

A STUDY ON WAREHOUSE MANAGEMENT AT PROMPT TERMINAL PRIVATE LIMITED

Submitted in partial fulfillment of the requirements for the award of

Master of Business Administration

by

BINEESH S
Register No.39410038



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 - 600 115.**

April - 2021



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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **BINEESH S (39410038)** who have done the Project work entitled **A STUDY ON WAREHOUSE MANAGEMENT AT PROMPT TERMINAL PRIVATE LIMITED** under my supervision from **December 2020 to February 2021**.

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DECLARATION

I **BINEESH S (39410038)** hereby declare that the Project Report entitled **A STUDY ON WAREHOUSE MANAGEMENT AT PROMPT TERMINAL PRIVATE LIMITED** done by me under the guidance of **Ms. KAVITHA RAJAYOGAN** and **Mr. FERNANDEZ** at Prompt Terminals Pvt. Ltd. 24/3 Ayyanadaippu Village, Madurai Bye Pass Road, Tuticorin - 628101 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.

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I wish to express my thanks to all Teaching and Non-teaching staff members of the School of Business Administration who were helpful in many ways for the completion of the project.

BINEESH S



PROJECT COMPLETION CERTIFICATE

To whomsoever it may concern

This is to certify that Mr. **BINEESH S**, student of MBA – (Operations and Marketing), **Sathyabama Institute of Science and Technology**, Chennai, had successfully completed his project work in our organization from **Dec 2020** to **Feb 2021**.

During the period of project work, he had done project titled "**A STUDY ON WAREHOUSE MANAGEMENT AT PROMPT TERMINAL PRIVATE LIMITED**". We wish him all success in his future.

For Prompt Terminal (P) Ltd

Fernandez

Manager-Logistics



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ABSTRACT

Warehousing is a key function of supply chain management. The main function of warehousing is to receive products (from inbound or manufacturing lines), to store materials until they are requested, and then, to extract products from inventory and ship them in response to the customers' orders. In the past, managing inventory focused on inspecting the processes to improve the performance of the warehouse. The inspection process did not need to use information technologies (IT) tools. In the last decade, warehouse operations have become more complex with an increasing number of items to be processed in a warehouse, so traditional and manual methods of warehouse management are no longer adequate or practical to manage this vast amount of operations, this led to an increased usage of IT in order to deal with these complexities. It is vital that inventory management systems allow managers to receive real time information on inventory. The traditional space optimization provides the resolution on inventory concerning the products available on shelves, when some products are misplaced, expired, damaged etc. Wireless technologies will assist management to accurately make informed decisions, anywhere anytime and save time and cost used for labor and thus working on inventory management properly, business enterprises can make accurate analysis on which product are top sellers and which are slow movers. As a result this study proposes to take advantage of the wireless technologies in the management of inventory. A total of 120 employees were selected with an attempt to cover a wide cross section of the Prompt Terminals Pvt. Ltd. Convenient sampling method is used in this study for data collection. Primary data was collected with the help of a Questionnaire. A detailed questionnaire was prepared for which data is collected from 120 employees of Prompt Terminals Pvt. Ltd in Tuticorin. Secondary data was collected by external sources like books, newspapers and journals; new age sources like the internet. Some White papers and articles were also referred to get an insight on the working of wireless Technology. Access to different articles with respect to wireless technology on the internet enabled to gather some useful information and facts about the same.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Warehouses are designed to meet specific requirements in the inventory handling mechanism in which they form a part of. Meanwhile, there are some operations which are common amongst them. Inventory handling can be categorized as; Inventories in or receiving. This involves the physical activity of unloading incoming transports, checking deliveries against purchase orders and recording. Depending on the agreement of both parties, future checks may include quality control. Some or all of the delivered inventories are either rejected or accepted at this stage. Rejected inventories are sent back to the supplier. Pre-receipt, suggesting that the warehouse manager should be involved in specifying and agreeing on the packaging, items per carton as well as any specific labeling required, in addition to the means of transport, so as to ensure that the delivered products are compatible with the storage facility. Put away into the storage area. Depending on the state of inventories in the above stage, accepted inventories are taken into storage. The storage area of the warehouse is often the largest space, with the spaces divided for the different kinds of inventories that come in order selection and picking or packing. Inventories are stored in the warehouse to be used later when needed. The needs for inventories are made when orders are placed for them. When orders are placed, the inventories are selected and picked according to their identifiable locations. The inventories are then made ready for transportation to the point of need. Inventories outward or dispatch are put together at the dispatch area and loaded onto the outbound vehicles, or picked up for use according to their size and place of need. The key aspect to be considered in the activities is the conflicting priority of maximizing the use of the space allocated to each, while minimizing to undertake the activity. The process of inventory handling can be described as follows;

Receiving

This is the process of unloading incoming truck, identifying, registering and sometimes repacking.

Put away

This is when goods are moved from unloading dock to the storage area.

Storage - in bulk or pick

Activities at the warehouse affect goods in storage. For instance, the amount of stocks has to be counted to verify inventory quantities.

Replenish

If inventory levels of the pick storage drop to certain amounts, it is replenished with stocks from the bulk storage.

Pick

Upon order for need of an item in storage, either full pallets are picked from the bulk area of storage, or smaller quantities are picked from the pick area of storage.

Ship

The picked items are packed, consolidated and staged for shipping.

Cross-dock

Some goods do not make their way into storage. Such goods, upon receipt are transferred to the shipping dock for shipment to point of need.

Value Added Logistics

There also recognition for the value added by some logistics activities at distribution centers. Such value can be the labeling of goods to the specific customer or country of destination.

1.2 INDUSTRY PROFILE

According to the Ministry of Shipping, around 95 per cent of India's trading by volume and 70 per cent by value is done through maritime transport. India has 12 major and 200 notified minor and intermediate ports. Cargo traffic, which recorded 1,052 Million Metric tons (MMT) in 2015, is expected to reach 1,758 MMT by 2017. The Indian ports and shipping industry plays a vital role in sustaining growth in the country's trade and commerce. India is the sixteenth largest maritime country in the world, with a coastline of about 7,517 km. The Indian Government plays an important role in supporting the ports sector. It has allowed Foreign Direct Investment (FDI) of up to 100 per cent under the automatic route for port and harbor construction and maintenance projects. It

has also facilitated a 10-year tax holiday to enterprises that develop, maintain and operate ports, inland waterways and inland ports.

Logistics is the backbone of the economy, providing the efficient, cost effective flow of goods on which other commercial sectors depend. The logistics industry in India is evolving rapidly and it is the interplay of infrastructure, technology and new types of service providers that will define whether the industry is able to help its customers reduce their logistics costs and provide effective services. Despite weak economic sentiments, the logistics & warehousing industry continued to witness growth largely due to growth in retail, e-commerce and manufacturing sectors. The Global Logistics sector is expected to grow at around 10-15% in the period 2015-16. With this forward looking attitude and a promise of growth and improvements, the service oriented logistics industry is all set to expand beyond the horizons in the latter half of this decade, utilizing this fiscal year as its launch pad.

Operationally, logistics is mainly divided into transportation, storage and warehousing, and distribution. Currently, India uses road transport more extensively vs. rail and waterways, thereby increasing cost of transportation. In storage and distribution, contribution of third party logistics (3PL) activity is significantly lower and major focus is on freight forwarding.

Market Size

Cargo traffic handled by India's major ports increased 3.26 per cent year-on-year to 273.96 million tones (MT) during April-August 2017. In terms of composition of cargo traffic, iron ore traffic volume rose 29.32 per cent to 18.73 MT, petroleum oil and lubricants rose 8.36 per cent to 93.14 MT, and container traffic rose 6.44 per cent. The Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry, reported that the Indian ports sector received FDI worth US\$ 1.64 billion between April 2000 and March 2017.

Investments/Developments

The Indian Minister for Shipping, Road Transport and Highways, Mr. Nitin Gadkari, announced a massive investment in India's ports and roads sector, which is likely to help boost the country's economy. The Indian government

plans to develop 10 coastal economic regions as part of plans to revive the country's Sagarmala (string of ports) project. The zones would be converted into manufacturing hubs, supported by port modernization projects, and could span 300–500 km of the coastline. The government is also looking to develop the inland waterway sector as an alternative to road and rail routes to transport goods to the nation's ports and hopes to attract private investment in the sector.

- Indian shipping companies are expected to gain from the surge in country's iron ore exports to China, and as a result shipping firms are increasing the number of their large sized vessels deployed on the India-China route.
- Reliance Defense and Engineering Ltd (RDEL) has signed a contract with the Ministry of Defense for the design and construction of 14 fast patrol vessels (FPVs) for the Indian Coast Guard, at a cost of Rs 916 crore (US\$ 137.4 million).
- Tata Steel has signed an agreement to purchase 51 per cent stake in Creative Port Development (CPDPL), which has a concession agreement with the Odisha government to develop a 10 million-tonnes-per-annum (MTPA) Subarnarekha port at Chamukh village in Balasore district of Odisha.
- The Cabinet approved setting up a major port at Enayam near Colachel in Tamil Nadu, with an estimated cost of Rs 6,575 crore (US\$ 986.25) for Phase—1 development; and the first container berth in Phase-I will be operational by December 2020. This would be the country's 13th major port.

Road Ahead

Increasing investments and cargo traffic point towards a healthy outlook for the Indian ports sector. Providers of services such as operation and maintenance (O&M), pilotage and harboring and marine assets such as barges and dredgers are benefiting from these investments. The capacity addition at ports is expected to grow at a CAGR of 5-6 per cent till 2022, thereby adding 275-325 MT of capacity. Under the Sagarmala Program, the

government has envisioned a total of 189 projects for modernization of ports involving an investment of Rs 1.42 trillion (US\$ 22 billion by the year 2035).

1.3 COMPANY PROFILE

Prompt Terminals operates one of the world's most comprehensive port networks. We're uniquely positioned to help both shipping line and landside customers grow their business and achieve better supply chain efficiency, flexibility and dependability.

Our team of 21,000 industry professionals is focused on delivering the operational excellence and solutions businesses require reaching their potential. We operate a network of 74 terminals globally. This equates to handling around 250 vessel calls per day and 40 million TEUs per year.

What they offer

- ✓ Reliable, safe and efficient operations with a continuous improvement focus.
- ✓ Flexible and solutions oriented approach to solve complex customer problems.
- ✓ Standardized approach to operations being implemented globally to enable consistent service levels and delivery.
- ✓ Innovative, digital solutions that enable customers to order their services quickly and easily.
- ✓ Dedicated key client managers and customer service personnel.

1.3.1 Vision

Our Vision is to make Prompt Terminals India the most innovative Supply Chain Management Services Company, focused on highest value creation for its customers and shareholders.

1.3.2 Mission

At Prompt Terminals India we strive to provide our clients with best of services customized to meet their unique needs through effective collaboration, management and optimization of its integrated value chain.

1.3.3 Quality

We, at Prompt Terminals India Supply Chain Solutions Limited are committed to provide a best-in-class Supply Chain Solutions to all our clients that enhance customer delight through our relentless pursuit of perfection in our operations that consistently meet the customer

requirements. We will strive to continually improve our core competencies to meet the market requirements

1.3.4 Optimized network

Prompt Terminals works with best-in-class joint venture partners, such as local businesses and governments to ensure our geographical footprint is optimised to be where our customers need us most. As a port infrastructure leader, we help nations achieve their ambitions – creating new jobs and economic prosperity. Shipping is a repeat business – so we demonstrate consistent performance every day to earn the business. For berthing we offer competitive rates, flexibility and superior service for shipping lines. In the yard we offer safe, reliable operations with high levels of productivity. And at the gate our easy to use products provide accurate information for supply chain partners.

1.3.5 Services include

Third Party Logistics

As a 3PL service provider, Prompt Terminals India serves as “third Party” supply chain service provider between Manufacturers/ Traders/ Suppliers and Buyers/ Dealers/Resellers

Reverse Logistics

Reverse Logistics provide a wide variety of opportunities for improvements, from customer service and returns processing to supplier relations and an unexpected. Reverse logistics play a major role in cutting down expenses. With Logistics solutions, the company provides a wide variety of opportunities for improvements, from customer service and returns processing to supplier relations and an unexpected revenue source. There are several key areas where we enable companies to positively impact revenue with our innovative reverse logistics activities. Reverse logistics can lead to improved relationships with OEMs and supply chain partners, improved profits through reduced costs and improved efficiencies and higher recovery rates for returns. Their culture of high quality customer service and commitment to deliver superior service enable organizations to find hidden profits, improve customer delight and minimize liabilities.



Fig 1.1 Figure Representing Solution rendered in Reverse Logistics

In-Plant Logistics Management

Warehousing & Internal Transportation Services are offered in clients premises. This comes with the options of infrastructure being provided by the client or by Prompt Terminals India. Improving efficiency of the process in handling in-plant logistics is the need of the hour to optimize the cost for improved productivity. Suitable infrastructure, organization and well laid down process/ systems would help in achieving the desired target. With its superior expertise, Team Prompt Terminals India undertakes of the study the entire in-plant operation & offers the right infrastructure, sets up the right manpower, re-aligns processes and runs the operation.

Project Management

Project logistics management provides the facility of consolidation of materials from various vendors into our warehouses and enables multi-location deliveries on a PAN India. Handling a turnkey project to meet the supply chain needs of a Client is daunting task given the precision of delivery schedules, setting up the required infrastructure, collaboration with partners for timely installation and handling reverse logistics, if any.

Prompt Terminals India offers,

- ✓ The required facilities for consolidation of materials from various vendors and enables multi-location deliveries on PAN India basis within the stipulated time
- ✓ To setting up of the necessary infrastructure and managing the resources for testing or undertaking value-added services & collaborating with partners for timely delivery for installation.

Supply Chain Consulting

With the gained expertise of servicing many Clients over these years, we have set up a team that studies the Client's supply chain requirements, maps with the best practices. With increasing pressure to perform and deliver in the competitive market, reassessment of the existing supply chain processes is needed.

- ✓ Is your supply chain network design optimal?
- ✓ Do you have the right supply chain process in place?
- ✓ Having difficulty integrating demand and supply with how much inventory & where?
- ✓ Does your technology and planning processes appropriately manage your supply chain complexity?
- ✓ Are your supply chain processes lean and agile?
- ✓ Are you benefiting as expected from collaborative planning with your partners?
- ✓ Prompt Terminals India studies and offers a most opted supply chain model in order to be competitive with optimized cost with improved efficiency & visibility and agility

Mission Critical

A Value Addition to Customers to fulfill their commitments to meet machinery uptime criticality by providing 24/7 services and deliverables, Prompt Terminals India Supply Chain Solutions Limited's (Prompt Terminals India) Mission Critical Service Division provides end-to-end Supply Chain Services for mission critical service parts and products logistics in the territory of India. The Services are rendered with well-defined process, controls and operational excellence in order to satisfy Customer requirements efficiently, maximize Customer value and achieve

a sustainable competitive advantage. Mission Critical Services involve availability of the right product at the right time and at the right place in order to meet Customer requirements within the committed span of time. It involves value addition by providing deliverables within the stipulated time in order to meet machine uptime criticality. The Company's aftermarket services include mission critical service parts logistics for strategic movement, management and tracking critical parts and products.

Services being offered include

1.3.6 Logistics

- ✓ RMA – Warranty Support
- ✓ Forward & Reverse Logistics
- ✓ Inventory Management
- ✓ Storage
- ✓ Ecommerce

1.3.7 E-Commerce

As e-commerce continues its rapid growth into virtually every market sector, retailers are anxious to expand their presence online to capture this market share. With the growth of ecommerce and the number of companies opting for it, Prompt Terminals India felt it was important to designate a separate vertical that managed the supply chain solutions in ecommerce. Ecommerce Fulfillment through Prompt Terminals India is more cost-efficient, as it is able to capitalize on its spread of warehouses & versatility in handling multiple clients. Even though an ecommerce merchant may not have a physical store, physical goods need to be stored at some location. Prompt Terminals India will typically take care of your warehousing requirements. It will invest in the space and technology required to efficiently run this warehouse.

Prompt Terminals India takes care your entire logistics requirement, services include

- *Supply Chain Management*

- *Warehousing*
- *Order Fulfillment*
- *Flexibility & Scalability*
- *Efficiency & Specialization*
- *Technology*
- *Transportation*
- *Prompt Terminals India 3PL Services improves E- Commerce Fulfillments*
- PICK, PACK, AND SHIP

1.3.8 ASSESSING PROMPT TERMINALS INDIA 3PL CAPABILITIES FOR E-COMMERCE

Within e-commerce, unpredictability is a constant factor. Flexibility in the 3PL supply chain, therefore, becomes critical. This can be derived from implementing the right software and automated systems that can support the fluidity that e-commerce requires.

- ✓ 3PLs under consideration for handling a retailer's e-commerce fulfillment should be assessed against the following criteria as to their performance capability. These points represent potential trouble areas in e-commerce fulfillment:
- ✓ Large SKU counts, with a high percentage of slow movers.
- ✓ Small number of pieces per order.
- ✓ Extreme peak season volumes.
- ✓ Under-stocking due to unpredictable changes in market demand.
- ✓ Front-end order processing.
- ✓ High volume of returns from end consumers.
- ✓ High potential for brand damage from poor fulfillment performance.
- ✓ Real-time, accurate inventory and order visibility.

Prompt Terminals India Operates

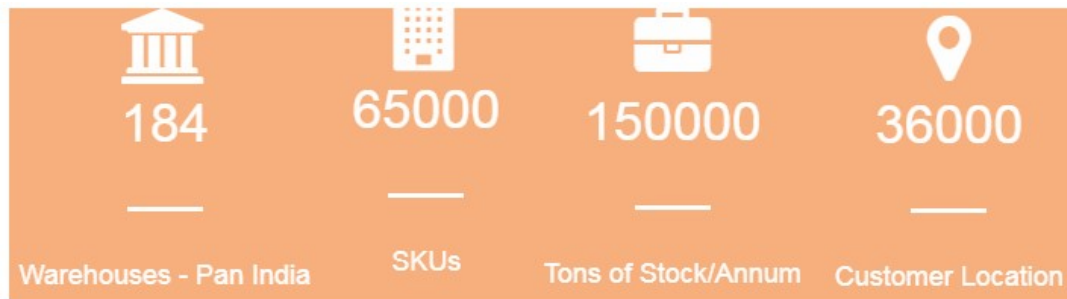


Fig 1.2 Figure Representing Prompt Terminals India Operates

Verticals



Fig 1.3 Figure Representing Verticals

1.4 NEED FOR THE STUDY

The project will provide an introduction to space optimization used in warehouses for storing and retrieving Inventory. It further discusses the various concepts of RFID technology that are in use today. For the advancement of human being, it is necessary that the technology should be used for their betterment and proper disposal should be done after its use. Hence the recommendations provide information about the proper use of technology while considering the precautions that should be considered while adopting these technologies at Prompt Terminals India.

1.5 SCOPE OF THE STUDY

The effectiveness of space optimization can be analyzed from the factors like Familiarity, Ease of use. Importance of workflow application, flexibility, and tenure reliability, importance of information, effectiveness of the various modules, performance, utilization rate, satisfaction and rate of success are also assessed using RFID. This study is limited to Prompt Terminals India, Tuticorin. This study will be helpful for the management to find the satisfaction level of employees towards the present method of space optimization, usage of modern technology, Challenges of inventory handling.

1.6 OBJECTIVES OF THE STUDY

1.6.1 Primary Objectives

To study the optimum space utilization in warehouses with reference to prompt Terminals Pvt. Ltd

1.6.2 Secondary Objectives

- ❖ To find out the level of satisfaction with the present warehouse management system adopted in Prompt Terminals India's warehouses, Tuticorin
- ❖ To study the functions of wireless technology in effective space optimization
- ❖ To know the challenges of inventory tracking in the warehouses of Prompt Terminals India
- ❖ To analyze the usefulness of modern technology in space optimization in warehouses

CHAPTER 2

REVIEW OF LITERATURE

2.1 CONCEPTUAL REVIEW

- **AMER M. MOMANI, AND ABDULAZIZ A. AHMED (2011)** the many feasible alternatives and conflicting objectives make equipment selection in cargo handling a complicated task. This paper presents utilizing Monte Carlo (MC) simulation combined with the Analytic Hierarchy Process (AHP) to evaluate and select the most appropriate Cargo handling Equipment (MHE). The proposed hybrid model was built on the base of cargo handling equation to identify main and sub criteria critical to MHE selection. The criteria illustrate the properties of the material to be moved, characteristics of the move, and the means by which the materials will be moved. The use of MC simulation beside the AHP is very powerful where it allows the decision maker to represent his/her possible preference judgments as random variables. This will reduce the uncertainty of single point judgment at conventional AHP and provide more confidence in the decision problem results. A small business pharmaceutical company is used as an example to illustrate the development and application of the proposed model

- **ANAND POOJARY, DR. R. SATISH KUMAR (2014),** Inventory management is the backbone for almost all the companies in the modern industrial world. Inventory management is very much essential to define the growth, survival or the success of any business. Poor inventory management can lead to sales reduction, loss of revenue which in turn can result in the failure of a business. Unfortunately not all the business enterprises seem to have proper inventory management in place. Effective inventory management depends upon consolidating, integrating, and analyzing data collected from many sources such as, distribution centres and warehouses. Conventional inventory tracking systems require manual intervention, which is labour intensive, time consuming, and error-prone. On the other hand, the use of RFID technology has significant advantages over the conventional methods.

- **ARUN N. NAMBIAR (2009)**, Radio Frequency Identification (RFID) facilitates automatic identification of items using radio-waves. This technology albeit initially introduced in the 1940s and 1950s, has seen a drastic increase in the number of applications and implementations in the recent years. This work aims to review some of the current developments in this field and to develop a taxonomic framework to classify literature which will facilitate quick content analysis and identify future direction of research.

- **AZLAN ET AL., 2014**, Logistics is a backbone for the global supply chains. In Malaysia, logistics are now recognized as strategic industry that positively contributes to gross domestic product (GDP) and performance of logistics is foremost significant, whereas most of the logistics performance has focused on investigating operational and trade facilitation context. Thus, the purpose of this paper is to examine the issues and reviews by practitioners and found 7 key components that translated it into operations performance objectives. It, thus, provided a base for future research to examine the relationships of this context empirically.

- **P. BAHALE, DR.S.S.DESHMUKH, 2014**, in the last several years cargo handling has become a new, complex, and rapidly evolving science. Cargo handling cannot be avoided in logistics, but can certainly be reduced to minimum levels. Cargo handling system (MHS) design has a direct influence on the logistics cost. Therefore, how to improve the efficiency of cargo handling system gets more and more people's attention. The paper deals with a case study of ginning machine manufacturing company. The purpose of the work is to locate and identify the wasteful activities regarding the cargo handling, and to streamline the activities to reach a minimum of cargo handling.

- **BO YAN, YIYUN CHEN, XIAOSHENG MENG (2008)**, having taken into account the features of modern warehouse management, we put forward a warehouse management system (WMS) based on Radio

Frequency Identification (RFID), and probe into the structure and operation flow of the system. The WMS will adopt RFID middleware as the support platform, cover goods entry, picking, checking, delivery and many other operation flows, and can collect, deliver, check, and update mass data on the frequent warehouse entry and delivery, so as to decrease the labor intensity, avoid fault scanning, miss scanning, re-scanning and other artificial errors, and improve the efficiency and accuracy. The WMS based on RFID will help to improve the efficiency of warehouse management, and make rapid self-recording of receiving and delivery.

- **CHIA-HUNG HUANG (2009)**, Radio Frequency Identification (RFID) has been around for nearly 50 years. RFID was first used during World War II in Friend-or-Foe identification system. Ever since then, RFID has caught the attention of many scientists, academics, and enterprises around the world. In addition, the announcement of requiring its top suppliers to adopt RFID technology made by Wal-Mart Cooperation in June, 2003, has once again heated up the topic of RFID. In this paper, I am going to give a brief overview of RFID technology, application, and security/privacy threats and solutions. In addition, I will also briefly introduce the security/privacy issues and solutions in EPC global Class 1 Generation 2

- **CLIFFORD SERETE MILIMU, 2015**, delay of containers on container clearance has emerged and evident at the port of Mombasa which has indicated long clearance period or overstay of received containers at the port for more than 10- 12 days. The delay in clearing containers at the port is made worse by infrastructural decay and lack of suitable ship and cargo handling equipment, lack of space capacity for the ships to dock waiting loading and long custom clearance procedures and requirements. The objective of the study was to assess the factors affecting containerized materials clearance in the Kenya port with focus on specific objectives, to establish the effects of documentation

process on container clearance at KPA, to determine the effects of handling equipment on containerized materials clearance at KPA, to find out the effects of transport infrastructure on containerized materials clearance at KPA and to assess the effects of space capacity on containerized materials clearance at KPA. This study adopted a descriptive research with survey of a total population of 200 and applied a stratified random sampling technique to select a sample size of 50 respondents. The study used questionnaires, interviews, observation techniques and reviews, in order to bring out the results of the study as expected. Respondents were drawn from the departments within Kenya Port Authority. The study analyzed the data using Statistical Package for Social Sciences (SPSS). The findings of the study were presented using tables and discussions.

- **DARYA PLINERE, ARKADY BORISOV (2015)** inventory management is a challenging problem area in supply chain management. Companies need to have inventories in warehouses in order to fulfil customer demand, meanwhile these inventories have holding costs and this is frozen fund that can be lost. Therefore, the task of inventory management is to find the quantity of inventories that will fulfil the demand, avoiding overstocks. This paper presents a case study for the assembling company on inventory management. It is proposed to use inventory management in order to decrease stock levels and to apply an agent system for automation of inventory management processes.
- **GUNASEKARAN, H.B. MARRI, F. MENCI, (1999)**, the warehouse is the interface area for production lines, market, customers and suppliers, and the business environment in general. Goods inwards (GI), constituting part of the warehouse activities, is the department responsible for booking-in the incoming parts from external suppliers. After the production process is improved, the resources in the warehouse are balanced to link the internal/ external transfer of physical items. With a broader view of the GI activities, and a look into its future, the actual problems may become clear, understandable, and

hence easy to solve. The aim of this paper is to study the problem areas in GI and provide solutions to increase the performance of warehousing operations. First, a conceptual framework has been developed to improve the effectiveness of warehousing operations. Second, a case study has been conducted with the help of the model to minimize the through-put time in warehousing operations. Finally, a summary of findings and recommendations are presented

- **HEINI SIMSEK (2016)**, was commissioned by a large international company focused on telecommunications. The scope of this thesis work was to study how RFID technology can be used in in-house logistics. The main focus for using RFID is to automate stock transfer in SAP system. This study uses RFID gate and RFID tags. Company X uses a material train for transporting material from warehouse to production. When transferring goods from warehouse to production, material stock is transferred manually. Material handlers create material transfer in SAP ERP Systems. In the studied plan, material train passes through an RFID gate which reads all the tags inside the train. The information contained in the tags automatically transfers the stocks in the SAP system. The aim of this plan is to reduce the time taken to transfer material stock as well as to introduce new technology that later can possibly be implemented and utilized in other stages of production. In the theoretical part of the thesis is studied more deeply functions of in-house logistics, storage solutions, SAP Warehouse system, RFID technology and RFID applications. The system was designed to first explore the existing current state by using Value Stream Mapping method. A thorough study of the current state helped greatly for defining the future state and to see the problem areas. The Gap analysis was carried out for the implementation of the new method, which shows the next actions or proposals to reach the target mode. To find out the costs of the new system, offer request of the RFID gates and tags were sent to subcontracting company. After knowing the cost of manual work and investment cost payback calculations were made. The output of this thesis work was an operating model how

the transfers can be carried out in the most efficient way possible using RFID technology. In the solution proposal, what changes it requires to the system, the layout and the sap software to function, benefits that the solution offers and costs.

- **HOSANG JUNG AND SUKJAE JEONG (2018)**, with the rapid development of information and communication technologies, inventory information sharing between a manufacturer and its suppliers is becoming easier than ever. In line with this trend, we focus on the virtual warehouse where only inventory information on all of the material provided by the suppliers can be stored and shared. Unlike traditional supplier management, the manufacturer constructs and operates this virtual warehouse to check the inventory levels of all the required material at the same time, but each supplier can access only the information about its inventory. This virtual warehouse-based approach can foster a tight relationship between the manufacturer and its suppliers and can handle suppliers as a single company without a large investment in constructing a physical warehouse. The virtual warehouse-based approach seems to be more economically sustainable. To investigate the effect of inventory information sharing via the virtual warehouse, we developed and analyzed a system dynamics-based simulation model. The experiment results show that sharing the inventory information of the suppliers via the virtual warehouse can help manufacturers to achieve better operational performance on several important measures, such as the reduction of finished goods inventory, parts purchasing quantity, degree of backlogs, and total cost.
- **IAITO INFOTECH (2010)**, Warehouse operation like Planning and control of warehouse facilities and systems has become more complex in supply chain. Warehousing is often needed to perform routine logistics operations such as Stock Storage, Order status, paper processes, Sorting, Cycle counts, Loading/unloading and customer service. Poor utilization of costly warehouse space, Manual errors,

wrong identification of the product during receipt & dispatch, locating items in warehouse will impact the productivity & profitability which results in organization's reputation & losses. RFID is an excellent real-time business tool that helps better manage supply chains, covers goods entry, picking, checking, delivery and many other operation flows & increases profit and decreases the cost by improving visibility into Warehouse management system. The Warehouse Management System based on RFID will help to improve the efficiency of warehouse management, and make rapid self-recording of receiving and delivery.

- **JIE ZHU , XIANZHONG QI , YING HUANG (2016)**, aims at the practical problems of warehouse in Z enterprise, constructing the intelligent storage system, through the use of RFID technology, sensor technology, ZigBee technology to improve information transmission efficiency of the system, shortening the system response time. The paper solved the problem which the warehousing activities can't be real-time controlled in the drawbacks of the product information in the warehouse.

- **KAMRAN AHSAN, HANIFA SHAH AND PAUL KINGSTON (2010)**, RFID is not a new technology and has passed through many decades of use in military, airline, library, security, healthcare, sports, animal farms and other areas. Industries use RFID for various applications such as personal/vehicle access control, departmental store security, equipment tracking, baggage, fast food establishments, logistics, etc. The enhancement in RFID technology has brought advantages that are related to resource optimization, increased efficiency within business processes, and enhanced customer care, overall improvements in business operations and healthcare. Our research is part of a big project; its aim is to produce a model for mobile technology implementation of hospital patients' movement process. However, the focus of this paper is to explore the main RFID components, i.e. the tag, antenna and reader. The results of the investigations conducted on

the three RFID components will be used to develop our research model.

- **KARIN ISAKSSON AND MARIA HUGE-BRODIN, 2013**, Awareness of environmental impacts on our society is increasing among companies. In order to turn environmental problems into business opportunities, many companies are beginning to consider how environmental or green aspects can be integrated into their service offerings. This opportunity can be of specific interest to logistics service providers, whose core business is an environmental impact in itself. The purpose of this article is to indicate where green-labelled logistics service providers are positioned today in their development, and to seek the underlying rationale in development of green service offerings. This article takes a logistics service provider's perspective and is based on a multiple case study of 6 companies. The analysis is based on cross-case analysis, and empirical, as well as theoretical, pattern matching. The attitude towards a green approach differs among the case companies: while some are working towards a green integration throughout the entire business, others offer green alternatives to the original service offering. The results point to possible explanations for these differences, and include differences in range of service offerings, size, and to different management principles for green aspects. This article can inspire logistics service providers in their continuing work to integrate green initiatives into the company. By introducing alternative green approaches in the development of service offerings, logistics service providers can match their own business and context with alternative rationales. While most of the green logistics research focuses on the logistics system's characteristics, this article offers initial insights into how the integration of green aspects into logistics services can impact logistics service providers.

- **KSHITIJA DESHMUKH, ASHITHA ANN SANTHOSH, YOGESH MANE, SAURABH VERMA, SADHANA PAI (2015)**, the improvements that can be made to present day warehouses by making it completely

automated. Every single activity related to the warehouse would be performed without any human intervention. The warehouse management system consists of a 3 wheeled robot which navigates through the entire warehouse and transports the cartons from one point to another. The system also provides an efficient, fast and precise inventory management procedure. The dealers access the warehouse by means of an application created specifically for the warehouse

- **LEUNG N-HZ, CHEN A, YADAV P, GALLIEN J (2016),** To characterize the impact of widespread inventory management policies on stock-outs of essential drugs in Zambia's health clinics and develop related recommendations. Daily clinic storeroom stock levels of artemether-lumefantrine (AL) products in 2009–2010 were captured in 145 facilities through photography and manual transcription of paper forms, then used to determine historical stock-out levels and estimate demand patterns. Delivery lead-times and estimates of monthly facility accessibility were obtained through worker surveys. A simulation model was constructed and validated for predictive accuracy against historical stock-outs, then used to evaluate various changes potentially affecting product availability. While almost no stock-outs of AL products were observed during Q4 2009 consistent with primary analysis, up to 30% of surveyed facilities stocked out of some AL product during Q1 2010 despite ample inventory being simultaneously available at the national warehouse. Simulation experiments closely reproduced these results and linked them to the use of average past monthly issues and failure to capture lead-time variability in current inventory control policies. Several inventory policy enhancements currently recommended by USAID | DELIVER were found to have limited impact on product availability. Inventory control policies widely recommended and used for distributing medicines in sub Saharan Africa directly account for a substantial fraction of stock-outs observed in common situations involving demand seasonality and facility access interruptions. Developing central capabilities in peripheral demand forecasting and inventory control is critical. More rigorous independent peer-reviewed

research on pharmaceutical supply chain management in low-income countries is needed,

- **LI JUNTAO, MA YINBO (2015)**, the internet of things is connected to the Internet, through all kinds of sensing device, the RFID technology, video recognition technology, infrared sensing, global positioning system (GPS), according to the need to implement objects connected to the network of the connectivity, exchange of information and communication, in order to realize intelligent identification, location, tracking and monitoring and management of intelligent network system. First this paper introduces the internet of things technology concrete application in the warehouse operation: the RFID technology; management and control technology; sensor technology. Then discusses the internet of things technology development trend in warehouse operation: the application of RFID technology in warehousing will be rapid development; the integrated application of sensing technology; the AGV will be integrated into the warehouse the Internet of things; the storage and the Internet of things will be the trend of the each other.
- **LINDA CASTRO & SAMUEL FOSSO WAMBA (2007)**, RFID (Radio Frequency Identification) is considered one of today's "hottest" technologies due to its specialized capacity to track and trace objects across the extended supply chain in real time. This article takes an inside look at the RFID world in order to improve the understanding of this technology and the EPC Network. An introduction to RFID systems, RFID's potential to improve the efficiency of operations, different areas of application, and a roadmap approach to implementing RFID will be discussed in this article.
- **MANDEEP KAUR, MANJEET SANDHU, NEERAJ MOHAN AND PARVINDER S. SANDHU (2011)**, gives an overview of the current state of radio frequency identification (RFID) technology. Aside from a brief introduction to the principles of the technology, major current and

envisaged fields of application, as well as advantages, and limitations of use are discussed. Radio frequency identification (RFID) is a generic term that is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves. It's grouped under the broad category of automatic identification technologies. RFID is increasingly used with biometric technologies for security. In this paper Basic Principles of RFID technology along with its types are discussed.

- **MARIA RYBALKO, 2012**, the main current focus of supply chain management (SCM) is the creation of long term, mutually beneficial relationships between a company and other participants in the supply chain. Strategic partnerships are a key factor in the effectiveness of the business of a company as a whole. The market of integrated services in the SCM sphere is developing rapidly, and these services themselves are becoming more complex. A growing market should offer different models of strategic behaviour by suppliers of logistics services. One of these models is that of partnerships. Industry journals and press releases today often report the creation of “logistics partnerships”. In this context, “logistics” is understood as a sphere of strategic importance and the source of competitive advantages, where supply chain participants cooperate closely not only with their suppliers and consumers, but also with providers of logistics services.

- **NATANAREE SOOKSAKSUN, SRIYOS SUDSERTSIN (2014)**, warehouses has three main problems: poor accuracy of inventory location, long cycle time of receiving process and non-real time empty storage location. Therefore, the objective of this research is to improve the process in the warehouse by applying radio frequency identification (RFID) technology. There are four steps in this research. First of all, the current of the receiving process and the picking process are studied. Second is to give the guideline for RFID application. Third is to implement of RFID system in this warehouse. The last one is to compare the result of the current process and the proposed process.

The passive ultra-high frequency (UHF) RFID is selected for used in this warehouse. The RFID readers are attached on forklift trucks, the warehouse entrance and loading dock area. The system used RFID tags in two forms: one form used to identify pallets and another to indicate the locations of shelves on which pallets are stored. After using RFID system in this warehouse, the results showed that the accuracy of inventory location increased from 78.2% to 100%. The cycle time reduces from 66 minutes to 47 minutes which is down to 28.79%. . Moreover, the empty storage location are known real time.

- **NICHOLAS EWIENE ADDY-TAYIE (2012)**, this Thesis work was done to analyze the current operations involving the finished-goods and fertilizer warehouse managements, as well as the fertilizer inventory management of Ghana Rubber Estates Limited (GREL). The aim was to explore improvement areas necessary in enhancing operational efficiency and transport safety, and come up with ways of improving the warehouse and inventory management. In this work, theoretical discussion was used alongside with the current operations of GREL to come up with the improvement suggestions. Some of these areas included warehouse management, inventory management, internal transportation, transport safety and operational efficiency. With regard to the company's current operations, the importance of each of the different kinds of fertilizers held in inventory was analyzed using the 80/20 rule, or the ABC analysis. The means of placing orders and the number of orders were also discussed, related to their appropriate timing. The outline of both the finished-goods and fertilizer warehouses, the equipment used and the means of operation were discussed as well. At the end of the work, suggestions were made for improvement in the management of both warehouses as well as the fertilizer inventory. Those suggestions included modifying the storage facilities in the fertilizer warehouse, as well as floor demarcation by the striping or marking of the finished-goods warehouse. The suggestion for improving the fertilizer inventory management was reduction in the

inventory levels. This was to be done by, first, negotiating for shorter lead time and then, using seasonal ordering policy.

- **PAI (2015)**, the improvements that can be made to present day warehouses by making it completely automated. Every single activity related to the warehouse would be performed without any human intervention. The warehouse management system consists of a 3 wheeled robot which navigates through the entire warehouse and transports the cartons from one point to another. The system also provides an efficient, fast and precise inventory management procedure. The dealers access the warehouse by means of an application created specifically for the warehouse

- **PETER AND VACULÍK (2013)**, in his words described this article as RFID technology in conjunction with warehouse management systems. Article also deals with automatic identification and data capture technologies and each process, which are used in warehouse management system. It describes processes from entering goods into production to identification of goods and also palletizing, storing, bin transferring and removing goods from warehouse. Article focuses on utilizing AMP middleware in WMS processes in Nowadays, the identification of goods in most warehouses is carried through barcodes. In this article we want to specify, how can be processes described above identified through RFID technology. All results are verified by measurement in our AIDC laboratory, which is located at the University of Žilina, and also in Laboratory of Automatic Identification Goods and Services located in GS1 Slovakia. The results of our research bring the new point of view and indicate the ways using of RFID technology in warehouse management system.

- **PHINDILE NDLALA AND CHARLES MBOHWA (2017)**, today, companies are making efforts on inventory control enhancement in order to deliver products and services to their customers rapidly at low cost. There is no doubt that inventory control enhances the firms

operations. Better inventory control means effective operations of a firm resulting in cost reduction and ultimately increasing on profit. The purpose of this paper is to showcase the significance of proper inventory control systems application in warehouses. The inventory control techniques applicable in the warehouse such as batch quantities, ordering methods and inventory classification and as well as the factors contributing to poor inventory control were highlighted in this paper.

- **QUIAN, ALYAHYA, AND DHAKAL (2015)**, it has been seen a rising trend in recent years for online shopping businesses across the UK. Customers prefer to place their orders online to purchase goods and ordered goods are dispatched directly from regional warehouses (or distribution centres) to customers' door steps. A number of studies through a literature review indicated that future generation warehouses may be designed and implemented as more centralized distribution centres as this is the most cost-effective way to run businesses of this form for many larger manufacturers, suppliers or retailers. These companies have therefore been seeking for even more efficient and effective methods for storing, picking and dispatching goods in increasingly centralized distribution centres in which a novel design of warehousing systems is desired. This paper presents a framework of an RFID-based management system as part of a proposed future generation warehouse design through application and integration of fast-growing IT technologies (radio frequency identification (RFID) tags, wireless sensors and communication networks) to maximise the warehouse capacity and achieve a better visualisation and real-time visibility of inventory control and data handling management.
- **RFID (JOURNAL, 2010)** Radio frequency identification (RFID) has been identified as a crucial technology for the modern 21st century knowledge-based economy. Many businesses started realizing RFID to be able to improve their operational efficiency, achieve additional cost savings, and generate opportunities for higher revenues. To investigate

how RFID technology has brought an impact to warehousing, a comprehensive analysis of research findings available through leading scientific article databases was conducted. Articles from years 1995 to 2010 were reviewed and analysed according to warehouse operations, RFID application domains, and benefits achieved. This paper presents four discussion topics covering RFID innovation, including its applications, perceived benefits, obstacles to its adoption and future trends. This is aimed at elucidating the current state of RFID in the warehouse and giving insights for the academics to establish new research scope and for the practitioners to evaluate their assessment of adopting RFID in the warehouse

- **SAINATHUNI, BHANUTEJA & PARIKH, PRATIK & ZHANG, XINHUI & KONG, NAN. (2014)** Warehouses play a vital role in mitigating variations in supply and demand, and in providing value-added services in a supply chain. However, our observation of supply chain practice reveals that warehousing decisions are not included when developing a distribution plan for the supply chain. This lack of integration has resulted in a substantial variation in workload (42–220%) at our industry partner’s warehouse costing them millions of dollars. To address this real-world challenge, we introduce the warehouse-inventory-transportation problem (WITP) of determining an optimal distribution plan from vendors to customers via one or more warehouses in order to minimize the total distribution cost. We present a nonlinear integer programming model for the WITP considering supply chains with multiple vendors, stores, products, and time-periods, and one warehouse. The model also considers worker congestion at the warehouse that could affect worker productivity. A heuristic based on iterative local search is developed to solve industry-sized problems with up to 500 stores and 1000 products. Our experiments indicate that the distribution plans obtained via the WITP, as compared to a sequential approach, result in a substantial reduction in workload variance at the warehouse, while considerably reducing the total distribution cost. These plans, however, are sensitive to aisle

configuration and technology at the warehouse, and the level and productivity of temporary workers.

- **S.L. TING, ALBERT H. C. TSANG¹ AND Y. K. TSE (2013)**, there are an increasing number of organizations planning to implement Radio Frequency Identification (RFID) systems to enhance their competitiveness. Due to the novelty of the technology, many managerial challenges exist in determining and planning for the implementation of such systems. These challenges often lead to wasted efforts and resources, as well as to failed implementations. This paper presents a systematic and holistic RFID implementation framework which has been validated by both users and experts. The framework outlines the important tasks to be performed in each step of the implementation process. To enable practitioners to make informed go/no-go decisions, essential considerations of implementation are also discussed in this paper. Furthermore, the critical success factors for the deployment of such systems are also elaborated.

- **VIEIRA, G. B. B., PASA, G. S., BORSA, M. B. N. O., MILAN, G. S., PANDOLFO, A (2011)**, the highly competitive environment, linked to the globalization phenomena, demands from companies more agility, better performance and the constant search for cost reduction. The present study focused on improvements in internal cargo handling management, approaching the case of a large company in the automotive industry. Cargo handling is intrinsically associated with production flow. Because of this, it has direct influence on transit time, resources usage, and service levels. The objective was to evaluate, in a systematic way, the impact of implemented changes in cargo handling management on the internal customers' perceptions of cost, safety in service, service reliability, agility and overall satisfaction. A literature review preceded a case study in the company's manufacturing unit and the questionnaires were completed by 26 employees directly involved in the process. Analyzing the answers, it was possible to suggest that internal customers understood that the

new cargo handling management system enlarged service agility and reliability and reduced costs, which caused an improvement in overall satisfaction.

- **WALAA HAMDY, NOHA MOSTAFA, AND HESHAM ELAWADY (2018)**, in any supply chain, the warehouse is a main component in linking the chain partners and nowadays it acts as a competitive factor. Hence, it has become very necessary to manage warehouses effectively and allocate their resources efficiently. Warehouse Management Systems (WMSs) have been developed for monitoring, tracking and controlling the warehouse operations, but with the increasing dynamicity of the market, traditional systems have become less efficient and unsuitable for today's market requirements, that are why new technologies have started to emerge to be used for such applications. Internet of Things (IoT) is a promising technology that can be used in the context of Industry 4.0. In this paper, a smart WMS framework based on IoT is proposed; this system helps the warehouse manager to achieve more control and monitoring of the operations in real time. A review of WMS and IoT implementation in warehouses is presented. Also, the blocks and layers of IoT are illustrated. Finally, the benefits and challenges of implementing IoT in the supply chain and the warehouse are discussed.
- **WANG, SALEH, NICK BENNETT, AND HOM DHAKAL (2015)**, it has been seen a rising trend in recent years for online shopping businesses across the UK. Customers prefer to place their orders online to purchase goods and ordered goods are dispatched directly from regional warehouses (or distribution centres) to customers' door steps. A number of studies through a literature review indicated that future generation warehouses may be designed and implemented as more centralized distribution centres as this is the most cost-effective way to run businesses of this form for many larger manufacturers, suppliers or retailers. These companies have therefore been seeking for even more efficient and effective methods for storing, picking and dispatching

goods in increasingly centralized distribution centres in which a novel design of warehousing systems is desired. This paper presents a framework of an RFID-based management system as part of a proposed future generation warehouse design through application and integration of fast-growing IT technologies (radio frequency identification (RFID) tags, wireless sensors and communication networks) to maximise the warehouse capacity and achieve a better visualisation and real-time visibility of inventory control and data handling management

CHAPTER 3

RESEARCH METHODOLOGY

The Research Methodology, which follows, is the backbone of the study.

3.1 RESEARCH DESIGN

The present study is quantitative in nature. To better understand this style of research we need to break down its major views. They are three: observing and explaining something that happens, collecting information, and analyzing the information. The combination of these three parts is at work when presenting clear and well-researched findings.

This report involves descriptive research and uses percentage analysis to explain analytically. Descriptive research is used to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred.

3.2 DATA DESIGN

3.2.1 Type of Data Used

Data are facts, figures and other relevant materials, past and present, serving as bases for study and analysis.

3.3 Sources of data

3.3.1 Primary data: Primary data is a fresh data collected for the first time using a research instrument. In this report, the primary data is collected with a Questionnaire. A detailed questionnaire was prepared and data would be collected from 120 respondents of Prompt Terminals India in Tuticorin

3.3.2 Secondary data:

Secondary data is collected from existing data sources like books, articles, journals and internet.

3.3.3 Mode of data collection:

The questionnaire method has been adopted to gather necessary inputs from Prompt Terminals India. The questionnaire is placed at Appendix the questionnaire will be answered by the employees of the organization who are

conversant with the various processes in the procurement of raw Inventory and Inventory accounting in their respective domains.

3.4 SAMPLING DESIGN

3.4.1 Sample Size

Out from their many hundred employees, the sample size is restricted to 100 and more respondents

3.4.2 Sampling Methods & Type

Convenient sampling method is adopted to collect samples for questionnaire from respondents

3.4.3 QUESTIONNAIRE DESIGN

Type of Questionnaire

Scales used for Questionnaire Development

According to **Robert Gatewood, Hubert S. Field, Murray Barrick**, measurement includes the systematic application of rules for allocating numerical values to objects to represent the quantities of a person's attributes or traits. The first evaluation is Rules, attribute, psychological factors, metrics or units. Likert 5 scales are used in this study. A Likert scale is commonly used to measure attitudes, knowledge, perceptions, values and behavioral changes. A Likert-type scale involves a series of statements that respondents may choose from in order to rate their responses to evaluative questions (Vogt, 1999).

Variables used to construct questionnaire

The following variables are used to construct the questionnaire

- ✓ Storage
- ✓ Handling
- ✓ Movement
- ✓ Effectiveness

Reliability and Validity of the questionnaire

Reliability is the “concept” used for testing and evaluating the quantitative information. The most important part of the study is its quality.

Validity is the concept of “described” wide range of terms. Some qualitative researcher agreed that for qualitative research the validity is not expected but

at the same time many researchers create or establish by what they declare as right like rigidity; excellence and trustworthiness

The questionnaire framed is valid and reliable

3.4.4 Population

Population describes whole universe of the study. In this study the population is all the employees of Prompt Terminals India

3.4.5 Target Respondents

The target respondents for this study are the employees of Prompt Terminals India

3.5 PROBLEM STATEMENT

Prompt Terminals India needed a strategic look at the development of an information management structure that exploits the availability of real – time, accurate information and amend and develop business applications that drive business improvements. That is the reason the company is adopting space optimization in its warehouses. The employees are required to be trained, educated, and exposed to this new technology. Thus a research is required within the organization.

3.6 TOOLS FOR ANALYSIS

The following tests and statistical tools were used for the analysis of the data.

Descriptive Analysis

- ✓ Percentage analysis

Inferential Analysis:

- ✓ Chi-square Test
- ✓ One Way ANOVA
- ✓ Correlation

CHAPTER 4

DATA ANALYSIS & INTERPRETATION

4.1 PERCENTAGE ANALYSIS

Table 4.1.1: TABLE SHOWING AGE OF THE RESPONDENTS

Age	No. of Respondents	Percentage
25-30 Years	16	13.3
30-40 Years	7	5.8
40-50 Years	81	67.5
50-60 Years	13	10.8
Above 60 Years	3	2.5
Total	120	100.0

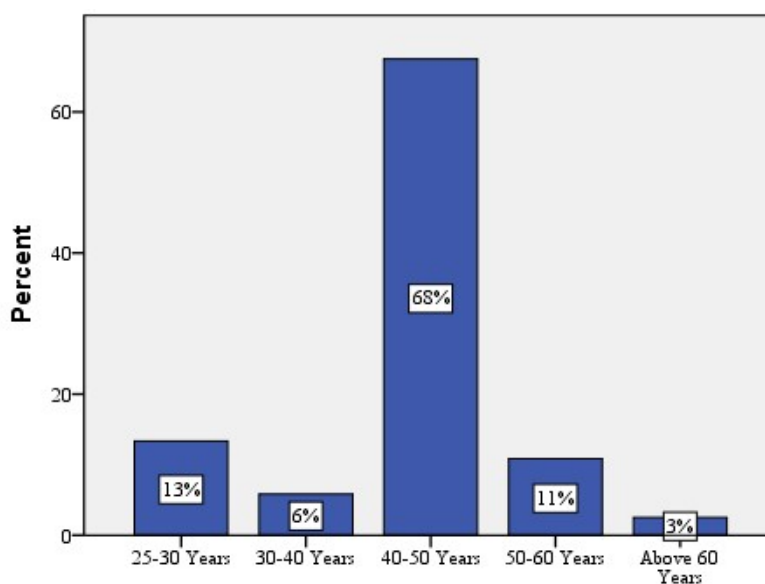


Chart 4.1.1: CHART REPRESENTING AGE OF THE RESPONDENTS

INTERPRETATION:

13% of the respondents are 25-30 years of age, 6% of them are 30-40 years old, 68% of them are 40-50 years old, 11% of them are 50-60 years old and rest 3% of them are above 60 years old.

INFERENCE:

Majority (68%) of the respondents are between 40-50 years of age.

Table4.1. 2: TABLE SHOWING EDUCATIONAL QUALIFICATION OF THE RESPONDENTS

Educational Qualification	No. of Respondents	Percentage
Undergraduate	110	91.7
Post Graduate	3	2.5
10 th	2	1.7
12 th	3	2.5
Uneducated	2	1.7
Total	120	100.0

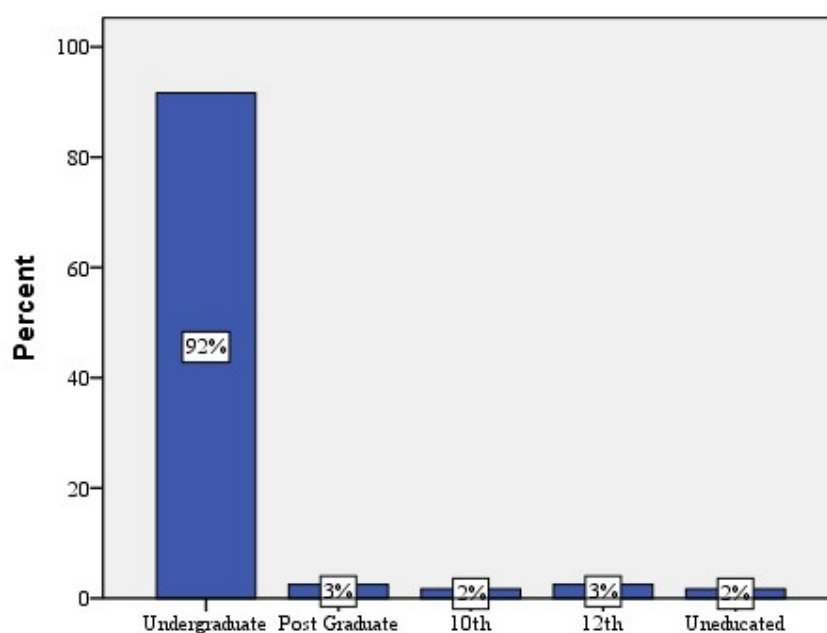


Chart4.1 2:CHART REPRESENTING EDUCATIONAL QUALIFICATION OF THE RESPONDENTS

INTERPRETATION:

92% of the respondents are under graduates, 3% of them are post graduates, 2% of the respondents are 10th standard qualified, 3% of them are 12th standard qualified and rest 2% of them are uneducated

INFERENCE:

Majority (92%) of the respondents are under graduates.

Table 4.1.3: TABLE SHOWING EXPERIENCE OF THE RESPONDENTS

Experience	No. of Respondents	Percentage
0-1 Years	31	25.8
3-5 Years	27	22.5
5-8 Years	51	42.5
More than 8 Years	11	9.2
Total	120	100.0

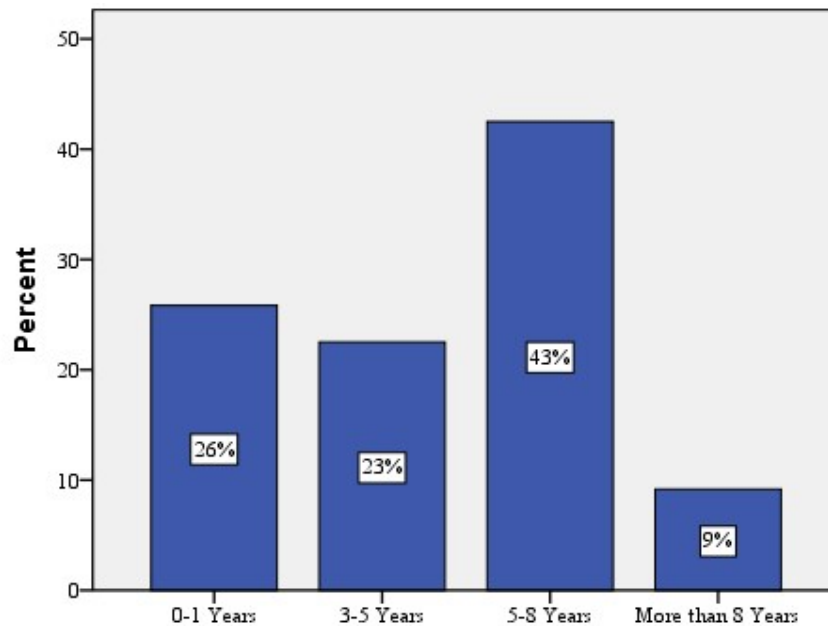


Chart 4.1.3: CHART REPRESENTING EXPERIENCE OF THE RESPONDENTS

INTERPRETATION:

26% of the respondents are having less than 1 year of experience, 23% of them are 3-5 years experienced, 43% of them are 5-8 years experienced and rest 9% of them are having more than 8 years of experience

INFERENCE:

Majority (43%) of the respondents have 5-8 years of experience.

Table 4.1.4: TABLE SHOWING GENDER OF THE RESPONDENTS

Gender	No. of Respondents	Percentage
Male	95	79.2
Female	25	20.8
Total	120	100.0

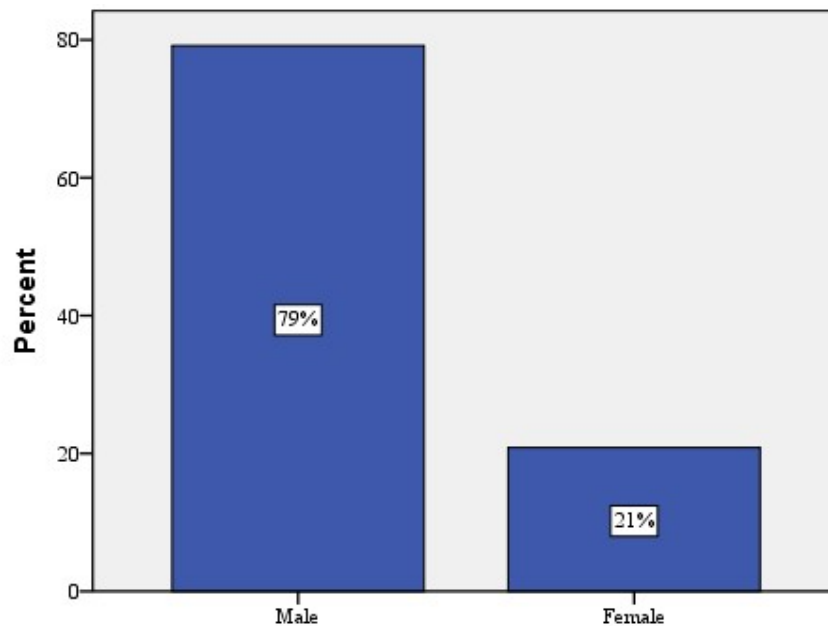


Chart 4.1.4: CHART REPRESENTING GENDER OF THE RESPONDENTS

INTERPRETATION:

79% of the respondents are male and rest 21% of them are female respondents

INFERENCE:

Majority (79%) of the respondents are male

Satisfaction on Present Method of Inventory Tracing

Table4.1. 5: TABLE SHOWING SATISFACTION TOWARDS PHYSICAL CHECKING OF INVENTORIES

Physical Checking Of Inventories	No. of Respondents	Percentage
Highly satisfied	3	2.5
Satisfied	7	5.8
Neutral	101	84.2
Dissatisfied	5	4.2
Highly Dissatisfied	4	3.3
Total	120	100.0

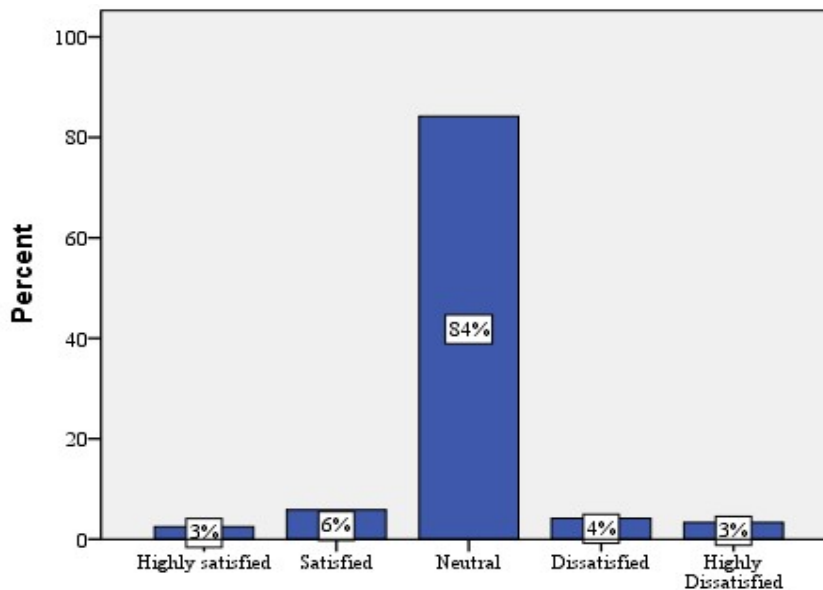


Chart 4.1. 5: CHART REPRESENTING SATISFACTION TOWARDS PHYSICAL CHECKING OF INVENTORIES

INTERPRETATION:

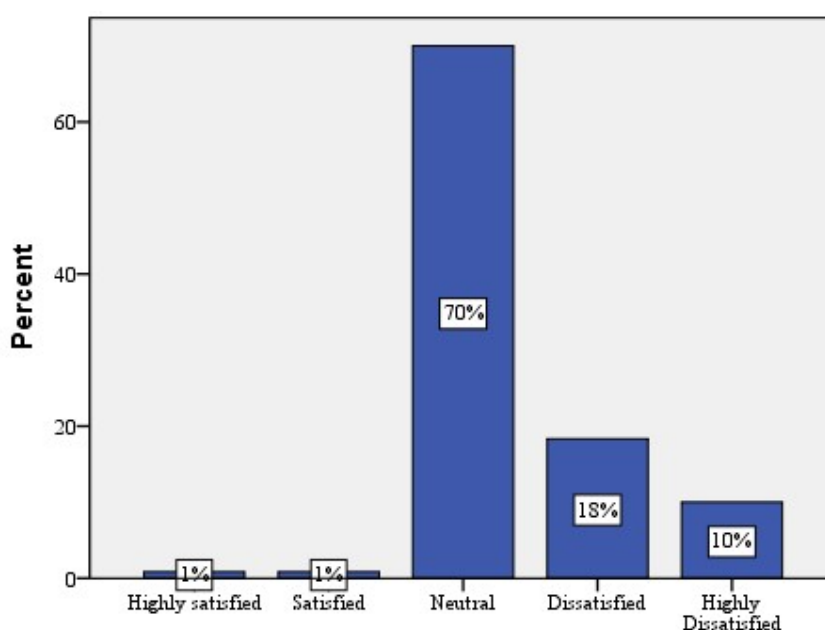
3% of the respondents are highly satisfied with the physical checking of inventories, 6% of them are satisfied, 84% respondents neither satisfied nor dissatisfied, 4% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied

INFERENCE:

Majority (84%) of the respondents are neither satisfied nor dissatisfied towards physical checking of inventors.

**Table4.1. 6: TABLE SHOWING SATISFACTION LEVEL OF BOOKING
INVOICE NUMBER**

Level Of Booking Invoice Number	No. of Respondents	Percentage
Highly satisfied	1	.8
Satisfied	1	.8
Neutral	84	70.0
Dissatisfied	22	18.3
Highly Dissatisfied	12	10.0
Total	120	100.0



**Chart4.1. 6:Chart Representing SATISFACTION LEVEL OF BOOKING
INVOICE NUMBER**

INTERPRETATION:

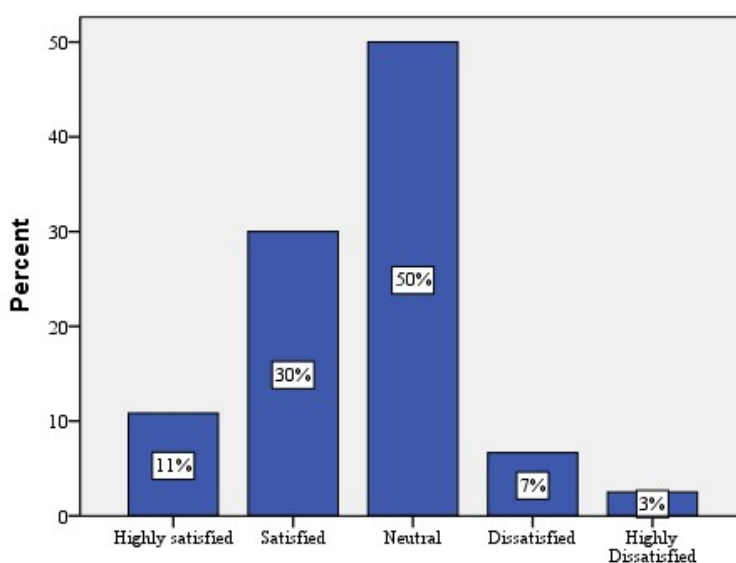
1% of the respondents are highly satisfied with the booking invoice number, 1% of them are satisfied, 70% respondents neither satisfied nor dissatisfied, 18% respondents are said to be dissatisfied and rest 10% respondents are highly dissatisfied

INFERENCE:

Majority (70%) of the respondents are neither satisfied nor dissatisfied with the booking invoice number.

**Table 4.1.7: TABLE SHOWING SATISFACTION TOWARDS THE
PRESENT ERP BEING USED**

Present ERP Being Used	No. of Respondents	Percentage
Highly satisfied	13	10.8
Satisfied	36	30.0
Neutral	60	50.0
Dissatisfied	8	6.7
Highly Dissatisfied	3	2.5
Total	120	100.0



**Chart4.1. 7:CHART REPRESENTING SATISFACTION TOWARDS THE
PRESENT ERP BEING USED**

INTERPRETATION:

11% of the respondents are highly satisfied with the present ERP being used, 30% of them are satisfied, 50% respondents neither satisfied nor dissatisfied, 7% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied

INFERENCE:

Majority (50%) of the respondents are neither satisfied nor dissatisfied with the present ERP being used.

Table 4.1.8: TABLE SHOWING SATISFACTION TOWARDS THE SHIPPING REQUEST DETAILS

Shipping Request Details	No. of Respondents	Percentage
Highly satisfied	71	59.2
Satisfied	29	24.2
Neutral	7	5.8
Dissatisfied	9	7.5
Highly Dissatisfied	4	3.3
Total	120	100.0

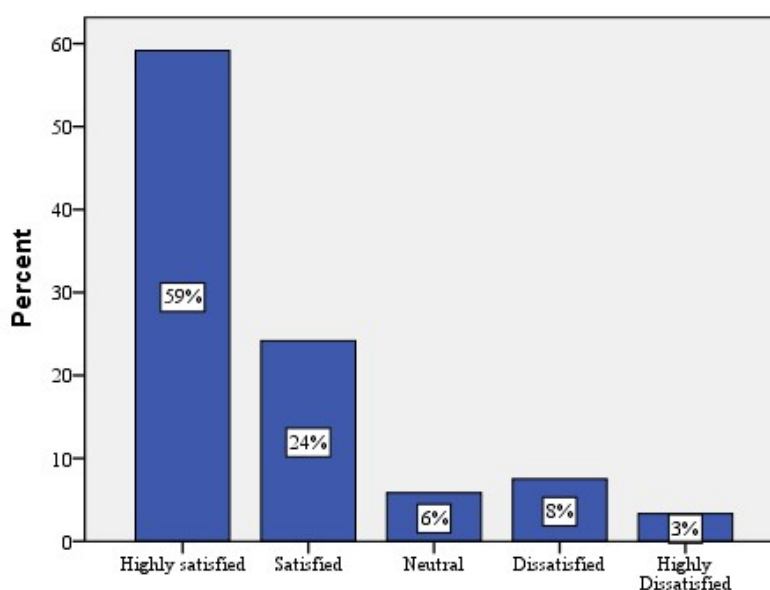


Chart 4.1.8: CHART REPRESENTING SATISFACTION TOWARDS THE SHIPPING REQUEST DETAILS

INTERPRETATION:

59% of the respondents are highly satisfied with the shipping request details, 24% of them are satisfied, 6% respondents neither satisfied nor dissatisfied, 8% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied

INFERENCE:

Majority (59%) of the respondents are highly satisfied with the shipping request details.

Table 4.1.9: TABLE SHOWING SATISFACTION ON THE DATE OF DELIVERY

Date of Delivery	No. of Respondents	Percentage
Highly satisfied	17	14.2
Satisfied	64	53.3
Neutral	29	24.2
Dissatisfied	7	5.8
Highly Dissatisfied	3	2.5
Total	120	100.0

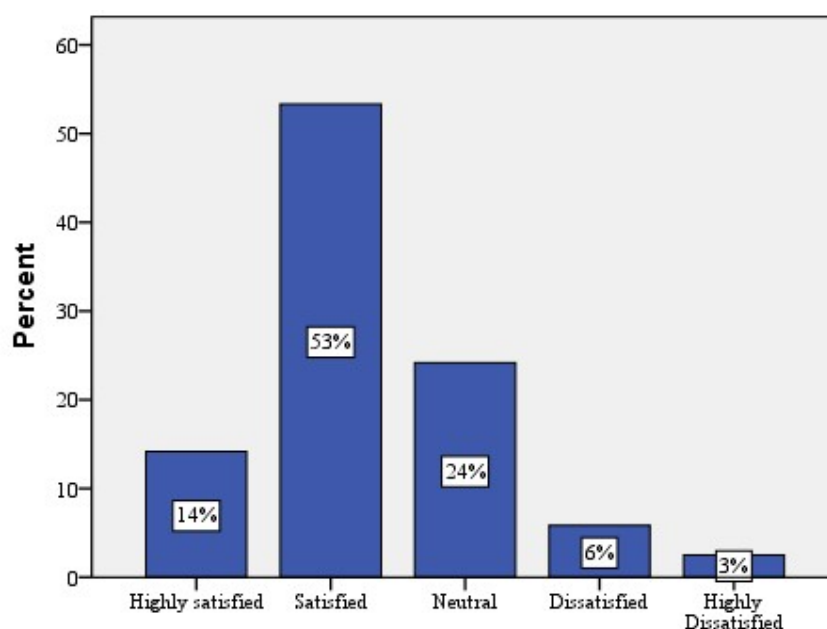


Chart4.1. 9:CHART REPRESENTING SATISFACTION ON THE DATE OF DELIVERY

INTERPRETATION:

14% of the respondents are highly satisfied with the date of delivery, 53% of them are satisfied, 24% respondents neither satisfied nor dissatisfied, 6% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied

INFERENCE:

Majority (53%) of the respondents are satisfied with the date of delivery.

Challenges of Inventory Tracking System

Table 4.1.10: TABLE SHOWING MATERIAL LEAD TIME IS A CHALLENGE OF INVENTORY TRACKING SYSTEM

Lead Time is a Challenge of Inventory Tracking System	No. of Respondents	Percentage
Strongly Agree	14	11.7
Agree	40	33.3
Neutral	57	47.5
Disagree	5	4.2
Strongly Disagree	4	3.3
Total	120	100.0

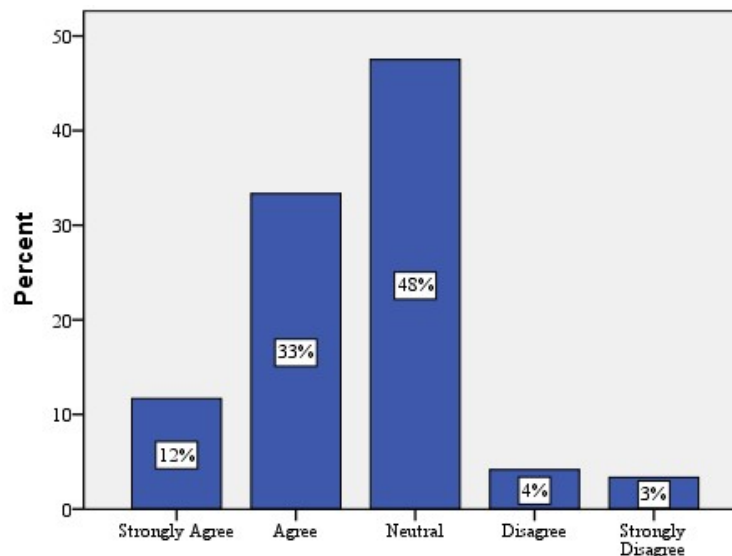


Chart 4.1.10: CHART REPRESENTING MATERIAL LEAD TIME IS A CHALLENGE OF INVENTORY TRACKING SYSTEM

INTERPRETATION:

12% of the respondents strongly agree that the Material Lead Time is a challenge of inventory tracking system, 33% of them agree with this, 48% of them neither agree nor disagree, 4% of them disagree and rest 3% of them strongly disagree with this

INFERENCE:

Majority (48%) of the respondents are neither agree nor disagree with the material lead time

Table 4.1.11: TABLE SHOWING RESOURCE FLUENCY IS THE MAJOR CHALLENGE FOR INVENTORY TRACKING SYSTEM

Major Challenge For Inventory Tracking System	No. of Respondents	Percentage
Strongly Agree	71	59.2
Agree	15	12.5
Neutral	14	11.7
Disagree	16	13.3
Strongly Disagree	4	3.3
Total	120	100.0

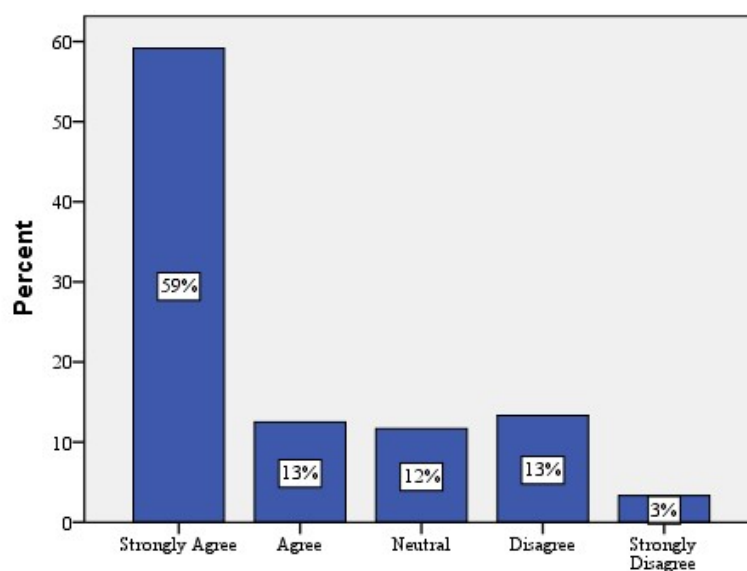


Chart 4.1.11: CHART REPRESENTING RESOURCE FLUENCY IS THE MAJOR CHALLENGE FOR INVENTORY TRACKING SYSTEM

INTERPRETATION:

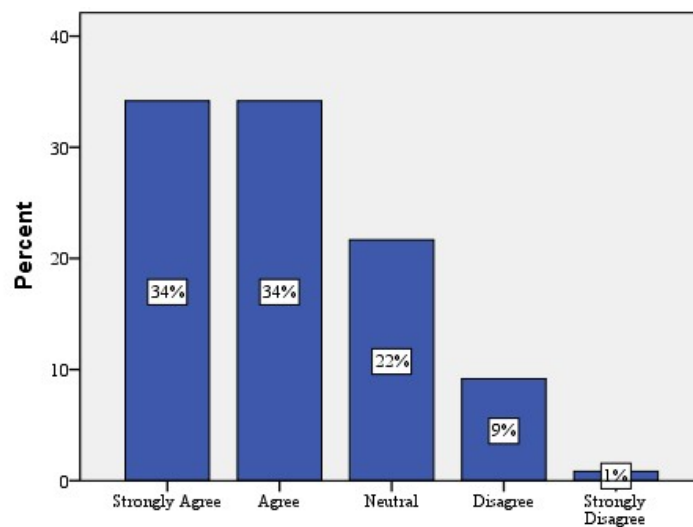
59% of the respondents strongly agree that resource fluency is the major challenge for inventory tracking system, 13% of them agree with this, 12% of them neither agree nor disagree, 13% of them disagree and rest 3% of them strongly disagree with this

INFERENCE:

Majority (59%) of the respondents strongly agree that resource fluency is major challenge for inventory tracking system.

**Table4.1. 12: TABLE SHOWING LOSS OF INVENTORY DUE TO
PILFERAGE IS HANDLED EFFICIENTLY BY INVENTORY TRACKING
SYSTEM**

Loss Of Inventory	No. of Respondents	Percentage
Strongly Agree	41	34.2
Agree	41	34.2
Neutral	26	21.7
Disagree	11	9.2
Strongly Disagree	1	.8
Total	120	100.0



**Chart4.1. 12:CHART REPRESENTING LOSS OF INVENTORY DUE TO
PILFERAGE IS HANDLED EFFICIENTLY BY INVENTORY TRACKING
SYSTEM**

INTERPRETATION:

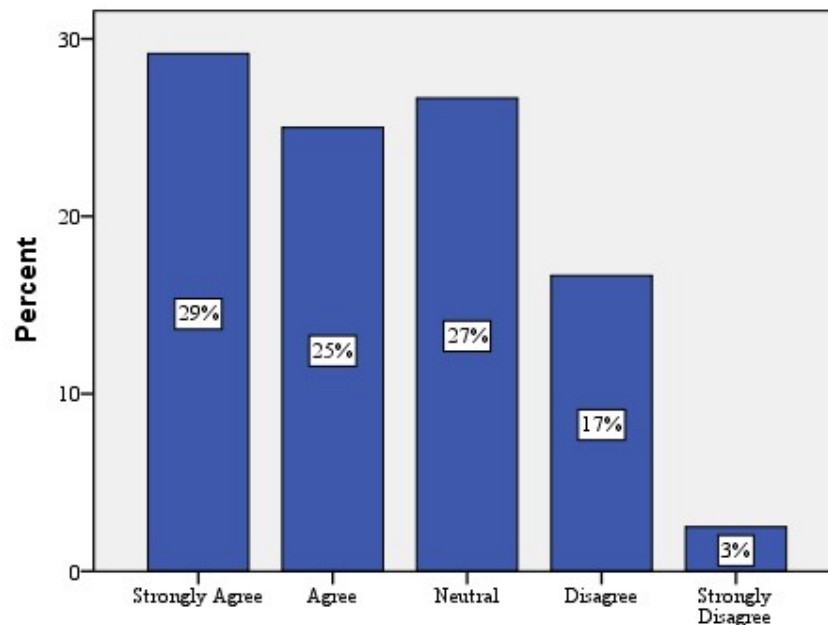
34% of the respondents strongly agree that loss of inventory due to pilferage is handled efficiently by inventory tracking system, 34% of them agree with this, 22% of them neither agree nor disagree, 9% of them disagree and rest 1% of them strongly disagree with this

INFERENCE:

Majority (34%) of the respondents strongly agree and also agree with the loss of inventory due to pilferage is handled efficiently by inventory tracking system.

**Table 4.1.13: TABLE SHOWING CUSTOMER HANDLING IS THE MADE
EASY BY INVENTORY TRACKING SYSTEM**

Customer Handling	No. of Respondents	Percentage
Strongly Agree	35	29.2
Agree	30	25.0
Neutral	32	26.7
Disagree	20	16.7
Strongly Disagree	3	2.5
Total	120	100.0



**Chart 4.1.13:CHART REPRESENTING CUSTOMER HANDLING IS THE
MADE EASY BY INVENTORY TRACKING SYSTEM**

INTERPRETATION:

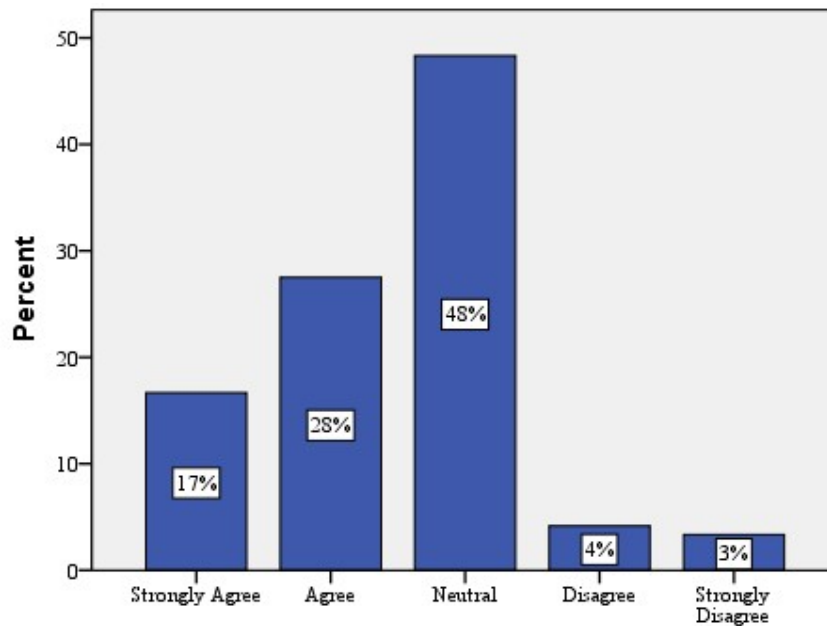
29% of the respondents strongly agree that customer handling is the made easy by inventory tracking system, 25% of them agree with this, 27% of them neither agree nor disagree, 17% of them disagree and rest 3% of them strongly disagree with this

INFERENCE:

Majority (29%) of the respondents strongly agree that customer handling is made easy by inventory tracking system.

**Table 4.1.14: TABLE SHOWING OPERATING HOURS ARE TO BE
CONVENIENT IN THE WAREHOUSE**

Operating Hours	No. of Respondents	Percentage
Strongly Agree	20	16.7
Agree	33	27.5
Neutral	58	48.3
Disagree	5	4.2
Strongly Disagree	4	3.3
Total	120	100.0



**Chart 4.1.14:CHART REPRESENTING OPERATING HOURS ARE TO BE
CONVENIENT IN THE WAREHOUSE**

INTERPRETATION:

17% of the respondents strongly agree that operating hours are to be convenient in the warehouse, 28% of them agree with this, 48% of them neither agree nor disagree, 4% of them disagree and rest 3% of them strongly disagree with this

INFERENCE:

Majority (48%) of the respondents are neither agree nor disagree with the operating hours

Usefulness of Modern Technology

Table 4.1.15: TABLE SHOWING EFFICIENT EDI/BARCODE/RFID IS VERY USEFUL

Efficient EDI/BARCODE/RFID	No. of Respondents	Percentage
Excellent	14	11.7
Very Good	46	38.3
Good	50	41.7
Fair	6	5.0
Poor	4	3.3
Total	120	100.0

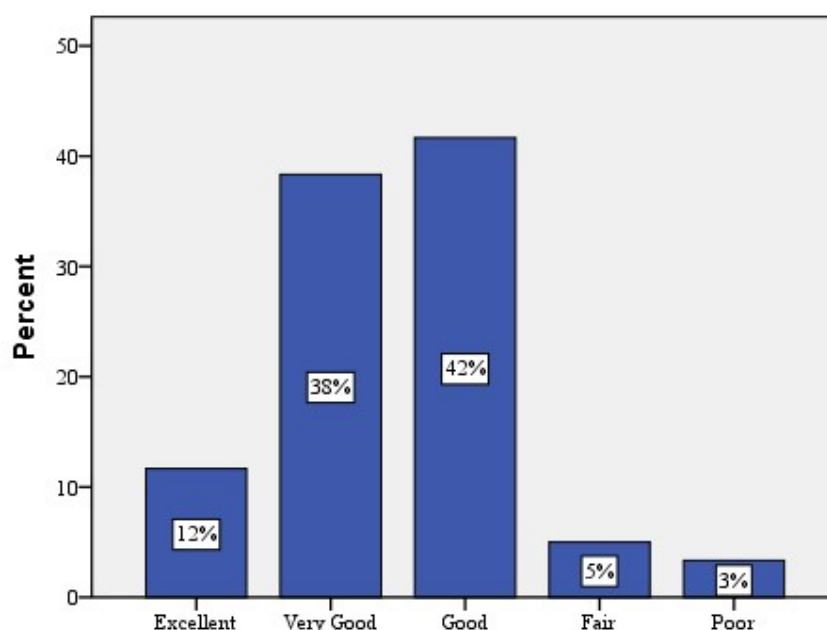


Chart 4.1.15: CHART REPRESENTING EFFICIENT EDI/BARCODE/RFID IS VERY USEFUL

INTERPRETATION:

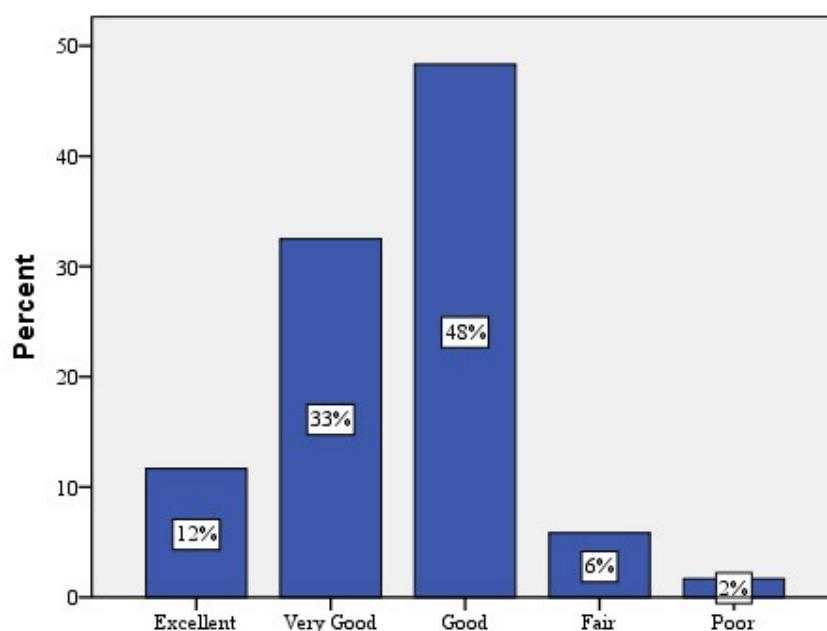
12% of the respondents said efficient EDI / Barcode / RFID is excellently useful, 38% of them said they are very good, 42% respondents said it is good, 5% of them said it as fair and rest 3% rated it as poor

INFERENCE:

Majority (42%) of the respondents have said efficient EDI/BARCODE/RFID is good

**Table 4.1.16: TABLE SHOWING PLANNER'S EFFICIENCY CAN BE
WITNESSED THROUGH RFID**

Planners Efficiency	No. of Respondents	Percentage
Excellent	14	11.7
Very Good	39	32.5
Good	58	48.3
Fair	7	5.8
Poor	2	1.7
Total	120	100.0



**Chart 4.1.16: CHART REPRESENTING PLANNER'S EFFICIENCY CAN BE
WITNESSED THROUGH RFID**

INTERPRETATION:

12% of the respondents said planner's efficiency can be excellently witnessed through RFID, 33% of them said it is very good, 48% respondents said it is good, 6% of them said it as fair and rest 2% rated it as poor

INFERENCE:

Majority (48%) of the respondents said planner's efficiency can be witnessed through RFID is good

Table 4.1.17: TABLE SHOWING WAREHOUSE IS EQUIPPED WITH NEW TECHNOLOGY

Warehouse Euipped with New Technology	No. of Respondents	Percentage
Excellent	68	56.7
Very Good	35	29.2
Good	15	12.5
Fair	1	.8
Poor	1	.8
Total	120	100.0

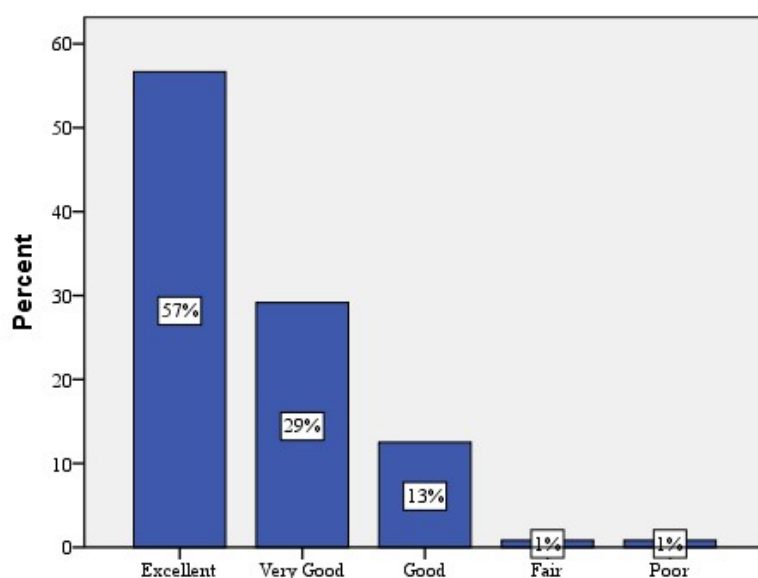


Chart4.1. 17:CHART REPRESENTING WAREHOUSE IS EQUIPPED WITH NEW TECHNOLOGY

INTERPRETATION:

57% of the respondents said warehouses are excellently equipped with new technologies, 29% of them said it is to a very good extent, 13% of them said it as good, 1% rated as fair and rest 1% said it as poor

INFERENCE:

Majority (57%) of the respondents said warehouses are excellently equipped with new technologies

Table 4.1.18: TABLE SHOWING INVENTORY HANDLING CLEARLY IS MARKING DAMAGED AND OBSOLETE INVENTORY

Marking Damaged and Obsolete Inventory	No. of Respondents	Percentage
Excellent	12	10.0
Very Good	36	30.0
Good	63	52.5
Fair	5	4.2
Poor	4	3.3
Total	120	100.0

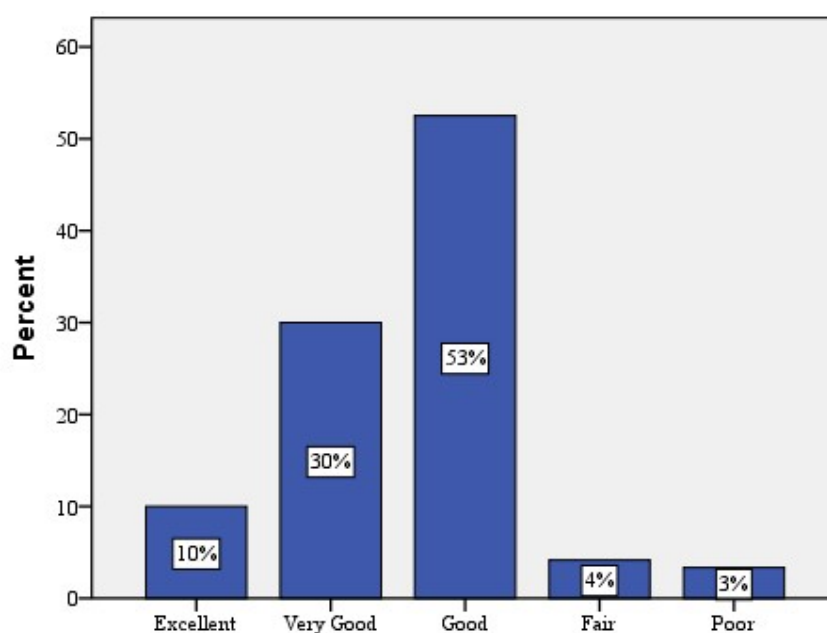


Chart 4.1.18: CHART REPRESENTING INVENTORY HANDLING CLEARLY IS MARKING DAMAGED AND OBSOLETE INVENTORY

INTERPRETATION:

10% of the respondents said inventory handling is clearly marking damaged and obsolete inventory to an excellent extent, 30% of them said it is to a very good extent, 53% of them said it as good, 4% rated as fair and rest 3% said it as poor

INFERENCE:

Majority (53%) of the respondents said inventory handling is good in clearly making damaged and obsolete inventory.

Table4.1. 19: TABLE SHOWING GOOD SOFTWARE AND IT SYSTEM ARE PLACED IN INVENTORY HANDLING

Good Software and IT System Handling	No. of Respondents	Percentage
Excellent	17	14.2
Very Good	48	40.0
Good	45	37.5
Fair	6	5.0
Poor	4	3.3
Total	120	100.0

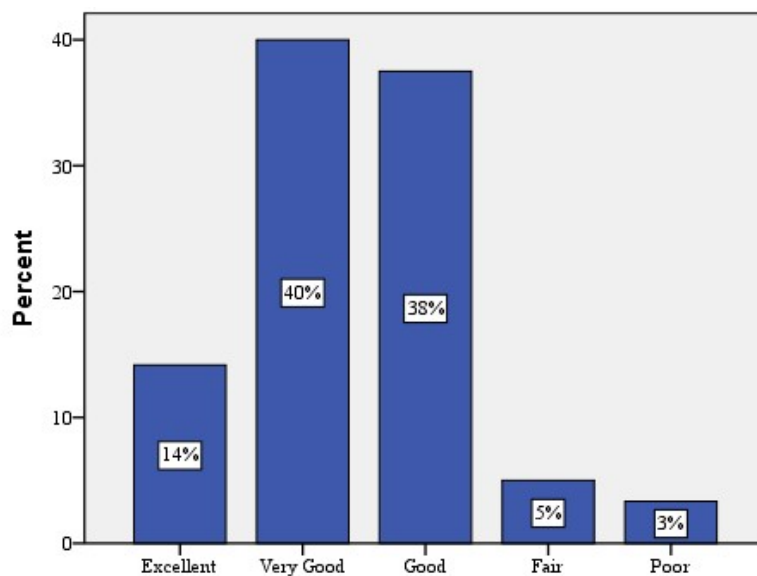


Chart 4.1.19:CHART REPRESENTING GOOD SOFTWARE AND IT SYSTEM ARE PLACED IN INVENTORY HANDLING

INTERPRETATION:

14% of the respondents said good Software and IT system are excellently placed in inventory handling, 40% said it is placed to a very good extent, 38% said it as good, 5% rated as fair and rest 3% said it as poor

INFERENCE:

Majority (40%) of the respondents said very good software and IT system placed in inventory handling.

Wireless technology in effective inventory handling

Table 4.1.20: TABLE SHOWING WIRELESS TECHNOLOGY REDUCED COSTS OF OPERATIONS

Costs of Operations	No. of Respondents	Percentage
Excellent	9	7.5
Very Good	35	29.2
Good	63	52.5
Fair	7	5.8
Poor	6	5.0
Total	120	100.0

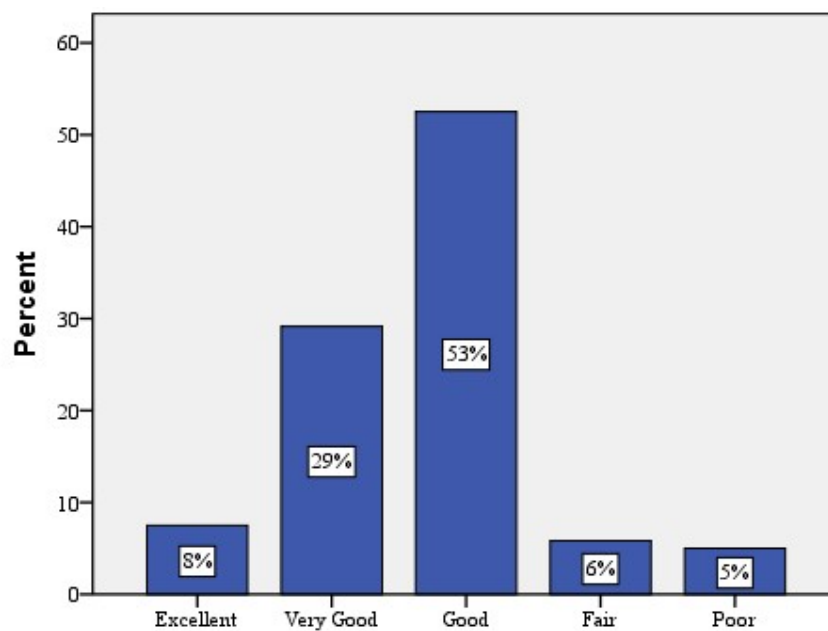


Chart 4.1.20: CHART REPRESENTING WIRELESS TECHNOLOGY REDUCED COSTS OF OPERATIONS

INTERPRETATION:

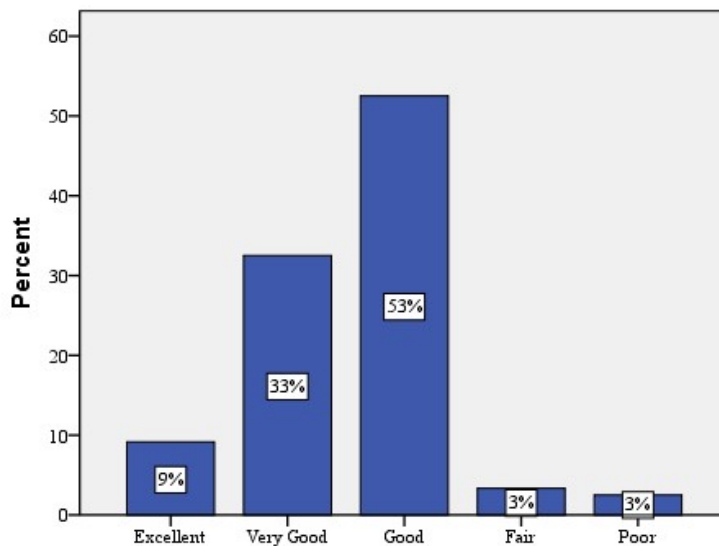
8% of the respondents said wireless technology excellently reduced costs of operations, 29% said it reduced to a very good extent, 53% said it as good, 6% rated as fair and rest 5% said it as poor

INFERENCE:

Majority (53%) of the respondents said good wireless technology reduced costs of operations.

**Table 4.1.21: TABLE SHOWING WIRELESS TECHNOLOGY SHORTEN
THE LEAD TIME**

Shorten Lead time	No. of Respondents	Percentage
Excellent	11	9.2
Very Good	39	32.5
Good	63	52.5
Fair	4	3.3
Poor	3	2.5
Total	120	100.0



**Chart4.1. 21:CHART REPRESENTING WIRELESS TECHNOLOGY
SHORTEN THE LEAD TIME**

INTERPRETATION:

9% of the respondents said wireless technology excellently shortened the lead time, 33% said it shortened to a very good extent, 53% said it as good, 3% rated as fair and rest 3% said it as poor

INFERENCE:

Majority (53%) of the respondents said good wireless technology shortened the lead time

Table 4.1.22: TABLE SHOWING WIRELESS TECHNOLOGY GIVES QUICK RESPONSE TO MARKET CHANGES

Market Changes	No. of Respondents	Percentage
Excellent	18	15.0
Very Good	47	39.2
Good	46	38.3
Fair	7	5.8
Poor	2	1.7
Total	120	100.0

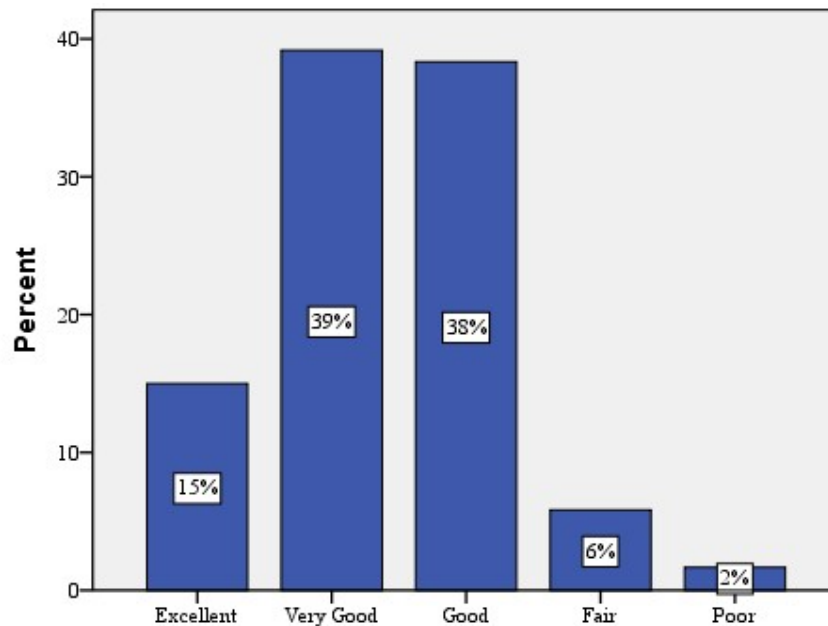


Chart 4.1.22: CHART REPRESENTING WIRELESS TECHNOLOGY GIVES QUICK RESPONSE TO MARKET CHANGES

INTERPRETATION:

15% of the respondents said wireless technology excellently gives quick response to market changes, 39% said it is placed to a very good extent, 38% said it as good, 6% rated as fair and rest 2% said it as poor

INFERENCE:

Majority (39%) of the respondents said its placed to very good wireless technology gives response to mark changes.

Table 4.1.23: TABLE SHOWING WIRELESS TECHNOLOGY FOCUS ON WASTE ELIMINATION

Waste Elimination	No. of Respondents	Percentage
Excellent	11	9.2
Very Good	32	26.7
Good	67	55.8
Fair	6	5.0
Poor	4	3.3
Total	120	100.0

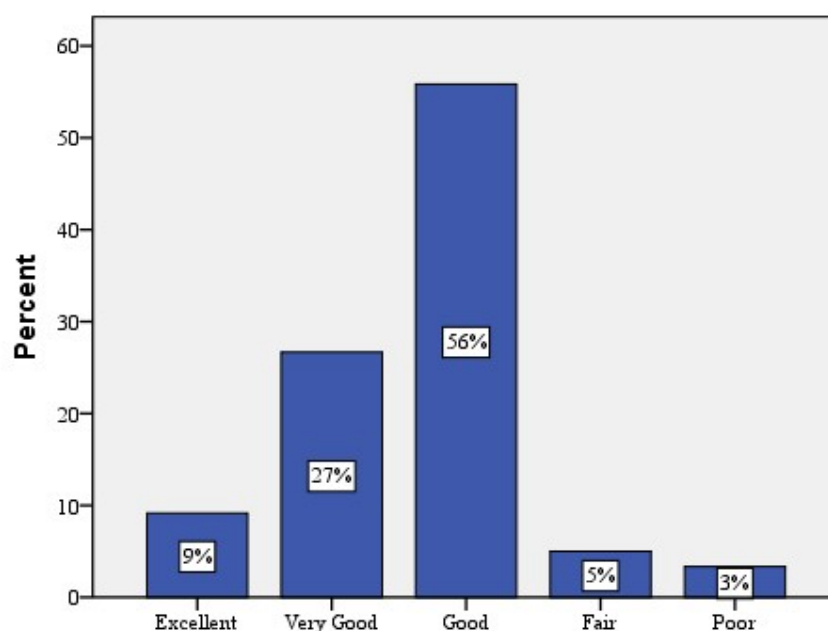


Chart4.1. 23:CHART REPRESENTING WIRELESS TECHNOLOGY FOCUS ON WASTE ELIMINATION

INTERPRETATION:

9% of the respondents said wireless technology excellently focus on waste elimination, 27% said it focus to a very good extent, 56% said it as good, 5% rated as fair and rest 3% said it as poor

INFERENCE:

Majority (56%) of the respondents said good wireless technology focus on waste elimination.

Table 4.1.24: TABLE SHOWING WIRELESS TECHNOLOGY HAS HIGHER SPEED OF DELIVERY

Higher Speed of Delivery	No. of Respondents	Percentage
Excellent	21	17.5
Very Good	42	35.0
Good	47	39.2
Fair	6	5.0
Poor	4	3.3
Total	120	100.0

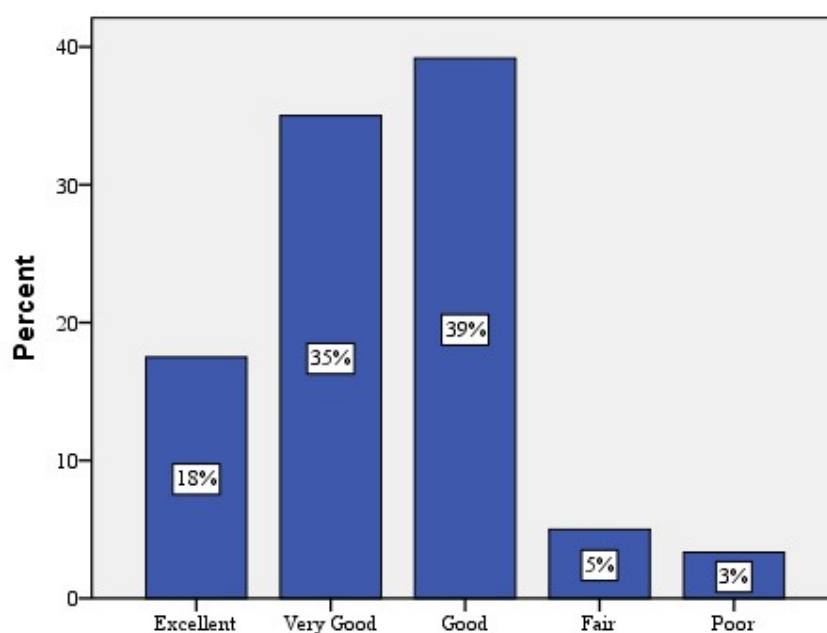


Chart 4.1.24: CHART REPRESENTING WIRELESS TECHNOLOGY HAS HIGHER SPEED OF DELIVERY

INTERPRETATION:

18% of the respondents said wireless technology excellently have higher speed of delivery, 35% said it has to a very good extent, 39% said it as good, 5% rated as fair and rest 3% said it as poor

INFERENCE:

Majority (39%) of the respondents said good wireless technology have higher speed of delivery.

4.2: CHI SQUARE TEST

H₀ (Null hypothesis) = There is no significant relationship between age of the respondents and their opinion on customer handling made easy by inventory tracking system

H₁ (Alternate hypothesis) = There is a significant relationship between age of the respondents and their opinion on customer handling made easy by inventory tracking system

Table 4.2.1: TABLE SHOWING CHI SQUARE TEST

AGE * CUSTOMER HANDLING CROSS TABULATION								
			CUSTOMER HANDLING					TOTAL
			STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	
Age	25-30 Years	Count	6	0	1	9	0	16
		Expected Count	4.7	4.0	4.3	2.7	.4	16.0
	30-40 Years	Count	1	1	4	1	0	7
		Expected Count	2.0	1.8	1.9	1.2	.2	7.0
	40-50 Years	Count	23	24	24	8	2	81
		Expected Count	23.6	20.3	21.6	13.5	2.0	81.0
	50-60 Years	Count	4	4	3	1	1	13
		Expected Count	3.8	3.3	3.5	2.2	.3	13.0
	Above 60 Years	Count	1	1	0	1	0	3
		Expected Count	.9	.8	.8	.5	.1	3.0
Total		Count	35	30	32	20	3	120
		Expected Count	35.0	30.0	32.0	20.0	3.0	120.0

Table 4.2.2: TABLE SHOWING CHI SQUARE TEST

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.786 ^a	16	.008
Likelihood Ratio	32.960	16	.007
Linear-by-Linear Association	2.467	1	.116
N of Valid Cases	120		
a. 21 cells (84.0%) have expected count less than 5. The minimum expected count is .08.			

At 5% level of significance and df (16) the table value is 32.786

Calculated value = 0.008

Significance value ($p=0.005$) < calculated value

H_0 is accepted.

INTERPRETATION:

The results of the "**Pearson Chi-Square**" say that $\chi (16) = 32.786, p = 0.008$.

This tells us that there is a statistically significant association between age of the respondents and their opinion on customer handling made easy by inventory tracking system

4.3 ONE WAY ANOVA TEST

Null Hypothesis:

H_0 = There is no statistically significant relationship between educational qualification of the respondents and their opinion on efficient EDI /Barcode /RFID as a very useful part of modern technology

Alternate Hypothesis:

H_1 = There is a statistically significant relationship between educational qualification of the respondents and their opinion on efficient EDI /Barcode /RFID as a very useful part of modern technology

Table 4.3.1: TABLE SHOWING ONE WAY ANOVA TEST

Descriptive								
Efficient								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Undergraduate	110	2.4636	.87448	.08338	2.2984	2.6289	1.00	5.00
Post Graduate	3	2.3333	.57735	.33333	.8991	3.7676	2.00	3.00
10 th	2	3.0000	.00000	.00000	3.0000	3.0000	3.00	3.00
12 th	3	2.3333	.57735	.33333	.8991	3.7676	2.00	3.00
Uneducated	2	4.5000	.70711	.50000	-1.8531	10.8531	4.00	5.00
Total	120	2.5000	.88877	.08113	2.3393	2.6607	1.00	5.00

Table 4.3.2: TABLE SHOWING ONE WAY ANOVA TEST

ANOVA					
Efficient					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	8.812	4	2.203	2.974	.022
Within Groups	85.188	115	.741		
Total	94.000	119			

INTERPRETATION:

This is the table that shows the output of the ANOVA analysis and we have a statistically significant difference between our group means. We can see that the significance level is 0.022 ($p = .022$), which is more than 0.005, therefore, there is a statistically significant relationship between educational qualification of the respondents and their opinion on efficient EDI /Barcode /RFID as a very useful part of modern technology

4.4: CORRELATION

A Pearson product-moment correlation was run to determine the relationship between experience of the respondents and their opinion on wireless technology giving quick response to market changes

Table 4.4.1: TABLE SHOWING CORRELATION

Correlations			
		Experience	Quick response
Experience	Pearson Correlation	1	.002
	Sig. (2-tailed)		.983
	N	120	120
Quick response	Pearson Correlation	.002	1
	Sig. (2-tailed)	.983	
	N	120	120

INTERPRETATION

The data showed no violation of normality, linearity or homoscedasticity. There was a positive correlation between experience of the respondents and their opinion on wireless technology giving quick response to market changes, which was statistically significant ($r = 0.002$, $n = 120$, $p = 1$). The Pearson correlation coefficient, r , is 0.002 and that is statistically significant

CHAPTER 5

FINDINGS, SUGGESTIONS & CONCLUSIONS

5.1 FINDINGS OF THE STUDY

- 13% of the respondents are 25-30 years of age, 6% of them are 30-40 years old, and 68% of them are 40-50 years old, 11% of them are 50-60 years old and rest 3% of them are above 60 years old.
- 92% of the respondents are under graduates, 3% of them are post graduates, 2% of the respondents are 10th standard qualified, 3% of them are 12th standard qualified and rest 2% of them are uneducated
- 26% of the respondents are having less than 1 year of experience, 23% of them are 3-5 years experienced, 43% of them are 5-8 years experienced and rest 9% of them are having more than 8 years of experience
- 79% of the respondents are male and rest 21% of them is female respondents

Satisfaction on Present Method of Inventory Tracing

- 3% of the respondents are highly satisfied with the physical checking of inventories, 6% of them are satisfied, and 84% respondents neither satisfied nor dissatisfied, 4% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied
- 1% of the respondents are highly satisfied with the booking invoice number, 1% of them are satisfied, and 70% respondents neither satisfied nor dissatisfied, 18% respondents are said to be dissatisfied and rest 10% respondents are highly dissatisfied
- 11% of the respondents are highly satisfied with the present ERP being used, 30% of them are satisfied, and 50% respondents neither satisfied nor dissatisfied, 7% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied
- 59% of the respondents are highly satisfied with the shipping request details, 24% of them are satisfied, 6% respondents neither satisfied nor dissatisfied, 8% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied

- 14% of the respondents are highly satisfied with the date of delivery, 53% of them are satisfied, 24% respondents neither satisfied nor dissatisfied, 6% respondents are said to be dissatisfied and rest 3% respondents are highly dissatisfied

Challenges of Inventory Tracking System

- 12% of the respondents strongly agree that the Material Lead Time is a challenge of inventory tracking system, 33% of them agree with this, 48% of them neither agree nor disagree, 4% of them disagree and rest 3% of them strongly disagree with this
- 59% of the respondents strongly agree that resource fluency is the major challenge for inventory tracking system, 13% of them agree with this, 12% of them neither agree nor disagree, 13% of them disagree and rest 3% of them strongly disagree with this
- 34% of the respondents strongly agree that loss of inventory due to pilferage is handled efficiently by inventory tracking system, 34% of them agree with this, 22% of them neither agree nor disagree, 9% of them disagree and rest 1% of them strongly disagree with this
- 29% of the respondents strongly agree that customer handling is the made easy by inventory tracking system, 25% of them agree with this, 27% of them neither agree nor disagree, 17% of them disagree and rest 3% of them strongly disagree with this
- 17% of the respondents strongly agree that operating hours are to be convenient in the warehouse, 28% of them agree with this, 48% of them neither agree nor disagree, 4% of them disagree and rest 3% of them strongly disagree with this

Usefulness of Modern Technology

- 12% of the respondents said efficient EDI / Barcode / RFID is excellently useful, 38% of them said they are very good, 42% respondents said it is good, 5% of them said it as fair and rest 3% rated it as poor
- 12% of the respondents said planner's efficiency can be excellently witnessed through RFID, 33% of them said it is very good, 48%

respondents said it is good, 6% of them said it as fair and rest 2% rated it as poor

- 57% of the respondents said warehouses are excellently equipped with new technologies, 29% of them said it is to a very good extent, 13% of them said it as good, 1% rated as fair and rest 1% said it as poor
- 10% of the respondents said inventory handling is clearly marking damaged and obsolete inventory to an excellent extent, 30% of them said it is to a very good extent, 53% of them said it as good, 4% rated as fair and rest 3% said it as poor
- 14% of the respondents said good Software and IT system are excellently placed in inventory handling, 40% said it is placed to a very good extent, 38% said it as good, 5% rated as fair and rest 3% said it as poor

Wireless technology in effective inventory handling

- 8% of the respondents said wireless technology excellently reduced costs of operations, 29% said it reduced to a very good extent, 53% said it as good, 6% rated as fair and rest 5% said it as poor
- 9% of the respondents said wireless technology excellently shortened the lead time, 33% said it shortened to a very good extent, 53% said it as good, 3% rated as fair and rest 3% said it as poor
- 15% of the respondents said wireless technology excellently gives quick response to market changes, 39% said it is placed to a very good extent, 38% said it as good, 6% rated as fair and rest 2% said it as poor
- 9% of the respondents said wireless technology excellently focus on waste elimination, 27% said it focus to a very good extent, 56% said it as good, 5% rated as fair and rest 3% said it as poor
- 18% of the respondents said wireless technology excellently have higher speed of delivery, 35% said it has to a very good extent, 39% said it as good, 5% rated as fair and rest 3% said it as poor

5.2 SUGGESTIONS

- Before establishing space optimization and using handheld devices, organizations should use risk management processes to assess the risks involved, to take steps to reduce the risks to an acceptable level, and to maintain that acceptable level of risk.
- Maintain a full understanding of the topology of the space optimization
- Label and keep inventories of the fielded wireless and handheld devices.
- Create backups of data frequently.
- Perform periodic security testing and assessment of the space optimization
- Perform ongoing, randomly timed security audits to monitor and track wireless and handheld devices.
- Apply patches and security enhancements.
- Monitor the wireless industry for changes to standards that enhance security features and for the release of new products.
- Maintain an awareness of the technical and security implications of wireless and handheld device technologies:
- Configuration/change control and management practices should ensure that all equipment has the latest software release, including security feature enhancements and patches for discovered vulnerabilities.
- Standardized configurations should be employed to reflect the security policy, and to ensure change of default values and consistency of operations.
- Security training is essential to raise awareness about the threats and vulnerabilities inherent in the use of space optimization.
- Robust cryptography is essential to protect data transmitted over the radio channel, and theft of equipment is a major concern.
- Physical controls should be implemented to protect wireless systems and information.
- Enable, use, and routinely test the inherent security features, such as authentication and encryption methods that are available in space

optimization. Firewalls and other appropriate protection mechanisms should also be employed.

5.3. CONCLUSION

The wireless system at Prompt Terminals Pvt. Ltd provides value to the organization at different levels. At an operational level, the system is helping employees to carry out their duties more effective and efficiently. There are a number of reasons for this, such as the readily available information, the reduced time that the fork-lift trucks runs without load and the error preventing features available in the application. At a management level, the system provides accurate information on many areas of the business. This helps management in the decision-making process, both regarding operational and strategic decisions. In order to achieve the advantages presented above, certain pitfalls have to be avoided. The ones we have identified as most important are user attitudes and hardware issues. It is not enough that the system itself is good in every way. If the users do not accept the system, they will not use it in a correct way and they might even work against it. The organization is very vulnerable of hardware failure; one simple faulty hardware device can close down a big part of the warehouse, or even the entire warehouse. As the final conclusion, we argue that the advantages that a wireless system brings to the organization outweigh the disadvantages that are related to such a system. Because of this, we can conclude that a space optimization generates value to the organization

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APPENDIX - I

QUESTIONNAIRE

1. Name:

2. Age:

- ☐ 25-30 Years
- ☐ 30-40 Years
- ☐ 40-50 Years
- ☐ 50-60 Years
- ☐ Above 60 Years

3. Educational qualification

- ☐ Under graduate
- ☐ Post graduate
- ☐ 10th
- ☐ 12th
- ☐ Uneducated

4. Experience

- ☐ 0-1 Years
- ☐ 3-5 Years
- ☐ 5-8 Years
- ☐ More than 8years

5. Gender

- ☐ Male
- ☐ Female

Q.No	Satisfaction on Present method of WHMS	Highly Satisfied	Satisfied	Neutral	Dissatisfied	Highly Dissatisfied
6	Satisfaction towards physical checking of inventories					
7	Satisfaction level of booking invoice number					
8	Satisfaction towards the present ERP being used					

9	Satisfaction towards the shipping request details					
10	Satisfaction on the date of Delivery					

Q.No	Challenges of space optimization	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
11	Material Lead Time is a challenge of inventory tracking system					
12	Resource Fluency is the major challenge for inventory tracking system					
13	Loss of inventory due to pilferage is handled efficiently by inventory tracking system					
14	Customer handling is the made easy by inventory tracking system					
15	Operating hours are to be convenient in the warehouse					

Q.No	Usefulness of Modern Technology	Excellent	Very Good	Good	Fair	Poor
16	Efficient EDI/Barcode/Rfid is very useful					
17	Planner's efficiency can be witnessed through RFID					
18	Warehouse is equipped with new technology					
19	Inventory handling clearly is marking damaged and obsolete inventory					
20	Good Software and IT system are placed in inventory handling					

Q.No	Wireless technology in space optimization in warehouses	Excellent	Very good	Good	Fair	Poor
21	Wireless technology reduced costs of operations					
22	Wireless technology shorten the lead time					
23	Wireless technology gives quick response to market changes					
24	Wireless technology focus on waste elimination					
25	Wireless technology have higher speed of delivery					

26. Any Suggestions for the improvement of WHMS in Prompt Terminals

S _____

APPENDIX – II

ARTICLE

A STUDY ON THE SATISFACTION LEVELS OF CUSTOMERS IN USING WAREHOUSING AND SHIPPING FACILITIES OF LOGISTICS COMPANY

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ABSTRACT:

Warehouses are designed to meet specific requirements in the inventory handling mechanism. Meanwhile, there are some operations which are common amongst them.

We're uniquely positioned to help both shipping line and landside customers grow their business and achieve better supply chain efficiency, flexibility and dependability. The main reason for the study is to identify the customer satisfaction levels on using the shipping & warehouse facilities of Logistics Company. Convenient sampling method is used in this study for data collection. Primary data was collected with the help of a Questionnaire. Secondary data was collected by external sources like books, newspapers and journals; new age sources like the intern. The study used tools such frequency analysis and percentage analysis. From the study the level of satisfaction of customers from using the warehouse facilities have been identified.

Keywords: Inventory, Shipping, Data of Delivery, ERP

INTRODUCTION:

Warehouses are designed to meet specific, requirements in the inventory handling mechanism. Meanwhile, there are some operations which are common amongst them. Inventory handling can be categorized as inventories, in or receiving. This involves the physical activity of unloading incoming transports, checking deliveries against purchase orders and recording. Depending on the agreement of both parties, future checks may include quality control. Some or all of the delivered inventories are either rejected or accepted at this stage. Rejected inventories are sent back to the supplier.

Pre receipt, suggesting that the warehouse manager should be involved in specifying and agreeing on the packaging, items per carton as well as any specific labeling required, in addition to the means of transport, so as to ensure that the delivered products are compatible with the storage facility. Put away into the storage area. Depending on the state of inventories in the above stage, accepted inventories are taken into storage. The storage area of the warehouse is often the largest space, with the spaces divided for the difference kinds of inventories that come in order selection and picking or packing. Inventories are stored in the warehouse to be used later when needed. The needs for inventories are made ready for transportation to the point of need. Inventories outward or dispatch are put together at the dispatch area and loaded onto the outbound vehicles, or picked up for use according to their size and place of need. The key aspect to be considered in the activities is the conflicting priority of maximizing the use of the space allocated to each, while minimizing to undertake the activity.

OBJECTIVES OF THE STUDY

Primary Objectives

To contemplate the ideal space usage in distribution centers concerning brief warehouse and shipping facilities of Logistics Company.

Secondary Objectives

To find out the level of satisfaction with the present warehouse management system adopted in India's warehouses. To study the functions of wireless technology in effective space optimization. To know the challenges of inventory tracking in the warehouses of logistics company. To analyze the usefulness of modern technology in space optimization in warehouses

LITERATURE REVIEW:

- **SAINATHUNI, BHANUTEJA& PARIKH, PRATIK & ZHANG, XINHUI& KONG, NAN. (2014)** Warehouses play a vital role in mitigating variations in supply and demand, and in providing value-added services in a supply chain. However, our observation of supply chain practice reveals that warehousing decisions are not included when developing a distribution plan for the supply chain
- **CLIFFORD SERETEMILIMU, 2015**,The objective of the study was to assess the factors affecting containerized materials clearance in the Kenyaport with focus on specific objectives, to establish the effects of documentation

process on container clearance at KPA, to determine the effects of handling equipment on containerized materials clearance at KPA, to find out the effects of transport infrastructure on containerized materials clearance at KPA and to assess the effects of space capacity on containerized materials clearance at KPA.

- **P. BAHALE, DR.S.S.DESHMUKH, 2014**, in the last several years cargo handling has become a new, complex, and rapidly evolving science. Cargo handling cannot be avoided in logistics, but can certainly be reduced to minimum levels. Cargo handling system (MHS) design has a direct influence on the logistics cost.
- **CHIA-HUNG HUANG (2009)**, Radio Frequency Identification (RFID) has been around for nearly 50 years. RFID was first used during World War II in Friend-or-Foe identification system. Ever since then, RFID has caught the attention of many scientists, academics, and enterprises around the world.
- **NICHOLAS EWIENEADDY-TAYIE (2012)**, this Thesis work was done to analyse the current operations involving the finished-goods and fertilizer warehouse managements, as well as the fertilizer inventory management of Ghana Rubber Estates Limited (GREL).

RESEARCH METHODOLOGY:

The present study is quantitative in nature. To better understand this style of research we need to break down its major views. The research study used both primary and secondary data. The sample size of the research study is 120. The research study adopted a convenience sampling method and data collection was done through questionnaire method. The close-end questions are asked to the respondents.

PERCENTAGE ANALYSIS:

S.NO	Particulars	No. of Respondents	Percent
1.	GENDER		
	Male	95	79.2
	Female	25	20.8
	Total	120	100.0
2.	AGE		
	25-30 Years	16	13.3
	30-40 Years	7	5.8
	40-50 Years	81	67.5
	50-60 Years	13	10.8
	Above 60 Years	3	2.5
	Total	120	100.0

3.	GRADUATION		
	Undergraduate	110	91.7
	Post Graduate	3	2.5
	10 th	2	1.7
	12 th	3	2.5
	Uneducated	2	1.7
	Total	120	100.0

CHI SQUARE ANALYSIS

Table Showing The Age * Customer Handling Cross Tabulation

Chi-Square Tests			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.786 ^a	16	.008
Likelihood Ratio	32.960	16	.007
Linear-by-Linear Association	2.467	1	.116
N of Valid Cases	120		
a. 21 cells (84.0%) have expected count less than 5. The minimum expected count is .08.			

H₁ (Alternate hypothesis) = There is a significant relationship between age of the respondents and their opinion on customer handling made easy by inventory tracking system

ANOVA

ANOVA					
Efficient					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	8.812	4	2.203	2.974	.022
Within Groups	85.188	115	.741		
Total	94.000	119			

H_1 = There is a statistically significant relationship between educational qualification of the respondents and their opinion on efficient EDI /Barcode /RFID as a very useful part of modern technology

FINDINGS :

79.2% of respondents are male and 20.8% are female. 67.5% of the respondents are between the age group of 40-50 years and 91.7% respondents are Undergraduate here. There is a significant relationship between age of the respondents and their opinion on customer handling made easy by inventory tracking system. There is a statistically significant relationship between educational qualification of the respondents and their opinion on efficient EDI /Barcode /RFID as a very useful part of modern technology.

CONCLUSION:

The system is helping employees to carry out their duties more effective and efficiently. There are a number of reasons for this, such as the readily available information, the reduced time that the fork-lift trucks runs without load and the error preventing features available in the application. At a management level, the system provides accurate information on many areas of the business. This helps management in the decision-making process, both regarding operational and strategic decisions. In order to achieve the advantages presented above, certain pitfalls have to be avoided. The ones we have identified as most important are user attitudes and hardware issues. It is not enough that the system itself is good in every way. If the users do not accept the system, they will not use it in a correct way and they might even work against it. The organization is very vulnerable of hardware failure; one simple faulty hardware device can close down a big part of the warehouse, or even the entire warehouse. As the final conclusion, we argue that the advantages that a wireless system brings to the organization outweigh the disadvantages that are related to such a system. Because of this, we can conclude that a space optimization generates value to the organization

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