "B items" with less tightly controlled and good records, and "C items" with the simplest controls possible and minimal records.

The ABC analysis provides a mechanism for identifying items that will have a significant impact on overall inventory cost, [1] while also providing a mechanism for identifying different categories of stock that will require different management and controls.

The ABC analysis suggests that inventories of an organization are not of equal value.[2] Thus, the inventory is grouped into three categories (A, B, C) in order of their estimated importance.

'An' items are very important for an organization. Because of the high value of these 'An' items, frequent value analysis is required. In addition to that, an organization needs to choose an appropriate order pattern (e.g. 'just-in-time') to avoid excess capacity. 'B' items are important, but of course less important than 'An' items and more important than 'C' items. Therefore, 'B' items are intergroup items. 'C' items are marginally important.

3. The step used in ABC analysis

The steps to conduct an ABC analysis are as follows:

1. Determine annual usage or sales for each item.

2. Determine the percentage of the total usage or sales by item.

3 Rank the items from highest to lowest percentage.

4. Classify the items into groups

Criteria	A type	B type	C Type
Quantity	10%	20%	70%
Annual Usage	70%	20%	10%
Control	Very strict	Moderate	Less
Ordering	Daily/weekly	Monthly	Yearly
Safety stock	Less	Moderate	High
Handled By	Senior officers	Middle management.	Fully delegated.

CONCLUSION AND FUTURE SCOPE:

By implementing the ABC Analysis

According to experiments, it can be concluded that timely reaction to changes in the environment can propose better results. This can be done by a human or decision support system comparing the forecasted demand with real and making corrections in orders, or this can be done by an agent as it is proposed here..

Conclusion:

Inventory management is essential to every company, having inventories. Companies need to have stock, but in such amount to avoid out-of-stock and overstock situations. Inventory management can improve company's inventory control existing situation and decrease costs of the company.

Agent system, in turn, proposes the automation of this process, it can support several forecasting methods and it reacts to changes in the environment. In this paper, the existing inventory management situation is analyzed, twofold improvement is proposed – to use inventory management with the aim to decrease company's inventory level and holding costs by avoiding overstocks and to apply the agent system in order to automate the inventory management processes and to timely react to demand deviations from the forecasted demand by making corrections in replenishment policies.

According to experiments, it can be concluded that timely reaction to changes in the environment can propose better results. This can be done by a human or decision support system comparing the forecasted demand with real and making corrections in orders, or this can be done by an agent as it is proposed here.

The next step of the present research will be the application of achieved results of demand forecasts, safety stock and reorder points into simulation software in order to achieve more accurate results.

Future Scope:

The main use of ABC analysis is to improve your ability to deal with large and complex data sets by breaking them down into three segments. These segments define the priority of the data within whatever area you are using them in.

Once the data is broken down into segments, it is easier to focus on the data and use it in a meaningful way. Breaking down the data into these segments makes specific issues in the data more obvious. It also helps in prioritizing the different segments.

For example, ABC analysis can be used to segment your customers and break down customer-specific data.

First, you would divide the customers into each of the three categories based on the sales volume the customer provides. Then, you would consider how that volume relates to your margin contribution.

If you segment the customers successfully, the customers with the most value will go into the high priority category A, while less important customers would be placed in the bottom category C. Customers that are somewhere in between will stay in category B.

The segmentation allows you to pinpoint your most valuable customers. It then allows you to examine them separately so that you can form a plan of action. When you can look at things in three different categories, it is easier to allocate your resources in a more strategic way than it is if you're flitting back and forth between charts or just trying to make sense of heaps of raw data.

The benefit of taking this extra step is that it makes it easier to analyze the data strategically which in turn makes it easier to maximize your profits.

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1. Hadi-V encheh, A. 2010. An Improvement to Multiple Criteria ABC Inventory Classification", European Journal of Operational Research, pp. 962–965.

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