

# **STUDY ON MATERIAL HANDLING AND CUSTOMER SATISFACTION TOWARDS MEYTHOMA INTERNATIONAL**

Submitted in partial fulfillment of the requirements for the award of

**Master of Business Administration**

by

**SRUTI C R**

**Register No. 39410209**



**SCHOOL OF BUSINESS ADMINISTRATION**

# **SATHYABAMA**

**INSTITUTE OF SCIENCE AND TECHNOLOGY  
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC | 12B Status by UGC | Approved by AICTE  
Jeppiaar Nagar, RAJIV GANDHI SALAI, CHENNAI - 600 119**

**April - 2021**



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Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 600 119  
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## **SCHOOL OF BUSINESS ADMINISTRATION**

### **BONAFIDE CERTIFICATE**

This is to certify that this Project Report is the bonafide work of SRUTI C R 39410209 who have done the project work entitled **STUDY ON MATERIAL HANDLING AND CUSTOMER SATISFACTION TOWARDS METHOYMA INTERNATIONAL** under my supervision from December 2020 to March 2021.

**Dr. S.UMA MAHESWARI**

**Internal Guide**

**RESOURCE MANAGER**

**External Guide**

**Dr. BHUVANESWARI G.**

**Dean – School of Business Administration**

---

**Submitted for Viva voce Examination held on \_\_\_\_\_.**

**Internal Examiner**

**External Examiner**



**TO WHOMSOEVER IT MAY CONCERN**

Respected Sir/Madam,

This is to certify that **SRUTI C R (Register number: 39410209)** is a student of **II-year MBA (Marketing & Operations)** studying in **SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY**, has completed her project working in our organization during **05<sup>th</sup> December 2020 – 13<sup>th</sup> March 2021**. She has successfully completed her project entitled on **“A STUDY ON MATERIAL HANDLING AND CUSTOMER SATISFACTION TOWARDS MEYTHOMA INTERNATIONAL”**.

We wish her Bright Future ahead!

Yours Sincerely,



(Senior Resource Manager)  
Meythoma International

No 1, Bharathinagar 1st street,  
North Usman Road, T. Nagar,

Chennai – 600 017.

## **DECLARATION**

I **SRUTI C R 39410209** hereby declare that the Project Report entitled **STUDY ON MATERIAL HANDLING AND CUSTOMER SATISFACTION TOWARDS MEYTHOMA INTERNATIONAL** done by me under the guidance of Dr. S.UMA MAHESWARI at Material handling and Customer Satisfaction towards Meythoma International is submitted in partial fulfillment of the requirements for the award of Master of Business Administration degree.

**DATE:**

**PLACE:**

**SIGNATURE OF THE CANDIDATE**

## **ACKNOWLEDGEMENT**

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my sincere thanks to **Dr. BHUVANESWARI G.**, Dean, School of Business Administration and **Dr. Palani A.**, Head, School of Business Administration for providing me necessary support and details at the right time during the progressive reviews.

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**SRUTI C.R.**

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## **ABSTRACT**

Materials handling is the science and the art of including the moving, packaging and storing away of substance in any structure, and incorporates the arrangement, setting and situating the material to manage their development process. The Present Study is focused on the material handling both in Packaging as well as storage. It was studied with reference to Meythoma international. The goal of the study is to discover the difficulties faced in material handling, it likewise assesses the effect of changes in material handling of the executives by implementing some logistics methodologies. Whether it meets the security of service, cost of service finally whether it meets client requirements. The Questionnaire was given to the employees of Meythoma International to discover the difficulties they looked in material Handling. From the response we can observe that some answer for tackle the difficulties and furthermore we propose technique to service, dependability and decrease the cost and overall to meet consumer satisfaction level.

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## LIST OF ABBREVIATIONS

| S.No | ABBREVIATION | EXPANSION            |
|------|--------------|----------------------|
| 1    | ANOVA        | Analysis of Variance |
| 2    | LIFO         | Last In, First Out   |
| 3    | FIFO         | First In, First Out  |

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Introduction**

#### **1.1.1 MATERIAL HANDLING IN MEYTHOMA:**

Meythoma International purchase the cardamom and pepper directly from the farmers of Kerala. Cardamom, called the queen of spices, proved worthy of its title when it fetched a record price in the market this year and brought good tidings to kerala farmers who are otherwise affected by the vagaries of the weather. With the price hitting Rs 6000/Kg, cardamom growing area saw people buying acres of farms and those who had turned to other crops returning to cultivate the green gold. Kerala's reputation as the land of spices goes back at least 3000 years.

Green fruit capsules are harvested before they are fully mature and dried in curing installations, so ensuring that they retain their green color („greens“). These are the highest grade cardamom pods, the best quality coming from Guatemala. Fruit capsules that have matured to a yellow color are harvested at this stage and dried in the sun („yellows“). They have a tendency to burst open readily, entailing a loss of essential oils. In addition to the whole fruits, cardamom seeds and husks are also commercial products. The 2 – 3 mm seeds range in color from white through brown to black, and are the most valuable form of the spice. High grade cardamom comes from southern India, Guatemala and Tanzania. Lower grades come from other countries of Asia, such as Sri Lanka, Thailand or northern India.

In general, the weight in grams per liter and the color are decisive in determining quality. The proportion of burst fruit capsules („open pods“) also determines quality, as do color (green or yellow) and drying method (mechanical or sun). Provided that the recommended storage conditions are complied with, cardamom may be kept for up to 12 months. Have the best shelf life, as the intact fruit capsule provides the best protection for the seeds.

The process the farmer and the purchaser follow after harvesting is as follow:

Once the cultivation is over the farmer harvest the cardamom from the plant. They won't do any processing. They directly sell the material to the auction carried out area Indian Spices committee. The farmer take some sample material of 5 kg cardamom to the committee. The committee look for the Quality and fixed some price. The Client here is Meythoma and others pick up the cardamom as per their requirement and budget. The price fixation happens in this committee. Once the price is accepted by both the farmers and purchaser. The client here Meythoma buy the required amount of cardamom directly from the Farmer by paying the fixed amount done by the committee.

### **1.1.2 STORAGE:**

Once the bulk amount of cardamom is purchased they were taken to Chennai warehouse. Activities such as offloading of the goods coming from the suppliers, the intermediate packaging (if required), and shipping to other destinations (retailers or end consumers) are handled in the warehouse. Similarly, they can also serve as a storage house for handing peak consumer demand to avoid stock out of items, and acts as a buffer between the starting point (usually manufacturing plant) and ending point (think about a typical retail outlet). The process involved in storage area is drying and quality check. The drying is the most critical process in the production of dried herbs and spices. The aim of drying is to reduce the moisture content of the product from actively growing in the field to a level that prevents deterioration of the product and allows storage in a stable condition. Dried cardamom capsules must be stored in moisture-proof containers away from direct sunlight. For long term bulk storage, polythene-lined gunny bags (strong sacks made from jute fibers) inside wooden boxes are used. The polythene bags help to preserve the green colour of the pods. It is essential that the capsules are fully dry before they are placed in the gunny bags for storage. Any moisture within the bags will cause the capsules to rot. The stored cardamoms should be inspected regularly for signs of spoilage or moisture. If they have absorbed moisture, they should be re- dried to a moisture content of 10%. The storage room should be clean, dry, cool and free from pests. Mosquito netting should be fitted on the windows to prevent pests and insects from entering the room. Strong smelling foods, detergents and paints should not be stored in the same room as they will spoil the delicate aroma and flavor of the cardamom. Polishing of capsules give shining to the

produce Grade according to size and colour. Store in moist proof containers. Jute bag with 100 gauge LOPE lining is observed to be the most cost effective packaging material for cardamom. The dried produce may be preferably sold soon after drying provided the growers get remunerative price.

#### **1.1.3 Transportation Used By Meythoma International:**

- Van
- Truck

#### **1.1.4 Types of Material Handling:**

- Manual Lift
- Hand Trolley
- Pallet Stack

#### **1.1.5 Material Handling Equipments Used in Storage Department:**

- Dryer
- Sizer
- Litre Weight

#### **1.1.6 CHALLENGES FACED IN STORAGE DEPARTMENT:**

- Natural Calamities
- Shortage of Equipments
- Problem in Equipments
- Stock Overload
- Shortage of Electricity

#### **1.1.6.1 Natural Calamities:**

Regardless of the natural calamities, businesses frequently face the following problems after an incident:

- Structural damage
- Lack of employee access to their place of work
- Interruptions in supply chains
- Losses of perishable goods
- Temporary business closures

To continue the working process after any natural calamities that outlines immediate response tactics. A disaster recovery plan in place, an organization is more likely to bounce back after an incident with minimal downtime. Addition to regular work cleanup process should also be handled by the employee. While there are parts of the cleanup process that can be handled by the employees, there are some aspects that should be carried out by a property damage restoration specialist. Due to calamities the material will get collapsed and get wet. In such case it includes removal of Hazardous materials, Items affected by mold and Items affected by contaminated water.

#### **1.1.6.2 Shortage and Trouble in Equipments:**

Storage department carry out the process of drying and Quality check process which is handled by Equipments. If shortage of Equipment happen, there will be delay in processing and wastage of material. In such employee has to do the job manually which require more space and time and require more manual effort. If the equipment won't work properly the same challenges need to be faced. In such case trained staff should handle the equipment and fix the issue. Not all the employee aware of the solution in such situation fixing the equipment also consume more time. If all the employee are aware of fixing and installation process it is not necessary to depend on particular person.

#### **1.1.6.3 Stock Overload:**

If the delivery delay and the purchase process keep on doing stock overload will occur. In such case we won't find place to load the new purchased material. It leads to renting of temporary room or place. Which might be near or in distance. It leads to extra cost and also expense for transportation. It is an additional unwanted process to be handled by the organisation.

#### **1.1.6.4 Shortage of Electricity:**

Sometime electric shortage may occur. It occur more often during summer. Shortage of supply leads to operation of material handling equipment which leads to the same problem as above.

#### **1.1.7 PACKAGING DEPARTMENT:**

Cardamom capsules can be packaged in polythene bags of various sizes according to the market demand. The bags should be sealed to prevent moisture entering. Sealing machines can be used to seal the bags. Attractive labels should be applied to the products. The label needs to contain all relevant product and legal information – the name of the product, brand name (if appropriate), details of the manufacturer (name and address), date of manufacture, expiry date, weight of the contents, added ingredients (if relevant) plus any other information that the country of origin and of import may require (a barcode, producer code and packer code are all extra information that is required).

##### **1.1.7.1 Equipment Used in Packaging Department:**

###### **1.1.7.1.1 Sealing Machine**

Based on the Quality the cardamom were packed separately. They were packed in a bundle to avoid shortage of supply. This habit helps to retain the customer and to meet customer expectation.

### **1.1.8 CHALLENGES FACED IN PACKAGING DEPARTMENT:**

- Time Consumption
- Lack of Packaging Material
- Missing of Information in Packing

#### **1.1.8.1 Time Consumption:**

Meythoma International use sealing machine for package which require more human effort and it consume more time. It has to be done one by one.

#### **1.1.8.2 Lack of Packaging Material:**

If the stock overload occur and more delivery was pending then it leads to shortage of packaging material.

#### **1.1.8.3 Missing of Information in Packaging:**

Sometime required information to be present in packing might miss because of the printing mistake. They can't use such packing stuff. Because customer expect and get attracts of that information. And it also necessary to maintain such information in packaging as per government rule. So it leads to extra purchase of packing material, wastage of packing material and delay in deliver.

## **1.2 INDUSTRY PROFILE**

### **1.2.1 Introduction**

Manufacturing has emerged as one of the high growth sectors in India. Prime Minister of India, Mr Narendra Modi, had launched the „Make in India" program to place India on the world map as a manufacturing hub and give global recognition to the Indian economy. India is expected to become the fifth largest manufacturing country in the world by the end of year 2020\*.

### **1.2.2 Market Size**

The Gross Value Added (GVA) at basic current prices from the manufacturing sector in India grew at a CAGR of 4.34 per cent during FY12 and FY18 as per the second advance estimates of annual national income published by the Government of India. During April-September 2018, GVA from manufacturing at current prices grew 14.8 per cent year-on-year to Rs 138.99 trillion (US\$ 198.05 billion). Under the Make in India initiative, the Government of India aims to increase the share of the manufacturing sector to the gross domestic product (GDP) to 25 per cent by 2022, from 16 per cent, and to create 100 million new jobs by 2022. Business conditions in the Indian manufacturing sector continue to remain positive.

### **1.2.3 Investments**

With the help of Make in India drive, India is on the path of becoming the hub for hi-tech manufacturing as global giants such as GE, Siemens, HTC, Toshiba, and Boeing have either set up or are in process of setting up manufacturing plants in India, attracted by India's market of more than a billion consumers and increasing purchasing power.

Cumulative Foreign Direct Investment (FDI) in India's manufacturing sector reached US\$ 76.82 billion during April 2000-June 2018.

### **1.2.3 Government Initiatives**

The Government of India has taken several initiatives to promote a healthy environment for the growth of manufacturing sector in the country. Some of the notable initiatives and developments are:

- In October 2018, the Government of India released the draft National Policy on Electronics (NPE) which has envisaged creation of a US\$ 400 billion electronics manufacturing industry in the country by 2025.
- In September 2018, the Government of India exempted 35 machine parts from basic custom duty in order to boost mobile handset production in the country.

- India has become one of the most attractive destinations for investments in the manufacturing sector. Some of the major investments and developments in this sector in the recent past are:
- India's manufacturing PMI increased for the third consecutive month to 54.0 in November 2018 from 53.1 in October 2018. The expansion was driven by strong inflows of new orders which led to higher production and input purchasing.
- As of December 2018, premium smartphone maker OnePlus is anticipating that India will become its largest Research and Development (R&D) base within the next three years.
- As of October 2018, Filatex India, a polymer manufacturer, is planning to undertake forward integration by setting up a fabric manufacturing and processing unit.
- As of August 2018, IISC's Society of Innovation and Development (SID) and WIPRO 3D are collaborating to produce India's first industrial scale 3D printing machine.
- For its Commercial Vehicles, Ashok Leyland is utilising machine learning algorithms and its newly created telematics unit to improve the performance of the vehicle, driver and so on.
- Government of India is in the process of coming up with a new industrial policy which envisions development of a globally competitive Indian industry. As of December 2018, the policy has been sent to the Union Cabinet for approval.
- In Union Budget 2018-19, the Government of India reduced the income tax rate to 25 per cent for all companies having a turnover of up to Rs 250 crore (US\$ 38.75 million).
- Under the Mid-Term Review of Foreign Trade Policy (2015-20), the Government of India increased export incentives available to labour intensive MSME sectors by 2 per cent.
- The Government of India has launched a phased manufacturing programme (PMP) aimed at adding more smartphone components under the Make in India initiative thereby giving a push to the domestic manufacturing of mobile handsets.
- The Government of India is in talks with stakeholders to further ease foreign direct investment (FDI) in defence under the automatic route to 51 per cent from the current 49 per cent, in order to give a boost to the Make in India initiative and to generate employment.

- The Ministry of Defence, Government of India, approved the “Strategic Partnership” model which will enable private companies to tie up with foreign players for manufacturing submarines, fighter jets, helicopters and armoured vehicles.
- The Union Cabinet has approved the Modified Special Incentive Package Scheme (M-SIPS) in which, proposals will be accepted till December 2018 or up to an incentive commitment limit of Rs 10,000 crore (US\$ 1.5 billion).

#### **1.2.4 Road Ahead:**

India is an attractive hub for foreign investments in the manufacturing sector. Several mobile phone, luxury and automobile brands, among others, have set up or are looking to establish their manufacturing bases in the country. The manufacturing sector of India has the potential to reach US\$ 1 trillion by 2025 and India is expected to rank amongst the top three growth economies and manufacturing destination of the world by the year 2020. The implementation of the Goods and Services Tax (GST) will make India a common market with a GDP of US\$ 2.5 trillion along with a population of 1.32 billion people, which will be a big draw for investors. With impetus on developing industrial corridors and smart cities, the government aims to ensure holistic development of the nation. The corridors would further assist in integrating, monitoring and developing a conducive environment for the industrial development and will promote advance practices in manufacturing.

Exchange Rate Used: INR 1 = US\$ 0.0142 as of Q2 FY19

#### **1.2.5 Report**

The Gross Value Added (GVA) from the manufacturing sector is estimated at US\$ 390.84 billion in FY18PE. During April-September 2018, GVA from manufacturing at current prices grew 14.8 per cent year-on-year to Rs 138.99 trillion (US\$ 198.05 billion). During 2017-18, Index of Industrial Production for manufacturing sector grew 4.50 per cent. India's Index of Eight Core Industries advanced 4.2 per cent year-on-year during 2017-2018.

The electronic goods industry is one of the fastest growing industries and is expected to be worth US\$ 400 billion by 2020. Government is working on an export-oriented policy

for Electronic products. The idea behind this policy is to promote greater exports of electronics and drive larger investments by setting up port-based electronic manufacturing clusters. Also, in October 2018, Ministry of Electronics and Information Technology had released a draft National Policy on Electronics. The Government of India has been supportive towards this growth. It set up Electronic Hardware Technology Parks (EHTPs), Special Economic Zones (SEZs) and brought about a favourable climate for Foreign Direct Investment (FDI). The government has also increased liberalisation and relaxed tariffs to promote growth in the sector. In addition, it has given the nod to Modified Special Incentive Package Scheme (MSIPS) under which the central government will be offering up to US\$ 1.7 billion in benefits to the electronics sector in next five years. Under the scheme, subsidy for investment in capital expenditure is provided to the extent of 20 per cent of investment in SEZs and 25 per cent of investment in non-SEZs. The growing customer base and the increased penetration in consumer durables segment have provided enough scope for the growth of the Indian electronics sector. Also, digitisation of cable could lead to increased broadband penetration in the country and open up new avenues for companies in the electronics industry.

### **1.3 COMPANY PROFILE:**

Meythoma International is the most promising dealers of Kerala for one of its essential ingredient, the Green Cardamoms. Kerala has been a major spice exporter since 3000 BC, Meythoma International joins hand by importing the different categories of cardamom to its place first, where in turn the spices are exported from Kerala to other places. We mainly strive and work to deliver only the top graded quality cardamoms at very reasonable prices, by ensuring it reaches to all the dealers and suppliers. Long lasting relationship with our Clients is the main motive and success mantra for Meythoma International. We always believe the best ingredient added in your Kitchen list is the good way to add aroma to your foods.

We, Meythoma International maintain the Quality standards to a level of 100%.

We ensure that the customer satisfaction is met while delivering all our products irrespective of quantity requested. Each of our clients are considered as an asset for us

and we take all necessary steps to retain our clients for a long lasting business relationship.

### **1.3.1 VISION AND MISSION OF THE COMPANY**

#### **1.3.1.1 OUR VISION**

“To be a globally respected corporation that provides best-of-breed business solutions, leveraging technology, delivered by best-in-class people”

#### **1.3.1.2 OUR MISSION**

“To achieve our objectives in an environment of fairness, honesty, and courtesy towards our clients, employees, vendors and society at large”

#### **1.3.1.3 Our Prestigious Clients**

- ITC Grand Chola,
- Adayar Ananda Bhavan
- Super Saravana Stores
- KovaiPazhamudir
- Grace Super Market
- INNOBEST HOME NEEDS PRIVATE LIMITED – Andhra
- SAR SPICES – Karnataka
- S.K. COFFEE LINKS – Karnataka
- Union Trading Company

#### **1.3.1.4 Board of directors**

Mohammed Hussain – Head of the company

Darwin                      - Human resource manager

Siva Prakash              - Managing Director

### **1.3.2 MEYTHOMA INTERNATIONAL**

Meythoma International- the name stands or describes itself for MerkkuthodarchiMalai. The brand Meythoma International clearly defines that it deals with the product produced from Western Ghats. We completely deal with only Green Cardamom and Black Peppers from Western Region. The products are only purchased from Kerela region and they are processed and packed according to the client needs and delivered. Meythoma International maintains the Quality standards to a level of 100%. We also maintain a high level of customer satisfaction while delivering all our products irrespective of quantity requested. Each of our clients are considered as an asset for us and we take all necessary steps to retain our clients for a long lasting business relationship.

Meythoma International Sure about,

- The products are delivered at the right time
- Ensuring the feedbacks from the clients are implemented at each stage
- Regular feedbacks and follow ups to understand the Client needs and satisfaction level are maintained high at all stages.

Meythoma International works with the motive to deliver high standard quality products to all our Clients and no compromises on the same at any stage. The employees of meythoma international is nearly up to 80 members working in different departments. Yearly turnover of meythoma international is nearly above 2.5crores.

### **1.4 NEED OF THE STUDY:**

Material Handling is not an easy job and requires a lot of diligence. There are always goods and other materials being moved around and correct handling is required at all times. The importance of correct handling through cannot be overemphasized especially when it comes to perishable materials. It is not only important that materials are correctly handled so they don't lose their quality, it is also important because it will ensure that all products use the end users in very good condition. Good material handling ensures to avoid accident, reduce operation time, and avoid redundant work and workers.

## **1.5 SCOPE OF THE STUDY**

The main aim of this study is to analyse the challenges they faced in material handling in meythoma international. It also covers the performance of the company after implementing logistics and supply chain management system in meythoma International. By identifying the problem we can rectify the solution to overcome the problem.

## **1.6 OBJECTIVES OF THE STUDY:**

### **1.6.1 PRIMARY OBJECTIVE**

- To analyze the performance of logistics and supply chain management system in Meythoma International

### **1.6.2 SECONDARY OBJECTIVE**

- To understand the process followed in packaging and storing the material
- To analyze the challenges they faced in material handling
- To suggest some adequate measure to overcome the problems in material handling

## **1.7 LIMITATIONS OF THE PROJECT**

- Only the domestic market is the focus of this study.
- Sample size is limited due to the limited period allocated for the survey
- The analysis is completely based on the information provided by the employees and hence could be biased.
- Taking appointment of the respondents became a little difficult.
- Geographical area is restricted only to Chennai region
- Employees felt that the questionnaire was too big

## CHAPTER 2

### REVIEW OF LITERATURE

#### 2.1 Material flow

Materials handling is comprised of different activities such as loading, moving, and unloading of materials. Materials handling equipment represents the second-largest cost of capital and labor the most important operating expense. There is a trade-off between the 2 therein labor costs are often reduced by using more handling equipment (**Arnold et al, 2008**).

Materials handling will make the production flow possible, as it will give dynamism to static elements such as materials, products, equipment, layout, and human resources. Material handling may be a topic that regularly is treated superficially by companies which have been highlighted despite its importance. When the perception is favorable, the advantages are possible; if not, behavioral issues can emerge. Evaluations that are done are said to be important when interventions will come into the work environment are implemented. Utilizing the effectiveness of material handling management, the company's operational performance may improve (**Stock & Lambert, 2001; Chopra & Meindl, 2001**).

Whether products are to be repaired, remanufactured, or recycled, the economic interests of all the parties involved must be understood and aligned for the activities to be performed. The unit load principle stands together of the foremost important and widely applied principles in material handling. In material handling, a unit loads simply the mass that is to be moved or otherwise handled at one time. The unit load may contains just one part, it's going to contains a container loaded with multiple parts, or it's going to contains a pallet loaded with multiple containers of parts. .To the addition, the MHIA has estimates that 20% to 25% of the manufacturing costs are said to be associated with material handling (**Groover 2001**).

However, other authors have perceived its relevance. During the amount during which **(Shingo 1996)** contributed to the event of the Toyota Production System, he developed the assembly Function Mechanism that proposes to elucidate how the assembly phenomenon happens. He has indicated that, within the West, production was treated as a process of a sequence of operations. In the Production Function Mechanism, the concepts are directly associated with a production analysis focus. A process analysis consists of an observation of the assembly flows that turn raw materials into final products. From this idea, the author highlights that the most analysis is that the one related to the method because it follows the assembly object. The analysis of the operations will come later because it said to focus on production subjects (operators and machines). When making this distinction, it's possible to perceive the relevance of handling.

To do the material handling process safely and economically, different types of gadgets, tackles, and equipment are used. Any human activity involving materials needs materials handling. Materials handling is said to be not a production process and hence does not add to the value of the product. It also costs money; therefore it should be eliminated or a minimum of reduced the maximum amount as possible. However, the important point in favor of handling is that it helps production. The applied external forces on the body are said to be transmitted to the support through the material of the body which is loaded. Depending on the load, volume, and throughput of materials, mechanical handling of materials may become unavoidable. The operating point and operating range will need to get a better system performance curve of the loading of material handling **(Rattan, 2011; Modi and Seth, 2011)**.

Beyond the essential function of movement, it's also relevant to cite the functions of storage and knowledge transfer, which occurs simultaneously and has both strategic and operational dimensions. Organizations are relying on information systems using tools like Electronic Data Interchange (EDI), or similar information technology resources, to gain precision and reliability, in the interchange, and availability of information **(Laudon & Laudon, 2006, Milan, Basso & Pretto, 2007)**.

The important proportion of manufacturing expenses will be attributed to material handling and the most critical material handling decisions in the area are the arrangement and design of material flow patterns. The idea which is shared will argue the importance aspect of any production system which is the design of the material handling system which will be integrated into production operations **(Sef-Vaziri & Laporte 2005, Ioannou 2002).**

It is well understood that material handling improvement may have positive effects on production. However, it's not only production but the way the workers see the new situation. The secret of the fluid power's success and widespread use is said to be because of its versatility and manageability **(Esposit, 2008).**

Material handling accounts for 30–75% of the total cost of a product will be given along with the production chain, and efficient material handling is said to be responsible for reducing the manufacturing system operations cost by 15–30% and the key factor in the material handling system design process is the selection and configuration of equipment for material transportation **(Sujono & Lashkari (2006) & Chan et al. (1999)).**

The storage and handling of goods are essential among the set of logistics activities, and their costs can absorb 12% to 40% of its costs **(Ballou (1993).** The main logistic responsibility in manufacturing is to formulate a master- program for the timely provision of materials, components, and work-in-process **(Bowersox and Closs (1996).**

Understands that the logistics including materials and goods flowing in and out of a production facility as well as its internal handling has become very important to an organization to acquire competitive advantages, because the companies struggle to deliver the proper product at the right place and time. The main challenge is to promote, with low cost, a flow whose velocity allows the execution of the manufacturing process with the expected satisfaction level **(Stevenson, 2001).**

## **2.2 Elements and Characteristics of a Material Handling System**

Material handling study has been conducted by **(Groover, 2001)** which require several elements to be considered. The first is said to be the handling system project, which will covers the activities of sequencing, velocity, layout and routing. To complete the analysis,

the author (**Groover, 2001**) will recommend to analyse the material itself or the object to be transported.

Therefore, it suggests the classification of the elements of the authors **Muther and Hagan (apud Groover, 2001)**, which considers: (i) physical state is solid, liquid, gas; (ii) size is volume, length, width, height; (iii) weight; (iv) condition (hot, cold, dry, dirty, sticky, adhesive); (v) risk of damage is weak or strong and (vi) safety hazards such as explosive, flammable, toxic, corrosive, etc.

Additionally, the difficulty of kit and devices must be examined. The term “Moving” has been adopted and has been management (handling) to adopt the terminology of Groover (2001). When handling equipment, it presents a broad classification that covers five categories: (i) transporters such as belts, chains, rollers, etc.); (ii) cranes, hoists, and lifts; (iii) industrial vehicles such as carts, tractors, pallet transporters, forklifts (iv) the positioning equipment, weighing and control ramps, transfer equipment; and (v) stents and support structures of the pallets, holders, reels (**Dias (1993)**).

According to **Gurgel (1996)**, the equipment should be selected based on some preliminary considerations: take into account the utilization of the factory floor and its load capacity; examine the dimensions of doors and corridors; pay close attention to ceiling height, identify the environmental conditions and their nature, avoid the use of combustion engines traction equipment in the storage of food products, meet all safety standards to protect humans and to eliminate the possibility of incurring criminal and civil liabilities arising from accidents, and examine all kinds of available energy options and their capacity to supply required movements.

The right choice of equipment and location of work-in-process is said to be fundamental for the optimization of a company's manufacturing capacity. It states that a critical factor in positioning stocks in the process is a balance between convenience and consolidation to create efficiencies when the stock flows along the value chain (**Bowersox and Closs (1996)**).

The importance of layout, which defines the location of kit and, consequently, restricts possible routes and sequencing, are often perceived by the prominence that the topic is treated in production management literature. The analysis of the connection between layout studies and material handling, however, doesn't receive much attention within the same literature. This lack of attention are often seen in works like **Gaither and Frazier (2002)**, **Chase, Jacobs, and Aquilano (2006)**, and **Slack, Chambers, Harland, Harrison, and Johnston (1997)**.

Finally, systems and information technology will constitute the essential factors that are given for the materials handling management. **Stair and Reynolds (2006)**, **Laudon and Laudon (2006)**, and **O'Brien and Marakas (2007)** support the study of fundamentals and general principles of data systems.

To improve the performance of distribution operations and, in this specific case, the internal material handling process, it is important to consider both human and technical factors (**Chakravorty, 2008**). In this sense, this study assesses the interior customers' perception of a cloth handling process improvement.

About the attributes to be considered in a material handling system (**Kulak (2005)**), the effective use of labor, providing system flexibility, increasing productivity, decreasing lead times and costs are some of the most important factors influencing the selection of material handling equipment. These factors are directly associated with some attributes found within the present study.

The determination of a cloth handling system involves both the choice of suitable material handling equipment and therefore the assignment of fabric handling operations to every individual piece of kit (**Sujono & Lashkari, 2006**). The material handling system selection will be defined as the selection of material handling equipment to perform the material handling operations within a working area which will be considered all the aspects of the products are said to be handled. In this context, it's important to say that, during this study, only the choice of the fabric handling equipment was considered.

**Thomy Eko Saputro (2015)** has stated that the problem of fabric handling equipment (MHE) within the industry area is widely paid attention to since MHE has contributed to material, good, and merchandise accomplishment. Few methods and software have been proposed and developed to select the most appropriate MHE for a complex selection problem. The context of the choice problem and therefore the approaches are served to spotlight the complex MHE selection consistent with the amount of alternatives provided, to research the consideration for the matter context, and to reveal the superior method for complex MHE selection.

Material handling has become a replacement, complex, and rapidly evolving science. Material handling cannot be avoided in logistics but can be reduced to minimum levels. Material handling system (MHS) design has said to have a direct influence on the logistics cost. Therefore, improvement of the efficiency of fabric handling system gets more and more people's attention to locates and identifies the wasteful activities regarding the fabric handling, and to streamline the activities to succeed in a minimum of fabric handling. This study has been stated by **(P. Sunderam, E.Viswanathan(2014) .**

In today's competitive technology environment, the implementation of advanced manufacturing technologies and its systems like flexible manufacturing systems (FMS) has become the necessity of manufacturing organizations. Selection of appropriate material handling equipment has been done based on their variables which will affect the effectiveness of the material handling system has become the necessary requirement of FMS. This focuses on the identification of different variables like the speed of delivery, available space, cost and throughput rate, etc. which will affects the effectiveness of the material handling system and prioritization of these variables**(Surinder Kumar (2020).**

ISM may be a well-proven strategy for analyzing the synergic influences of varied attributes to the general system under study. The unique feature of ISM is that it analyzes the attributes supported their driving power and dependence. Within the current study, the ISM has been developed for a number one telecom service provider operating in various global regions having its headquarters in India. The hierarchy of varied inhibitors was established supported the outcomes of the ultimate reachability metrics. Finally,

MICMAC analysis was administered to categorize the inhibitors into four clusters (**V. R. Pramod, and D. K. Banwet(2010)**).

Nowadays in industries, it is very necessary to use a material handling system to move material from one place to another place continuously to minimize operation time. Various conventional conveyor systems like belt conveyors, bucket elevators, screw conveyors, pneumatic and vibratory conveyors, and roller conveyor systems are utilized in industry, just like the food, chemical, plastic, material processing industry. In our case, the selected industries being run on a small scale certainly have limitations to adopt these conventional material handling systems to convey the powders economically and precisely. In this study, we study different material handling system like conveyor, automatic guided vehicle, robots, hydraulic and pneumatic material handling system (**Deepak Tarbada (2017)**).

**Prof. A.V. Gaur, Prof. Dr. M.S. Pawar(2016)**, To provide a literature review of AGV based material handling system. Among the various factors influencing the design and operation performance of AGV in a manufacturing unit, a literature review on four major factors are undertaken as Throughput, Unit load, Flow path design and Fleet size. The study aims at revealing basic research methodologies/approaches followed, objective function, and problem areas of the material handling systems.

Material Handling (MH) is one among the key issues for each production site and features a great impact on manufacturing costs. The core concern within the design of an MH system is selecting the foremost suitable equipment for each MH operation and optimizing them totally to achieve an optimum solution. The system selects the foremost appropriate MHE types for each MH operation during a given application employing a Fuzzy Knowledge-Based Expert System (**S. Hamid L.Mirhosseyni (2009)**).

The Effective use of labor will provide the system flexibility, increasing productivity, decreasing lead times, and costs are some of the most important factors influencing the selection of material handling equipment. In this study, a decision support system. Consists of a database, a rule-based system, and multi-attribute decision-making modules. This database will include detailed data about the equipment types and their properties. The rule-based system module provides rules, which are utilized by the

inference engine for determining the most proper material handling equipment type. This study was determined by **OsmanKulak(2005)** .

A material handling system can be defined as the movement, handling, storage, and controlling of materials throughout the manufacturing process. The main purpose of using a material handling system is to ensure that the material in the right amount is said to be carefully delivered to the desired destination at the right time at the minimum cost. The material handling system ensures the timely delivery of a desired quantity of material at the desired location with minimum cost and maximum safety. Material handling is not a manufacturing process but involves a substantial amount of product cost and labor. Due to the daily invention of new technologies the material handling equipment is undergoing continuous automation. In today's competitive world, it is a very difficult and complex task to select one alternative from different sets of alternatives especially when the data are vague and inexact. This study will focus on the application of one of the multi-criteria decision-making tools called the Analytical Hierarchy Process (AHP) for the selection of material handling equipment at a local industry to optimize the material handling system. Questionnaires were developed and distributed among experts, employees, and workers working in the industry. The measure of central tendency Mean is calculated from the data was used as the input for the pair-wise exchange matrix. The selection was subject to four criteria with each having three sub-criteria. The overall results showed that the AGV's are more significant for material handling in the pharmaceutical industry when compared to forklifts and conveyor belts (**Aditya A. Kamble, Prof. Pratik A.(2019)**).

In today's competitive world, it is a very difficult and complex task to select one alternative from different sets of alternatives especially when the data are vague and inexact. This study focuses on the application of one of the multi-criteria decision-making tools called the Analytical Hierarchy Process (AHP) for the selection of material handling equipment and distributed among experts, employees, and workers working in the industry (Muhammad Zubair(2019)).

The material handling system has an important impact on the performance of a manufacturing or service system. The material handling equipment (MHE) selection problem is said to generally include the evaluation of a finite number of alternatives which

should be ranked against different qualitative. The synthetic value of judgments method is said to be adopted to convert the assessments stated as linguistics variables (by all experts) for each alternative with respect to each sub-criterion into a single fuzzy weight. Next, the fuzzy weighted average is applied to aggregate the only fuzzy weights of every alternative associated with sub-criteria under each criterion **(Hadi-Vencheh(2015))**.

The selection of suitable material handling equipment for typical conditions and handling environment is found to be a multi-criteria decision-making problem. The selection procedure is said to be found to be unstructured, which is characterized by extensive domain-dependent knowledge, and will require the application of an effective and efficient multi-criteria decision-making tool, such as the analytic hierarchy process (AHP). The relative importance of each criterion, sub-criteria and is measured using pair-wise comparison matrices and the overall ranking of each alternative equipment is then determined **(Shankar Chakraborty (2006))**.

The material handling system ensures the timely delivery of desired quantity o material at the desired location with minimum cost and maximum safety. Material handling is not a manufacturing process but involves a substantial amount of product cost and labor. Due to the daily invention of the latest technologies material-handling equipment is undergoing continuous automation. Wide ranges of material handling equipment are available in the market and it is difficult to select the best one for industries requirement. A material handling system will be chosen in such a way so that to reduce the manufacturing costs and will avoid interruption and damage. On the other side right selection and planning of MH improves productivity, efficiency, and profit of a company. This study focuses on the classification of fabric handling systems. The challenges in selecting the material handling systems were discussed. In this study, an effort is formed to line some guidelines for choosing the simplest material handling system for a specific task out of obtainable ones done by **(Vikas Gupta, Rajesh Bansal, Vineet Kumar Goel 2013)**.

A material handling system can be defined as the movement, handling, storage, and controlling of materials throughout the manufacturing process. The main purpose of employing a material handling system is to make sure that the fabric within the correct quantity is carefully delivered to the specified destination at the proper time at minimum

cost. The material handling system ensures the timely delivery of a desired quantity of fabric at the specified location with minimum cost and maximum safety. Material handling is not a manufacturing process but involves a substantial amount of product cost and labor. Due to the daily invention of the latest technologies material handling equipment is said to undergo continuous automation. Wide ranges of material handling equipment are available in the market and it is difficult to select the best one for industries requirements. A material handling system should be chosen in such how so that to scale back manufacturing costs and avoid interruption and damage. On the other side, the right selection and planning of MH improve the productivity, efficiency, and profit of a company for material handling **(Aditya A. Kamble, Prof. Pratik A, 2019)**.

Better utilization of manpower, providing product edibility, increasing productivity, decreasing lead time, reduction in handling cost, increased efficiency of material flow, and enhancement of production process are some of the most important issues which are influencing the material handling (MH) equipment selection decision. As a good sort of MH equipment is out there today, selection of the right equipment for a designed manufacturing system may be a complicated task. The selection of suitable Material handling equipment for a typical handling environment is found to be a multicriteria decision-making (MCDM) problem. As the selection process is found to be unstructured, characterized by domain-dependent knowledge, there's a requirement to use an efficient MCDM tool to pick the foremost suitable MH equipment for the given application. **(Prasad Karande,Shankar Chakraborty,2013)**.

The material handling system has a crucial impact on the performance of a producing or service system. The fabric handling equipment (MHE) selection problem generally includes the evaluation of a finite number of alternatives which should be ranked against different qualitative or quantitative criteria or sub-criteria. Accordingly, such a drag is often considered a multi-criteria decision-making problem. Thus, during this article, the voting approach is first won't to weight criteria and sub-criteria, by introducing the assessment grades like very low importance, low importance, moderate importance, high importance, and really high importance. The synthetic value of judgments method is then adopted to convert the assessments stated as linguistics variables (by all experts) for every alternative with reference to each sub-criterion into one fuzzy weight. Next, the fuzzy

weighted average is applied to aggregate the only fuzzy weights of every alternative associated with sub-criteria under each criterion **(A. Hadi-Vencheh & A. Mohamadghasemi, 2015)**.

It describes a rule-based expert system, MATHES (MATerial Handling Equipment Selection), which selects the appropriate types of material handling equipment for intra-factory moves of unitized material. The equipment types are chosen by applying heuristic selection rules (acquired from a person's expert) to responses from a user concerning relevant details about the characteristics of a cloth move. The heuristic rules relate characteristics of the move to appropriate sorts of material handling equipment. Associated with each selected equipment type may be a factor which will be wont to order the list of selected equipment on each type's degree of appropriateness **(FISHER, E. L., FARBER, J. B., AND KAY, M. G, 1988)**.

For material handling system design, material handling equipment selection is that the first stage. Also, the material handling system and facility layout design problems are coupled. Solving these problems needs consideration of those three different problems. The right material handling equipment selection and good design of the material handling system and facility layout can increase productivity and reduce investments and operations costs. In this study, after describing the fabric handling equipment selection and pre-design of fabric handling systems problems and explaining their complexity and solution approaches, it's shown that material handling equipment selection and the pre-design of a material handling system are said to be combined by using a knowledge-based approach. **( R. Yaman, 2001)**.

Material handling features a very old and vast history. Within the evaluation and implementation of a cloth handling system, multiple factors should be considered, including the plant facilities, the machinery, the fabric handling equipment, and in fact, the people involved. During this study, the general revive of principles of fabric handling systems and various material handling systems utilized in the foundry is **taken (Kumbhar P.M., Ballal Y.P and Pawar G.B, 2015)**.

In today's rapid climb of industrialization got to meet the goal of every and each industry. Material handling system design features a direct influence on the general cost. Any

industry looks for its profit higher the production more will be the profit. Design and analysis of material handling systems (chain conveyors) are discussed in this study in order to improve the effectiveness of the organization with reduced cost **(Kulkarni Prabharanjan, Gudhate Saurabh S. , Praveen K Mali, 2016)**.

For material handling system design, material handling equipment selection is that the first stage. Also, the material handling system and facility layout design problems are said to be coupled. Solving these problems needs consideration of those three different problems. The right material handling equipment selection and good design of the material handling system and facility layout can increase productivity and reduce investments and operations costs. In this study, after describing the fabric handling equipment selection and pre-design of fabric handling systems problems and explaining their complexity and solution approaches, it's shown that material handling equipment selection and pre-design of a cloth handling system are often combined by employing a knowledge-based approach **(Atmani, A. & Dutta. S. P,1996)**.

The authors **(Cole, J., Lee, W. D., & Teschke, G, 1987)** present a comprehensive approach to select material handling equipment (MHE) at the assembly line design stage. They defined a two-level MHE typology, namely generic types, and specific equipment, to explain the various available systems. Based on this description, the system identifies the foremost suitable equipment in two stages. At the first stage, the performances of basic types are evaluated for the considered problem. Having chosen one (or more) generic equipment, specific information is employed to gauge and choose the acceptable specific one. The main originality of this study is that the application of a multicriteria decision-aid method called PROMETHEE II, which is embedded into a choice tree. At each selection stage (node of the tree), eligible solutions are ranked consistent with a worldwide evaluation of their performance for the considered parameters. The ranking is computed because of criteria and weights, allowing the user to accurately describe the choice process.

A knowledge-based system called MAHDE (materials handling design) is described that was devised to help facility designers within the selection and configuration of handling equipment. The system implements techniques for representing and acquiring the

preferences of the power designer. This preferential knowledge is said to be incorporated into a knowledge-based system utilizing heuristics to update the operational knowledge about the individual design. The system utilizes preference-directed search to capture improved designs by dynamically acquiring preferences throughout the planning process. **(Gabbert, P. & Brown, D. E ,1989).**

A key task within the material handling system design process is that the selection and configuration of kit for material transport and storage during a facility. Material handling equipment selection may be a complex, and also tedious task, but there are few tools aside from checklists to help engineers in the selection of appropriate, cost-effective material handling equipment. This study will describe the event of an intelligent material handling equipment selection system which is said to be termed as material handling equipment selection advisor (MHESA). The MHESA is said to consist of three modules which are known as :(1) a database which is to store the equipment types with their specifications,(2) a knowledge-based expert system for assisting the material handling equipment selection; and (3) an analytic hierarchy process (AHP) model to settle on the foremost favorable equipment type. The concept proposed during this paper can automate the planning of a cloth handling equipment selection system and provides AI within the decision-making process **(Chan, F.T.S.,Ip,R.W.L,& Lau, H.,2001).**

According to the author **(Hassan. M.M.D.,2014)**, Purpose – The purpose of this paper is to evaluate expert systems (ES) for the selection of material handling (MH) equipment on their use of information and generation of equipment, and provide guidelines that will enhance developing them within the future. Design/methodology/approach – Data envelopment analysis (DEA) is employed to gauge the efficiency of ES on their use of data and generation of kit. Characteristics of benchmark ES are identified to function guidelines in developing future ES. Findings – Results of the DEA indicate that most ES use a large amount of information that does not commensurate with the number and variety of equipment they generate. Research limitations/implications – the perfect MH equipment for a situation isn't known whether it's selected by ES or other procedures. Therefore, this study focuses on the efficiency of ES in using the information to generate MH equipment without regard to whether ES produces the right equipment for a situation or not. Practical implications – Developers of future ES should consider the efficiency of

an ES in using information and generation of kit, additionally to considering its functions and methodologies. They should utilize means almost like those employed by benchmark methodologies and other ones which will be thought of to economize information and generate more number and sort of equipment, and thus render ES which will be more useful to facility designers and manufacturing managers. Originality/value – The paper presents the primary evaluation of ES for the choice of MH equipment. The evaluation performed should enhance the development of future ES in this field and can be extended to ES in other application domains.

The selection of suitable material handling equipment (MHE) could also be a really difficult task for manufacturing companies thanks to the considerable capital investment required. There are many tangible and intangible factors for choosing a suitable MHE. Multiple criteria decision-making (MCDM) is said to be a useful approach to analyze these conflicting factors. The evaluation of MHE alternatives within the frame of varied subjective criteria and therefore the weights of the standards are usually expressed in linguistic terms. This makes symbolic logic a more natural approach to the present quiet problem. This study proposes a combined MCDM methodology for the evaluation and selection of MHE types for a company in the steel construction industry in Istanbul, Turkey. Fuzzy analytic network process (FANP) is said to be employed for assigning weights of the standards for MHE selection and fuzzy technique for order preference by similarity which is given for the ideal solution (TOPSIS) is used to determine the foremost proper system alternative using the standards weights attained by FANP and also will be followed by the sensitivity analyses of the results. The selection is predicated on the compatibility between MHE and production characteristics. The objective is to select the most efficient MHE considering also the cost-efficiency (**Onut, S., Kara, S.S., & Mert.S, 2009**).

Material handling equipment selection problem (MHESP) is a crucial decision-making area for companies since it's an immediate effect on manufacturing and repair productivity. In this study, an integrated fuzzy multi-criteria decision-making methodology for MHESP is said to be the proposed approach. The proposed approach is employed from fuzzy sets, Analytic Network Process (ANP), and Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE) approaches. Evaluation criteria for

the MHESP are weighted by the fuzzy-ANP (F-ANP) approach, then, the alternative material handling equipment is said to be evaluated by the fuzzy-PROMETHEE (F-PROMETHEE) approach. The methodology is applied for a producing company to prove its effectiveness. Finally, some sensitivity analyses are conducted to point out the results' sensitiveness to the changes of the weights of the evaluation criteria (**Tuzkaya, G., Gülsün, B., Kahraman, C., & Özgen, D., 2010**).

Material-handling systems can be defined as movement, handling, storage, and controlling of materials throughout the manufacturing process (**Nandkumar Patil, et. al., 2017**). The main purpose of employing a material handling system is to make sure that the fabric within the correct quantity is carefully delivered to the specified destination at the proper time at minimum cost. Helical compression springs are generally wont to absorb the energy thanks to the impacts and to make a versatile link that deflects under loading and restores the objects to the normal position where the disturbing forces are said to be removed.

An attempt is said to review the considerations for material flow design problems such as the material handling equipment selection, flow path design, facility layout design, routing, etc which is given for the related product design in the Industry (**Abhilasha Dongre, et. al., 2015**).

Ergonomics is the foremost concern in almost all fields. In industrial cases, ergonomics has become important that works on the reduction of human efforts. Material Handling Equipment (MHE) is designed to eliminate human efforts for storage and transportation in logistics. The major components of the steering company (Rane Madras Limited, Mysore Plant) are ball pins, sockets, bars, tubes, and outer columns. In the present work, MHE's are devised for all these components to reduce human effort, eliminate unloading charges, and optimizing the counting time that is incorporated during the in-warding of materials (**Rajesh A S, 2015**).

The highly competitive environment, linked to the globalization phenomena, demands from companies more agility, better performance, and therefore the constant look for cost reduction. The present study focused on improvements in internal handling management, approaching the case of an outsized company within the automotive industry. Materials handling is intrinsically associated with production flow. Because of this, it has a direct influence on transit time, resource usage, and service levels. The objective was to evaluate, systematically, the impact of implemented changes in materials handling management on the internal customers' perceptions of cost, safety in service, service reliability, agility, and overall satisfaction. It is possible to suggest that internal customers understood that the new materials handling management system enlarged service agility and reliability and reduced costs, which caused an improvement in overall satisfaction. This study was done by **(Vieira, Guilherme Bergmann Borges, Giovana Savitri Pasa, Maria Beatriz Nunes Oliveira Borsa, Gabriel Sperandio Milan, and Alberto Pandolfo, 2010)**.

This study develops and describes a scientific computer-assisted methodology for the choice of fabric handling equipment (MHE). A microcomputer-based system which is termed the ADVISOR models the fabric handling equipment selection process and will employ the information on 77 of the foremost common equipment types utilized in material transport, positioning, unit formation, and storage. The system identifies the acceptable equipment type for an application in two stages. At the first stage, potential equipment types are identified through the utilization of physical requirements of the fabric handling activities specified by users. Eligible equipment is ranked according to their normalized accumulated rating and placed in a candidate equipment list. After this, the second stage will involve an economic analysis for each eligible piece of equipment that is performed. The evaluation criteria which is provided by ADVISOR will include the present worth (PW), equivalent uniform annual cost (EUAC), and return on investment (ROI), and payback period (PP) methods. Through ADVISOR, the expert-like MHE selection system recommends a ranked set of the kit-supported user input files. An example problem is given within the study to demonstrate the utilization of the system **(H.-K. Chu, P. J. Egbelu, Ch.-T. Wu, 1995)**.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

Questionnaire method requires customers to fill out the forms. It's one of the most widely used research methodology because it's inexpensive to create and easy to distribute to numerous individuals at a faster rate. Questionnaires can have different question forms, such as open-ended questions, multiple choice, checklists or a mix of all of them.

#### **3.1 RESEARCH DESIGN:**

Sampling is a procedure to draw conclusions about significant group of Respondents by studying a small sample of the total population. A sample is a section of the population selected to present the population as a whole. Ideally the sample should be representative so that the researches can make accurate estimate of the thoughts and behaviors of the large populations.

#### **3.2 SOURCES OF DATA:**

##### **3.2.1 Primary Data:**

Primary data collection is necessary when a researcher cannot find the data needed in secondary sources. Three basic means of obtaining primary data are observation, surveys, and experiments. The choice will be influenced by the nature of the problem and by the availability of time. For this research study Questionnaire was the Primary Data source which is collected from the employee of Meythoma International.

##### **3.2.2 Secondary Data:**

Secondary data was collected from Journals, Books, Websites, company report and Research article to add value to the research.

#### **3.3 SAMPLE DESIGN:**

Survey method is employed to collect the data from the respondents and the data are collected with the help of questionnaires. Questionnaire is administered for the respondents. Questionnaire is a standardized form for collecting information to elicit data from the respondents. A questionnaire consists of a set of questions presented to a

responded for his or her answers. The questionnaire prepared in this study was mainly aimed at personal interview, multi-choice questions, and also checklists.

### **3.3.1 SAMPLING METHOD:**

Sampling method we used is Simple random Sampling. Simple random sampling is a method used to call a smaller sample size from a larger population and use it to research and make generalizations about the larger group. The advantages of a simple random sample include its ease of use and its accurate representation of the larger population.

### **3.3.2 SAMPLE SIZE:**

It refers to the number of elements of the population to sample. The sample size of this study is 107 respondents.

### **3.3.3 FIELD WORK:**

Fieldwork is the collection of any kind of information about any kind of observational units, with the exception of research conducted in a laboratory and desk or library research. In survey research, fieldwork in its simplest form is the administration of a questionnaire to a group of target persons. Conducting fieldwork seems straightforward. The researcher has developed a questionnaire, which is presented to a sample of units (typically persons) to be interviewed.

### **3.4 STATISTICAL TOOLS USED:**

Primary data source was applied for the collection of the data from the employee. Data collected are edited and coded by using the tabular columns. This helps in converting the gathered data into a tabulated grouped data.

- Percentage Analysis
- Chart Analysis
- Chi Square
- Anova
- Correlation

### **3.4.1 Percentage Analysis**

It is applied to create a contingency table from the frequency distribution and represent the collected data for better understanding. It refers to a special kind of rates, percentage are used in making comparison between two or more series of data. A percentage is used to determine relationship between the series.

### **3.4.2 Chart Analysis**

It is said to be applied for better understanding of the percentage analysis and it is done via pie, bar charts etc.

### **3.4.3 Chi Square**

The Chi-Square is most regular used to access check of independence when utilizing a tabulation. Cross tabulation displays the distribution of two categorical variables at the same time, with the intersection of the classifications of the variables showing up in the cells of the table. The test of independence surveys whether an association exists between the two factors by comparing the observed pattern of response to the expected pattern if the factors were really independent of each other.

### **3.4.4 ANOVA**

Analysis of variance (ANOVA) is a statistical technique that is used to check if the means of two or more groups are significantly different from each other. ANOVA checks the impact of one or more factors by comparing the means of different samples. The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of three or more independent groups.

### **3.4.5 Correlation**

Correlation is a term that refers to the strength of a relationship between two variables. A strong, or high, correlation means that two or more variables have a strong relationship with each other while a weak, or low, correlation means that the variables hardly related. It is used to measure the strength of a linear association between two variables, where the value  $r = 1$  means a perfect positive correlation and the value  $r = -1$  means a perfect negative correlation.

## CHAPTER 4

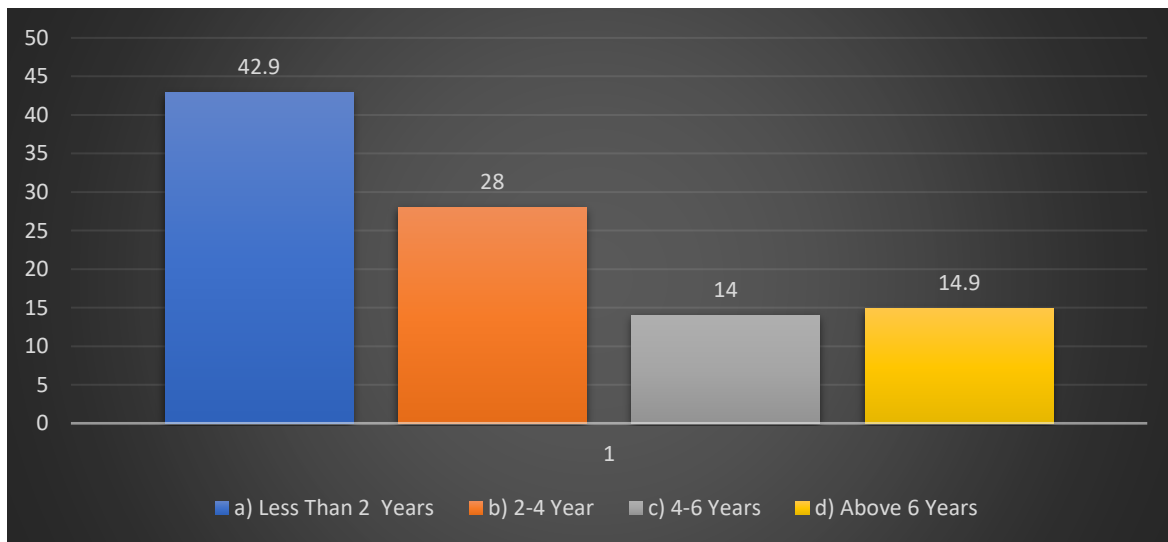
### DATA ANALYSIS AND INTERPRETATION

#### 4.1 Percentage Analysis

**Table 4.1.1: Experience of the respondents**

| S.No | Particulars          | No of Respondent | Percentage of Respondent |
|------|----------------------|------------------|--------------------------|
| 1    | a) Less Than 2 Years | 46               | 42.9                     |
| 2    | b) 2-4 Year          | 30               | 28                       |
| 3    | c) 4-6 Years         | 15               | 14                       |
| 4    | d) Above 6 Years     | 16               | 14.9                     |
|      | Total                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.1: Experience of the Respondents**

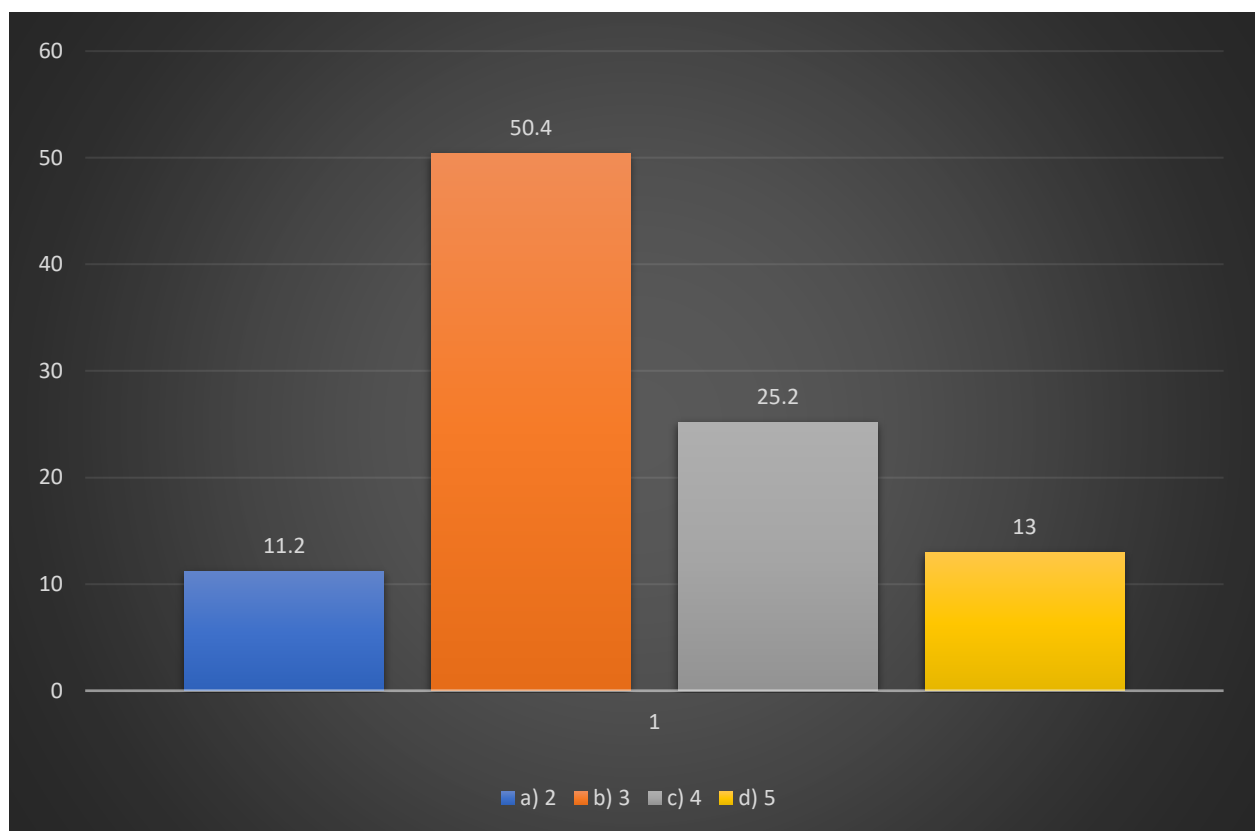
#### Interpretation:

From the above table, it is observed that around 42.9% have responded that they are less than 2 years, and the remaining 14% have responded that they are 4-6 years.

**Table 4.1.2: Processing equipments in Meythoma International**

| S.No | Particulars | No of Respondent | Percentage of Respondent |
|------|-------------|------------------|--------------------------|
| 1    | a) 2        | 12               | 11.2                     |
| 2    | b) 3        | 54               | 50.4                     |
| 3    | c) 4        | 27               | 25.2                     |
| 4    | d) 5        | 14               | 13                       |
|      | Total       | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.2: Processing equipments in Meythoma International**

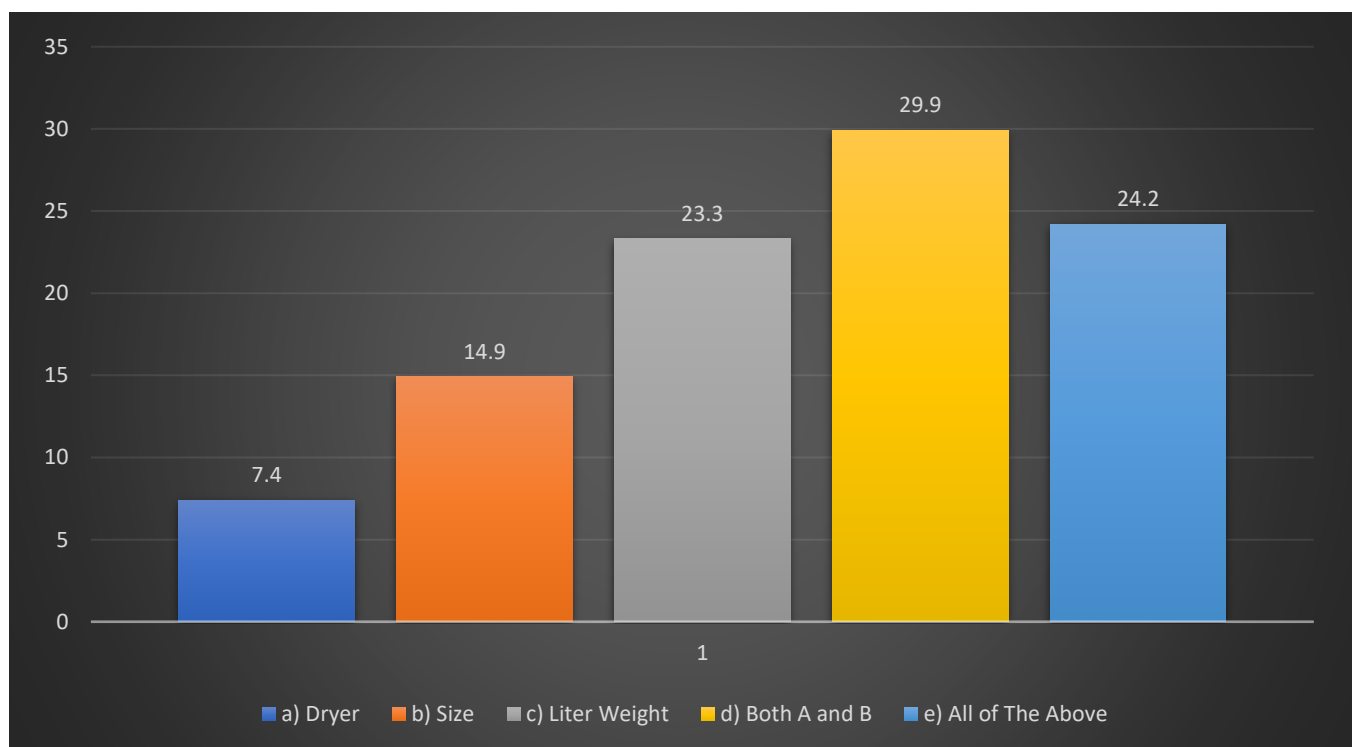
**Interpretation:**

From the above table, it is observed that around 50.4% have responded that there are 3 processing equipments in Meythoma, and the remaining 11.2% have responded that there is only 2 equipments.

**Table 4.1.3: Equipment dealt with while processing**

| S.No | Particulars         | No of Respondent | Percentage of Respondent |
|------|---------------------|------------------|--------------------------|
| 1    | a) Dryer            | 8                | 7.4                      |
| 2    | b) Size             | 16               | 14.9                     |
| 3    | c) Liter Weight     | 25               | 23.3                     |
| 4    | d) Both A and B     | 32               | 29.9                     |
| 5    | e) All of The Above | 26               | 24.2                     |
|      | Total               | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.3: Equipment dealt with while processing**

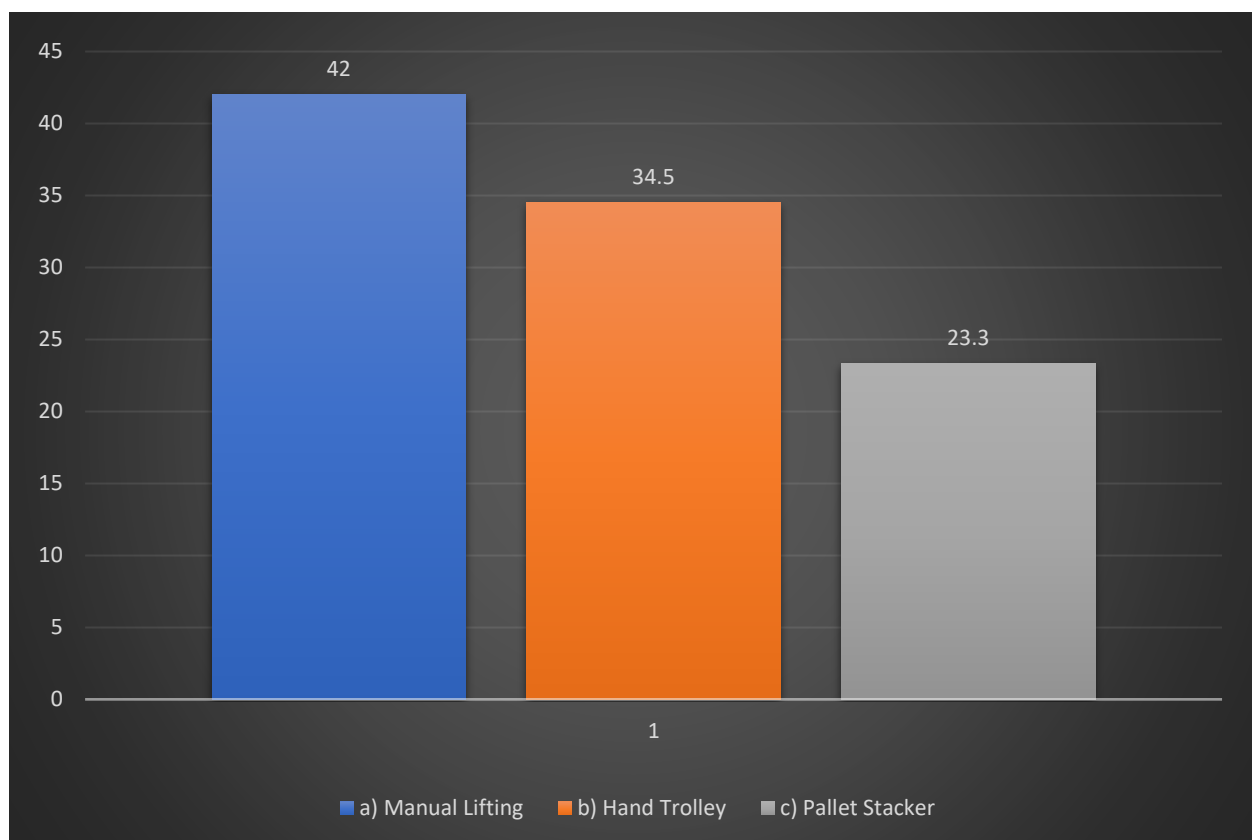
**Interpretation:**

From the above table, it is observed that around 29.9% of the respondents deal with dryer and size and the remaining 7.4% of the respondents deal with the all the major requirements.

**Table 4.1.4: Type of equipment used for material handling in meythoma international for loading**

| S.No | Particulars       | No of Respondent | Percentage of Respondent |
|------|-------------------|------------------|--------------------------|
| 1    | a) Manual Lifting | 45               | 42                       |
| 2    | b) Hand Trolley   | 37               | 34.5                     |
| 3    | c) Pallet Stacker | 25               | 23.3                     |
|      | Total             | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.4: Type of equipment used for material handling in meythoma international for loading**

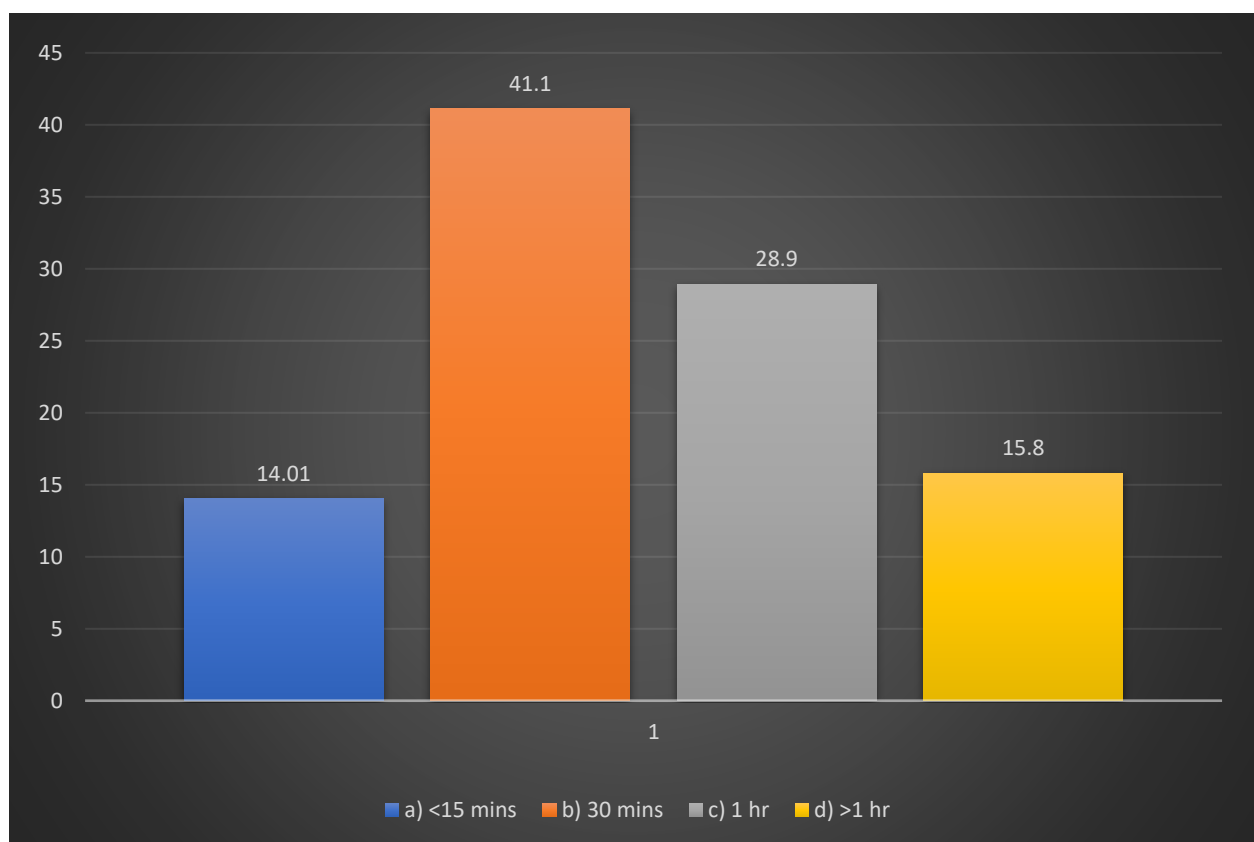
**Interpretation:**

From the above table, it is observed that around 42% of the respondents have used the manual lifting, and the remaining 23.3% of the respondents are pallet stacker.

**Table 4.1.5: How much time taken to load the material of 1000kg manually**

| S.No | Particulars | No of Respondent | Percentage of Respondent |
|------|-------------|------------------|--------------------------|
| 1    | a) <15 mins | 15               | 14.01                    |
| 2    | b) 30 mins  | 44               | 41.1                     |
| 3    | c) 1 hr     | 31               | 28.9                     |
| 4    | d) >1 hr    | 17               | 15.8                     |
|      | Total       | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.5: How much time taken to load the material of 1000kg manually**

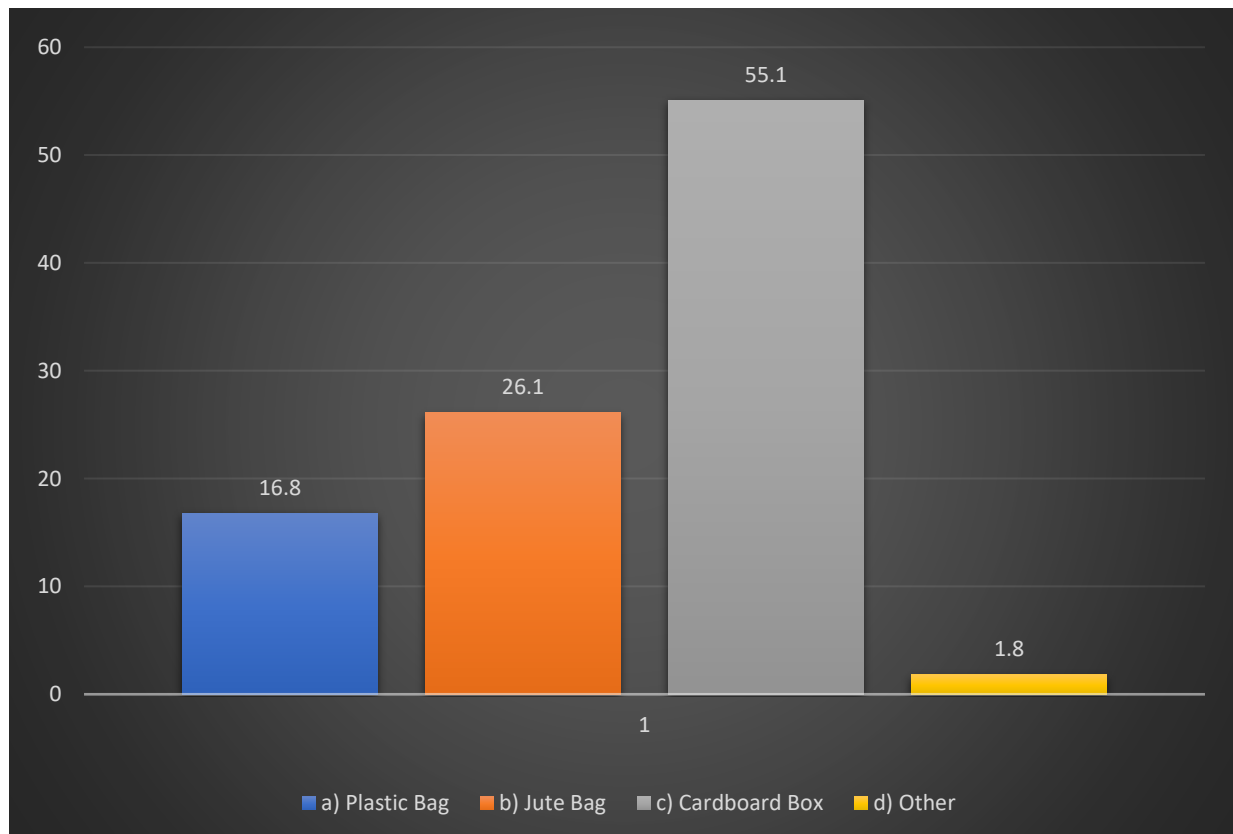
**Interpretation:**

From the above table, it is observed that around 41.1% of the respondents have taken 30 minutes time to load the material and the remaining 14.01% is greater than 15 minutes.

**Table 4.1.6: Type of bags used for the packaging the material during delivery**

| S.No | Particulars      | No of Respondents | Percentage of Respondent |
|------|------------------|-------------------|--------------------------|
| 1    | a) Plastic Bag   | 18                | 16.8                     |
| 2    | b) Jute Bag      | 28                | 26.1                     |
| 3    | c) Cardboard Box | 59                | 55.1                     |
| 4    | d) Other         | 2                 | 1.8                      |
|      | Total            | 107               | 100                      |

**Source: Primary Data**



**Chart 4.1.6: Type of bags used for the packaging the material during delivery**

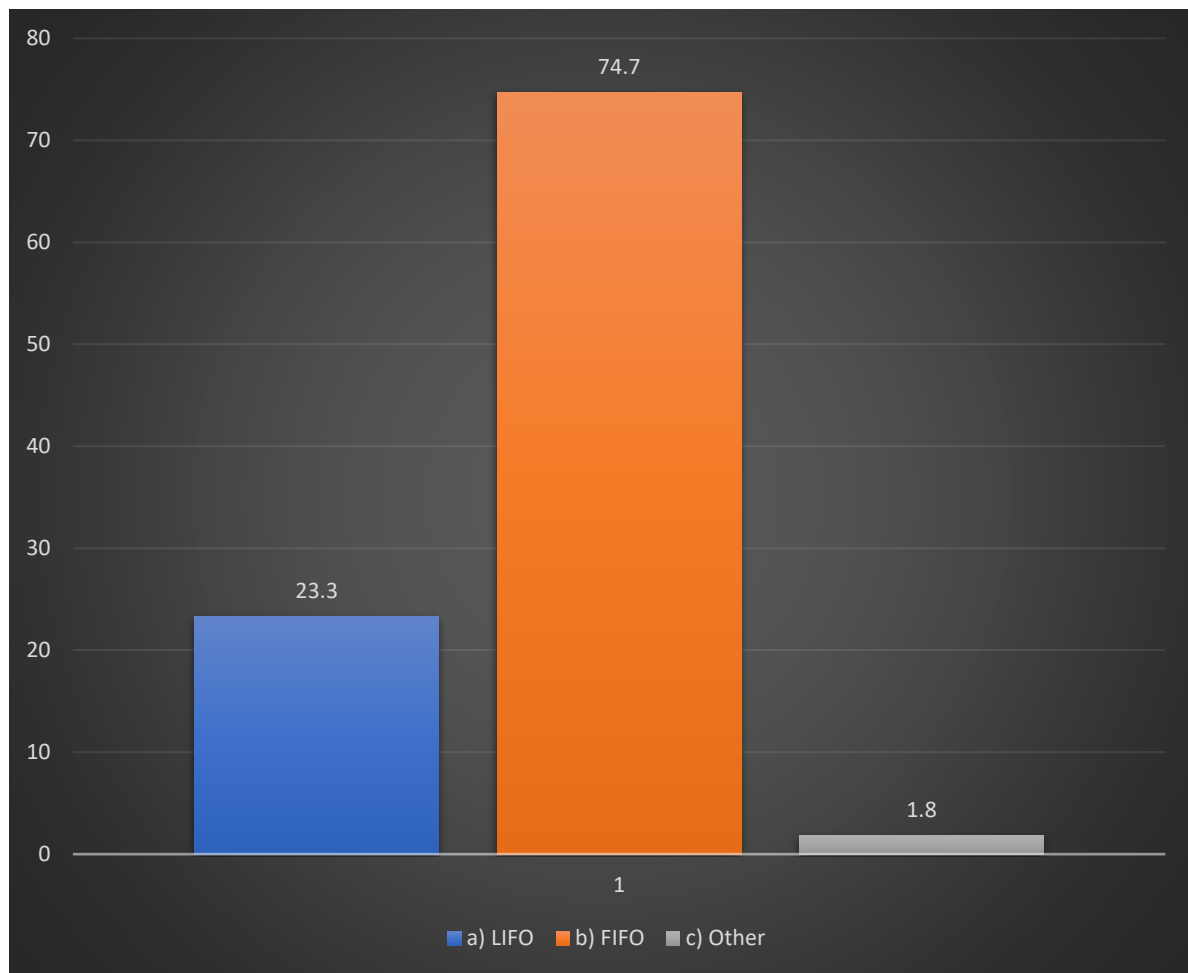
**Interpretation:**

From the above table, it is observed that around 55.1% of the respondents have used cardboard box and the remaining 1.8% have used other bags.

**Table 4.1.7: Models of Stock Managements**

| S.No | Particulars | No of Respondent | Percentage of Respondent |
|------|-------------|------------------|--------------------------|
| 1    | a) LIFO     | 25               | 23.3                     |
| 2    | b) FIFO     | 80               | 74.7                     |
| 3    | c) Other    | 2                | 1.8                      |
|      | Total       | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.7: Models of Stock Managements**

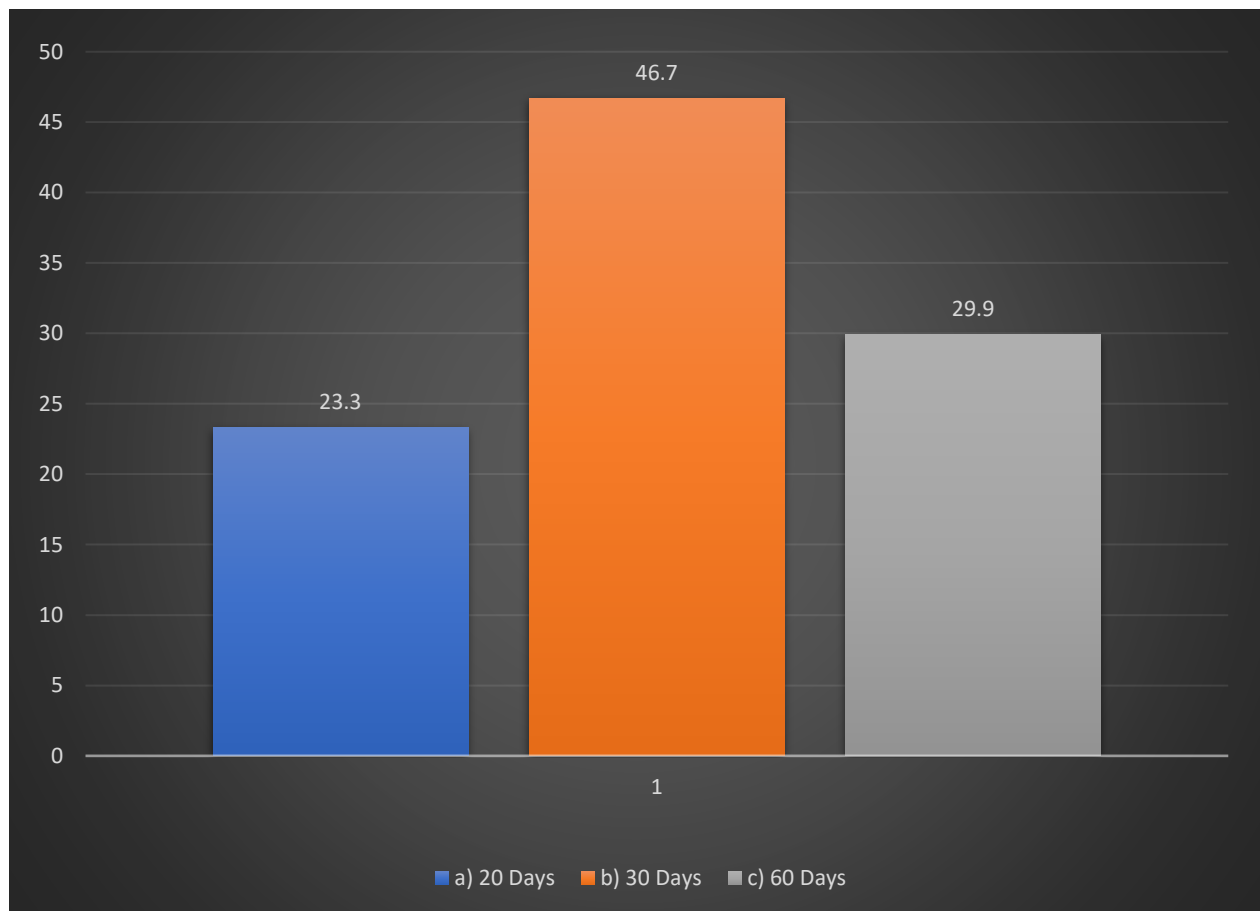
**Interpretation:**

From the above table, it is observed that around 74.7% follows the FIFO model and the remaining 1.8% follows other models of stock management

**Chart 4.1.8: Days taken to maintain the inventory of the raw material**

| S.No | Particulars | No of Respondent | Percentage of Respondent |
|------|-------------|------------------|--------------------------|
| 1    | a) 20 Days  | 25               | 23.3                     |
| 2    | b) 30 Days  | 50               | 46.7                     |
| 3    | c) 60 Days  | 32               | 29.9                     |
|      | Total       | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.8: Days taken to maintain the inventory of the raw material**

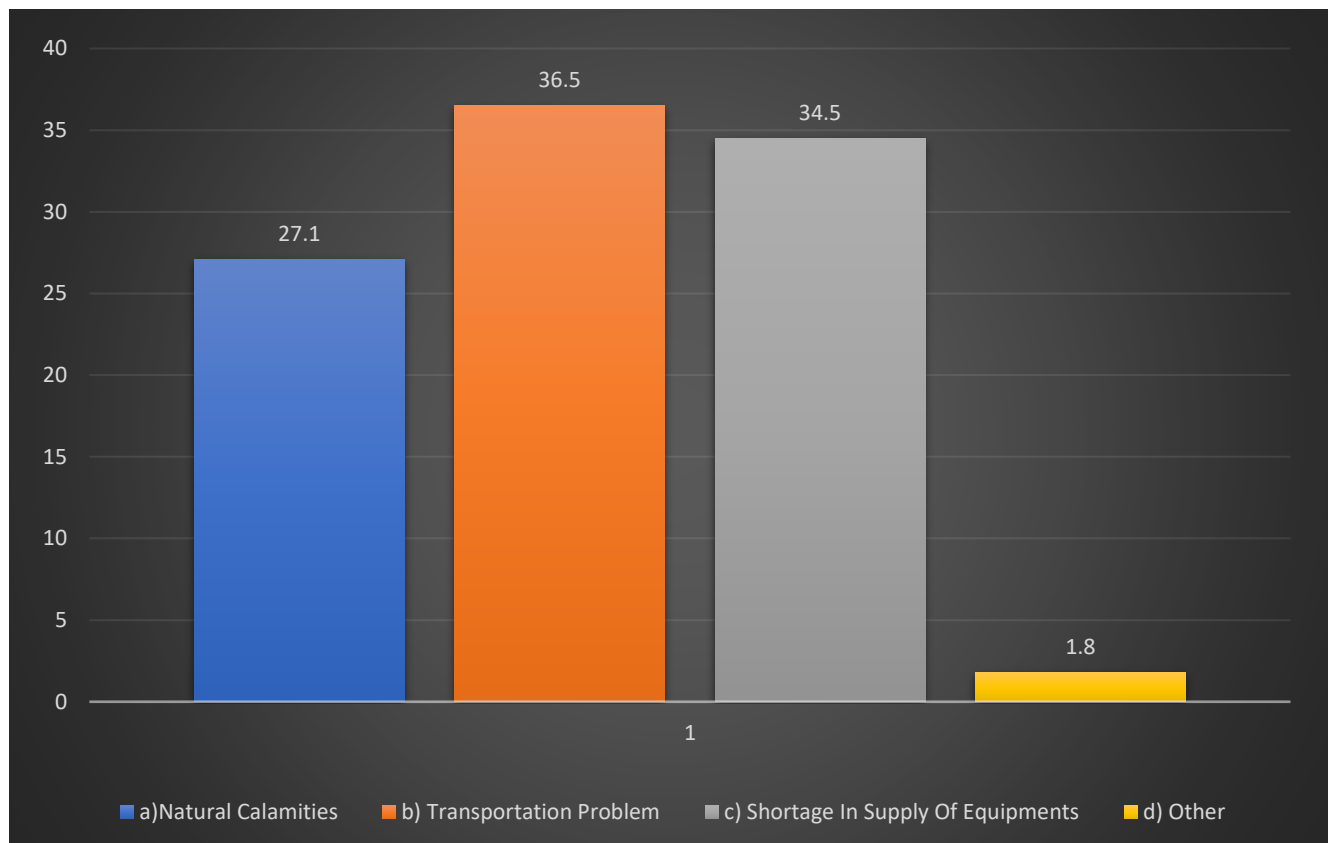
**Interpretation:**

From the above table, it is observed that around 46.7% of the respondents 30 days to maintain the inventory of raw materials, and the remaining 23.3% of the respondents takes 20 days.

**Table 4.1.9: Problems facing while handling the material**

| S.No | Particulars                         | No of Respondent | Percentage of Respondent |
|------|-------------------------------------|------------------|--------------------------|
| 1    | a)Natural Calamities                | 29               | 27.1                     |
| 2    | b) Transportation Problem           | 39               | 36.5                     |
| 3    | c) Shortage In Supply Of Equipments | 37               | 34.5                     |
| 4    | d) Other                            | 2                | 1.8                      |
|      | Total                               | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.9: Problems facing while handling the material**

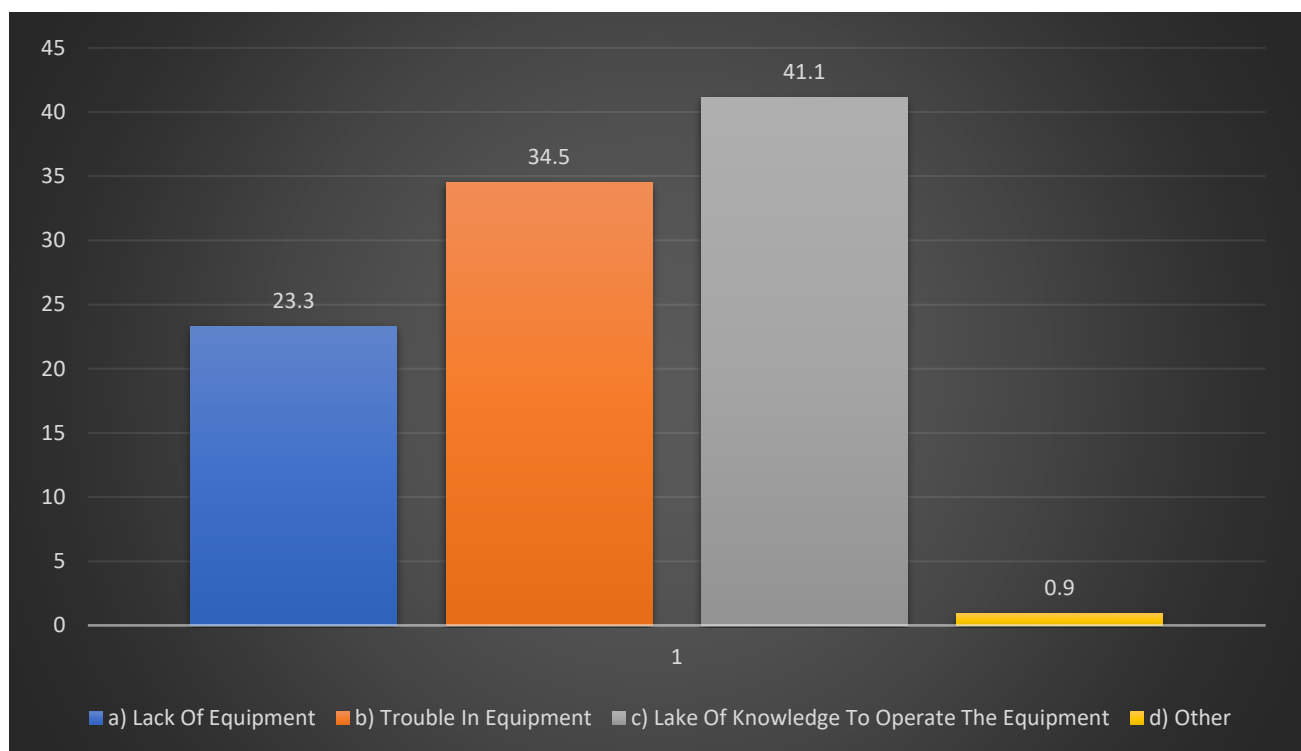
**Interpretation:**

From the above table, it is observed that around 36.5% have faced the transportation problem, and the remaining 1.8% are others

**Table 4.1.10: Major Problems to be considered in handling the equipment**

| S.No | Particulars                                   | No of Respondent | Percentage of Respondent |
|------|-----------------------------------------------|------------------|--------------------------|
| 1    | a) Lack Of Equipment                          | 25               | 23.3                     |
| 2    | b) Trouble In Equipment                       | 37               | 34.5                     |
| 3    | c) Lake Of Knowledge To Operate The Equipment | 44               | 41.1                     |
| 4    | d) Other                                      | 1                | 0.9                      |
|      | Total                                         | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.10: Major Problems to be considered in handling the equipment**

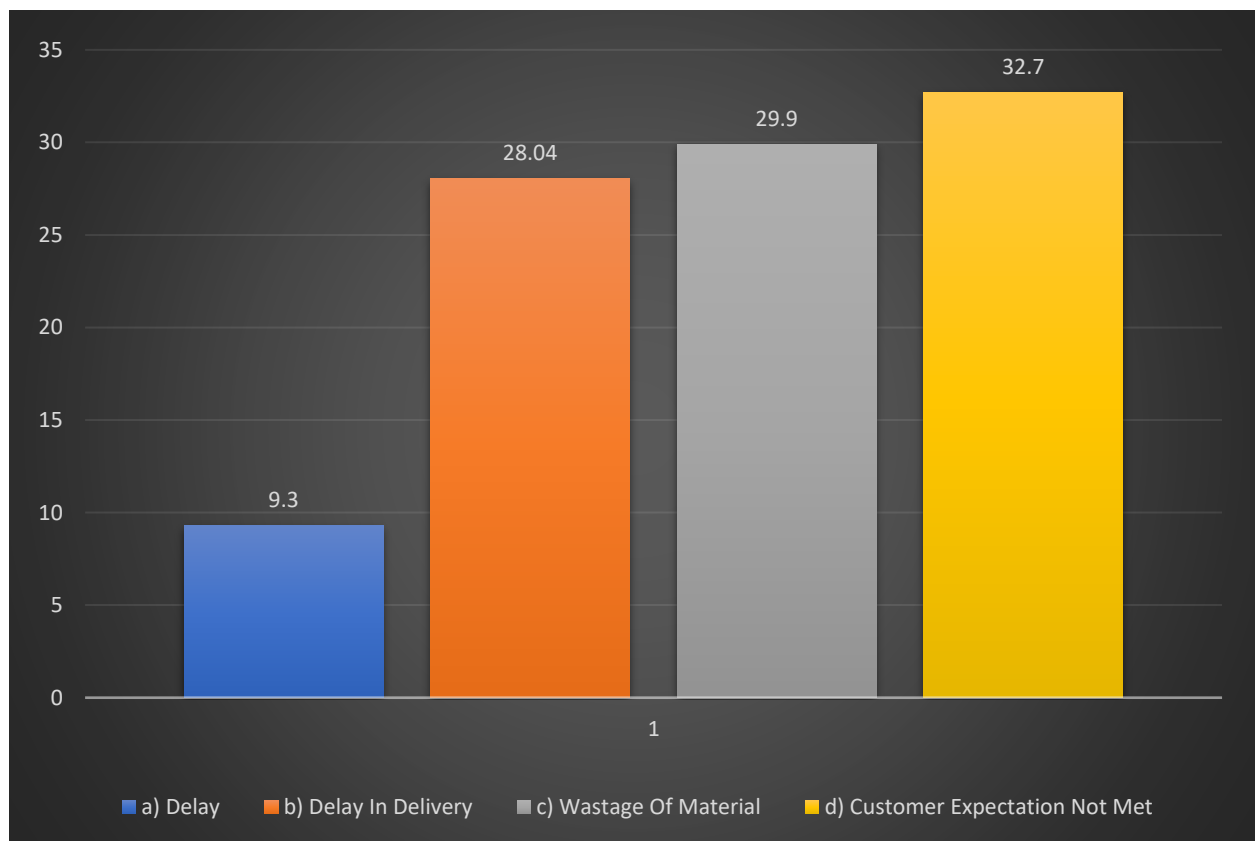
**Interpretation:**

From the above table, it is observed that around 41.1% have lack of knowledge to operate the equipment and the remaining 0.9% are others.

**Table 4.1.11: Impact of the problem faced in material handling**

| S.No | Particulars                     | No of Respondent | Percentage of Respondent |
|------|---------------------------------|------------------|--------------------------|
| 1    | a) Delay                        | 10               | 9.3                      |
| 2    | b) Delay In Delivery            | 30               | 28.04                    |
| 3    | c) Wastage Of Material          | 32               | 29.9                     |
| 4    | d) Customer Expectation Not Met | 35               | 32.7                     |
|      | Total                           | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.11: Impact of the problem faced in material handling**

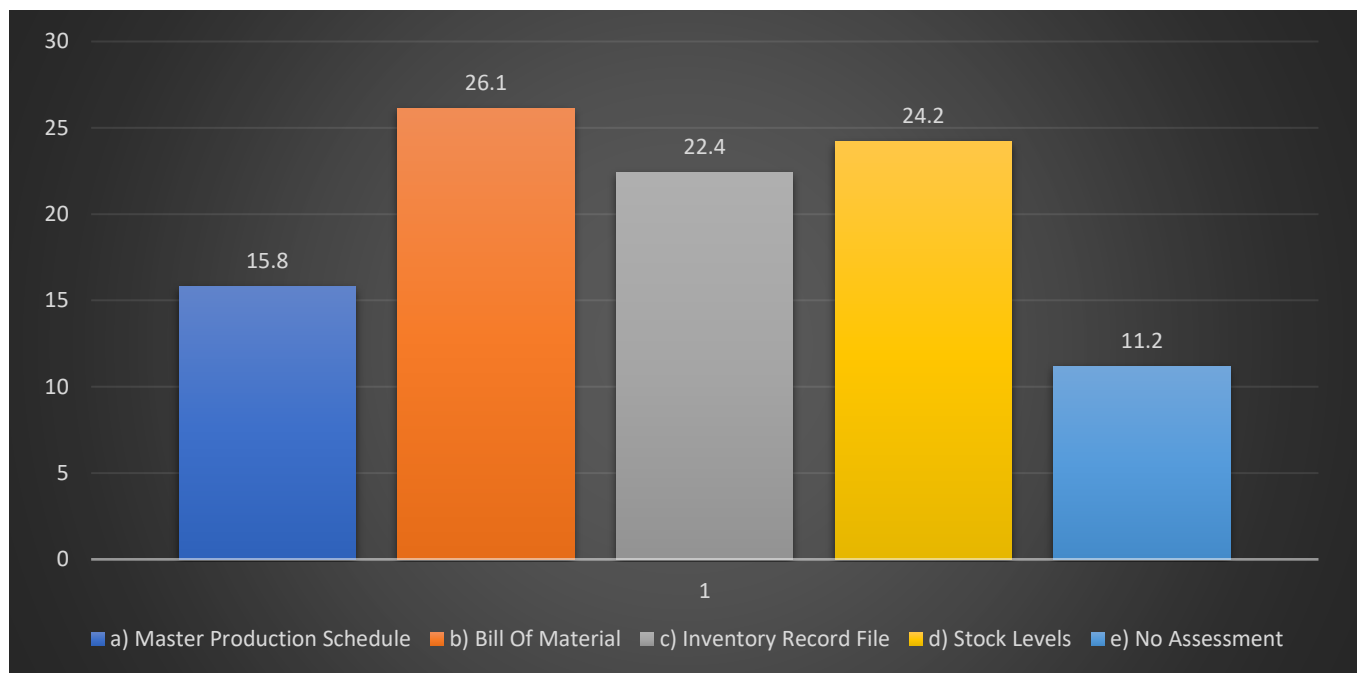
**Interpretation:**

From the above table, it is observed that around 32.7% has the impact of the problem faced when the customer expectation are not met and the remaining 9.3% have some delay.

**Table 4.1.12: Assessments tools used for proper material handling**

| S.No | Particulars                   | No of Respondent | Percentage of Respondent |
|------|-------------------------------|------------------|--------------------------|
| 1    | a) Master Production Schedule | 17               | 15.8                     |
| 2    | b) Bill Of Material           | 28               | 26.1                     |
| 3    | c) Inventory Record File      | 24               | 22.4                     |
| 4    | d) Stock Levels               | 26               | 24.2                     |
| 5    | e) No Assessment              | 12               | 11.2                     |
|      | Total                         | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.12: Assessments tools used for proper material handling**

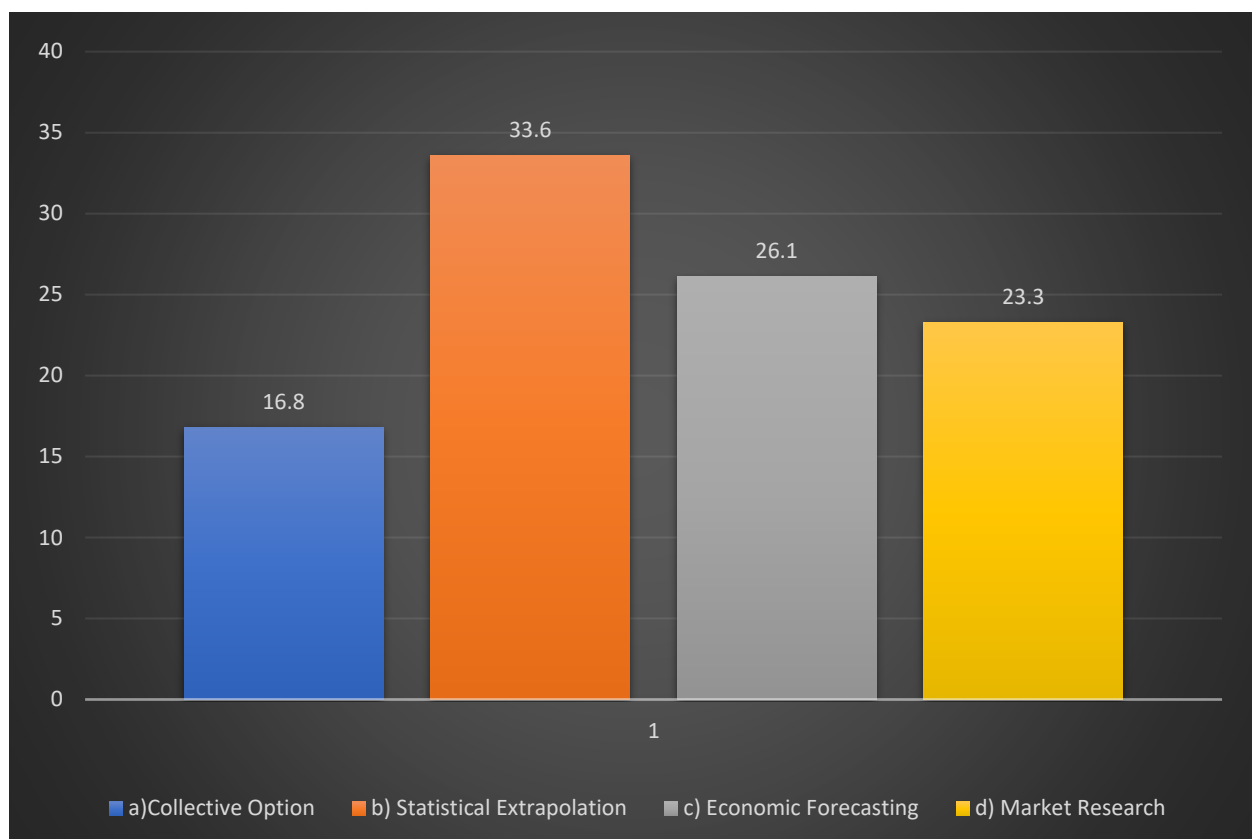
**Interpretation:**

From the above table, it is observed that around 26.1% have responded that there is bill of material and the remaining 11.2% have no assessment for proper handling of tools.

**Table 4.1.13: Methods used for determining material handling**

| S.No | Particulars                  | No of Respondent | Percentage of Respondent |
|------|------------------------------|------------------|--------------------------|
| 1    | a)Collective Option          | 18               | 16.8                     |
| 2    | b) Statistical Extrapolation | 36               | 33.6                     |
| 3    | c) Economic Forecasting      | 28               | 26.1                     |
| 4    | d) Market Research           | 25               | 23.3                     |
|      | Total                        | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.13: Methods used for determining material handling**

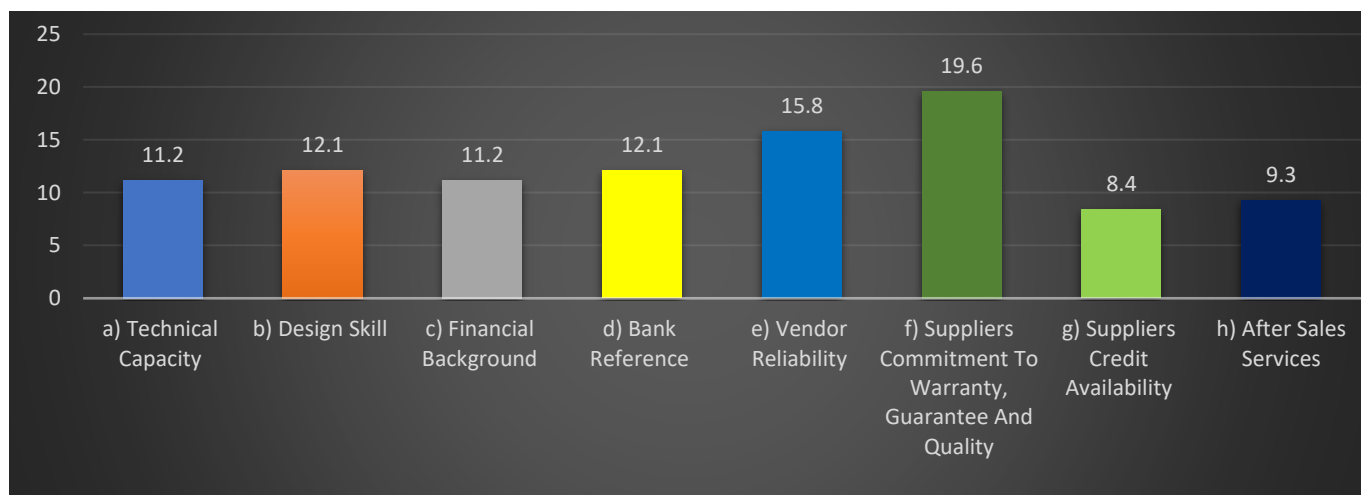
**Interpretation:**

From the above table, it is observed that around 33.6% have responded that they are used in determining the material handling and the remaining 16.8% have collective option.

**Table 4.1.14: Influencing Parameters in the choice of the supplier for material handling**

| S.No | Particulars                                                | No of Respondent | Percentage of Respondent |
|------|------------------------------------------------------------|------------------|--------------------------|
| 1    | a) Technical Capacity                                      | 12               | 11.2                     |
| 2    | b) Design Skill                                            | 13               | 12.1                     |
| 3    | c) Financial Background                                    | 12               | 11.2                     |
| 4    | d) Bank Reference                                          | 13               | 12.1                     |
| 5    | e) Vendor Reliability                                      | 17               | 15.8                     |
| 6    | f) Suppliers Commitment To Warranty, Guarantee And Quality | 21               | 19.6                     |
| 7    | g) Suppliers Credit Availability                           | 9                | 8.4                      |
| 8    | h) After Sales Services                                    | 10               | 9.3                      |
|      | Total                                                      | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.14: Influencing Parameters in the choice of the supplier for material handling**

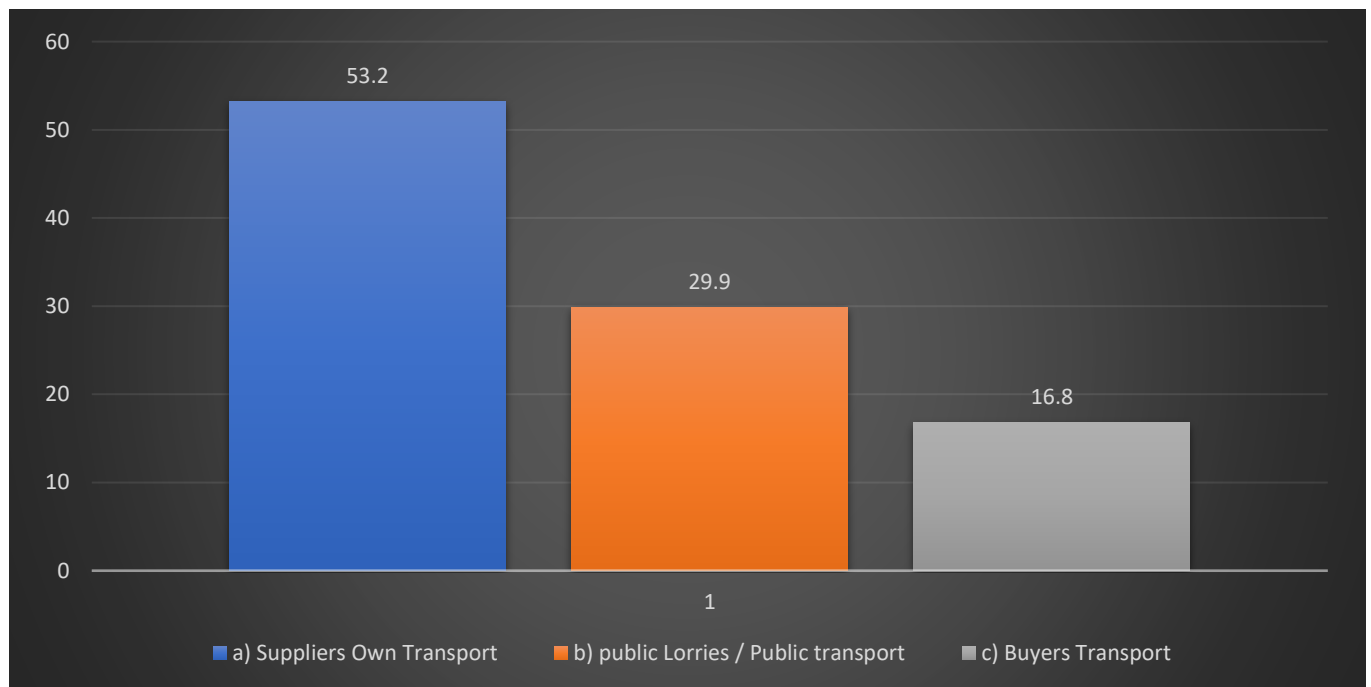
**Interpretation:**

From the above table, it is observed that around 19.6% of the suppliers have commitment to warranty, guarantee and reward quality and the remaining 8.4% of suppliers have credit availability.

**Table 4.1.15: Mode of transportation commonly used by meythoma international for incoming raw material in material handling**

| S.No | Particulars                          | No of Respondent | Percentage of Respondent |
|------|--------------------------------------|------------------|--------------------------|
| 1    | a) Suppliers Own Transport           | 57               | 53.2                     |
| 2    | b) public Lorries / Public transport | 32               | 29.9                     |
| 3    | c) Buyers Transport                  | 18               | 16.8                     |
|      | Total                                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.15: Mode of transportation commonly used by meythoma international for incoming raw material in material handling**

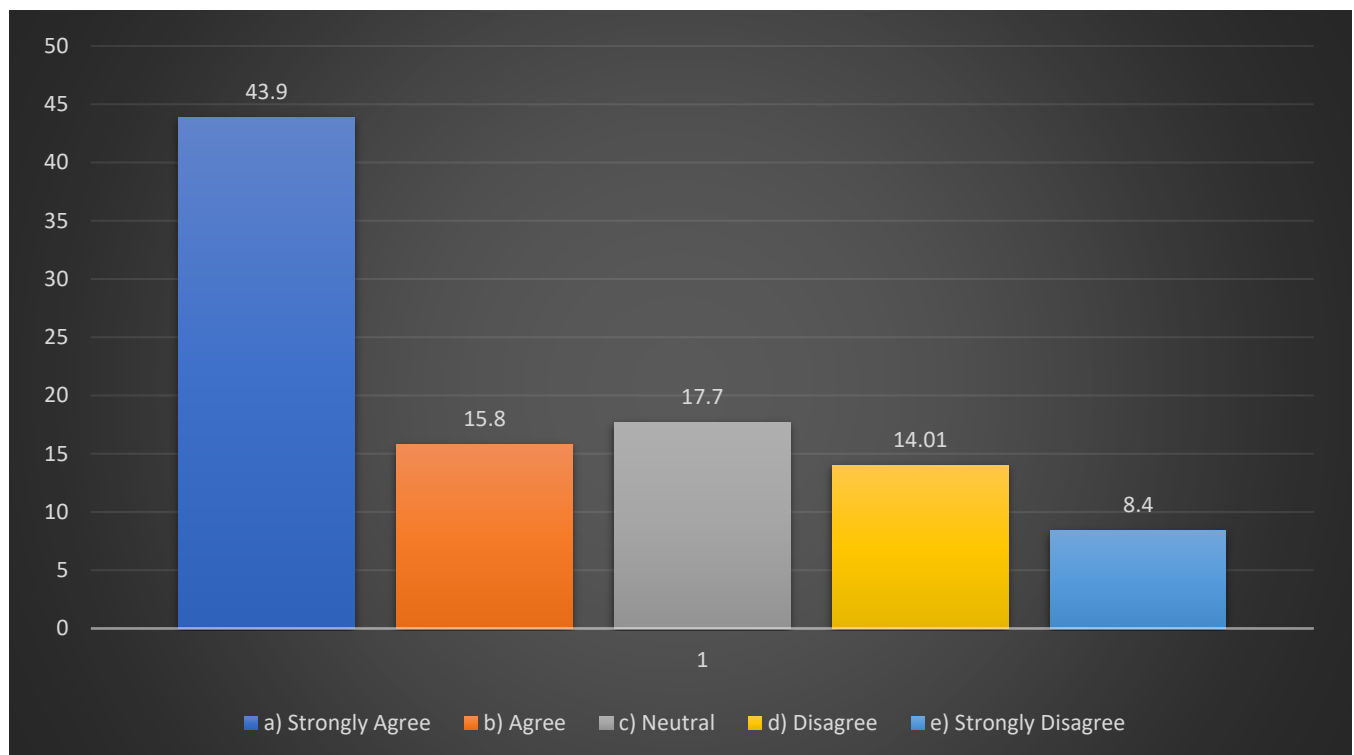
**Interpretation:**

From the above table, it is observed that 53.2% have responded that they commonly use suppliers own transport and the remaining 16.8% have buyers transport.

**Table 4.1.16: Opinion about training provided is very helpful or not for the process**

| S.No | Particulars          | No of Respondent | Percentage of Respondent |
|------|----------------------|------------------|--------------------------|
| 1    | a) Strongly Agree    | 47               | 43.9                     |
| 2    | b) Agree             | 17               | 15.8                     |
| 3    | c) Neutral           | 19               | 17.7                     |
| 4    | d) Disagree          | 15               | 14.01                    |
| 5    | e) Strongly Disagree | 9                | 8.4                      |
|      | Total                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.16: Opinion about training provided is very helpful or not for the process**

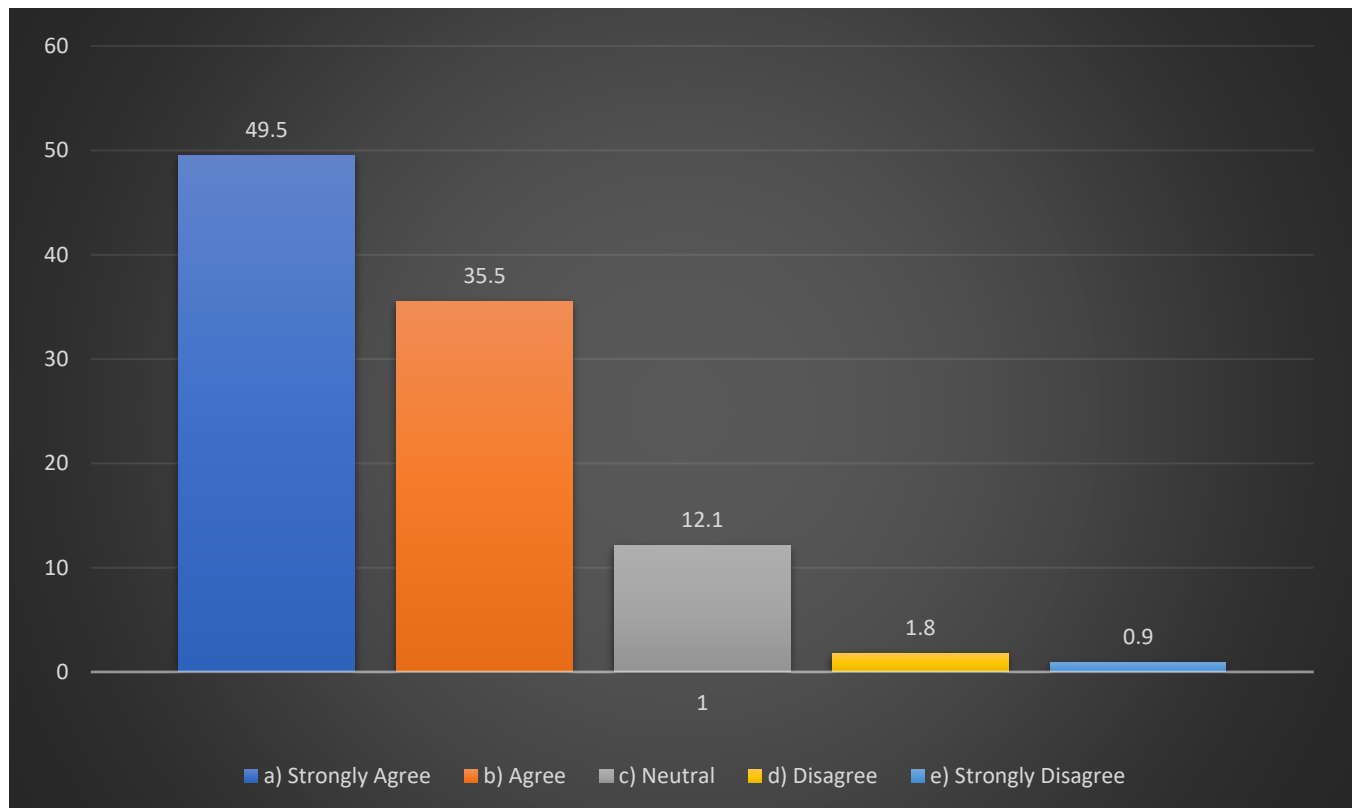
**Interpretation:**

From the above table, it is observed that around 43.9% are strongly agreed with the training provided which is very helpful and the remaining 8.4% are disagreed to the same.

**Table 4.1.17: Interested to adopt any new technology**

| S.No | Particulars          | No of Respondent | Percentage of Respondent |
|------|----------------------|------------------|--------------------------|
| 1    | a) Strongly Agree    | 53               | 49.5                     |
| 2    | b) Agree             | 38               | 35.5                     |
| 3    | c) Neutral           | 13               | 12.1                     |
| 4    | d) Disagree          | 2                | 1.8                      |
| 5    | e) Strongly Disagree | 1                | 0.9                      |
|      | Total                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.17: Interested to adopt any new technology**

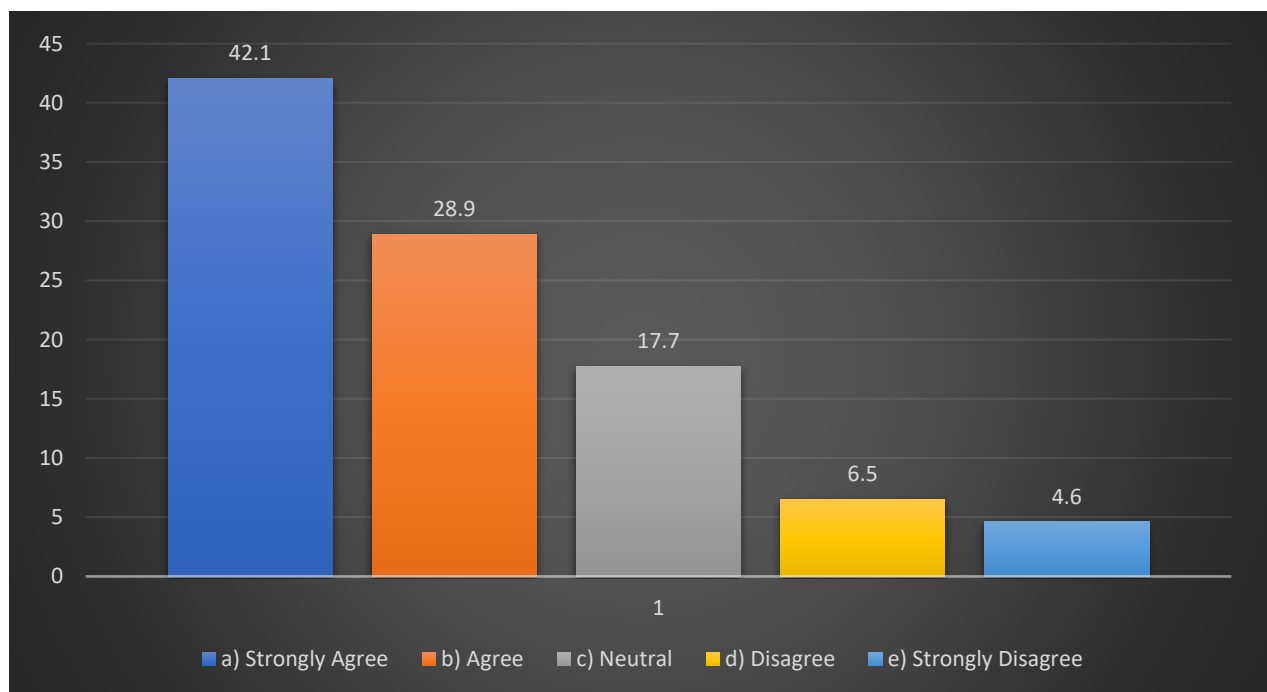
**Interpretation:**

From the above table, it is observed that around 49.5% are agreed with the interest to adopt any new technology and the remaining 0.9% are disagreed to the same.

**Table 4.1.18: Agreement of implementation of alternative methods in material handling**

| S.No | Particulars          | No of Respondent | Percentage of Respondent |
|------|----------------------|------------------|--------------------------|
| 1    | a) Strongly Agree    | 45               | 42.1                     |
| 2    | b) Agree             | 31               | 28.9                     |
| 3    | c) Neutral           | 19               | 17.7                     |
| 4    | d) Disagree          | 7                | 6.5                      |
| 5    | e) Strongly Disagree | 5                | 4.6                      |
|      | Total                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.18: Agreement of implementation of alternative methods in material handling**

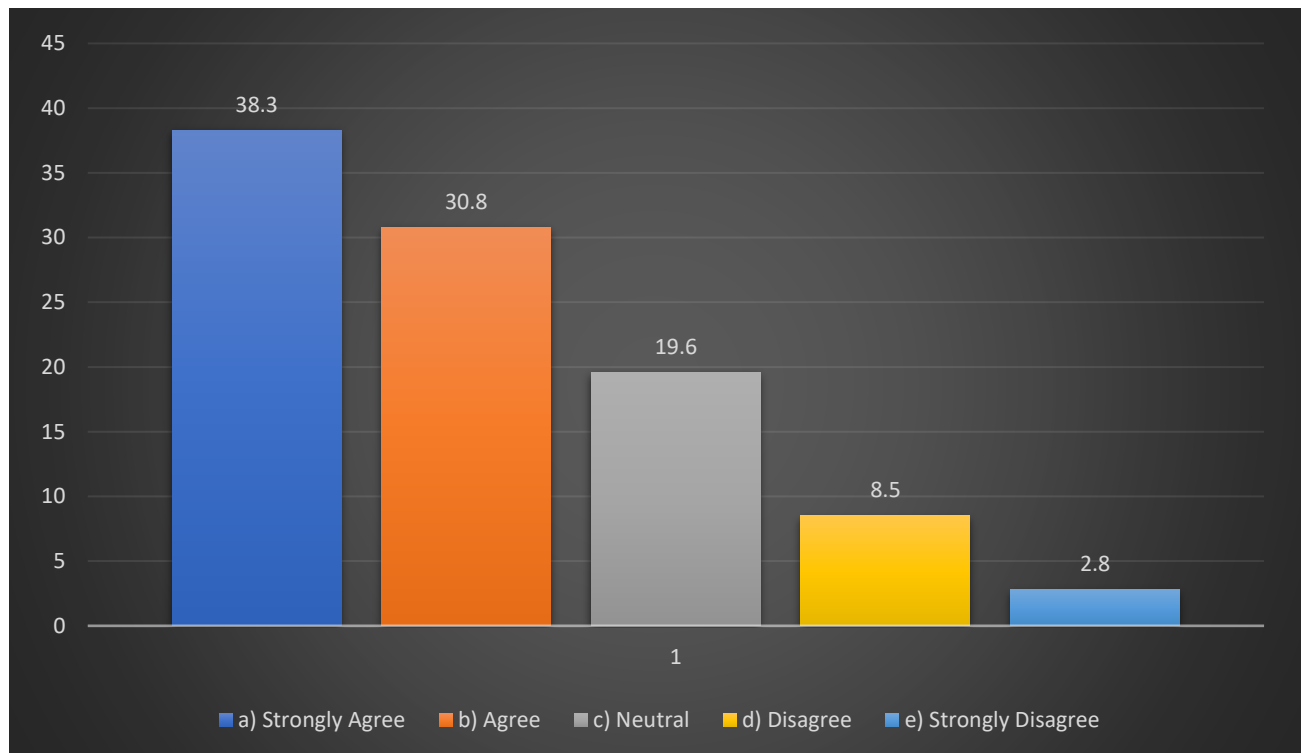
**Interpretation:**

From the above table, it is observed that around 42.1% are agreed with the interest to adopt any new technology and the remaining 4.6% are disagreed to the same.

**Table 4.1.19: Opinion to adopt new technology in rack systems**

| S.No | Particulars          | No of Respondent | Percentage of Respondent |
|------|----------------------|------------------|--------------------------|
| 1    | a) Strongly Agree    | 41               | 38.3                     |
| 2    | b) Agree             | 33               | 30.8                     |
| 3    | c) Neutral           | 21               | 19.6                     |
| 4    | d) Disagree          | 9                | 8.5                      |
| 5    | e) Strongly Disagree | 3                | 2.8                      |
|      | Total                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.19: Opinion to adopt new technology in rack systems**

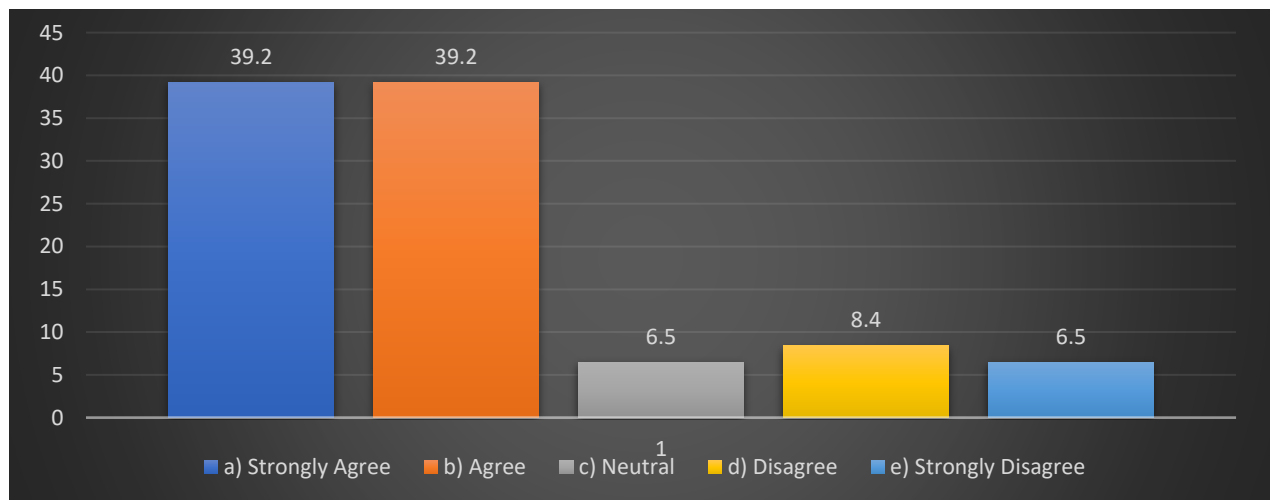
**Interpretation:**

From the above table, it is observed that around 38.3% of the respondents are agreed to the new technology in rack systems and the remaining 2.8% of the respondents are disagreed to the same.

**Table 4.1.20: Rating of performance in the company after implementing scm system**

| S.No | Particulars          | No of Respondent | Percentage of Respondent |
|------|----------------------|------------------|--------------------------|
| 1    | a) Strongly Agree    | 42               | 39.2                     |
| 2    | b) Agree             | 42               | 39.2                     |
| 3    | c) Neutral           | 7                | 6.5                      |
| 4    | d) Disagree          | 9                | 8.4                      |
| 5    | e) Strongly Disagree | 7                | 6.5                      |
|      | Total                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.20: Rating of performance in the company after implementing scm system**

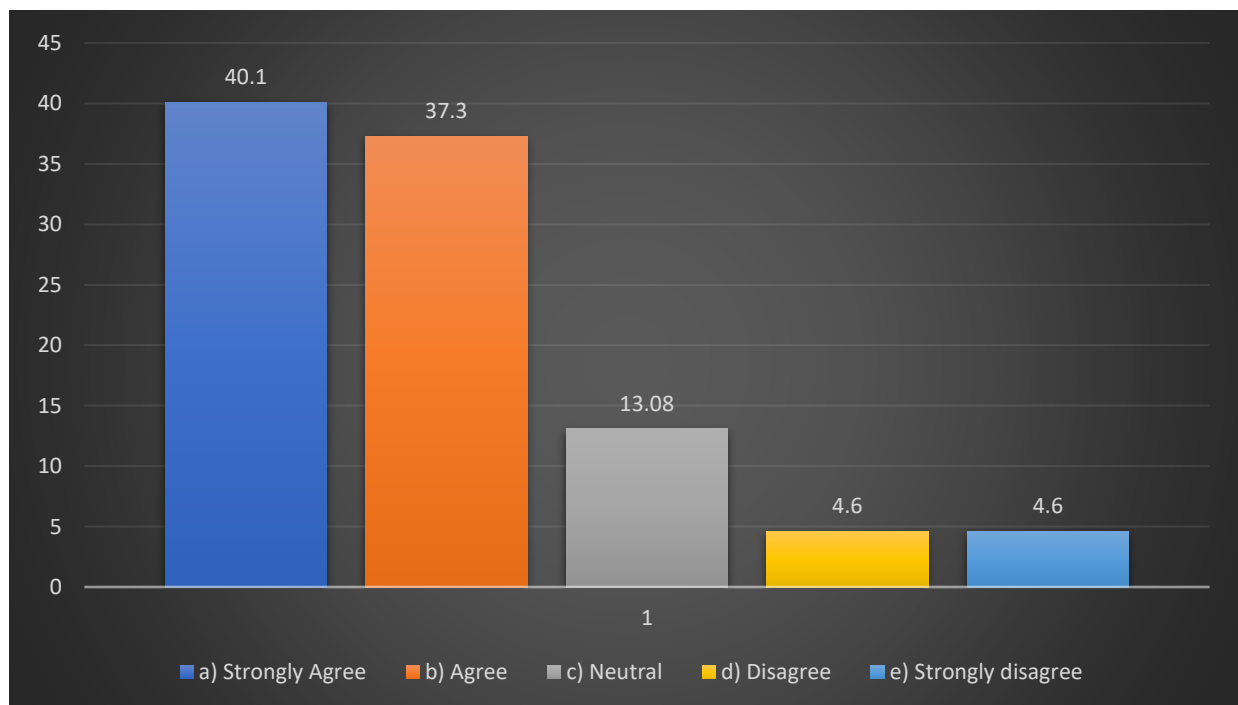
**Interpretation:**

From the above table, it is observed that around 39.2% are agreed towards the rating performance of the company after implementation scm system and the remaining 6.5% are disagreed.

**Table 4.1.21: Adequate training given to newly implemented scm system**

| S.No | Particulars          | No of Respondent | Percentage of Respondent |
|------|----------------------|------------------|--------------------------|
| 1    | a) Strongly Agree    | 43               | 40.1                     |
| 2    | b) Agree             | 40               | 37.3                     |
| 3    | c) Neutral           | 14               | 13.08                    |
| 4    | d) Disagree          | 5                | 4.6                      |
| 5    | e) Strongly disagree | 5                | 4.6                      |
|      | Total                | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.21: Adequate training given to newly implemented scm system**

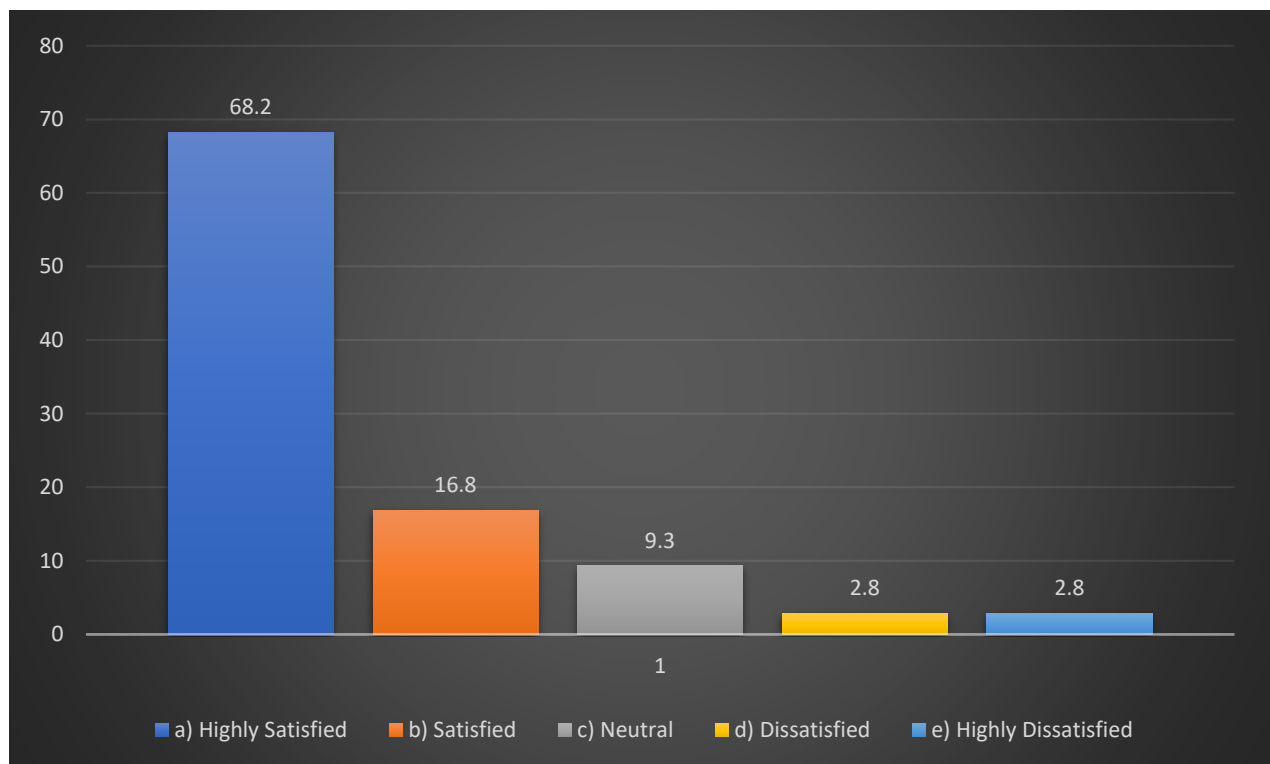
**Interpretation:**

From the above table, it is observed that around 40.1% have agreed to some adequate training to newly implemented scm system and the remaining 4.6% have disagreed the same.

**Table 4.1.22: Satisfaction level towards the SCM system**

| S.No | Particulars            | No of Respondent | Percentage of Respondent |
|------|------------------------|------------------|--------------------------|
| 1    | a) Highly Satisfied    | 73               | 68.2                     |
| 2    | b) Satisfied           | 18               | 16.8                     |
| 3    | c) Neutral             | 10               | 9.3                      |
| 4    | d) Dissatisfied        | 3                | 2.8                      |
| 5    | e) Highly Dissatisfied | 3                | 2.8                      |
|      | Total                  | 107              | 100                      |

**Source: Primary Data**



**Table 4.1.22: Satisfaction level towards the SCM system**

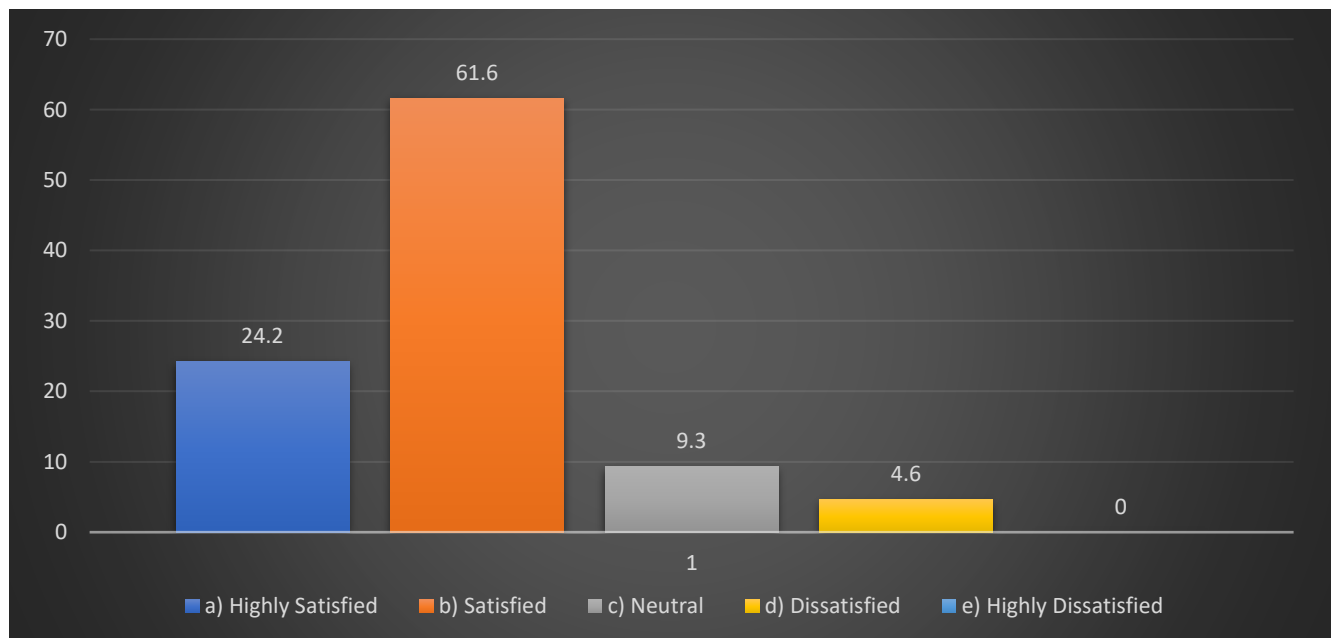
**Interpretation:**

From the above table, it is observed that around 68.2% are highly satisfied with the satisfaction level towards scm system and the remaining 2.8% are dissatisfied.

**Table 4.1.23: Satisfaction level towards the usage of material handling equipment in the SCM system**

| S.No | Particulars            | No of Respondent | Percentage of Respondent |
|------|------------------------|------------------|--------------------------|
| 1    | a) Highly Satisfied    | 26               | 24.2                     |
| 2    | b) Satisfied           | 66               | 61.6                     |
| 3    | c) Neutral             | 10               | 9.3                      |
| 4    | d) Dissatisfied        | 5                | 4.6                      |
| 5    | e) Highly Dissatisfied | 0                | 0                        |
|      | Total                  | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.23: Satisfaction level towards the usage of material handling equipment in the SCM system**

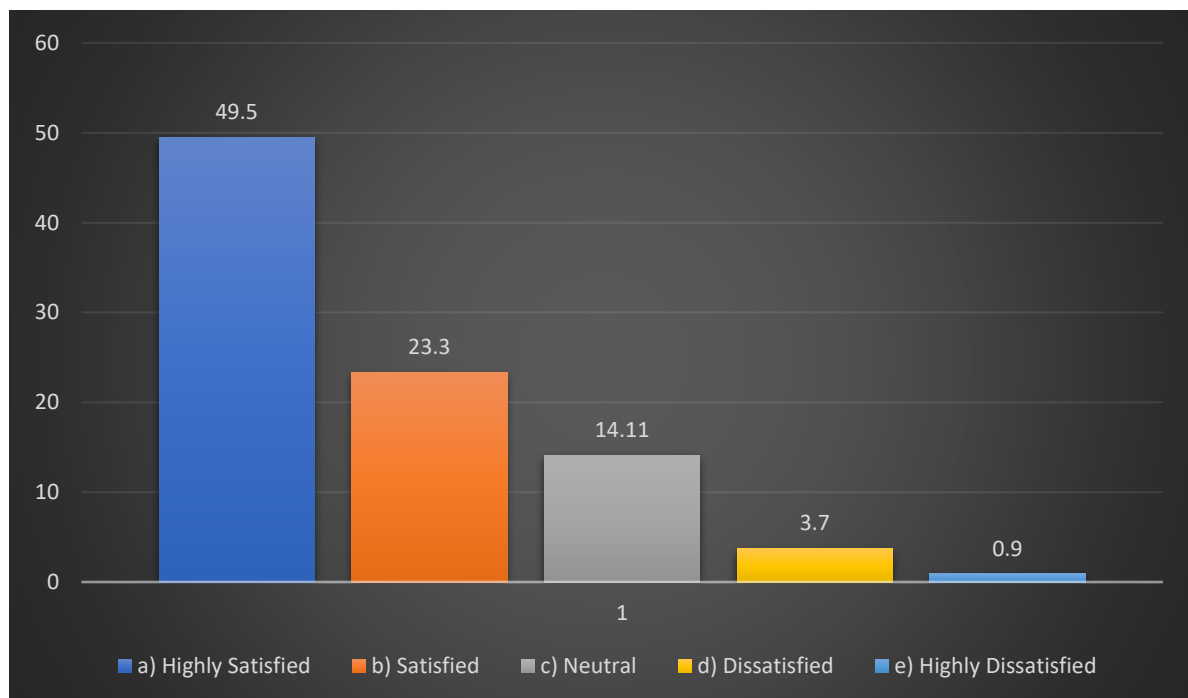
**Interpretation:**

From the above table, it is observed that 61.6% are satisfied with the usage of material handling equipment and the remaining 4.6% are dissatisfied to the same.

**Table 4.1.24: Effectiveness of Customer Satisfaction with SCM process**

| S.No | Particulars            | No of Respondent | Percentage of Respondent |
|------|------------------------|------------------|--------------------------|
| 1    | a) Highly Satisfied    | 53               | 49.5                     |
| 2    | b) Satisfied           | 25               | 23.3                     |
| 3    | c) Neutral             | 24               | 14.11                    |
| 4    | d) Dissatisfied        | 4                | 3.7                      |
| 5    | e) Highly Dissatisfied | 1                | 0.9                      |
|      | Total                  | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.24: Effectiveness of Customer Satisfaction with SCM process**

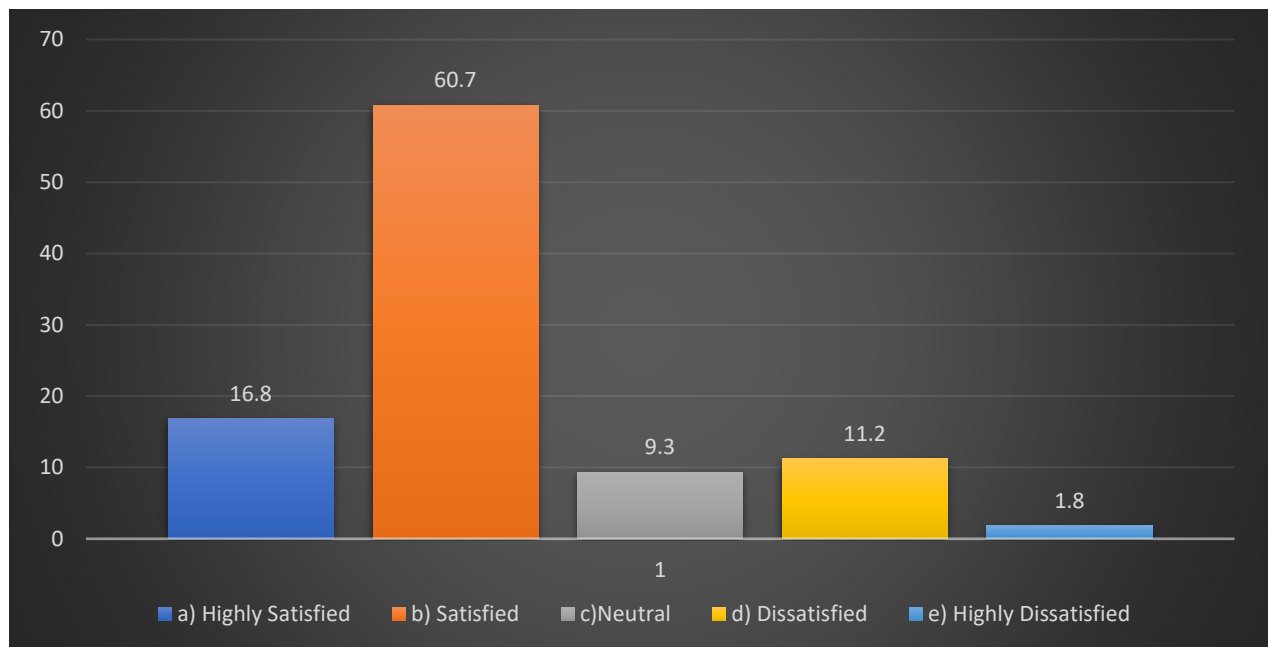
**Interpretation:**

From the above table, it is observed that around 49.5% are satisfied with the scm process and the remaining 0.9% are dissatisfied to the same.

**Table 4.1.25: Satisfaction level of method of storing the materials adopted in Meythoma international**

| S.No | Particulars            | No of Respondent | Percentage of Respondent |
|------|------------------------|------------------|--------------------------|
| 1    | a) Highly Satisfied    | 18               | 16.8                     |
| 2    | b) Satisfied           | 65               | 60.7                     |
| 3    | c)Neutral              | 10               | 9.3                      |
| 4    | d) Dissatisfied        | 12               | 11.2                     |
| 5    | e) Highly Dissatisfied | 2                | 1.8                      |
|      | Total                  | 107              | 100                      |

**Source: Primary Data**



**Table 4.1.25: Satisfaction level of method of storing the materials adopted in Meythoma international**

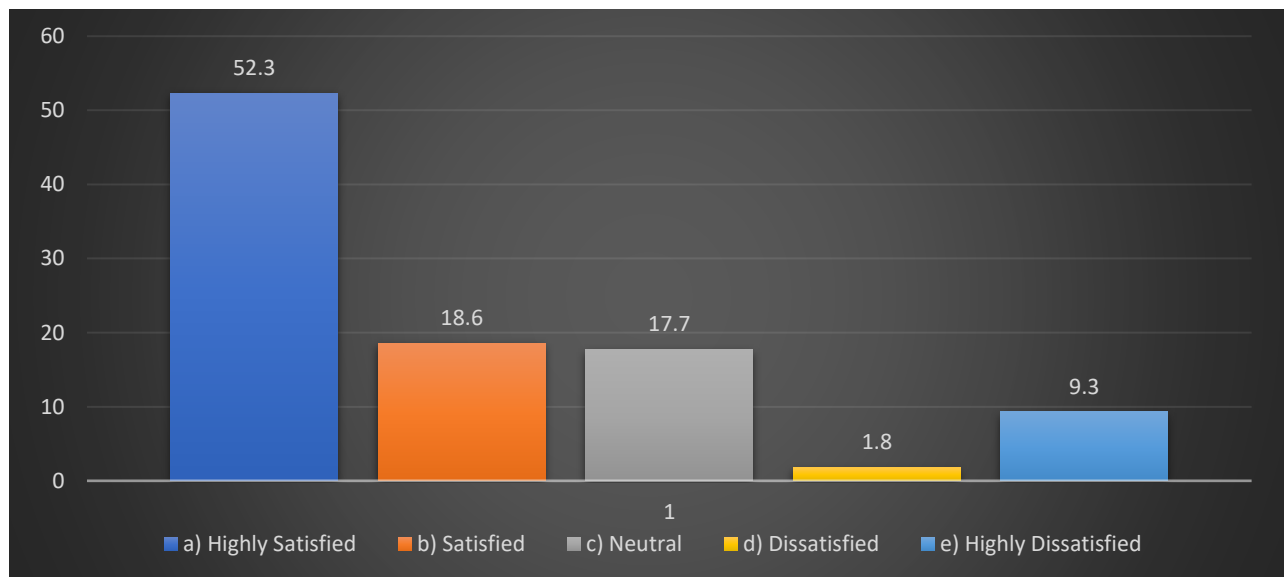
**Interpretation:**

From the above table, it is observed that around 60.7% are satisfied with the method of storing the materials and the remaining 1.8% are dissatisfied to the same.

**Table 4.1.26: Satisfaction level of material handling requirements currently used in meythoma international**

| S.No | Particulars            | No of Respondent | Percentage of Respondent |
|------|------------------------|------------------|--------------------------|
| 1    | a) Highly Satisfied    | 56               | 52.3                     |
| 2    | b) Satisfied           | 20               | 18.6                     |
| 3    | c) Neutral             | 19               | 17.7                     |
| 4    | d) Dissatisfied        | 2                | 1.8                      |
| 5    | e) Highly Dissatisfied | 10               | 9.3                      |
|      | Total                  | 107              | 100                      |

**Source: Primary Data**



**Table 4.1.26: Satisfaction level of material handling requirements currently used in meythoma international**

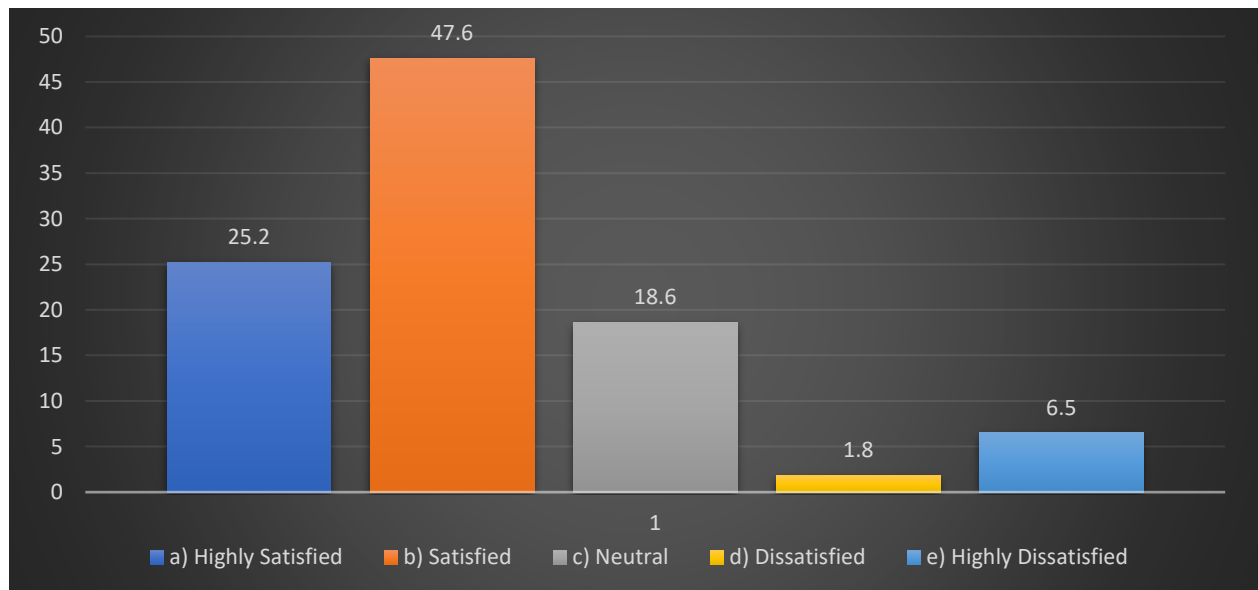
**Interpretation:**

From the above table, it is observed that around 52.3% of the respondents are satisfied with the currently used requirements, and the remaining 1.8% are dissatisfied to the same.

**Table 4.1.27: Satisfaction level of customers using material handling in meythoma international**

| S.No | Particulars            | No of Respondent | Percentage of Respondent |
|------|------------------------|------------------|--------------------------|
| 1    | a) Highly Satisfied    | 27               | 25.2                     |
| 2    | b) Satisfied           | 51               | 47.6                     |
| 3    | c) Neutral             | 20               | 18.6                     |
| 4    | d) Dissatisfied        | 2                | 1.8                      |
| 5    | e) Highly Dissatisfied | 7                | 6.5                      |
|      | Total                  | 107              | 100                      |

**Source: Primary Data**



**Chart 4.1.27: Satisfaction level of customers using material handling in meythoma international**

**Interpretation:**

From the above table, it is observed that around 47.6% of the respondents are satisfied with the level of customers and the remaining 1.8% are dissatisfied to the same.

## 4.2 ANOVA

**Table 4.2.1: Table showing the significant difference between the factors of Customer Satisfaction towards SCM System**

H0: There is no significant difference between the factors of Customer Satisfaction towards SCM System

H1: There is a significant difference between the factors of Customer Satisfaction towards SCM System

| ANOVA                         |                |                |     |             |       |       |
|-------------------------------|----------------|----------------|-----|-------------|-------|-------|
|                               |                | Sum of Squares | df  | Mean Square | F     | Sig.  |
| Scmsystemsatisfaction         | Between Groups | 5.017          | 3   | 1.672       | 1.805 | 0.151 |
|                               | Within Groups  | 95.451         | 103 | 0.927       |       |       |
|                               | Total          | 100.467        | 106 |             |       |       |
| satisfactionlevelmaterial     | Between Groups | 1.896          | 3   | 0.632       | 1.211 | 0.310 |
|                               | Within Groups  | 53.767         | 103 | 0.522       |       |       |
|                               | Total          | 55.664         | 106 |             |       |       |
| customersatisfaction          | Between Groups | 14.365         | 3   | 4.788       | 5.829 | 0.001 |
|                               | Within Groups  | 84.607         | 103 | 0.821       |       |       |
|                               | Total          | 98.972         | 106 |             |       |       |
| stroringthematerials          | Between Groups | 5.497          | 3   | 1.832       | 2.247 | 0.087 |
|                               | Within Groups  | 83.980         | 103 | 0.815       |       |       |
|                               | Total          | 89.477         | 106 |             |       |       |
| Requirements                  | Between Groups | 13.121         | 3   | 4.374       | 2.819 | 0.043 |
|                               | Within Groups  | 159.795        | 103 | 1.551       |       |       |
|                               | Total          | 172.916        | 106 |             |       |       |
| customersmaterialhandl<br>ing | Between Groups | 1.034          | 3   | 0.345       | 0.312 | 0.817 |
|                               | Within Groups  | 113.938        | 103 | 1.106       |       |       |
|                               | Total          | 114.972        | 106 |             |       |       |

**Source: Primary Data**

**Interpretation:**

Since the majority of the significant value is higher than 0.05, we accept H1 and reject H0. Therefore, there is a significant difference between the factors of Customer Satisfaction towards SCM System

### 4.3 Chi-square

**Table 4.3.1: Table showing the significant difference between the processing of the equipments and the models of stock managements**

H0: There is no significant difference between the processing of the equipments and the models of stock managements

H1: There is a significant difference between the processing of the equipments and the models of stock managements

| Case Processing Summary      |       |         |         |         |       |         |
|------------------------------|-------|---------|---------|---------|-------|---------|
|                              | Cases |         |         |         |       |         |
|                              | Valid |         | Missing |         | Total |         |
|                              | N     | Percent | N       | Percent | N     | Percent |
| Processingequipment * models | 107   | 100.0%  | 0       | 0.0%    | 107   | 100.0%  |

| Chi-Square Tests                |                    |    |                                      |
|---------------------------------|--------------------|----|--------------------------------------|
|                                 | Value              | df | Asymptotic<br>Significance (2-sided) |
| Pearson Chi-Square              | 8.030 <sup>a</sup> | 6  | 0.236                                |
| Likelihood Ratio                | 8.129              | 6  | 0.229                                |
| Linear-by-Linear<br>Association | 0.096              | 1  | 0.757                                |
| N of Valid Cases                | 107                |    |                                      |

**Source: Primary Data**

#### Interpretation:

Since p value is higher than 0.05, we accept H1 and reject H0. Therefore, there is said to be a significant difference between the processing of the equipments and the models of stock managements.

**Table 4.3.2: Table showing the significant difference between the processing of equipments and type of bags used for the packaging the material during delivery**

H0: There is no significant difference between the processing of equipments and type of bags used for the packaging the material during delivery

H1: There is a significant difference between the processing of equipments and type of bags used for the packaging the material during delivery

| Case Processing Summary       |       |         |         |         |       |         |
|-------------------------------|-------|---------|---------|---------|-------|---------|
|                               | Cases |         |         |         |       |         |
|                               | Valid |         | Missing |         | Total |         |
|                               | N     | Percent | N       | Percent | N     | Percent |
| Processingequipment *<br>bags | 107   | 100.0%  | 0       | 0.0%    | 107   | 100.0%  |

| Chi-Square Tests             |                     |    |                                      |
|------------------------------|---------------------|----|--------------------------------------|
|                              | Value               | df | Asymptotic Significance<br>(2-sided) |
| Pearson Chi-Square           | 14.928 <sup>a</sup> | 9  | 0.093                                |
| Likelihood Ratio             | 13.662              | 9  | 0.135                                |
| Linear-by-Linear Association | 0.7224              | 1  | 0.395                                |
| N of Valid Cases             | 107                 |    |                                      |

**Source: Primary Data**

#### **Interpretation:**

Since p value is higher than 0.05, we accept H1 and reject H0. Therefore, There is a significant difference between the processing of equipments and type of bags used for the packaging the material during delivery.

#### 4.4 Correlation

**Table 4.4.1: Table showing the significant differences between the problems which are faced in material handling**

| Correlations    |                     |          |              |                 |
|-----------------|---------------------|----------|--------------|-----------------|
|                 |                     | Problems | MajorProblem | Impactofproblem |
| Problems        | Pearson Correlation | 1        | .419**       | 0.147           |
|                 | Sig. (2-tailed)     |          | 0.000        | 0.132           |
|                 | N                   | 107      | 107          | 107             |
| MajorProblem    | Pearson Correlation | .419**   | 1            | 0.094           |
|                 | Sig. (2-tailed)     | 0.000    |              | 0.334           |
|                 | N                   | 107      | 107          | 107             |
| Impactofproblem | Pearson Correlation | 0.147    | 0.094        | 1               |
|                 | Sig. (2-tailed)     | 0.132    | 0.334        |                 |
|                 | N                   | 107      | 107          | 107             |

**Source: Primary Data**

#### **Interpretation:**

Since the value of Pearson correlation is between -1 and +1, we accept H1 and reject H0. Therefore, there is a significant differences between the problems which are faced in material handling

## **CHAPTER 5**

### **FINDINGS AND SUGGESTIONS**

#### **5.1 FINDINGS**

1. Around 42.9% have responded that they are less than 2 years, and the remaining 14% have responded that they are 4-6 years.
2. Around 50.4% have responded that there are 3 processing equipments in meythoma, and the remaining 11.2% have responded that there is only 2 equipments
3. Around 29.9% of the respondents deal with dryer and size and the remaining 7.4% of the respondents deal with the all the major requirements
4. Around 42% of the respondents have used the manual lifting, and the remaining 23.3% of the respondents are pallet stacker.
5. Around 41.1% of the respondents takes 30 minutes time to load the material and the remaining 14.01% is greater than 15 minutes.
6. Around 55.1% of the respondents have used cardboard box and the remaining 1.8% have used other bags.
7. Around 74.7% follows the FIFO model and the remaining 1.8% follows other models of stock management.
8. Around 46.7% of the respondents 30 days to maintain the inventory of raw materials, and the remaining 23.3% of the respondents takes 20 days
9. Around 36.5% have faced the transportation problem, and the remaining 1.8% are others.
10. Around 41.1% have lack of knowledge to operate the equipment and the remaining 0.9% are others
11. Around 32.7% has the impact of the problem faced when the customer expectation are not met and the remaining 9.3% have some delay.
12. Around 26.1% have responded that there is bill of material and the remaining 11.2% have no assessment for proper handling of tools.
13. Around 33.6% have responded that they are used in determining the material handling and the remaining 16.8% have collective option.

14. Around 19.6% of the supplier's commitment to warranty, guarantee and reward quality and the remaining 8.4% of suppliers credit availability.
15. Around 53.2% have responded that they commonly use suppliers own transport and the remaining 16.8% have buyers transport.
16. Around 43.9% are strongly agreed with the training provided which is very helpful and the remaining 8.4% are disagreed to the same.
17. Around 49.5% are agreed with the interest to adopt any new technology and the remaining 0.9% are disagreed to the same.
18. Around 42.1% are agreed with the interest to adopt any new technology and the remaining 4.6% are disagreed to the same.
19. Around 38.3% of the respondents are agreed to the new technology in rack systems and the remaining 2.8% of the respondents are disagreed to the same.
20. Around 39.2% are agreed towards the rating performance of the company after implementation scm system and the remaining 6.5% are disagreed.
21. Around 40.1% have agreed to some adequate training to newly implemented scm system and the remaining 4.6% have disagreed the same.
22. Around 68.2% are highly satisfied with the satisfaction level towards scm system and the remaining 2.8% are dissatisfied.
23. Around 61.6% are satisfied with the usage of material handling equipment and the remaining 4.6% are dissatisfied to the same.
24. Around 49.5% are satisfied with the scm process and the remaining 0.9% are dissatisfied to the same
25. Around 60.7% are satisfied with the method of storing the materials and the remaining 1.8% are dissatisfied to the same
26. Around 52.3% of the respondents are satisfied with the currently used requirements, and the remaining 1.8% are dissatisfied to the same.
27. Around 47.6% of the respondents are satisfied with the level of customers and the remaining 1.8% are dissatisfied to the same

## 5.2 SUGGESTIONS AND RECOMMENDATIONS

- Material Handling is the important aspect in manufacturing field. Material Handling include Safety, Timely Usage.
- From the study we gone through various equipments they were using to handle the material while processing, loading and packing.
- And we also study the problem they faced during material handling in storage and packing department.
- The employee of meythoma international states that they were somewhat ok with the existing method they follow.
- And after implementing supply chain management system, initial they feel little bit difficult in adapting to the new system.
- Now they it was time saving and energy saving.
- Even though they faced many challenges in material handling such as trouble in equipments and lack of knowledge about the equipments.
- And also they face problem like electricity shortage, transportation and storage problem. After analyzing the employee response here we can suggest some adequate measure to stay away from those problems.
- They can own generator or chargeable battery to overcome the electricity shortage problem, they maintain some temporary warehouse to avoid stock overload and should keep track of available of vehicles or else should maintain contract with some automobile company to take over the on time delivery.

### **5.3 CONCLUSION**

Efficient material & supply chain management is crucial for the success of manufacturing company. Better material management methods and decision models are needed to improve the Customer need. An effective supply management system is essential for managing efficient material management to avoid material shortages, misplacements, loss, and theft which might result in increases in crew idle times, loss of productivity and delay of activities. Failures to effectively manage materials could result in decreases in profit or even a loss. The primary goal is to have the material needed, in the amounts needed, with the quality required, and the time that they are needed. Future research will be needed to develop a more complete framework integrating other decisions needed in areas such as supplier selection, technician approach. A fully integrated approach will better improve communication and minimize gaps in information flow among all the parties and departments involved

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## Questionnaire

1. Name
2. Age
3. Experience
  - a) Less than 2 year
  - b) 2 – 4 year
  - c) 4 – 6 year
  - d) Above 6 year
4. How many processing equipments are there in Meythoma International?
  - a) 2
  - b) 3
  - c) 4
  - d) 5
5. What are all the equipments you deal with while processing?
  - a) Dryer
  - b) Sizer
  - c) Litre Weight
  - d) Both A and B
  - e) All of the above

6. What type of equipments are used for material handling in meythoma International for loading?

- a) Manual Lifting
- b) Hand Trolley
- c) Pallet Stacker

7. How much time taken to load the material of 1000kg manually?

- a) < 15 mins
- b) 30 mins
- c) 1 hr
- d) > 1 hr

8. What type of bags you used for packaging the material during delivery?

- a) Plastic Bag
- b) Jute Bag
- c) Cardboard Box
- d) Other

9. What are the modes of Stock Management?

- a) LIFO
- b) FIFO
- c) Other

10. How long will it take to maintain the inventory of Raw Material?

- a) 20 days
- b) 30 days
- c) 60 days

11. What are all the problem you are facing while handling the material?
- a) Natural Calamities
  - b) Transportation problem
  - c) Shortage in Supply of equipments
  - d) Other
12. What is the major problem to be considered in handling the equipments?
- a) Lack of Equipments
  - b) Trouble in Equipments
  - c) Lack of knowledge to operate the equipments
  - d) Other
13. What is the impact of the problem faced in material Handling?
- a) Delay in Processing
  - b) Delay in Delivery
  - c) Wastage of Material
  - d) Customer Expectation not met
14. What are the assessment tools which are used for proper material handling?
- a) Master Production schedule
  - b) Bill of Material
  - c) Inventory record file
  - d) Stock levels
  - e) No Assessment

15. Is demand forecasted? If yes, what method is used for determining material handling?

- a) Collective opinion
- b) Statistical extrapolation
- c) Economic forecasting
- d) Market research

16. What are the influencing parameters in the choice of the suppliers for Material Handling?

- a) Technical capacity
- b) Design skill
- c) Financial background
- d) Bank reference
- e) Vendor reliability
- f) Suppliers commitment to warranty, guarantee and quality
- g) Suppliers credit availability
- h) After sales services.

17. What is the mode of transportation commonly used by Meythoma International for incoming raw material in material handling?

- a) Suppliers own transport
- b) Public Lorries /public transport
- c) Buyers transport

### 18. Employee Training Towards Material Handling

| <b>Sub Questions</b>                                                               | <b>Strongly Agree</b> | <b>Agree</b> | <b>Neutral</b> | <b>Disagree</b> | <b>Strongly Disagree</b> |
|------------------------------------------------------------------------------------|-----------------------|--------------|----------------|-----------------|--------------------------|
| 1. Opinion about training which is provided is very helpful or not for the process |                       |              |                |                 |                          |
| 2. Interested to adopt any new technology                                          |                       |              |                |                 |                          |
| 3. Agreement of Implementation of alternative methods in material handling         |                       |              |                |                 |                          |
| 4.Opinion to adopt new technology in rack systems                                  |                       |              |                |                 |                          |
| 5. Rating the performance of the company after implementing scm system             |                       |              |                |                 |                          |
| 6.Adequate training given to the newly implemented scm system                      |                       |              |                |                 |                          |

## 19. Customer Satisfaction towards SCM System

| <b>Sub Questions</b>                                                                               | <b>Highly Satisfied</b> | <b>Satisfied</b> | <b>Neutral</b> | <b>Dissatisfied</b> | <b>Highly Dissatisfied</b> |
|----------------------------------------------------------------------------------------------------|-------------------------|------------------|----------------|---------------------|----------------------------|
| 1. Satisfaction level towards the SCM System                                                       |                         |                  |                |                     |                            |
| 2. Satisfaction level towards the usage of material handling equipments in the SCM System          |                         |                  |                |                     |                            |
| 3. Effectiveness of my customer Satisfaction with my SCM Process                                   |                         |                  |                |                     |                            |
| 4. Satisfaction level of exiting method of storing the materials adopted in Meythoma International |                         |                  |                |                     |                            |
| 5. Satisfaction level of Material Handling equipments currently used in Meythoma International     |                         |                  |                |                     |                            |
| 6. Satisfaction level of Customers using Material handling in Meythoma International               |                         |                  |                |                     |                            |

# **A STUDY ON MATERIAL HANDLING AND CUSTOMER SATISFACTION**

## **ABSTRACT**

Materials handling is the science and the art of including the moving, packaging, and storing away of substance in any structure, and incorporates the arrangement, setting, and situating the material to manage their development process. The Present Study is focused on material handling both in Packaging as well as storage. It was studied regarding Meythoma international. The goal of the study is to discover the difficulties faced in material handling, it likewise assesses the effect of changes in material handling of the executives by implementing some logistics methodologies. Whether it meets the security of service, cost of service finally whether it meets client requirements. The Questionnaire was given to the employees of Meythoma International to discover the difficulties they looked at in material Handling. From the response, we can observe that some answer for tackle the difficulties, and we propose a technique to service, dependability and decrease the cost and overall to meet consumer satisfaction level.

## **1. Introduction**

Cardamom, called the queen of spices, has proved to deserve its title when it is said to fetch a record price within the market this year and brought good tidings to Kerala farmers who are otherwise suffering from the vagaries of the weather. With the price hitting Rs 6000/Kg, the cardamom growing area saw people buying acres of farms and those who had turned to other crops returning to cultivate the green gold. Once the bulk amount of cardamom is purchased they were taken to the Chennai warehouse. Activities like offloading of the products coming from the suppliers, the intermediate packaging (if required), and shipping to other destinations (retailers or end consumers) are handled within the warehouse. Similarly, they will also function as a storage house for handling peak consumer demand to avoid stock out of things and acts as a buffer between the start line (usually manufacturing plant) and ending point (think a few typical retail outlets). The process involved in the storage area is drying and quality check

## **2. Review of Literature**

Beyond the essential function of movement, it's also relevant to cite the functions of storage and knowledge transfer, which occurs simultaneously and has both strategic and operational dimensions. Organizations are relying on information systems using tools like Electronic Data Interchange (EDI), or similar information technology resources, to gain precision and reliability, in the interchange, and availability of information (**Laudon & Laudon, 2006, Milan, Basso & Pretto, 2007**).

It is well understood that material handling improvement may have positive effects on production. However, it's not only production but the way the workers see the new situation. The secret of the fluid power's success and widespread use is said to be because of its versatility and manageability (**Esposit, 2008**).

Material handling accounts for 30–75% of the total cost of a product will be given along with the production chain, and efficient material handling is said to be responsible for reducing the manufacturing system operations cost by 15–30% and the key factor in the material handling system design process is the selection and configuration of equipment for material transportation (**Sujono & Lashkari (2006) & Chan et al. (1999)**).

The storage and handling of goods are essential among the set of logistics activities, and their costs can absorb 12% to 40% of its costs (Ballou (1993). The main logistic responsibility in manufacturing is to formulate a master- program for the timely provision of materials, components, and work-in-process (**Bowersox and Closs (1996)**).

Material handling study has been conducted by (Groover, 2001) which require several elements to be considered. The first is said to be the handling system project, which will covers the activities of sequencing, velocity, layout and routing. To complete the analysis, the author (**Groover, 2001**) will recommend to analyse the material itself or the object to be transported.

Therefore, it suggests the classification of the elements of the authors **Muther and Hagan (apud Groover, 2001)**, which considers: (i) physical state is solid, liquid, gas; (ii) size is volume, length, width, height; (iii) weight; (iv) condition (hot, cold, dry, dirty, sticky, adhesive); (v) risk of damage is weak or strong and (vi) safety hazards such as explosive, flammable, toxic, corrosive, etc.

The right choice of equipment and location of work-in-process is said to be fundamental for the optimization of a company's manufacturing capacity. It states that a critical factor in positioning stocks in the process is a balance between convenience and consolidation to create efficiencies when the stock flows along the value chain (**Bowersox and Closs (1996)**).

The importance of layout, which defines the location of kit and, consequently, restricts possible routes and sequencing, are often perceived by the prominence that the topic is treated in production management literature. The analysis of the connection between layout studies and material handling, however, doesn't receive much attention within the same literature. This lack of attention are often seen in works like **Gaither and Frazier (2002)**, **Chase, Jacobs, and Aquilano (2006)**, and **Slack, Chambers, Harland, Harrison, and Johnston (1997)**.

Finally, systems and information technology will constitute the essential factors that are given for the materials handling management. **Stair and Reynolds (2006)**, **Laudon and Laudon (2006)**, and **O'Brien and Marakas (2007)** support the study of fundamentals and general principles of data systems.

To improve the performance of distribution operations and, in this specific case, the internal material handling process, it is important to consider both human and technical factors (**Chakravorty, 2008**). In this sense, this study assesses the interior customers' perception of a cloth handling process improvement.

### **3. OBJECTIVES OF THE STUDY:**

#### **3.1 PRIMARY OBJECTIVE**

- To analyze the performance of logistics and supply chain management system in Meythoma International

#### **3.2 SECONDARY OBJECTIVE**

- To understand the process followed in packaging and storing the material
- To analyze the challenges they faced in material handling

- To suggest some adequate measure to overcome the problems in material handling

#### **4. Research Methodology**

The questionnaire method requires customers to fill out the forms. It's one of the most widely used research methodology because it's inexpensive to create and easy to distribute to numerous individuals at a faster rate. Questionnaires can have different question forms, like open-ended questions, multiple-choice, checklists, or a mixture of all of them.

##### **RESEARCH DESIGN:**

Sampling is a procedure to draw conclusions about a significant group of Respondents by studying a small sample of the total population. A sample is a section of the population selected to present the population as a whole. Ideally, the sample should be representative so that the researchers can make an accurate estimate of the thoughts and behaviors of the large populations.

##### **SOURCES OF DATA:**

###### **Primary Data:**

Primary data collection is important when a researcher cannot find the info needed in secondary sources. There are said to be three bases which are used for obtaining primary data are observation, surveys, and experiments. The choice is going to be influenced by the character of the matter and by the supply of your time. For this research study Questionnaire was the Primary Data source which is collected from the employee of Meythoma International.

###### **Secondary Data:**

Secondary data was collected for Journals, Books, Websites, company report and Research article to add value to the research

##### **SAMPLE DESIGN:**

A survey method is employed to collect the data from the respondents and the data are collected with the help of questionnaires. The questionnaire is administered to the respondents. A questionnaire is a standardized form for collecting information to elicit data from the respondents. A questionnaire consists of a group of questions presented to a respondent for his or her answers. The questionnaire prepared in this study was mainly aimed at personal interviews, multi-choice questions, and also checklists.

#### **SAMPLING METHOD:**

The sampling method that we used in this study for material handling is simple random sampling. Simple random sampling is said to be a method that is used to be called a smaller sample size from a larger population and use it to research and make generalizations about the larger group. The advantages of an easy random sample include its simple use and its accurate representation of the larger population.

The **statistical tools which are used** are anova, chi-square, and correlation analysis.

#### **5. Results Analysis and Interpretation**

##### **Table showing the significant difference between the factors of Customer Satisfaction towards SCM System**

H0: There is no significant difference between the factors of Customer Satisfaction towards SCM System

H1: There is a significant difference between the factors of Customer Satisfaction towards SCM System

| <b>ANOVA</b>          |                |                |     |             |       |       |
|-----------------------|----------------|----------------|-----|-------------|-------|-------|
|                       |                | Sum of Squares | df  | Mean Square | F     | Sig.  |
| Scmsystemsatisfaction | Between Groups | 5.017          | 3   | 1.672       | 1.805 | 0.151 |
|                       | Within Groups  | 95.451         | 103 | 0.927       |       |       |
|                       | Total          | 100.467        | 106 |             |       |       |

|                           |                |         |     |       |       |       |
|---------------------------|----------------|---------|-----|-------|-------|-------|
| satisfactionlevelmaterial | Between Groups | 1.896   | 3   | 0.632 | 1.211 | 0.310 |
|                           | Within Groups  | 53.767  | 103 | 0.522 |       |       |
|                           | Total          | 55.664  | 106 |       |       |       |
| customersatisfaction      | Between Groups | 14.365  | 3   | 4.788 | 5.829 | 0.001 |
|                           | Within Groups  | 84.607  | 103 | 0.821 |       |       |
|                           | Total          | 98.972  | 106 |       |       |       |
| storingthematerials       | Between Groups | 5.497   | 3   | 1.832 | 2.247 | 0.087 |
|                           | Within Groups  | 83.980  | 103 | 0.815 |       |       |
|                           | Total          | 89.477  | 106 |       |       |       |
| Requirements              | Between Groups | 13.121  | 3   | 4.374 | 2.819 | 0.043 |
|                           | Within Groups  | 159.795 | 103 | 1.551 |       |       |
|                           | Total          | 172.916 | 106 |       |       |       |
| customersmaterialhandling | Between Groups | 1.034   | 3   | 0.345 | 0.312 | 0.817 |
|                           | Within Groups  | 113.938 | 103 | 1.106 |       |       |
|                           | Total          | 114.972 | 106 |       |       |       |

**Source: Primary Data**

### **Interpretation:**

Since the majority of the significant value is higher than 0.05, we accept H1 and reject H0. Therefore, there is a significant difference between the factors of Customer Satisfaction towards SCM System

### **6. Limitations**

- Only the domestic market is that the focus of this study.
- The sample size is restricted thanks to the limited period allocated for the survey
- The analysis has totally supported the knowledge provided by the workers and hence might be biased.
- Taking the appointment of the respondents became a touch difficult.
- The geographical area is restricted only to the Chennai region
- Employees felt that the questionnaire was too big

## **7. Conclusion**

Efficient material & supply chain management is said to be crucial for the success of a manufacturing company. Better material management methods and decision models are needed to enhance Customer needs. An effective supply management system is important for managing efficient material management to avoid material shortages, misplacements, loss, and theft which could end in increases in crew idle times, loss of productivity, and delay of activities. Failures to effectively manage materials could end in decreases in profit or maybe a loss. The primary goal is to possess the fabric needed, within the amounts needed, with the standard required, and therefore the time that they're needed. Future research is going to be needed to develop a more complete framework integrating other decisions needed in areas like supplier selection, technician approach. A fully integrated approach will involve better improve communication and also minimize the gaps in information flow among all the parties and departments involved.

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