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VARIOUS TYPES OF MATERIAL HANDLING SYSTEM

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CHAPTER NO.1 INTRODUCTION

1.1 Material Handling:-

Materials handling is loading, moving, and unloading of materials.

To do it safely and economically, different types of tackles, gadgets and equipment are used, when the materials handling is referred to as mechanical handling of materials.

Material handling system to move materials from one stage of production to another is very important. Materials handling includes moving, packaging, and storing all the materials used by the production unit. Materials handling is one of the important activities in materials management and also in production. In fact, the story of production is essentially the story of materials in motion. The efficient handling and storing of materials are vital to industry. In addition to raw materials, these operations provide a continuous flow of parts and assemblies through the workplace and ensure that materials are available when needed. Unfortunately, the improper handling and storing of materials often result in costly injuries. Companies need to control the types and quantities of materials they purchase, plan which products are to be produced and in what quantities and ensure that they are able to meet current and future customer demand, all at the lowest possible

cost. Making a bad decision in any of these areas will make the company lose money.

Since primitive men discovered the use of wheels and levers, they have been moving materials mechanically. Any human activity involving materials need materials handling. However, in the field of engineering and technology, the term materials handling is used with reference to industrial activity. In any industry, be it big or small, involving manufacturing or construction type work, materials have to be handled as raw materials, intermediate goods or finished products from the point of receipt and storage of raw materials, through production processes and up to finished goods storage and dispatch points.

- Materials handling as such is 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 at least reduced as much as possible.
- However, the important point in favour of materials handling is that it helps production.
- Depending on the weight, volume and throughput of materials, mechanical handling of materials may become unavoidable.

Based on the need to be of optimum design and application specific to different type of industries, materials handling can be as diverse as industries themself. As a consequence, unfortunately, there is no universally accepted definition of materials handling.

CHAPTER NO.2 INTRODUCTION TO THE ORGANIZATION

An organization is a group of people working together to achieve the specified goal. A manager plays a central role in grouping the people and activities, establishing authority and responsibility, and interacting with people for the achievement of the organizational goal. He performs the functions of planning, organizing, directing, and controlling for smooth functioning of the organization. Moreover, continuous influence of dynamic environment on the organization requires new managerial techniques to manage these changes. The detailed study of various aspects of organization and management may provide proper techniques for managing them effectively. In this unit, you will learn the concept of organization and management. You will further learn the functions and roles of managers. You will be acquainted with the types of organizations and the features of the modern organization.

Organization is born when more than one person co-ordinates to do a work, such as a person passing bundles to another person to keep them in order. People helping one another in work constitute an organization.

Organization refers to a way in which the component of an enterprise is put into working order, so as to achieve the objectives of the firm. The components of organization consist of men, machine, materials, methods, money, functions, authority and responsibility.

Organization involves division of work among people whose effort must be coordinated to achieve specific objectives and to implement predetermined strategies. Organization is the foundation upon which the whole structure of management is built.

- Advantages of Organization:-

1. Benefits of specialization: The entire work of the concern is divided into several departments. The employees who do the work repeatedly in the department will become experts and likely to make less mistake. They can focus better and work easier.

2. Division of work: The total work to be done is divided into small parts, and each entrusted to a particular individual.

3. Scope for growth and diversification: It helps for the growth of business operations and ensures maximum utilization of existing resources and capabilities.

4. Scope for expansion and adoption of new technology: Organising helps to expand the business, if necessary and can adopt new technological changes which may increase the efficiency and minimize the cost.

5. Stimulates Creativity: An organisation provides space to the individuals to exhibits their creative skills. The individuals can act within their limits and can use innovative ideas to perform the tasks.

6. Minimise duplication of work: Though the works are divided and arranged in order, it minimise duplication of work.

CHAPTER NO.3 THEORETICAL FRAMEWORK

3.1 Introduction:-

Material handling and transfer is defined as the movement of physical objects such as raw materials, component parts, sub-assemblies, assemblies and finished goods along within the manufacturing environment from receiving through shipping. The purpose of moving the material should be to increase its value. However, the handling, transporting, housing, and controlling of materials and goods adds nothing but cost to the system. The material handling and transfer is thus regarded as a burden and therefore, often carried out as a final step after product, process and layout design have been completed.

An efficient Materials Handling System (MHS) greatly improves the competitiveness of a product through a reduction of handling cost. The fundamental principles of material handling include the use of 'systems approach' where the material handling requirements of the entire factory is considered, and simplification of moves through the reduction or elimination of un-necessary and combination of several moves. Traditionally, 'experts' who analyze a few alternatives from which a selection is made based on their experience in the application environment have determined MHS. Selection of suitable MHE requires a complete analysis of the material handling problem.

The design of MHS includes the selection of material handling devices to transport material between facilities, which also impact on lead time, safety, work in process, queue length, inventory levels and overall operating efficiency of a facility. Thus, the proper design of MHS is very important for both conventional and advanced manufacturing systems.

3.2 Problems and Challenges related to Material Handling Systems:-

If your business is in supply chain or warehousing, chances are that you are having a lot of the same problems as your peers. Having worked with companies across Indian to supply material handling equipment, we continue to see or hear about the same issues over and over again with clients.

Below are just a few of the most common material handling problems we see in Indian businesses.

1. Lack of diversity in storage:-

For businesses in warehousing or supply chain, you can't afford to have a "one-trick pony" racking system. A lack of diversity in your storage media can result in running out of storage space extremely quickly if and when your product mix changes.

If you can anticipate any changes or additions to your product, think about diversifying your storage with some of the following racking types:

- Pallet flow racks
- Case-flow racks
- Push-back racks
- Single or Double deep racks

2. Being blind-sided by fuel costs:-

When deciding to purchase material handling equipment such as forklifts, the fuel source is one of the most important aspects of the machinery to consider. Fuel will be a constant expense, no matter if you choose an electric forklift or an IC forklift. It is important to not only take into account the prices of fuel now, but also where they might trend in the future. For example, diesel may be cheaper than propane at the moment, but what about in 5 years, or even 10?

For larger fleets with lots of work hours being put into your fleet, you may also want to take into consideration the tax incentives for investing in clean burning fuel.

3. Honeycombing:-

Another problem that occurs with racking is honeycombing, where inefficient or poorly planned pallet racking results in clusters of empty spots that are unable to hold any product. Honeycombing reduces your overall storage space and increases the time it can take for employees to pick orders or navigate storage.

To avoid honeycombing in your space, plan your slotting according to your inventory, not the other way around. Re-slotting your inventory can take time, but smart organization of your product storage will have big payoffs, especially if you're able to plan far enough down the road to accommodate for potential changes in your product mix (see problem #1 above).

4. Not staying up to date on safety training:-

The safety and well-being of everyone in and around the workplace is in everyone's best interest. When companies lapse on safety training, such as with forklift operator training, disaster can strike. Not only will accidents be more likely to occur without properly timed training and safety recertification, but in the event of an accident onsite, an insurance policy may not cover damage or medical expenses if proper OSHA regulations aren't followed to a "T".

5. Not planning for changes in your business:-

Similar to the first problem we mentioned, not planning for changes in your business can easily chew up your profit margins. Being able to chart out how far into the future you're going to lease a new forklift fleet, reconfigure all of your racking into narrow-aisle shelving, expand into a secondary warehouse space, or any other big move can help you save time, money, and a lot of headache in the planning and execution of any of those changes.

- Material Handling is an essential and significant component of any productive activity. It is something that goes on in every plant all the time. It entails the following:
- Providing the right amount of the right material
- In the right condition
- At the right place
- At the right time
- In the right position
- And for the right cost
- By using the right method

In order to achieve these objectives, the material handling companies face various challenges.

The top 5 challenges faced by material handling companies are mentioned below:-

1. **Labor Costs:-**

In general, hundreds and thousands tons of materials are handled daily requiring the use of large amount of manpower while the movement of materials takes place from one processing area to another or from one department to another department of the plant. The forklift operator accounts for 96% of the operating cost over the vehicle life. Whereas, with an automated tugger solution replacing manned forklift travel, the vehicle can operate for approximately $3 per hour, 24/7. Moreover, high turnover rates result in expensive training regimen as operators come and go. The cost of material handling contributes significantly to the total cost of manufacturing. In the modern era of competition, this has acquired greater importance due to growing need for reducing the manufacturing cost. The importance of material handling function is greater in those industries where the ratio of handling cost to the processing cost is large. Today, material handling is rightly considered as one of the most potentially lucrative areas for reduction of costs. Almost every item of physical commerce is transported on a conveyor or lift truck or other type of material handling equipment in manufacturing plants, warehouses, and retail stores. These operators use material handling equipment to transport various goods in a variety of industrial settings including moving construction materials around building sites or moving goods onto ships. There is a shortfall of skilled labor to perform manual material handling. Companies are facing the challenge of solving truck driver shortage.

2. **Material Management:-**

When manufacturers don't have full visibility to their inventory, they face the problems of either running out of stock at the wrong time or carrying too much stock and thus decreasing cash flow while increasing expenses to warehouse extra materials. Inventory shortage can lead to unfulfilled orders and unhappy customers. Figuring out where to store inventory to meet demand quickly while

staying within profitability margins is a growing challenge as the retail marketplace struggles to balance online and in-store sales channels. Today, fifty percent of manufacturing expenses are tied up in materials, reinforcing the critical nature of efficient materials movement and management.

3. **Downtime:-**

Downtime due to equipment damage can have devastating result. There are numerous costs associated with downtime. These not only include upfront and visible costs, but also hidden costs, such as overtime, loss of revenue, emergency service calls. Machinery that continuously breaks down has an extremely negative impact on the business. New survey of auto industry manufacturing executives shows stopped production costs an average $22,000 per minute. Manufacturers say they need better machine maintenance. While one minute of stopped production, or downtime, costs an average of $22,000, some survey respondents cite the figure to be as high as $50,000 per minute. With such high costs at stake, keeping production machinery operating smoothly is critical to a factory's bottom line. Ensuring that all the machines are regularly serviced is an effective tool in preventing downtime. For most manufacturers down time is the single largest source of lost production time. It can be triggered due to material issues, a shortage of operators, or unscheduled maintenance.

4. **Safety:-**

Forklifts cause about 85 fatal accidents per year; 34,900 accidents result in serious injury; and 61,800 are classified as non-serious. Fatal forklift accident causes and where they occur:

- Crushed by vehicle tipping over — Mining
- Crushed between vehicle and a surface — Construction
- Crushed between two vehicles — Manufacturing
- Struck or run over by a forklift — Transportation
- Struck by falling material — Wholesale trades
- Fall from platform on the forks — Retail trade

Implementing a forklift safety program and effective training can prevent many of these accidents. Training can also prevent or reduce the severity of an accident related to the stability of a lift truck traveling with an elevated load.

5. **Productivity:-**

Lower unemployment rate coupled with ever-higher hourly compensation makes it difficult for materials handling executives to retain best workers. Variable labor is a cause of concern in manufacturing as well as distribution facilities, which operate on extremely thin margins. 25%

annual personnel turnover in warehousing and distribution has a negative impact on productivity.

3.3 Design Principles and Physical Elements:-

A common approach to the design of MH systems (MHSs) is to consider MH as a cost to be minimized. This approach may be the most appropriate in many situations because, while MH can add real value to a product, it is usually difficult to identify and quantify the benefits associated with MH; it is much easier to identify and quantify the costs of MH (e.g., the cost of MH equipment, the cost of indirect MH labor, etc.). Once the design of a production process (exclusive of MH considerations) is completed, alternate MHS designs are generated, each of which satisfies the MH requirements of the production process. The least cost MHS design is then selected.

The appropriateness of the use of MHS cost as the sole criterion to select a MHS design depends on the degree to which the other aspects of the production process are able to be changed. If a completely new facility and production process is being designed, then the total cost of production is the most appropriate criterion to use in selecting a MHS—the lowest cost MHS may not result in the lowest total cost of production. If it is too costly to even consider changing the basic layout of a facility and the production process, then MHS cost is the only criterion that need be considered. In practice, it is difficult to consider all of the components of total production cost simultaneously, even if a new facility and production process is being designed. Aspects of the design that have the largest impact on total cost are at some point fixed and become constraints with respect to the remaining aspects of the design.

- **Principles of Materials Handling:-**

Following are the principles of material handling:

1. Planning Principle:- All MH should be the result of a deliberate plan where the needs, performance objectives, and functional specification of the proposed methods are completely defined at the outset.

2. Standardization Principle:- MH methods, equipment, controls, and software should be standardized within the limits of achieving overall performance objectives and without sacrificing needed flexibility, modularity, and throughput.

3. Work Principle:- MH work (defined as material flow multiplied by the distance moved) should be minimized without sacrificing productivity or the level of service required of the operation.

4. Ergonomic Principle:- Human capabilities and limitations must be recognized and respected in the design of MH tasks and equipment to ensure safe and effective operations.

5. Unit Load Principle:- Unit loads shall be appropriately sized and configured in a way that achieves the material flow and inventory objectives at each stage in the supply chain.

6. Space Utilization Principle:- Effective and efficient use must be made of all available

(cubic) space.

7. System Principle:- Material movement and storage activities should be fully integrated to form a coordinated, operational system which spans receiving, inspection, storage, production, assembly, packaging, unitizing, order selection, shipping, and transportation, and the handling of returns.

8. Automation Principle:- MH operations should be mechanized and/or automated where feasible to improve operational efficiency, increase responsiveness, improve consistency and predictability, decrease operating costs, and to eliminate repetitive or potentially unsafe manual labor.

9. Environmental Principle:- Environmental impact and energy consumption should be considered as criteria when designing or selecting alternative equipment and MHS.

10. Life Cycle Cost Principle:- A thorough economic analysis should account for the entire life cycle of all MHE and resulting systems.

3.4 Types of Material Handling Equipment:-

Material handling equipment usually falls under four main categories: bulk handling material equipment, engineered systems, storage and handling equipment and industrial trucks.

1. Bulk Handling Material Equipment:-

Bulk handling material handling equipment covers equipment that transports,stores and controls bulk materials. Generally, manufacturers design bulk handling material equipment to move and store materials in a loose form. You can find these pieces of equipment handling food, liquid, metal items and minerals.

If you want a clear idea of what bulk material equipment is, review some of the main types below:

- **Hoppers:** Hoppers are large funnel-shaped objects with openings that close. Companies use hoppers to pour loose materials into containers.
- **Reclaimers:** Reclaimers are large machines designed to pick up loose materials from a company's stockpile.
- **Conveyor belts:** Conveyor belts are an essential part of a conveyor system. They use drums or pulleys to rotate their belts and move materials in bulk from one location to another.
- **Stackers:** Stackers are key to bulk material handling. This automated equipment can move loose materials to stockpiles on their own.
- **Bucket and grain elevators:** Sometimes referred to as grain legs, bucket elevators vertically move bulk materials. They'll transport these materials on a production pathway and sometimes store them.

2. Engineered Systems:-

Otherwise known as automated systems, engineered systems refer to automated bulk material handling equipment made to help transport and store materials. Usually, automated systems feature several pieces of equipment. They're very popular since they remove the need for manual labor to complete various tasks. Here are some of the primary kinds of engineered systems:

- **Automated Storage and Retrieval Systems (AS/RS):** An AS/RS is a very popular type of engineered system, as it can handle lots of work. It utilizes a shuttle to pick up loose materials and then place them on needed parts of the system, and the picking process can be manually operated or automated. These systems also feature racks, shelves, and aisles for easy processing. They can also be connected to a company's network, making it easy for managers to monitor their stock.
- **Automated guided vehicles (AGVs):** AGVs are computer-operated trucks featuring sensors and detectors. These vehicles can be entirely

  autonomous, moving materials safely around your facility on preset pathways.
- **Robotic delivery systems:** Many facilities utilize automated robotic delivery systems to transport materials. Companies typically use these systems to transport materials on an assembly line.
- **Conveyor systems:** Conveyor systems feature several devices and mechanical assemblies that automatically transport materials throughout a facility. These conveyor systems come in multiple varieties, like apron, cleated, chain, overhead and vehicle conveyor systems.

3. Industrial Trucks:-

Industrial trucks cover a wide swath of equipment, and they're all designed to assist with material transportation. These industrial trucks can range from small, hand-operated equipment to large, drivable equipment. Generally, you can break industrial trucks down into two main categories: non-stacking and stacking trucks. Non-stacking trucks are solely designed for transportation while stacking trucks can also load materials and stack them.

Here are some of the primary kinds of industrial trucks:

- **Hand trucks:** Hand trucks are commonly called dollies, and they're a simple piece of equipment designed to give operators the leverage they need to roll heavy materials to new locations.
- **Side loaders:** Manufacturer's craft side loaders to fit between narrow aisles, easily picking up items on either side of them.
- **Pallet trucks:** Otherwise known as forklifts, pallet trucks are machines operators can use to lift heavy pallets. They feature forks designed to slip under the pallet, lift it up and then secure it as the operator takes it to a new location. You can find manual and electrical forklifts in various

warehouses around the country.

- **Order pickers:** When operators need to access materials stored up high, they use order pickers. These machines safely lift operators, allowing them to access hard-to-reach materials.

4. **Storage and handling equipment:-**

Storage and handling equipment helps safely store and organize materials while they await another stage in the production or distribution process. Depending on a company's needs, they may use this storage equipment to hold materials for short or long periods. Generally, storage and handling equipment is stationary, not automated, but companies often use it with automated systems and equipment.

Here are some of the most common storage and handling equipment:

- **Drawers, bins, and shelves:** You can find shelving used to store and organize basic materials. Bins and drawers are more popular when a company needs to organize smaller materials that could be easily lost otherwise.
- **Mezzanines:** A mezzanine refers to a raised indoor platform that creates another storage area above the ground. These mezzanines help companies store items vertically and free up space on their warehouse floor. They come in modular, rack supported, movable, free-standing and building supported forms.
- **Racks:** Racks help companies store their materials in accessible locations and save floor space. You can find racks designed for various uses, such as sliding racks, drive-in or drive-through racks, pallet tracks and push-back racks.
- **Stacking frames:** Manufacturers design stacking frames to easily stack on top of one another. They're one of the main types of storage equipment in material handling, as they safely store pallets filled with fragile equipment, saving space as a result.

EXECUTIVE SUMMERY

Material handling system has become a very powerful competitive tool for transport and logistics industries. Material handling system is an important factor on logistics and distribution efficiency in heavy transport. Few people would argue against the importance of material handling systems as a major influence of an organization's success. It is upon this understanding that the researcher finds it necessary to access the application of handling systems on materials storage and distribution efficiency in V-Xpress logistics Company.

This study will be carried out at V-Xpress Logistics Company, which is located along Narol Road, in Ahmedabad. The study will be conducted with an aim of assessing the application of handling systems on materials logistics and distribution efficiency in heavy commercial transport. The study will involve the operation department together with other departments within the company. The researcher reviewed relevant literature to this work such as type of material handling system, advantages and disadvantages of material handling systems, role of manual handling of material, equipment maintenance and some of other problems associated with material handling system applications. The study will use both primary and secondary sources of data. The collected data will then be analyzed both qualitatively and quantitatively.

The study will identify the best material handling systems to be used in logistics and distribution efficiency in V-Xpress Logistics Company limited which could contribute to the improvement of the current status of material handling of materials handling applications in the operation sector. The study of the fifth chapter covers data presentation and analysis, which was collected from X the field, is analyzed this chapter and the findings are presented in descriptive statistics by use of tables. The study of the sixth chapter deals with summery of the findings, discussions, conclusions, and recommendations. Research results from the fifth chapter are discussed, summarized and the hypothesis of the study is stated.

- **BACKGROUND INFORMATION:-**

This chapter gives more information about the background of the organization, statement of the problem, objectives of the study, hypothesis, significance of the study, research question and scope of the study, limitation, and the conceptual framework.

V-Xpress is the express cargo division of V-Trans India. We stem from an organization formerly known as Vijay Transports Ltd, founded by Late Shri. Kunverji K. Shah in 1958.We are ISO 9001:2015 certified and strictly follow proven Systems and Processes and Compliance norms up to our branch levels. We have agile management practices and modern technologies and infrastructure to lead successfully.

V-Xpress India Limited is an India based express logistics service providing company. The company was founded in 1959, has main office as head office in Chembur, Maharashtra, India. V-Xpress India Limited is one of the largest logistic companies in India. It is one of the famous names, providing logistics and supply chain services in India. V-Xpress India Limited provides xpress logistics, xpress advantages, xpress my package and industry expertise. Below, you can

check all types of details of V-Xpress India Company.

To be amongst the top 3 Express Logistics solutions provider in Indian Subcontinent , we do this through Self Belief and commitment, Widest Reach, Organization Building, IT enabled Infrastructure, SOPs, and Brand Building; to create wealth for Indian economy, by bringing efficiency in logistics costs through timely & safe deliveries; thus, reducing inventory cost.

Resources

Today V-Xpress well trained and motivated team of 1000+ people

- a fleet of over 200+ trucks
- 28000 square meter of warehouses,
- 4 container yards with adequate heavy lifting equipment
- Advanced information systems

V-Xpress is the leading logistics company in the region, providing an array of services and provides its customers with 360 degrees solution.

V-Xpress services include:

- Customs brokerage
- General ware housing and distribution
- Commodity ware housing(tea, coffee, sugar)
- Import and export(via air, road, rail)
- Transportation (local and regional)
- Packing and removals
- Shipping
- Ship agency and stevedoring
- Express courier
- Airline GSA
- Refrigerated container handling
- Container freight station(CFS)

➢ **Statement of the Problem:-**

Since its establishment the organization has undergone growth both in size and magnitude to try to match with the other logistics companies but despite of this, the handling system of materials has hampered the organizations development. This is mainly contributed by the fact that the decision making by the directors is very slow and also there is misunderstanding by the directors to improve

the handling systems which make the lead time of transporting the goods to their final destination very long and the company loses a lot of clients because of delays of their consignment. This also makes the number of contracts that the company performs go down.

- **Objectives of the Study:-**

The objectives of the study are as follows.

a) To identify the material handling system used at V-Xpress Logistics company

b) To establish the role of material handling system to the attainment of supplier's efficiency

c) To analyze the merits of using modern material handling systems in V-Xpress Logistics company

d) To offer recommendations for the suggestion on the suitable material handling system in V-Xpress Logistics company limited

- **Hypothesis:-**

Effective material handling procedure increases the morale of the workers, organization, productivity, and hence increasing supplier efficiency because proper material handling system enhances service delivery and supplier efficiency between the organization and the suppliers. The manual handling system, which the organization is currently using, has led to the reduction of the workers moral, dissatisfaction by the employees and loss of suppliers, hence organization efficiency.

- **Scope of the study:-**

The study was carried out at V-Xpress Logistics Company limited at Nakawa along Narol Road, in Ahmedabad and involved the entire work force, that is to say, directors and operating staffs including the drivers. The main aims of the study were the improvement of material handling system and enhance the understanding of the directors on this matter.

The area of the study carried out involves what benefits the organization may get if they improve material handling system and what particular area weaknesses exist in the company's material handling system. The study took a period of three months.

CHAPTER NO.4

RESEARCH METHODOLOGY AND LIMITATIONS

4.1 Introduction:-

This chapter focuses on the means and process through which the gather the data and analyze it. The chapter further focused on the research site, sample procedure and various methods of data collection instruments that were used during the course of study.

4.2 Research Design/Site:-

The research design is a descriptive case study where the researcher found out the relationship between two variables under investigation. This design is the most suitable since this study concentrated on only one organization which is V-Xpress by analyzing material handling system on supplier efficiency.

The statically method needs the collection of data in two forms:

1. Primary data
2. Secondary data

1. PRIMARY DATA:- The primary data are those, which are collected afresh and for the first time, and thus happen to be original in character. The data on the required information is collected from actual persons using the product/ services. This data is more suited for the objectives of the project.

2. SECONDARY DATA:- The data which have already been collected by someone else or taken from published or unpublished sources and which have already been passed through the statistical process.

4.3 The Study Population/Sample:-

The study was carried out at V-Xpress Logistics Company located along Narol Road, in Ahmedabad. The study aimed to cover a population of 50 employees. The population at the site was distributed in four major sections as shown in the table below.

The study was a census in that all the target population was involved in the research process, thus it constituted of a saturated sample of the entire 5o employees of V-Xpress.

Figure 1 4.1

Department	Number of employees	Selected sample
Purchase	13	13
Sales	11	11
Accounting	8	8
Operations	18	18
Total	50	50

4.4 Sampling Technique:-

The technique used is stratified sampling. The study population was divided into four stratums in terms of job categories. This technique ensured that inclusion in the sample of sub-groups which otherwise would have been omitted entirely by other sampling methods because of their small number in the population.

4.5 Data Analysis and Presentation Techniques:-

Data was analyzed both quantitatively and qualitatively and the findings presented by use of graphs, pie charts and tables.

4.6 Limitations of the study:-

The following challenges are anticipated during the process of carrying out the research study:

a) Inaccessibility of information the management had no reliable documentation that could assist in the research study. Since the problems are from the directors misunderstanding, they did not like their problems to be documented. In addition to that retrieval of the useful information from the employees can be faithless because they take themselves as inferior.

b) Lack of relevant and up to date material This being the first time to prepare a research proposal, getting relevant information from the right sources was very difficult because there were no available cases to compare with.

c) Lack of enough time the staff working at V-Xpress Logistics Company limited is always busy and has set objectives. Therefore, the limited time for the researcher to discuss the necessary details required for the research.

d) financial problem the lack of funds to purchase computers and data analysis packages, which could make the research proposal very easy to carry out. This is in addition to transport expenses.

➢ **Conceptual Framework:-**

INPUT /PROBLEM	PROCESS/SOLUTION	RESULT /OUTCOME
POOR HANDLING METHODS	BETTER SYSTEMS	IMPROVEMENTS
- high rate of damages - time consuming - high cost of labor - risk of health/safety - loss of customers	- modern mechanical - staff trainings - provision of safety /health equipment's - insurance services - effective communication	- reduced damages - skilled workers -increased safety - increase morale - reduces cost of operation

In order to have proper material handling systems, the organization should have to minimize the rate of damages, improve on time consumption, should minimize the cost of labor, and should set aside health and safety measure and also improving customer relationships.

Use of modern material will reduce the rate of damages in the workplace and reduce the cost of operation.

Training of staff trough seminars will result in skilled workforce. Introduction of provision of health and safety equipment will result in increased safety and also increase staff morale.

Introduction of instant services and effective communication will lead to effective service delivery and retention of customers.

CHAPTER NO. 5

DATA ANALYSIS AND PRESENTATION

5.1 Introduction:-

The data which were collected from the respondents through the research study process are here in organized, processed and analyzed for easy presentation and interpretation in order to make conclusions and recommendation from specific findings of research.

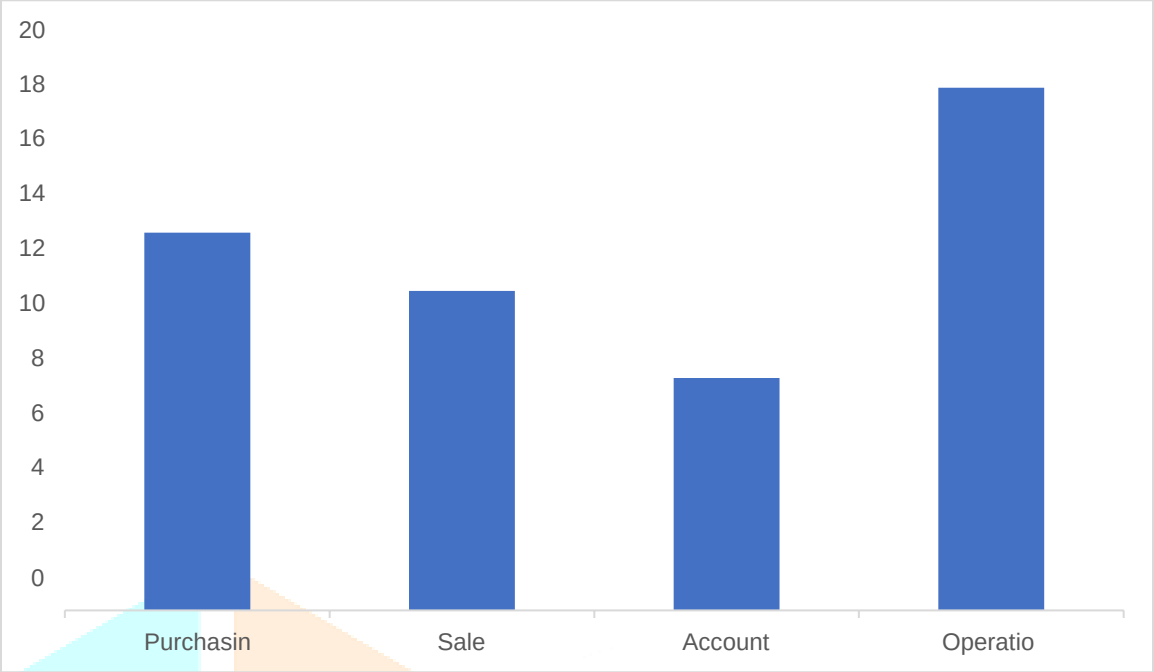
5.2 The Response Rate:-

The target of the population study was at a total of 50 employees of the organization which were all involved in the research process. were conducted involving all the 50-target population of the study. The response was as provided in the table below.

Figure 2 5.2 Response Rate

Department	No. of Employees	No.Of Respondents	Percentage
Purchasing	13	13	100
Sales	11	11	100
Accounts	8	8	100
Operations	18	18	100
Total	50	50	100

Figure 3 5.2 Response Rate



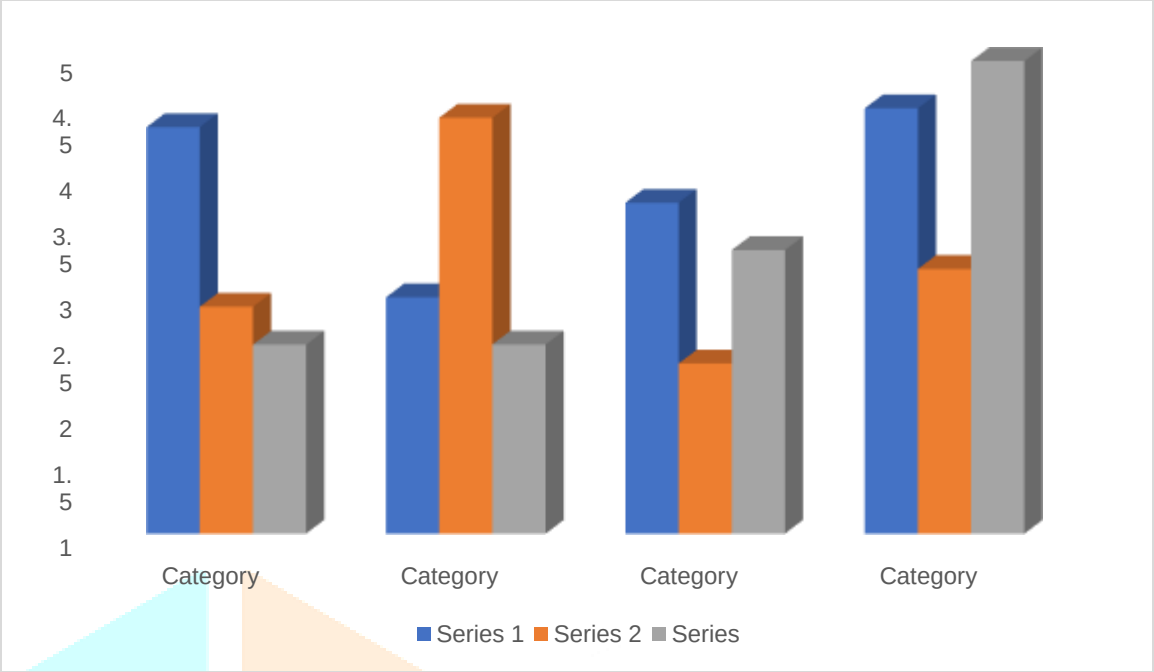
5.3 Material Handling Systems used:-

The respondents were asked to identify the most common material handling system used in SDV TRANSAMI and the response was given in the table below:

Table 1: 5.3 Material Handling Systems Used.

System	No. of Respondents	Percentage
Forklift	45	90
Conveyors	15	30
Pallet truck	20	40
Cranes	30	60
Manual	40	80

Figure 4:5.3 Material handling systems used



No. of respondents

Analysis

From the table above, it is evident that 90% of the respondents' identified forklifts as the commonly used equipment, followed by manual method with 80% there are also other material handling equipment used such as cranes, pallet trucks and conveyors.

Findings

It can therefore be concluded from the above table that most of the materials are handled manually in the organization by the use of the forklift equipment which was identified by 90%of the respondents who confessed to have seen it being used for the purposes of material handling in the organization.

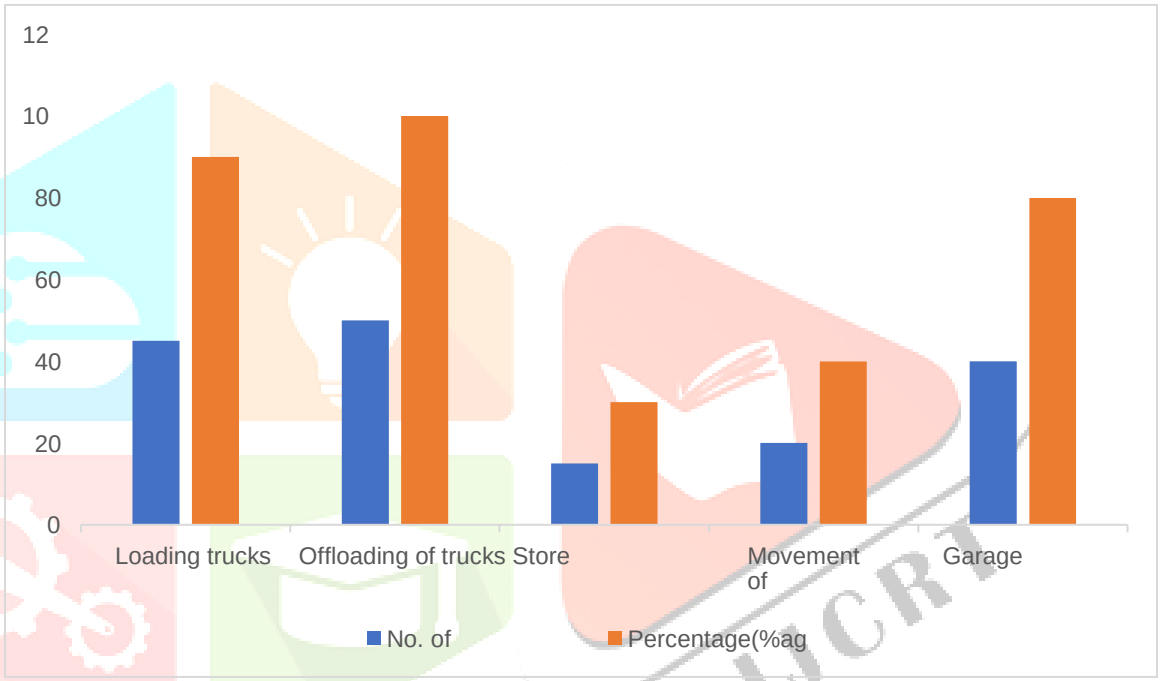
5.4 The role of material handling systems:-

The respondents were requested to state the contribution of material handling systems m enhancing the attainment of supplier's efficiency in the organization. The respondents highlighted the following roles of material handling systems.

Table 2:5.4 Role of material handling systems

Roles	No. of respondents	Percentage(%age)
Loading of trucks	45	90
Offloading of trucks	50	100
Store arrangement	15	30
Movement of warehouses	20	40
Garage activities	40	80

Figure 5: The role of material handling



Analysis

The respondents stated that, the role of material handling systems include the loading of goods on trucks (90%), the offloading of materials from trucks (100%), facilitation of activities in the garage (80%), stores function (30%), and movement of materials within, out of and into the warehouse are among the main areas of application.

Findings

From the table 6.4 above, it can be deduced that material handling systems are more applicable in loading and offloading of trucks. This is true because V- Xpress A Logistics Company dealing mainly with the transportation of goods by use of both light and heavy trucks from place to place.

5.5 The merits of using modern material handling systems:-

The research seeks the respondents on the advantages of using the modern materials handling systems in a transport industry. The responses were as provided in the table below.

Table 3: Advantages of modern systems

Merits	No. of respondents	Percentage(%age)
Time saving	40	80
Save material damage	30	60
Labour saving	20	40
Less fatigue	35	70
Increased safety	25	50
Reduced handling costs	15	30
Saving space	5	10

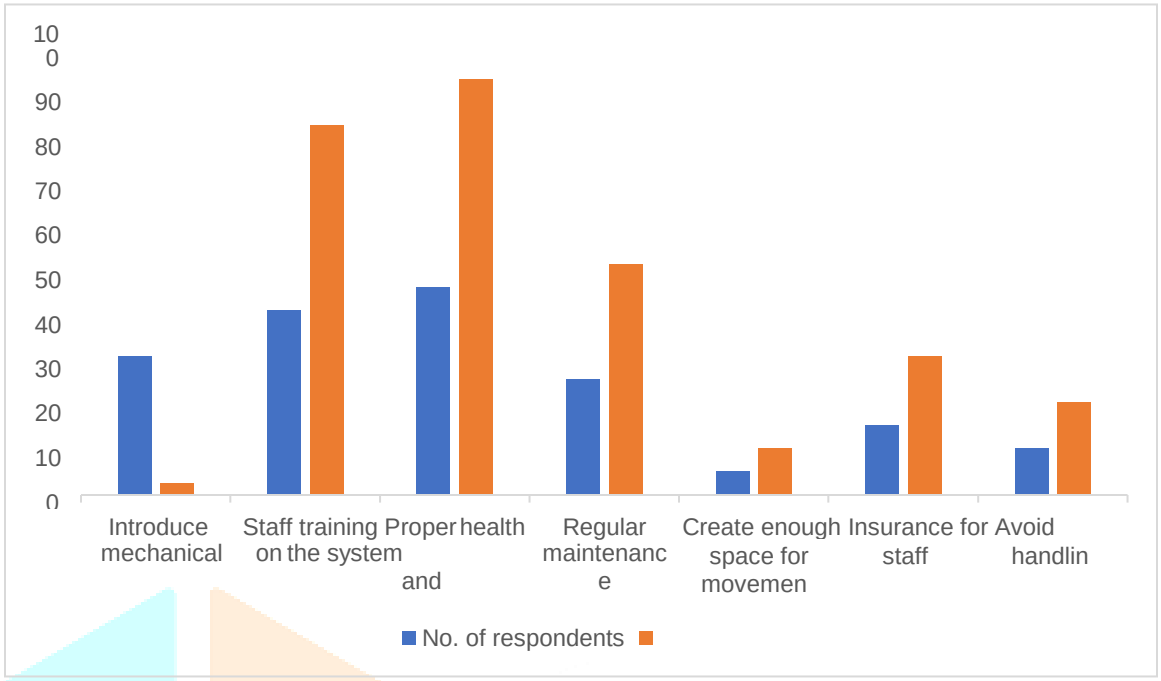
5.6 Suggestions on the suitable materials handling systems:-

On how the system would be improved, the respondents were requested to give suggestions on what they perceive as the most suitable and necessary material handling methods appropriate for the organization. Several recommendations were proposed as listed in the table below.

Table 4: On Recommendations

Recommendations	No. of respondents	Percentage
Introduce mechanical system	30	60
Staff training on the system	40	80
Proper health and safety equipment	45	90
Regular maintenance equipment	25	50
Create enough space for movement	5	10
Insurance for staff	15	30
Avoid manual handling	10	20

Figure 6: Recommendations



Analysis

Most of the respondents recognized that there is need for proper efficient health and safety measures necessary in the activities of handling materials in the company. This suggestion was made by 90% of the respondents while 80% also recommended that there is need for staff training on the use of mechanical equipment and be imparted with relevant skills concerning health and safety matter in the process of conducting their activities, other proposals include, the introduction of mechanical; material handling methods (60%) of the respondents and regular maintenance of those equipment (50%), besides ensuring the staff against accidents and injuries, among others.

Findings

From the above, it can be concluded that the workers would recommend the change of handling materials from the manual method to modern mechanical material handling systems which would increase the efficiency and satisfactory service delivery to its customer with high rate of return and at a reduced risk of injuries and also feel there is need for improved skills in handling materials through proper training of relevant staff.

CHAPTER NO. 6

SUMMERY, CONCLUTIONS AND RECOMMENDATIONS

6.1 SUMMERY:-

The research study was highly successful with the response rate of 100% thus all the targeted population of the study was involved in engaged participation of engineering data or information on the subject of study. Even though there were limitations of the study, the researcher tried to manage

the short comings with a view of establishing the valid study results.

The common method of handling materials in V-Xpress Logistics Company is manual operation, which is risky and time-consuming resulting into many often injuries and accidents among other health and safety problems which are costly to the organization. The damage of property through manual handling increases the cost of operation, sometimes requiring compensation and fines paid to the owners of goods damaged.

As the firm continues to grow in size with increasing volume of transaction, it has become extremely difficult to cope with the rate of business expansion, which requires more effective and efficient methods of material handling capable of meeting the demand of increasing customer base. Manual methods can no longer match the need of business activities as currently conducted in viewof the industry. This has retarded the continuous growth and development of the company.

The methods of handling materials are of very significant value in transport business activities involving loading and off-loading of goods from place to place. The movement of materials and storage of warehouses require high level of precaution for both safety of goods themselves and the workers engaged in such activities hence much attention is required to adopt the appropriate 26 techniques of handling materials which are efficient, safe, time saving and cost effective, in order to provide reliable services to customers. In V-Xpress Logistics Company the most commonly used equipment for loading and offloading are simple forklifts and conveyors which are sometimes manually operated. Other methods include the use of pallet trucks and cranes which are off fashioned and function below expected standards. This has slowed down the transport and distribution activities in the organization leading to congestion in the warehouse and delay in service delivery to customers some of which cut down their business with the firm.

Most of the employees of V-Xpress have been trained on the modern methods of material handling systems appropriate for the current global technological change. This has led to low productivity of employees who are exposed to dangers of health and safety matters, leading to low morale and fatigued workforce in the organization.

6.2 CONCLUTIONS:-

After careful evaluation, analysis and interpretation of the research results the researcher made the following observations and conclusions as per research objectives.

a) Objective one: The type of methods used

In V-Xpress Logistics Company, the material handling processes are mainly manual methods which

involve the use of manual force required to cope with the increasing demand of the volume of flow of materials in and out of the organization through its warehouse and trucks. There are also simple and old-fashioned mechanical devices and equipment's used but are operated manually, for instance, forklifts, crane pallets trucks and conveyors, which are not well maintained and therefore perform below the expected standards.

There is lack of training programs to impact the level of skills of material handling systems especially on the technological equipment's and machines used for handling materials and equipment's besides the loss of faith and trust by the customers. Lack of training of employees on appropriate methods has resulted into several health and safety problems among the employees themselves, for instance, frequent accidents and injuries at place of work leading to low morale and less efficiency.

b) Objective two: Roles of material handling methods

Effective material handling systems play an important role in enhancing suppliers' efficiency especially in a logistics company like V-Xpress, for instance, its enable's timely delivery of consignments from one place to another without delay and because time is a very important resource in and has cost implications to both the activities of clients or customers and the company itself, resulting into enhancement of supply function.

Proper handling of materials also contributes towards the attainment of supplier's efficiency by reducing the rate of damage of materials and property at the point of loading, unloading and in transit by Lorries, trucks, and other vehicles especially by road transport.

It's also safe to handle goods and other materials carefully especially during the loading and unloading or in motion, through better techniques in order to avoid injuries and accidents of those employees who directly handle materials from the point of receipt and delivery. This will help reduce costs associated with such incidents.

In order to achieve efficiency in store functions for effective performance, there must be in place good and modern techniques especially mechanical handling systems in the warehouse for orderly stores layout which conforms to current technological advancements.

c) Objective three: Merits of modern handling systems

There are several merits of using modern material handling systems which culminate into the attainment of supplier efficiency, service delivery and cost effectiveness. Mechanical methods of

handling materials in logistics and distribution processes reduce the number of labor involved in the supply chain process, thus help to alleviate the problems of overcrowding, congestion, and duplication of duties where repetitive jobs as performed by many workers at several stages in the organization.

Modern methods of material handling are cost effective due to the fact that they reduce the general handling costs, for example materials and goods are packed in the same bigger load units or barges and moved together in bulk consignments whose overall effect is reduction in overhead expenses, compared to manual methods which involve several small units which are light in weight but costly in handling.

The use of modern methods of handling materials is faster and time saving besides being less fatigue which promotes and motivates employee's preference of doing their work. It also allows the job and duty arrangements in shifts whose ultimate goal is to enhance job performance and employee productivity. Appropriate methods of material handling also increase the safety at work and general operation of supply process besides saving material damage.

d) Objective four: Recommendation

It's a general consensus by the respondents that that there is a need to introduce the modern material handling systems in the organizations operations especially the mechanical devices to save time for handling goods and reduce labor hours put into doing work and at the same time reduce the rate of material damage.

The respondents suggested that the employees of the organization who are directly involved in handling materials should be adequately trained on how to use and operate the relevant modern equipment for handling materials, for example machines and tools and be given knowledge in the necessary information and communication technology the staff should also be trained on health and safety measures related to their working environment. It is also necessary to offer regular and frequent maintenance and repair services to such modern material handling equipment’s to keep them viable and in good condition for effective productivity. This together with the provision of enough and proper health, safety equipment's will ensure continued operation with uninterrupted provision of services to the customers.

In order to attain effective supplier’s performance, the respondents proposed the provision of insurance cover to all the employees against accidents and general life hazards. The manual handling of materials should also be reduced.

6.3 RECOMMENDATIONS:-

After a careful analysis and intervention of the data collected the research study offers the following recommendations.

That V-Xpress should adopt the modern handling methods in its activities including loading, transporting, distribution; unloading and storage, for instance, the mechanical material handling methods should be preferred to the current manual system.

The company management requires a revolution change of attitude on work performance; if they are to measure to the competitive market in the modern global technological changes, for example the overall work arrangements and standards of performance should be gauged to international standards if they are to attain their market share.

The employees should be provided with training opportunities through off-the job training programs to help enhance and provide them with knowledge and modern skills on handling materials mechanically: this will also improve their health and safety positions.

The company should organize either to out-source or build international units for regular maintenance of their material handling equipment's including machines, tools, lorries and trucks for transporting goods. Thus, there should be properly equipped workshop with relevant experts to offer maintenance and repair services. This may involve hiring of the correct personnel trained in the relevant areas or hire experts from outside firms.

Apart from providing equipment for health and safety measures the company should enhance the morale of its employees by ensuring insurance policies against accidents and injuries to consolidate the confidence of those directly involved in the process of material handling. It should also ensure that its properties and equipment's including vehicles against accidents and damage. This should cover the goods on transit so as to win the confidence of the customers for the provision of transport, storage, and distribution of materials.

REFERENCES

1. Vinod V. Sople – Logistics Management: Supply Chain Imperative, Publisher: Pearson Education India
2. Prof. L. C. Jhamb- Material & Logistics Management Book by L.C. Jhamb, Publisher: Everest Publishing House, India
3. S. K. Bhattacharya- Logistics Management reference Book by S. K. Bhattacharya, Publisher: S. Chand & Company, India
4. Satish C. Ailawadi, Rakesh P. Singh- Logistics Management reference Book by S.C. Ailawadi, Publisher: PHI Learning New Delhi
5. Donald Bowersox, David Closs, M B Cooper, John Bowersox- Logistics Management reference Book by Foreign/ International Authors, Publisher: McGraw Hill Education
6. Paul A. Myerson- Supply Chain and Logistics Management Made Easy: Methods and Applications for Planning, Operations, Integration, Control And Improvement, And Network, Publisher: Paul Boger