

A STUDY ON IMPACT OF WAREHOUSE MANAGEMENT IN A SKYJAC LOGISTICS PVT LTD

Submitted in partial fulfilment of the requirements for the award of

MASTER OF BUSINESS ADMINISTRATION

by

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Register No: 42410110



SCHOOL OF MANAGEMENT STUDIES

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

**Accredited with Grade “A++” by NAAC | 12B Status by UGC | CATEGORY - 1
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DECEMBER 2023



SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **MUTHU PRAKASH.S 42410110**, who carried out the project entitled “**A STUDY ON IMPACT OF WAREHOUSE MANAGEMENT IN A SKYJAC LOGISTICS PVT LTD**” under my supervision from October 2023 to December 2023.

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01st November 2023

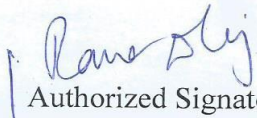
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This is to certify that **Mr. MUTHU PRAKASH S - MBA (Reg. No: 42410110)** student of **SATHYABAMA INSTITUTE OF SCIENCE & TECHNOLOGY** has successfully completed his internship in our concern from 03rd October 2023 to 19th October 2023.

He was found sincere and committed to learning during his tenure of internship.

We wish him all the best for his future endeavors.

For Flyjac Logistics Pvt. Ltd.


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DECLARATION

I, **MUTHU PRAKASH.S** hereby declare that the Project Report entitled "**A STUDY ON IMPACT OF WAREHOUSE MANAGEMENT IN A LOGISTICS COMPANY**" done by me under the guidance of **Dr.C .Lakshmi** is submitted in partial fulfilment of the requirements for the award of Master of Business Administration degree.

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ACKNOWLEDGEMENT

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

I convey my sincere thanks to **Dr. G. Bhuvaneswari, MBA., Ph.D., Dean - School of Management Studies** and **Dr. A. Palani, M.Com., MBA., Ph.D., Head - School of Management Studies** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr.C. Lakshmi** for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

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

MUTHU PRAKASH.S

TABLE OF CONTENTS

CHAPTER NO	CHAPTERS	PAGE NO
	ABSTRACT	
	LIST OF TABLES	
	LIST OF CHARTS	
I	INTRODUCTION	
	1.1 INTRODUCTION	1
	1.2 INDUSTRY PROFILE	2
	1.3 COMPANY PROFILE	3
	1.4 OBJECTIVES	5
	1.5 NEED FOR THE STUDY	5
	1.6 SCOPE OF THE STUDY	6
II	REVIEW OF LITERATURE	
	2.1 REVIEW OF LITERATURE	7
III	RESEARCH METHODOLOGY	
	3.1 METHODOLOGY	17
	3.2 RESEARCH DESIGN	17
	3.2.1 DESCRIPTIVE RESEARCH DESIGN	17
	3.3 SAMPLING TECHNIQUES	18
	3.4 SOURCES OF DATA	18
	3.6 SAMPLE SIZE	18
	3.7 PERIOD OF STUDY	19
	3.8 ANALYTICAL TOOLS	19
IV	DATA ANALYSIS AND INTERPRETATION	
	4.1 PERCENTAGE ANALYSIS	20
	4.2 CHI-SQUARE TEST	39
	4.3 KARL PEARSON'S CORRELATION	40
V	FINDINGS, SUGGESTIONS, LIMITATIONS AND CONCLUSION	
	5.1 FINDINGS	41
	5.2 SUGGESTIONS	43

	5.3 CONCLUSION	44
VI	ANNEXURE	
	BIBLIOGRAPHY	45
	QUESTIONNAIRE	46

ABSTRACT

A warehouse is a commercial building for storage of goods. Warehouses are used by manufactures, importers, exporters, wholesalers, transport businesses, customs, etc. They are usually large plain buildings in industrial areas of cities and towns and villages. They usually have loading docks to load and unload goods from trucks.

The scope of the study conducted focuses on the wireless technology used in Skyjac PVT LTD to enhance the supply chain operations. The effectiveness of wireless technology 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 wireless technology for tracing goods. This study is limited to Skyjac PVT LTD.

Skyjac PVT LTD 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 wireless technology in its warehouse.

Primary objectives are to study the Warehouse management with special reference to Secondary objectives are to identify the issues in the location of warehouse and its impact of customer service, find out the factors influencing ideal warehouse location, analyze which location is suitable for various goods like perishable goods, electronic goods, agriculture products, chemical products and identify which place is the convenient place of warehouse to use both distribution and storage of goods.

The warehouse location is must be near the high ways, market areas, near to the port and airport. And warehouse place is requiring availability of manpower, electricity, warehouse space, safety and security. The considerations of warehouse site selection revolve around four major factors as location, infrastructure, access, availability, market. However, transportation cost, which is a major element in logistic, it depends on the location of the warehouse. Locations of the warehouse depend on the products and customers. So, company can consider location of because warehouse location cost is standard and other costs are variable like transportation cost.

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO
4.1.1	Gender	20
4.1.2	Martial Status	21
4.1.3	Age	22
4.1.4	Experience	23
4.1.5	Type of goods that client are storing in the warehouse	24
4.1.6	Important factor which your client look while approaching warehouse	25
4.1.7	Time taken by the goods on average to reach the customers from warehouse	26
4.1.8	How do your clients or customers would rate basic facility provided by the warehouse	27
4.1.9	Do you think location is the most important factor of Warehouse	28
4.1.10	According to you , mention the choice of location of the warehouse so that is efficient and profitable	29
4.1.11	Transportation Infrastructure Rate by your client or customer	30
4.1.12	Does the warehouse provide advance facility like RFID , GPS etc	31
4.1.13	To what extent have advancements in automation and robotics influenced your organization's warehouse location decision-making process?	32
4.1.14	The primary method of arranging storage within the warehouse	33
4.1.15	How is inventory tracked and managed within the warehouse	34
4.1.16	Does the layout of the warehouse support the flow of goods from receiving to shipping efficiently	35
4.1.17	How familiar are you with the advancements in warehouse automation and robotics	36
4.1.18	What type of bottleneck do you face in the Warehouse	37
4.1.19	Which location is mostly preferred by you for warehousing	38

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4.1.2	Martial Status	21
4.1.3	Age	22
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4.1.8	How do your clients or customers would rate basic facility provided by the warehouse	27
4.1.9	Do you think location is the most important factor of Warehouse	28
4.1.10	According to you , mention the choice of location of the warehouse so that is efficient and profitable	29
4.1.11	Transportation Infrastructure Rate by your client or customer	30
4.1.12	Does the warehouse provide advance facility like RFID , GPS etc	31
4.1.13	To what extent have advancements in automation and robotics influenced your organization's warehouse location decision-making process?	32
4.1.14	The primary method of arranging storage within the warehouse	33
4.1.15	How is inventory tracked and managed within the warehouse	34
4.1.16	Does the layout of the warehouse support the flow of goods from receiving to shipping efficiently	35
4.1.17	How familiar are you with the advancements in warehouse automation and robotics	36
4.1.18	What type of bottleneck do you face in the Warehouse	37
4.1.19	Which location is mostly preferred by you for warehousing	38

CHAPTER- 1

1.1 INTRODUCTION

WAREHOUSE

A warehouse is a commercial building for storage of goods. Warehouses are used by manufactures, importers, exporters, wholesalers, transport businesses, customs, etc. They are usually large plain buildings in industrial areas of cities and towns and villages. They usually have loading docks to load and unload goods from trucks. Sometimes warehouses are designed for the loading and unloading of goods directly from railways, airports or seaways. They often have cranes and forklifts for moving goods, which are usually placed on ISO standard pallets loaded into pallet racks. Stored goods can include any raw materials, packing materials, spare parts, components, or finished goods associated with agriculture, manufacturing, or commerce.

LOGISTICS

Logistics is the management of the flow of resources, not only goods, between the point of origin and the point of destination in order to meet the requirements of customers or corporation. Logistics involves the integration of information, transportation, warehouse, warehousing, material handling and packaging, and often security. Today the complexity of production logistics can be modeled, analyzed, visualized and optimized by plant simulation software, but is constantly changing. This can involve anything from consumer goods such as food, to IT materials.

Inbound logistics is one of the primary processes and it concentrates on purchasing and arranging inbound movement of materials, parts and/or finished warehouse from suppliers to manufacturing or assembly plants, warehouses or retail stores.

Outbound logistics is the process related to the storage and movement of the final product and the related information flows from the end of the production line to the end user.

1.2 INDUSTRY PROFILE

Logistics is about moving materials, information and funds from one business to another business or from a business to the consumer. Logistics is an important part of the business economic system and is a major global economic activity. It encompasses activities like freight transportation, warehousing, material handling, protective packaging, inventory control, order processing, marketing, forecasting and customer service.

Fierce competition in today's global market, the introduction of products with short life cycles, the heightened expectations of customer and the cost cutting measures have forced business enterprise to focus attention on logistics industry. Historically, the logistics sector was clearly separated and restricted mainly to transportation and warehousing. The logistics management in today's world however, covers all the aspects of value chain including an efficient integration of transportation, distribution, warehousing, reverse logistics, value added services such as payment collection, packaging, documentation, customer brokerage facilities, kitting, repair management, reconfiguration etc.

The logistics industry in India is growing rapidly, with the country's economy expanding at a rapid pace. The sector is expected to grow at a compound annual growth rate (CAGR) of 15.5% between FY2019 and FY2024, according to various market research.

The sector employs around 22 million people and is expected to create another 1.2 million jobs by 2025.

The government's focus on infrastructure development, FDI reform, and the implementation of the Goods and Services Tax (GST) are some of the key drivers of growth in the sector. The government's initiatives such as Make in India and Digital India are also expected to boost the growth of the logistics industry in the country

1.3 COMPANY PROFILE

Flyjac was founded in 1990 with a vision to provide Total Integrated Logistics Service Solution by upholding philosophical values of Customer Delight, Self-Development & Social Welfare. It has perfected the art of Global Delivery System on International Freight Forwarding and Warehousing Management. Flyjac covers all gateways in the country having offices in 27 strategic locations and warehousing facilities in 17 locations all over India. With presence in 60 countries, spread across all continents and with own offices & agents' network, we ensure global reach of service to our customers in India. Flyjac has merged with Hitachi Transport System Ltd., in 2010, to become one of the largest IntegratedLogisticsServiceProviders.

Profile

Strength 1500 + EMPLOYEES

Hitachi Transport System Group

Hitachi Transport System Group, one of the group companies of Hitachi Limited (Turnover INR 96940 crores and employee's strength of 3,59,746 - FY 2009), was founded in 1950 and engages in the international forwarding industry & third-party logistics, endeavouring to provide tailor-made services & effective logistic solutions to all its customers. Its extensive domestic and global network has Our IT Initiatives enabled to deliver excellence to all customers. Over the years, it has established its specialties and strengths in ocean freight and airfreight, inland transport, warehousing operation as well as project cargo handling.

Strength - 27,834 + EMPLOYEES

Network - Domestic (Japan) : 20 companies , 247 offices

Overseas : 41 companies , offices

COMPANY MISSION

Flyjac Logistics was founded on the belief that a professional and ethically upright organization never needs to create a market for its services. Rather, the market creates the space for it to operate regardless of the level of competition, large monopolies or unpredictable business challenges. Over the past two decades, we have grown to a fully integrated logistics company with a national standing.

MISSION STATEMENT

- To be a partner of our customers in building a seamless value chain
- To build care and competence in networking, communication and personalized service
- To create opportunities for self-development and excellence

Flyjac Logistics represents the unfolding of a dream— to build a world-class company that is rooted in India in the wisdom and ethos of five thousand years of tradition. The merger of Hitachi Terminal System and Flyjac Logistics represented a marriage of the Indian and Japanese ethos. It combined Hitachi's strengths, its financial prowess, its global presence and its capabilities with Flyjac 's unique customer-centric approach to business which has helped Flyjac Logistics to grow. Our watch words are:

- Every business as an opportunity to serve
- Customers as an extension of the Flyjac Family
- Building friends [clients] for life

SERVICES PROVIDED BY COMPANY

Flyjac delivers a wide array of integrated logistics solutions to enterprises both large and small in key areas such as freight transportation, warehousing, distribution, 3PL, reverse logistics and end-to-end supply chain management only to name a few. What differentiates us as a logistics solutions provider from other companies.

1.4 OBJECTIVES

- To understand the impact of warehouse management on maintaining product quality standards.
- To identify the issues in the location of warehouse and its impact of customer service
- To study about the right balance in inventory to meet demand while minimizing holding costs.

1.5 NEED FOR THE STUDY

- Understanding the impact allows organizations to identify inefficiencies, bottlenecks, or areas of improvement within their warehouse operations.
- Warehouse operations often represent a significant portion of operational costs. Studying the impact helps in identifying cost-saving opportunities, optimizing resources, and reducing unnecessary expenses.
- Proper warehouse management impacts inventory levels, reducing excess stock and minimizing stockouts. Studying this impact helps in achieving better inventory control, optimizing stock levels, and improving turnover rates.
- A well-placed warehouse can provide a competitive advantage. Faster delivery times, lower costs, and better service due to optimal location contribute to gaining an edge over competitors.
- Strategic warehouse placement can minimize transportation expenses by reducing distances between the warehouse and suppliers or end consumers.

1.5 SCOPE OF THE STUDY

- Efficient warehouse management optimizes processes, layout, and workflows, leading to streamlined operations, reduced errors, and increased productivity.
- Implementing lean inventory practices involves reducing excess inventory and waste by adopting just-in-time (JIT). This methods ensure that inventory is replenished only when needed, minimizing holding costs.
- Warehouse management involves conducting regular quality control checks to inspect incoming and outgoing products. This ensures that only goods meeting quality standards are accepted and dispatched.
- Utilizing advanced technologies like Inventory Management Systems or Warehouse Management Systems enables real-time monitoring of inventory levels, aiding in efficient replenishment and minimizing excess inventory.
- A well-located warehouse minimizes the distance between the warehouse and customers, reducing the chances of errors in order fulfillment. This leads to increased accuracy in delivering the right products to the right customers.

CHAPTER – 2

2.1 REVIEW OF LITERATURE

Ashutosh Verma (2023) Warehouse management is the key aspect for an uninterrupted flow of products within a supply chain. This paper deals with the critical factors that are responsible for creating an impactful influence on the working of warehouse management. The analysis involves the selection of critical factors then applying Interpretive Structural Modelling (ISM) methodology to them in order to get the level partition and final ISM model. This research also involves the MICMAC analysis on the factors which classifies all the selected factors into four groups namely, autonomous variables, dependent variables, linkage variables and driver variables. This research will help the supply chain architects to establish a better and reliable warehouse system. As this research involves analysis of multiple domains that is why a variety of users can refer to this work for their businesses, also the ISM approach gives a good accuracy of the hierarchy of the factors which helps in deciding the most effective chronology of the implementation of various warehousing operations. Researchers can also refer to this work to get insights of the significance of warehouse management in the supply chain and also the complete working of the ISM methodology.

Pablo Becerra (2021) This paper provides a systematic and up-to-date review and classification of 91 studies on quantitative methods of green supply chains for sustainable warehouse management. It particularly identifies the main study areas, findings and quantitative models by setting a point for future research opportunities in sustainable warehouse management. It seeks to review the quantitative methods that can better contribute to deal with the environmental impact challenge.

Natalia Burganova, Patrik Grznar (2021) Warehouse management and internal

logistics planning and control are growing in importance. Nowadays, many methods have been developed in the areas of warehouse management and internal logistics planning and control. Internal logistics is essential in creating value and maximizing profits by streamlining internal logistics tasks. As a key indicator of logistic processes, efficiently is set transport time. The article deals with the possibilities of improving logistics and warehousing using available methods with the smallest possible input capital and decreasing transport time. In the first part, the warehouse is reorganised, and lean methods such as Kanban and Milk run are set. The presented design is applied to the newly created hall. The result is improved processes and shorter transport times for material at the workplace and, ultimately, faster delivery of the finished product to the market and customer satisfaction. Scientific and more important for this study professional benefits consist in the application of mentioned methods. Deepesh Singh, Ajay Verma (2018) in their research, The Purpose of this paper is to overview the warehouse management in supply chain and their current warehouse related issue in a present-day business and present a conceptual methodology for related issue. The methodology based on the warehouse, which are inputs for the methodology and benefits which are output of methodology.

Syafrial Fachri Pane (2018) Logistic sector actors need innovation to improve competitiveness in providing their best services to consumers, one of them on Warehouse Management System (WMS) because the system is used to control the movement of the supply chain. There is a problem in one of Indonesia logistics companies on the process of selecting goods, so the warehouseman still difficulties in this process. Thus, RFID implementation on WMS becomes one of the solutions to handle the goods selection process. This research uses Design Science Research Methodology (DSRM) which focuses on developing and improving the model performance of a system and using waterfall model for system development. Then the authors will analyze the test results with the validity test and reliability test of the questionnaire, and the results of the data analysis will determine the feasibility of this research to be applied.

Jia Mao, Huihui Xing & Xiuzhi Zhang (2018) With the continuous development and application of information technology in the logistics industry, mobile applications, bar code, wireless communication, system integration and other technologies are widely used in warehouse management. Focusing on warehousing process management has become a new trend of informatization and lean management of material warehouse management. In this paper, the management of distributed storage cloud model is discussed, and a variety of automation, intelligence and information technology are utilized to effectively integrate the resources effectively. The author studies the resource scheduling optimization problem in the system, proposes an effective scheduling method, and initially realizes the intelligent warehouse management system based on cloud model, which provides users with a good package management service.

C.K.M. Lee, Yaqiong Lv (2018) Warehouse operations need to change due to the increasing complexity and variety of customer orders. The demand for real-time data and contextual information is required because of the highly customized orders, which tend to be of small batch size but with high variety. Since the orders frequently change according to customer requirements, the synchronization of purchase orders to support production to ensure on-time order fulfilment is of high importance. However, the inefficient and inaccurate order picking process has adverse effects on the order fulfilment. The objective of this paper is to propose an Internet of things (IoT)-based warehouse management system with an advanced data analytical approach using computational intelligence techniques to enable smart logistics for Industry 4.0. Based on the data collected from a case company, the proposed IoT-based WMS shows that the warehouse productivity, picking accuracy and efficiency can be improved and it is robust to order variability.

Mourad Makaci (2017) Today, pooled warehouse presents a major issue for supply chain actors. Managing such structures establishes a more complex and little-known actions system. In this paper, we provide the main specificities of a pooled warehouse examined from the perspectives of both a literature review and an exploratory qualitative study built on seven cases in France. This study is based on semi-structured interviews with 22 companies managing projects in the field of pooled

warehouses. From this qualitative analysis, we distinguish the main characteristics of pooled warehouses, such as compatibility and partner maturity, shared Vendor Managed Warehouse, and collaborative management. In addition, we identify new key performance indicators, uncertainty sources and risks of pooled warehouses. This work helps define pooled warehouse concept and brings practitioners a better understanding of how it can be managed. Furthermore, it allows researchers to develop new models of optimization considering the pooling context.

Burcu Balcik, Cem Deniz Caglar Bozkir, O. Erhun Kundakcioglu (2016) In this paper, we present a review and analysis of studies that focus on humanitarian warehouse planning and management. Specifically, we focus on papers which develop policies and models to determine how much to stock, where to stock, and when to stock throughout the humanitarian supply chain. We categorize papers according to the disaster management cycle addressed; specifically, we focus on pre-disaster and post-disaster warehouse management. We evaluate existing literature in terms of problem aspects addressed such as decision makers, stakeholders, disaster types, commodities, facility types, performance measures as well as methodological aspects (i.e., types of policies, models, and solution approaches). We identify current gaps in the literature and propose directions for future research.

Johannes Fichtinger, Peter Baker (2015) There has been considerable research on the environmental impact of supply chains but most of this has concentrated on the transport elements. The environmental impact of warehousing has received relatively little attention except within the context of distribution networks. A high proportion of total warehouse emissions emanate from heating, cooling, air conditioning and lighting and these aspects are largely related to warehouse size. This in turn is greatly influenced by warehouse management, affecting stockholding levels, and warehouse design, affecting the footprint required for holding a given amount of stock. Other

Wen Ding (2013) With the development of enterprises and the constant demands of the product diversity, traditional warehouse management model cannot meet that, due to its heavy workload and low efficiency. This paper presents a new type of intelligent warehouse management system - Smart Warehouse Management System based on the IOT, and expounded the principles and structure of it. This system has great advantages compared with the traditional mode, and we expect good prospects for its development.

emissions, such as those caused by material handling equipment, are closely related to warehouse throughput and equipment choice. There is a substantial gap in the literature regarding this interaction between warehouse and warehouse management and its environmental impact. The purpose of this paper is to contribute to filling this gap. Therefore, an integrated simulation model has been built to examine this interaction and the results highlight the key effects of warehouse management on warehouse-related greenhouse gas emissions.

A.Smidts(2013) The purpose of this paper is to investigate how warehouse management, understood as a cluster of planning and control decisions and procedures, is organized and driven by task complexity (TC) and market dynamics (MD).

Ramaa.A, K.N.Subramanya, T.M.Rangaswamy (2012) In a supply chain, warehousing function is very critical as it acts as a node in linking the material flows between the supplier and customer. In today's competitive market environment companies are continuously forced to improve their warehousing operations. Many companies have also customized their value proposition to increase their customer service levels, which has led to changes in the role of warehouses. This paper highlights the findings of the study carried out to evaluate performance levels and enhance productivity of the manual warehouses by developing a WMS framework and cost benefit analysis.

S Hong-Ying (2009) Applying barcode technology to logistics and warehouse management becomes an inevitable trend for logistics modernization. In this paper, we introduce the bar code technology using in logistics and warehouse, then we pay more attention to how to apply barcode technology in the course of goods entering warehouse, storage and outing warehouse. At last, we put forward that applying barcode technology to logistics and warehouse will bring logistics enterprises huge profit.

Michael Hompel, Thorsten Schmidt (2008) The book gives an overview on background, potentials, risks and strategies for efficient warehouse-management in modern production and supply chains.

Jay D. Schwartz, Wenlin Wang, Daniel E. Rivera (2006) A simulation-based

optimization framework involving simultaneous perturbation stochastic approximation (SPSA) is presented as a means for optimally specifying parameters of internal model control (IMC) and model predictive control (MPC)-based decision policies for warehouse management in supply chains under conditions involving supply and demand uncertainty. The effective use of the SPSA technique serves to enhance the performance and functionality of this class of decision algorithms and is illustrated with case studies involving the simultaneous optimization of controller tuning parameters and safety stock levels for supply chain networks inspired from semiconductor manufacturing. The results of the case studies demonstrate that safety stock levels can be significantly reduced and financial benefits achieved while maintaining satisfactory operating performance in the supply chain.

H.Min (2006) With the increasing demand for impeccable customer service, today's warehouses are pressured to raise their goals for warehouse accuracy, timely delivery service, individualized order fulfilment, flexible value-added service and responsiveness to special customer requests. To meet these high-performance goals, a way needs to be found to eliminate any waste from the warehouse, to streamline its operations, and improve efficiency in every aspect of warehousing activities. One of the most proactive ways of doing so is the use of a warehouse management system (WMS) that is designed to speed up order turnaround time, improve warehouse accuracy, provide instant order status information, manage warehouse space and enhance labor productivity. This paper aims to help firms assess the extent of the WMS benefits for warehouse operations and their impact on competitiveness, while developing practical guidelines for successful WMS implementation based on the findings of our exploratory study of selected US firms. The findings suggest that WMS has become an integral part of warehouse operations and the subsequent supply chain processes.

E Krauth (2005) With the ever-increasing focus on cost reduction, product leadership and customer intimacy, the need for Supply Chain Management practices rises across many industries. Over the last two decades Logistics Service Providers have become important players in many chains and industries. New challenges arise due to the emergence of technologies. Data and information can be found anywhere, however, to make the proper decisions we need to have an insight in how decisions should be made, and what is important for the company and what not. In order to do so we

solicited the Key Performance Indicator (KPI) literature -focusing on the areas of general management, supply chain management, logistics service provision and warehousing. In our earlier work we proposed a KPI framework that we here revisit and validate in the Warehousing domain – through the means of expert interviews.

Chad W. Autry Ph.D., Stanley E. Griffis Ph.D., (2005) Modern warehousing firms and distribution centers are overwhelmed with information related to the flows and storage of goods and services. The efficient and effective utilization of logistics-related information can enhance firms' ability to reduce costs while simultaneously improving customer satisfaction. Warehouse management systems (WMS) are frequently implemented and used with these goals in mind. The current research examines resource-based empirical justification for the pursuit and implementation of WMS. In addition, a research agenda is offered to guide future research efforts related to WMS and the broader area of logistics information systems (LIS).

Smith, Robert L. (2005) Uncertainties inherent in customer demands make it difficult for supply chains to achieve just-in-time warehouse replenishment, resulting in losing sales opportunities or keeping excessive chain-wide inventories. In this paper, we propose two adaptive warehouse-control models for a supply chain consisting of one supplier and multiple retailers. The one is a centralized model and the other is a decentralized model. The objective of the two models is to satisfy a target service level predefined for each retailer. The warehouse-control parameters of the supplier and retailers are safety lead time and safety stocks, respectively. Unlike most extant warehouse-control approaches, modelling the uncertainty of customer demand as a statistical distribution is not a prerequisite in the two models. Instead, using a reinforcement learning technique called action-value method, the control parameters are designed to adaptively change as customer-demand patterns changes. A simulation-based experiment was performed to compare the performance of the two warehouse-control models.

M.Braglia & L. Zavanella (2003) Stock control in Supply Chain management is of concern here, particularly an industrial practice observed in the automotive manufacturing context and defined as 'Consignment Stock' (CS). To understand the potentiality of CS policy, an analytical modelling is offered that refers to the problem of a single-vendor and single-buyer productive situation. A comparison with the optimal solution available in the literature is also shown. The conclusion proposes a method

that is useful in identifying those productive situations where CS might be implemented successfully. Results show how CS policy might be a strategic and profitable approach to stock management in uncertain environments, i.e., where delivery lead times or market demand vary over time.

Gerard P. Cachon, Marshall Fisher (2000) In traditional supply chain warehouse management, orders are the only information firms exchange, but information technology now allows firms to share demand and warehouse data quickly and inexpensively. We study the value of sharing these data in a model with one supplier, N identical retailers, and stationary stochastic consumer demand. There are warehouse holding costs and back-order penalty costs. We compare a traditional information policy that does not use shared information with a full information policy that does exploit shared information. In a numerical study we find that supply chain costs are 2.2% lower on average with the full information policy than with the traditional information policy, and the maximum difference is 12.1%. We also develop a simulation-based lower bound over all feasible policies. The cost difference between the traditional information policy and the lower bound is an upper bound on the value of information sharing: In the same study, that difference is 3.4% on average, and no more than 13.8%. We contrast the value of information sharing with two other benefits of information technology, faster and cheaper order processing, which lead to shorter lead times and smaller batch sizes, respectively. In our sample, cutting lead times nearly in half reduces costs by 21% on average, and cutting batches in half reduces costs by 22% on average. For the settings we study, we conclude that implementing information technology to accelerate and smooth the physical flow of goods through a supply chain is significantly more valuable than using information technology to expand the flow of information.

Dornier et al., (1998); Maida et al., (2016) Studies highlight how efficient warehouse management positively impacts operational efficiency and cost savings. Effective inventory control, optimized workflows, and streamlined processes lead to reduced operating costs and improved overall efficiency

Christopher, (2016) The literature discusses how warehouse management is integral to supply chain integration. Collaboration among different stakeholders in the supply

chain, including suppliers, manufacturers, and distributors, enhances visibility, coordination, and responsiveness

Rouwenhorst (2000) Research focuses on the role of labor management practices in warehouse operations. Effective workforce management, training programs, and incentive structures positively impact productivity, accuracy, and overall warehouse performance

Dr. John Bartholdi (Georgia Institute of Technology)(1990): Known for his work in warehouse design and operations, Dr. Bartholdi has conducted extensive research on order picking strategies, layout optimization, and the impact of technology on warehouse productivity. His work focuses on improving warehouse efficiency through innovative design and operational strategies.

Dr. René de Koster (Erasmus University Rotterdam)(2005): Dr. de Koster's research revolves around logistics and warehouse management. His studies delve into the integration of technology in warehouses, order picking optimization, and the impact of operational decisions on overall supply chain performance. He's particularly known for his work on order picking systems and their efficiency.

Dr. Yossi Sheffi (Massachusetts Institute of Technology)(2004)

Resilient Supply Chains: Dr. Sheffi's research focuses on supply chain resilience. He examines how disruptions, such as natural disasters or geopolitical events, affect warehouse operations and broader supply chain performance. His work emphasizes strategies to build resilient warehouses and supply chains.

Supply Chain Risk Management: He contributes significantly to the understanding of supply chain risks and their impact on warehouse operations. Dr. Sheffi's research highlights the importance of risk mitigation strategies, contingency planning, and adaptive strategies to manage disruptions effectively.

Sustainable Logistics and Operations: Dr. Sheffi explores sustainability practices within logistics and warehouses. His work emphasizes eco-friendly warehouse designs, green supply chain initiatives, and the integration of sustainable practices to reduce environmental impact.

Dr. Richard Wilding (Cranfield University) and Dr. Mike Hewitt (University of Northampton): An expert in supply chain strategy, Dr. Wilding's research spans warehouse management and logistics. He explores supply chain resilience, warehouse automation, and sustainable supply chain practices, emphasizing practical solutions for industry implementation. Dr. Hewitt focuses on supply chain sustainability and innovation. His research investigates sustainable practices in warehouse management, emphasizing social responsibility, ethical considerations, and innovative approaches to reduce environmental impact.

Dr. Christos Emmanouilidis (Aston University) and Dr. Mandyam Srinivasan (Hong Kong University of Science and Technology) : Dr. Emmanouilidis focuses on intelligent systems and logistics optimization. His research involves the application of artificial intelligence and machine learning in warehouse management systems and process optimization. Dr. Srinivasan's work focuses on operations management and supply chain analytics. His research investigates warehouse efficiency, inventory optimization, and the application of data analytics in logistics.

Dr. Asoo Vakharia (University of Florida) and Dr. Jack Ampuja (2000) : Vakharia's contributions in inventory management, warehouse layout design, and decision support systems began in the early 2000s and have continued with ongoing developments in dynamic warehouse operations. Ampuja's work in lean principles, sustainability, and inventory control within warehouses became prominent around the mid-2000s and has continued to evolve with advancements in sustainable logistics practices.

CHAPTER – 3

RESEARCH METHODOLOGY

3.1 METHODOLOGY

Research methods are the techniques and tools by which you research a subject or a topic. Research methodology involves the learning of various techniques to conduct research and acquiring knowledge to perform tests, experiments, surveys, and critical analysis.

Research methodology simply refers to the practical “how” of any given piece of research. It’s about how a researcher systematically designs a study to ensure valid and reliable results that address the research aims and objectives.

3.2 RESEARCH DESIGN:

Research design refers to the overall strategy utilized to carry out research that defines a succinct and logical plan to tackle established research question(s) through the collection, interpretation, analysis, and discussion of data.

THEY WELL CHOSEN BY PRIMARY DATA was collected by interview method.

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with “IMPACT OF WAREHOUSE MANAGEMENT IN SKYJAC PVT LTD” in procedure. This Research design applied for the study is ‘Descriptive Research’.

3.2.1 Descriptive research design:

Descriptive research aims to accurately and systematically describe a population, situation or phenomenon. It can answer what, where, when and how questions, but not why questions. A descriptive research design can use a wide variety of research methods to investigate one or more variables.

3.3 SAMPLING TECHNIQUE :

This research has adopted simple random sampling techniques for collecting the data from the respondents. Sufficient time was given to the respondents for filling up the questionnaire. The target population was employees in give a hand foundation, the researcher will choose a sample of 130 employees in Skyjac PVT LTD

3.4 SOURCES OF DATA

Data collection is the term used to describe a process of preparing and collecting data.

- Primary Data – Questionnaire given to 130 respondents.
- Secondary Data - Websites and online journals, Published reports & Review of literature from published articles

3.5 STRUCTURE OF QUESTIONNAIRE :

Questionnaire is the tool used for the data collection under Primary Method. It was divided into two sections. First part was designed to know the general information about customers and the second part contained the respondent's opinions about warehouse management.

3.6 SAMPLE SIZE :

The sample size of this study is 130 which is collected from the Employees of Skyjac PVT LTD.

3.7 PERIOD OF STUDY :

This is one-time research where the research is conducted only for one-time and that the project is based on the responses derived from a definite period of time. The period of study for the project of about 20 days project is based on the responses collected from the 130 participants.

3.8 ANALYTICAL TOOLS :

CHI-SQUARE TEST:

A Chi-square Statistic Is One Way To Show A Relationship Between Two Categorical Variables. In Statistics, There Are Two Types Of Variables: Numerical (Countable) Variables And Non-numerical (Categorical) Variables.

KARL PEARSON'S CORRELATION

Correlation analysis is the statistical tool used to measure the degree to which two variables are linearly related to each other. Correlation measures the degree of association between two variables. The Pearson product-moment correlation coefficient is a measure of the strength and direction of association that exists between two variables measured on at least an interval scale. It is denoted by the symbol r .

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{N\sum X^2 - (\sum X)^2} \sqrt{N\sum Y^2 - (\sum Y)^2}}$$

CHAPTER - 4

DATA ANALYSIS AND INTERPRETATION

The following consist of the data analysis and interpretation of my questionnaire:

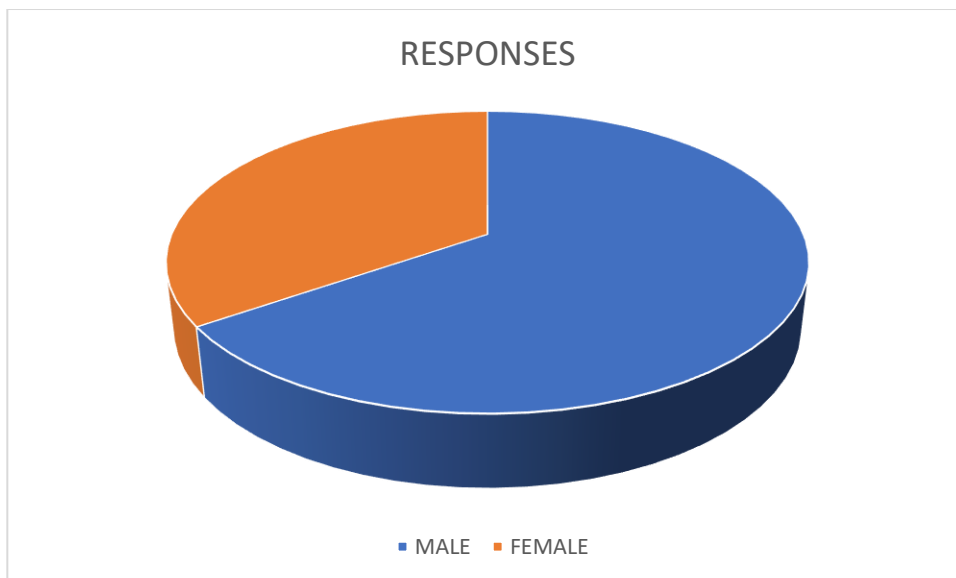
4.1 PERCENTAGE ANALYSIS:

1. Gender Of The respondent

Table No. 4.1.1:

OPTIONS	RESPONSES	PERCENTAGE
MALE	85	65.38%
FEMALE	45	34.62%
TOTAL	130	100%

CHART NO: 4.1.1



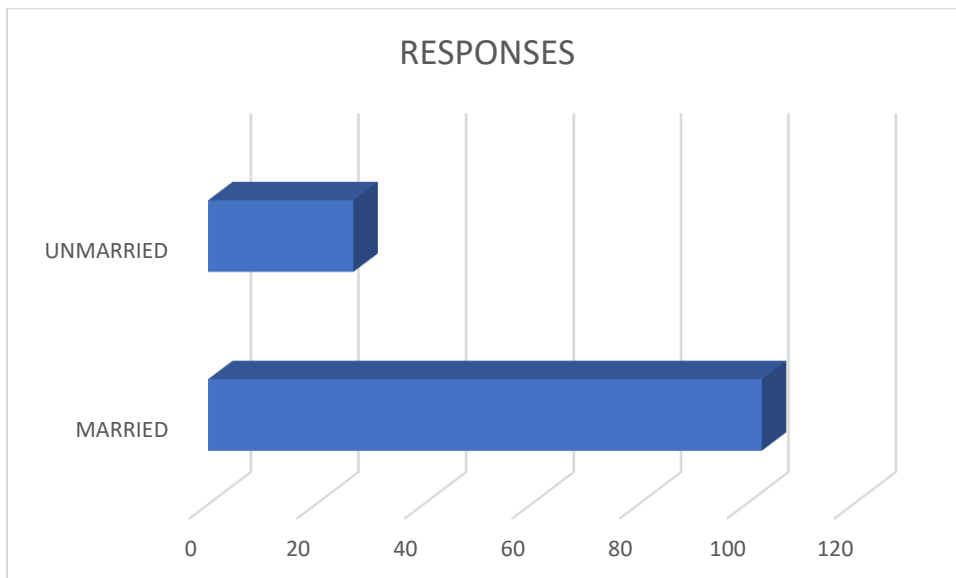
Inference: Majority (65.38%) of respondents are male.

2. Marital Status

TABLE NO : 4.1.2

OPTIONS	RESPONSES	PERCENTAGE
MARRIED	103	79.23%
UNMARRIED	27	20.77%
TOTAL	130	100%

CHART NO: 4.1.2



Interpretation:

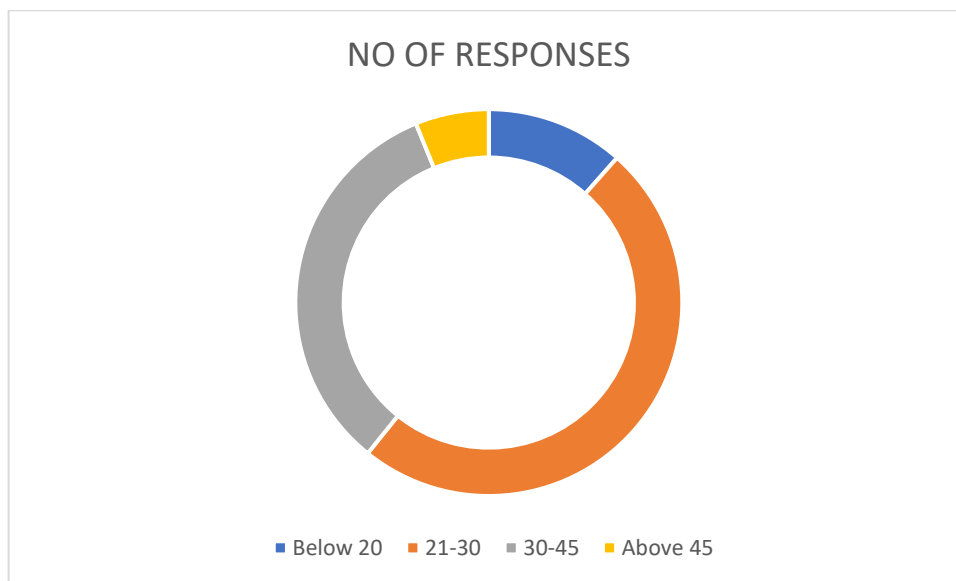
From the above table, it can be interpreted that out of the option given 79.23%% of respondents are married, 20.77 % of respondents are unmarried.

3. Age of the respondent

TABLE NO : 4.1.3

OPTIONS	NO OF RESPONSES	PERCENTAGE
Below 20	15	11.54%
21-30	64	49.23%
30-45	43	33.08%
Above 45	8	6.15%
Total	130	100%

CHART NO: 4.1.3



Interpretation:

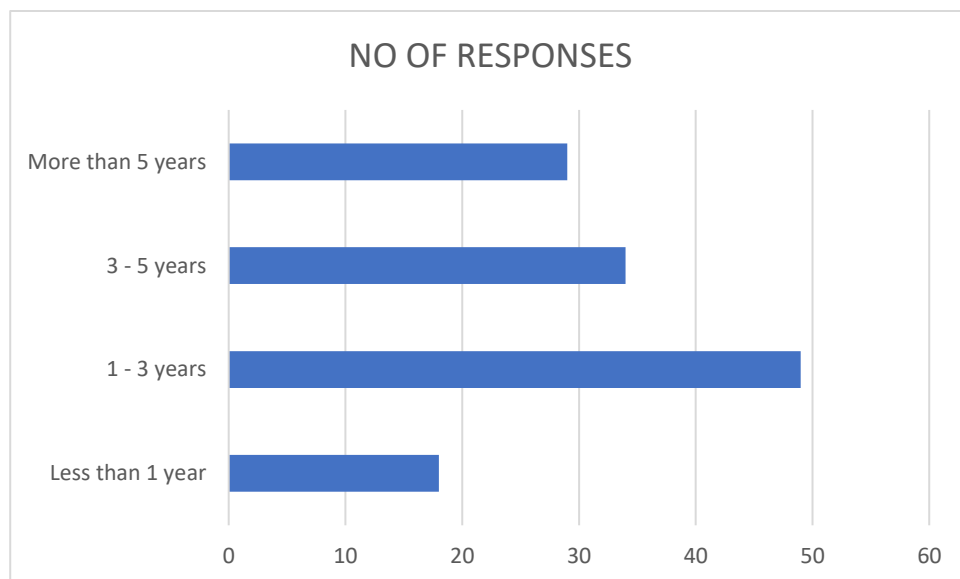
From the above table, it is interpreted that 11.54% of respondents are of age group of below 20 , 49.23% of them belong to age group 21-30 and 33.08% belong to the age group 33-45 and 6.15% belong to age group more then 45.

4. Experience in the field

TABLE NO : 4.1.4

OPTIONS	NO OF RESPONSES	PERCENTAGE
Less than 1 year	18	13.85%
1 - 3 years	49	37.69%
3 - 5 years	34	26.15%
More than 5 years	29	22.31%
Total	130	100%

CHART NO: 4.1.4



Interpretation :

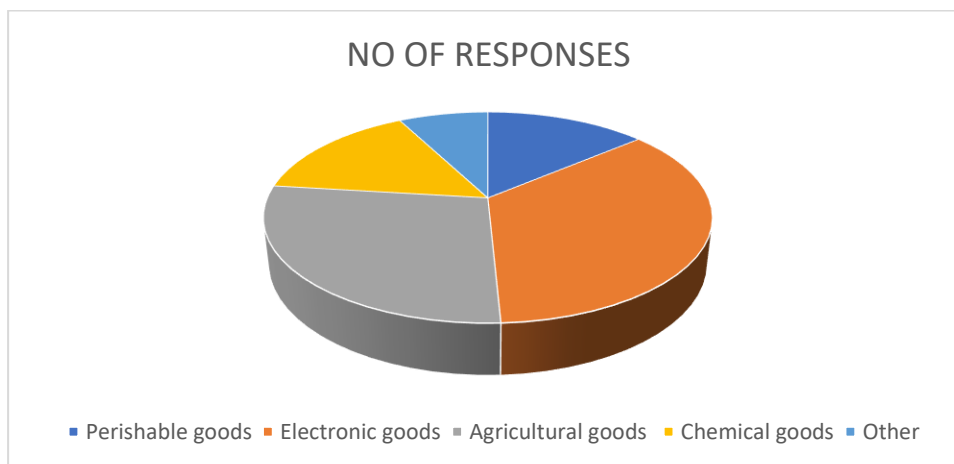
From the above table, it is interpreted that 13.85% of respondents have less than 1 year experience , 37.69% have 1 – 3 years of experience , 26.15% have 3 – 5 years of experience and 22.31% have more than 5 years of experience in the field.

5. According to you, which type of goods are your customer or client storing in the warehouse?

TABLE NO: 4.1.5

OPTIONS	NO OF RESPONSES	PERCENTAGE
Perishable goods	18	13.85%
Electronic goods	46	35.38%
Agricultural goods	36	27.69%
Chemical goods	20	15.38%
Others	10	8%
Total	130	100%

CHART NO: 4.1.5



Interpretation :

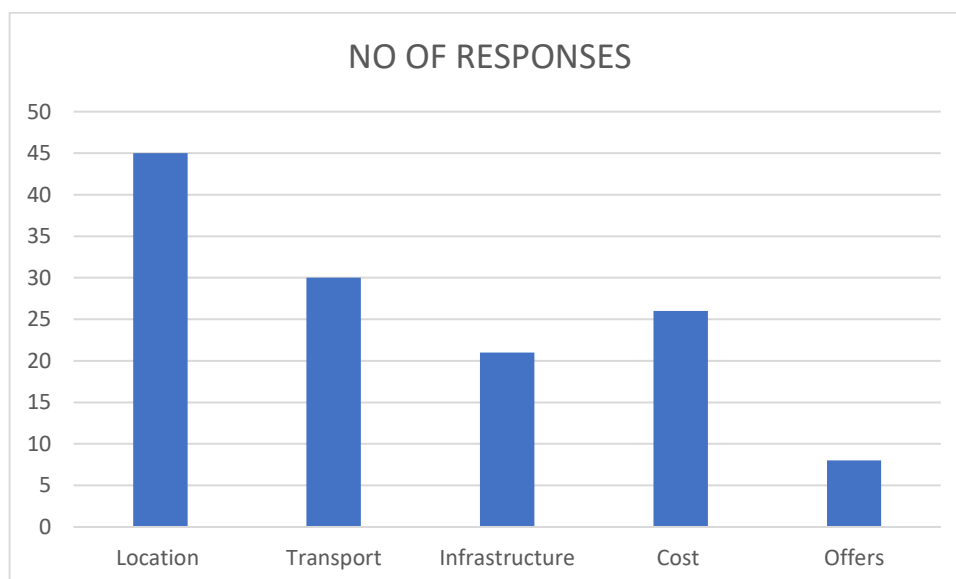
From the above table, it is interpreted that 13.85 % of their clients store perishable goods , 35.38% of their clients store electronic goods , 27.69% store agricultural goods ,15.38% store chemical goods and 8 % of them store other type of goods

6. What is the most important feature or factor which your client or consumer look while approaching Warehouse?

TABLE NO : 4.1.6

OPTIONS	NO OF RESPONSES	PERCENTAGE
Location	45	34.62%
Transport	30	22.08%
Infrastructure	21	16.15%
Cost	26	20%
Offers	8	6.15%
Total	130	100%

CHART NO: 4.1.6



Interpretation :

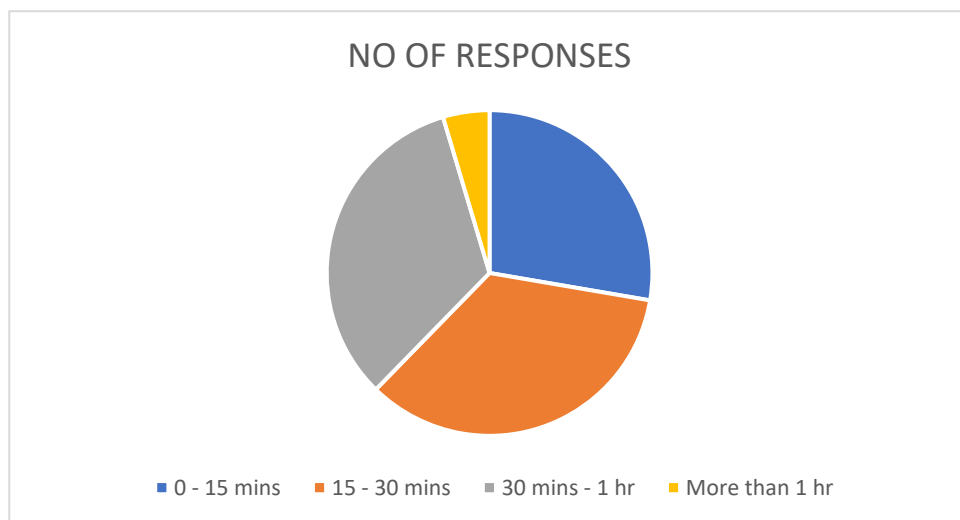
From the above table, it is interpreted that 34.62% of the clients look for location aspect , 22.08% of them look for transport aspect , 16.15% of them look for infrastructure , 20% of them look for cost aspect and 6.15% look for offers of the warehouse.

7. What is the time taken by the goods on average to reach the customers from warehouse?

TABLE NO: 4.1.7

OPTIONS	NO OF RESPONSES	PERCENTAGE
0 - 15 mins	36	27.69%
15 - 30 mins	45	34.62%
30 mins - 1 hr	43	33.08%
More than 1 hr	6	4.62%
Total	130	100%

CHART NO : 4.1.7



Interpretation :

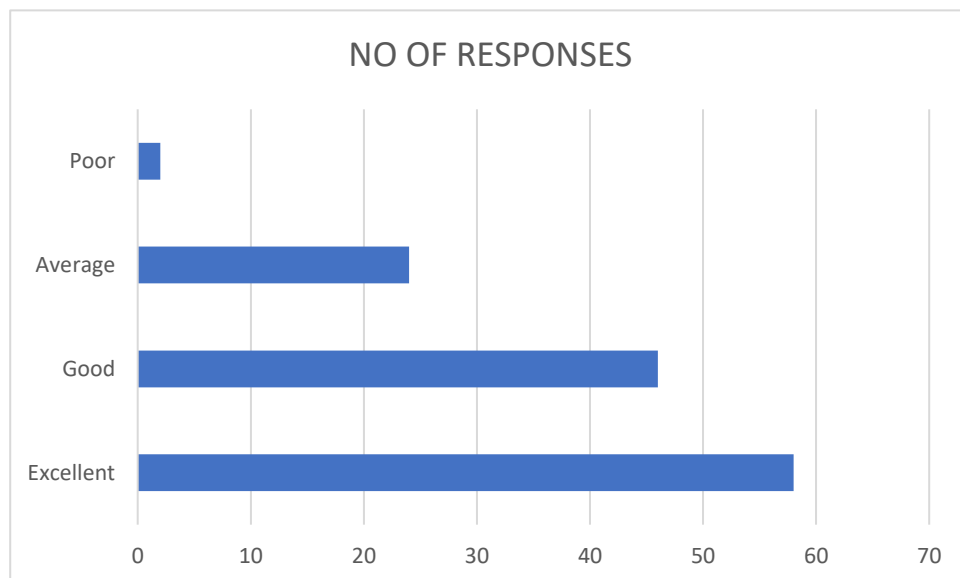
From the above table , it is interpreted that 27.69% of them would reach the consumer in 0 – 15 mins, 34.62% of them would reach in 15 – 30 mins, 33.08% of them would rerach them in 30 mins – 1 hr and 4.62% of them would reach them in more than 1 hr.

8. How do your clients or customers would rate basic facility provided by the warehouse like a transport, manpower, electricity, safety, etc.?

TABLE NO: 4.1.8

OPTIONS	NO OF RESPONSES	PERCENTAGE
Excellent	58	44.61%
Good	46	35.38%
Average	24	18.46%
Poor	2	1.54%
Total	130	100%

CHART NO : 4.1.8



Interpretation :

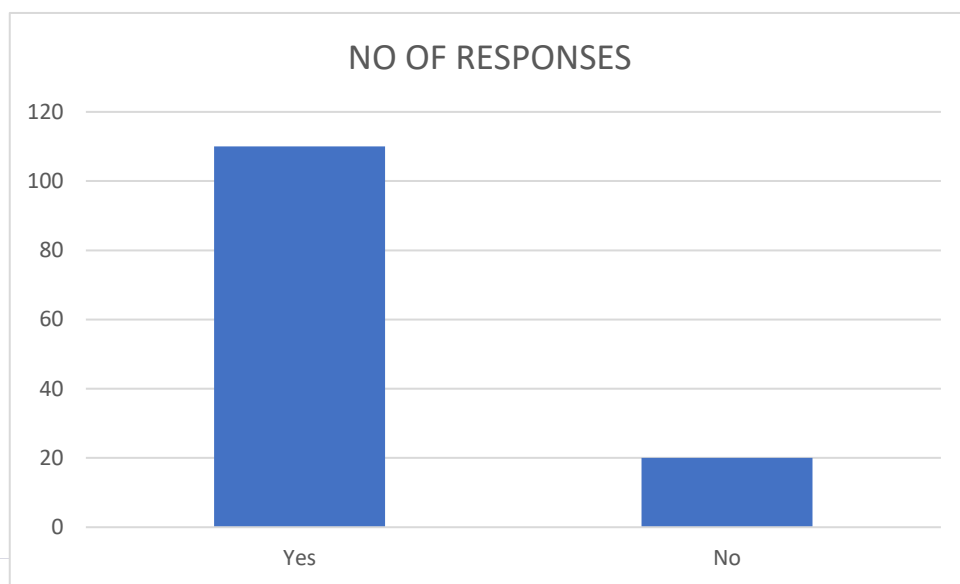
From the above table, it is interpreted that 44.61% of their clients rated excellent, 35.38 % of them rated good, 18.46% of them rated average and 1.54% of them rated poor on their warehouse facilities

9. Do you think location is the most important factor of Warehouse?

TABLE NO : 4.1.9

OPTIONS	RESPONSES	PERCENTAGE
Yes	98	75.38%
No	32	24.62%
Total	130	100%

CHART NO: 4.1.9



Interpretation :

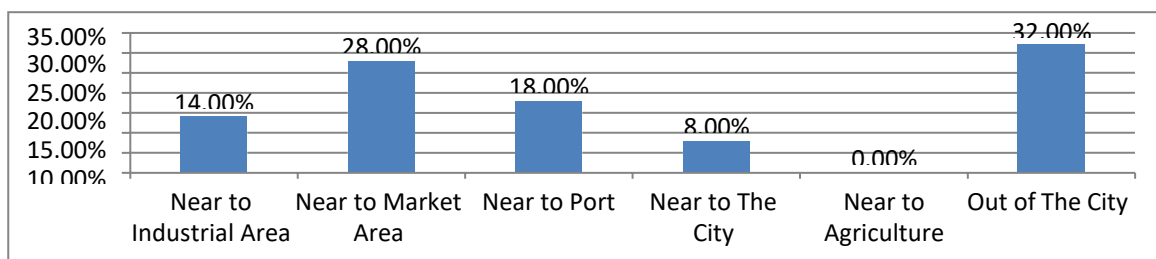
From the above table, it is interpreted that 75.38% of the respondents said Yes and 24.62% of the respondents said No

10. According to you mention the choice of location of the warehouse so that is efficient and profitable

TABLE NO: 4.1.10

Choice of Location	No of Respondents	Percentage
Near to Industrial Area	18	14.00%
Near to Market Area	36	28.00%
Near to Port	23	18.00%
Near to The City	11	8.00%
Near to Agriculture Area	0	0.00%
Out of The City	42	32.00%
Total	130	100%

CHART NO: 4.1.10



Interpretation :

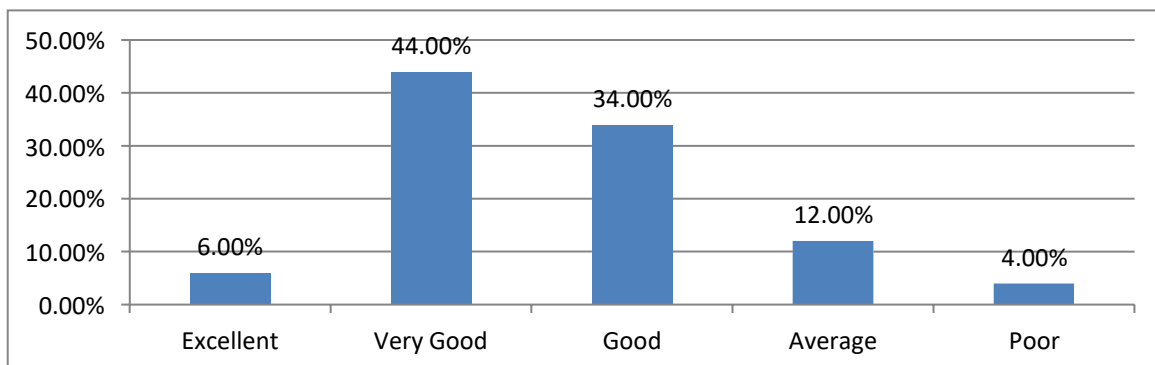
From the above table, 14% of them prefer the warehouse to be near to industrial area, 28% of them prefer to be near to market area, 18% of them prefer to be near to port, 8% of them prefer to be near to the city, 0 % prefer to be near the agriculture area and 32% of them prefer to be out of the city.

11. Transportation Infrastructure Rate by your client or customer

TABLE NO: 4.1.11

Transportation	No of Respondents	Percentage
Excellent	8	6.00%
Very Good	57	44.00%
Good	44	34.00%
Average	16	12.00%
Poor	5	4.00%
Total	130	100%

CHART NO : 4.1.11



Interpretation :

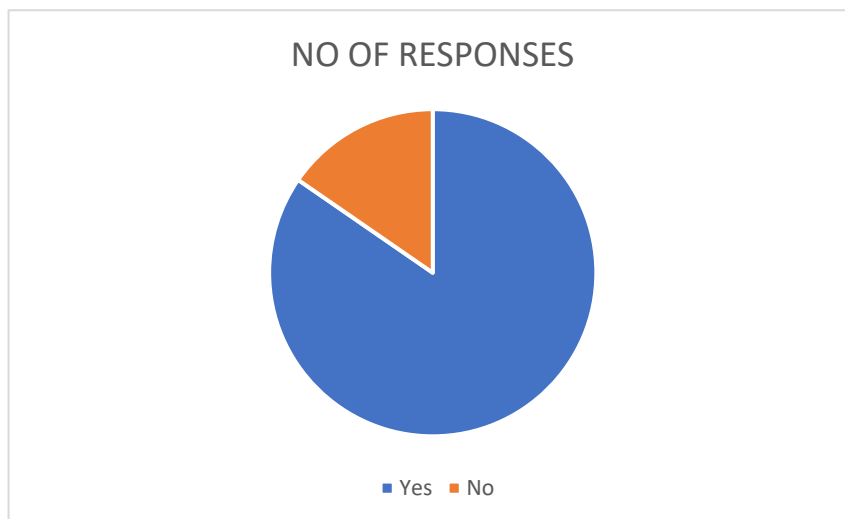
From the above table, it is interpreted that 6% of the respondents rated excellent, 44% of them rated very good, 34% of them rated good, 12% of them rated average and 4% of them rated poor.

12. Does the warehouse provide advance facility like RFID , GPS etc..

TABLE NO: 4.1.12

OPTIONS	NO OF RESPONSES	PERCENTAGE
Yes	110	84.62%
No	20	15.38%
Total	130	100.00%

CHART NO : 4.1.12



Interpretation :

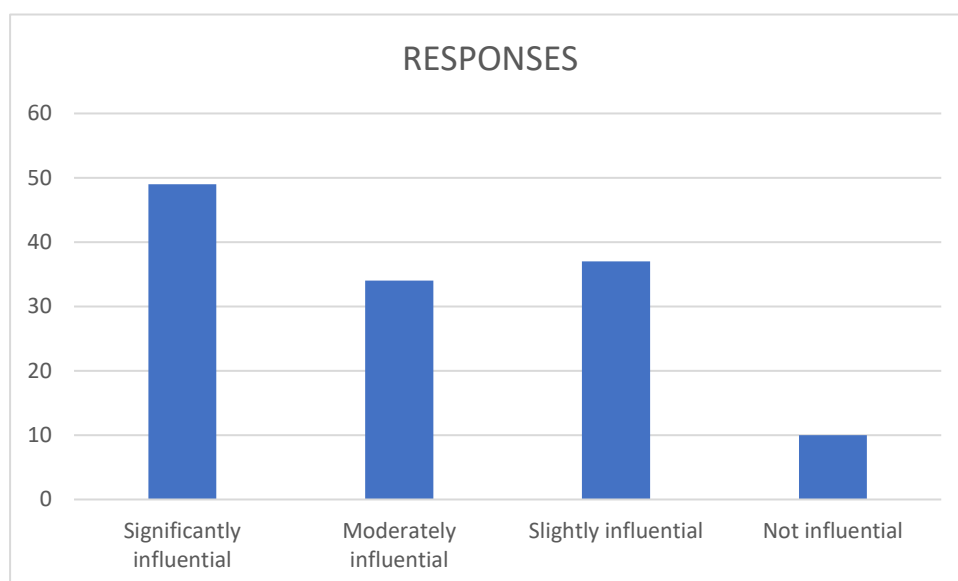
From the above table , it is interpreted that 84.62% of the respondents said Yes and 15.38% of the respondents said No.

13. To what extent have advancements in automation and robotics influenced your organization's warehouse location decision-making process?

TABLE NO: 4.1.13

OPTIONS	RESPONSES	PERCENTAGE
Significantly influential	49	37.69%
Moderately influential	34	24.15%
Slightly influential	37	28.46%
Not influential	10	7.69%
Total	130	100%

CHART NO : 4.1.13



Interpretation :

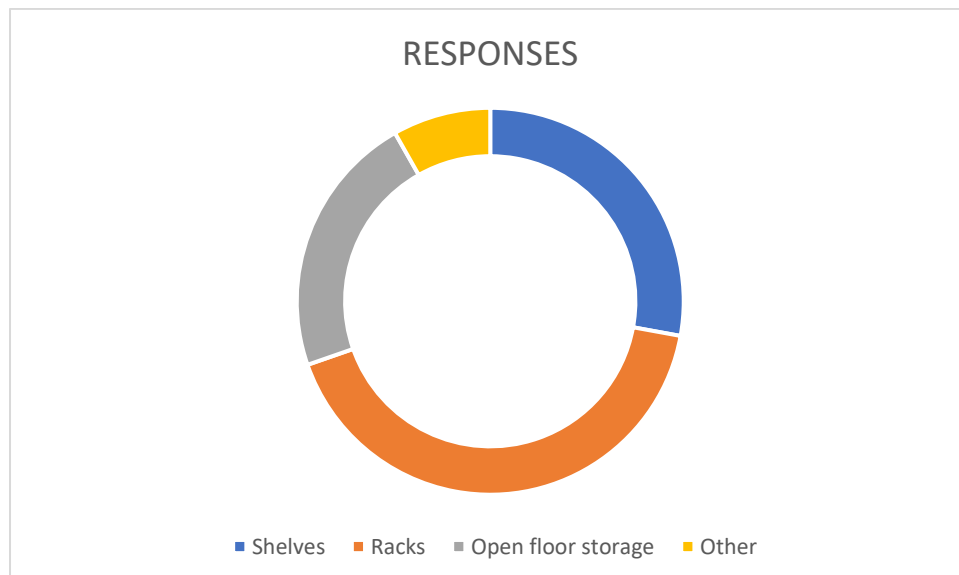
From the above table, it is interpreted that 37.69% opted it is significantly influential, 24.15% opted it is moderately influential, 28.46% opted it is slightly influential and 7.69% opted it is not influential.

14. What is the primary method of arranging storage within the warehouse?

TABLE NO : 4.1.14

OPTIONS	RESPONSES	PERCENTAGE
Shelves	34	37.69%
Racks	51	24.15%
Open floor storage	27	28.46%
Others	10	7.69%
Total	130	100%

CHART NO : 4.1.14



Interpretation :

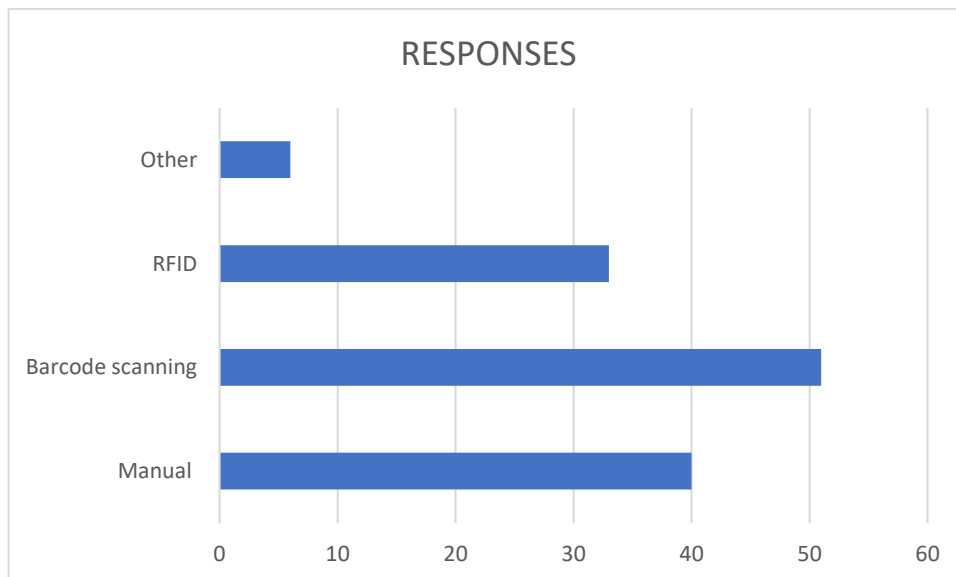
From the above table, 37.69% of the respondents said shelves as the primary method of arranging storage within the warehouse. 24.15% of the respondents said racks, 28.46% said open floor storage and 7.69% said others as the primary method for arranging storage within the warehouse.

15. How is inventory tracked and managed within the warehouse?

TABLE NO: 4.1.15

OPTIONS	RESPONSES	PERCENTAGE
Manual	40	30.77%
Barcode scanning	51	39.23%
RFID	33	25.38%
Others	6	4.62%
Total	130	100%

CHART NO: 4.1.15



Interpretation :

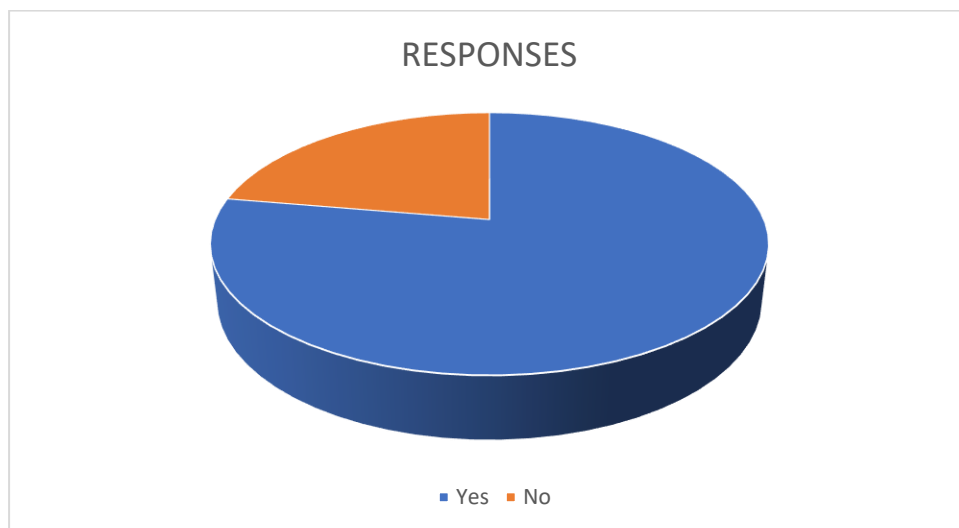
From the above table, it is interpreted that 30.77% of respondents opted manual , 39.23% of them opted barcode scanning ,25.38% of them opted RFID and 4.62% of them opted others as the method that inventory are tracked and managed within the warehouse.

16. Does the layout of the warehouse support the flow of goods from receiving to shipping efficiently?

TABLE NO: 4.1.16

OPTIONS	RESPONSES	PERCENTAGE
Yes	101	77.69%
No	29	22.31%
Total	130	100%

CHART NO: 4.1.16



Interpretation :

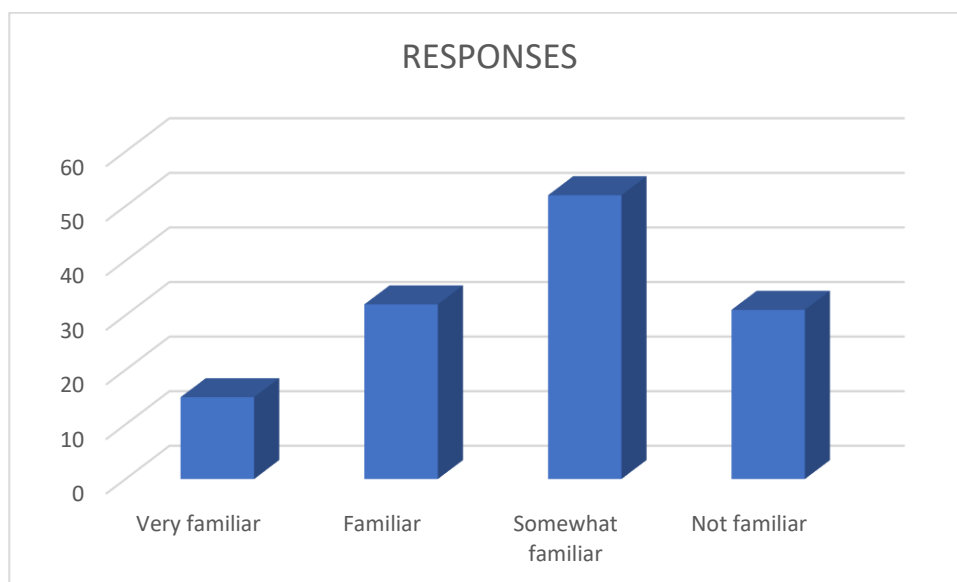
From the above table, it is interpreted that 77.69% of respondents opted Yes and 22.31% of respondents opted No.

17. How familiar are you with the advancements in warehouse automation and robotics?

TABLE NO : 4.1.17

OPTIONS	RESPONSES	PERCENTAGE
Very familiar	15	11.54%
Familiar	32	24.62%
Somewhat familiar	52	40.00%
Not familiar	31	23.85%
Total	130	100%

CHART NO : 4.1.17



Interpretation :

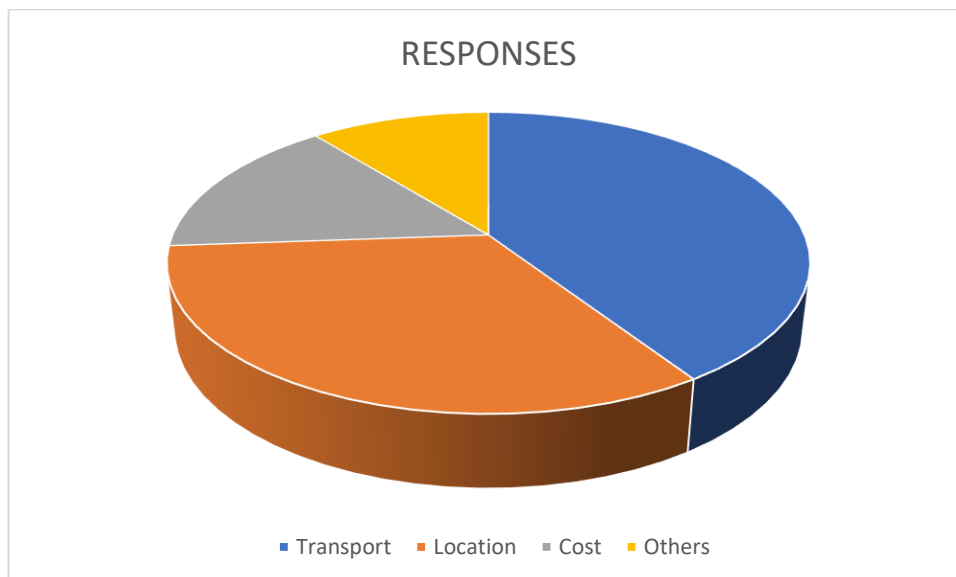
From the above table, it is interpreted that 11.54% of the respondents are very familiar in warehouse automation and robotics, 24.62% of them opted that they are familiar, 40% of them are somewhat familiar with robotics and warehouse automation and 23.85% of them are not familiar with warehouse automation and robotics

18. What type of bottleneck do you face in the Warehouse?

TABLE NO : 4.1.18

OPTIONS	RESPONSES	PERCENTAGE
Transport	53	40.77%
Location	43	33.08%
Cost	20	15.38%
Others	14	10.77%
Total	130	100%

CHART NO : 4.1.18



Interpretation :

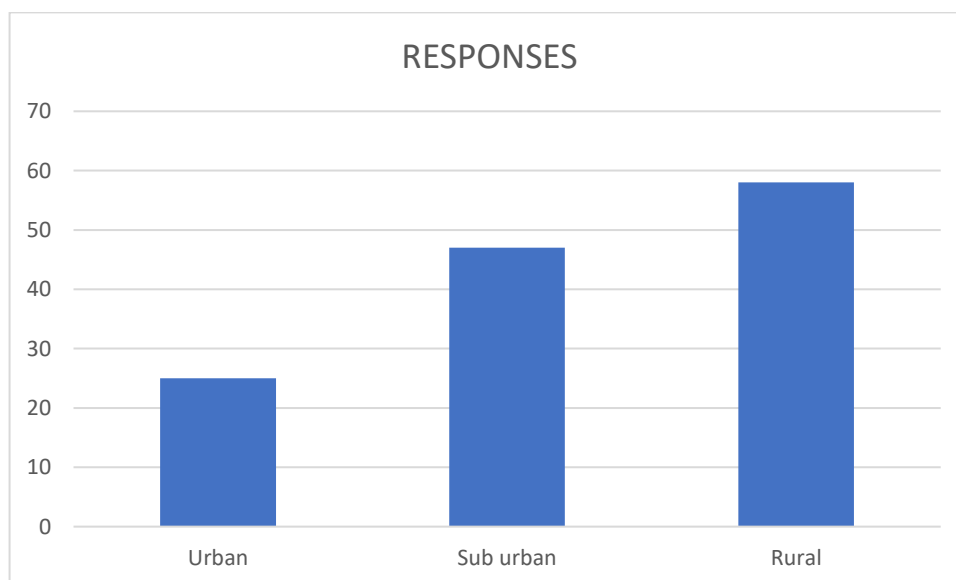
From the above table, it is interpreted that 40.77% of the respondents opted transport as the bottleneck, 33.08% of them opted location as the bottleneck, 15.38% of them opted cost as the bottleneck and 10.77% of them opted others as the bottleneck that they are facing in the warehouse.

19. Which location is mostly preferred by you for warehousing?

TABLE NO : 4.1.19

OPTIONS	RESPONSES	PERCENTAGE
Urban	25	19.23%
Sub urban	47	36.15%
Rural	58	44.62%
Total	130	100%

CHART NO : 4.1.19



Interpretation :

From the above table , it is interpreted that 19.23% of the respondents opted urban area as their preferred warehouse location , 36.15% of them opted sub urban area as their preferred warehouse location and 44.62% of them opted rural area as their preferred warehouse location.

4.2 CHI – SQUARE TEST:

Null Hypothesis (H0): There Is No Significant Difference between the products stored and the experience of the employees

Alternative Hypothesis (H1): There is a significant difference between the products stored and the experience of the employees

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Experience in the field * According to you, which type of goods are your customer or client storing in the warehouse?	130	100.0%	0	0.0%	130	100.0%

Experience in the field ^ According to you, which type of goods are your customer or client storing in the warehouse? Crosstabulation

			According to you, which type of goods are your customer or client storing in the warehouse?					Total
			Agriculture goods	Chemical goods	Electronic goods	Others	Perishable goods	
Experience in the field	1 - 3 years	Count	11	3	19	2	4	39
		Expected Count	10.5	3.6	17.7	3.6	3.6	39.0
	3 - 5 years	Count	6	3	9	2	1	21
		Expected Count	5.7	1.9	9.5	1.9	1.9	21.0
	Less than 1 year	Count	9	5	19	5	4	42
		Expected Count	11.3	3.9	19.1	3.9	3.9	42.0
	more than 5 years	Count	9	1	12	3	3	28
		Expected Count	7.5	2.6	12.7	2.6	2.6	28.0
	Total	Count	35	12	59	12	12	130
		Expected Count	35.0	12.0	59.0	12.0	12.0	130.0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.617 ^a	12	.970
Likelihood Ratio	5.028	12	.957
N of Valid Cases	130		

a. 12 cells (60.0%) have expected count less than 5. The minimum expected count is 1.94.

INTERPRETATION :

The p value is 0.970 is higher than the chosen significance level (0.05), hence the null hypothesis is (H0) is accepted .

4.3 KARL PEARSON'S CORRELATION

Correlations

		Experi ence in the field	Choice of Location According to the Customer
Experience in the field	Pearson Correlation	1	-.001
	Sig. (2-tailed)		.991
	N	130	130
Choice of Location According to the Customer	Pearson Correlation	-.001	1
	Sig. (2-tailed)	.991	
	N	130	130

INTERPRETATION:

The p value is -.001 is higher than the chosen significance level (0.05), hence alternative hypothesis (H1) is accepted.

CHAPTER – 5

FINDING AND SUGGESTIONS CONCLUSIONS

Based on the analysis and discussion on primary data in the previous chapter. Finding, Suggestions, and Conclusion of the study in logical manner.

5.1 FINDINGS

From the questionnaire, the following points are found and noted :

- ✓ Majority of the respondents of my questionnaire are male
- ✓ Majority of the respondents of my questionnaire are married
- ✓ Majority of the respondents are between age of 21 – 30.
- ✓ Majority of the respondents of my questionnaire have 1 – 3 years of experience in the field.
- ✓ Majority of the respondent's client or customer are storing electronic goods in the warehouse.
- ✓ Majority of the respondent's client or customer look for location factor while looking for a warehouse
- ✓ Majority of the respondents said that the goods would reach the customers within 15 - 30 mins from their warehouse.
- ✓ Majority of respondent's client or customer has rated excellent for their basic facilities

provided in the warehouse.

- ✓ Majority of the respondents opted YES that location is one of the important factor of the warehouse.
- ✓ Majority of the respondents said that Out of the city is most efficient and profitable place to locate a warehouse.
- ✓ Majority of the respondent's client or customer rated very good on their transportation infrastructure.
- ✓ Majority of the respondents said Yes that their warehouse provide RFID , GPS etc..
- ✓ Majority of the respondents said that advancement in automation and robotics have significantly influenced the organization's warehouse location decision making process
- ✓ Majority of the respondents said that shelves are the primary method of arranging storage in the warehouse.
- ✓ Majority of the respondents said the inventory is tracked and managed by barcode scanning within the organization.
- ✓ Majority of the respondents said Yes that the layout of the warehouse supports flow of goods from receiving to shipping efficiently.
- ✓ Majority of the respondents opted that they are Somewhat familiar with the advancement of warehouse automation and robotics.
- ✓ Majority of the respondents opted transport is one of the bottleneck in the warehouse.
- ✓ Majority of the respondents opted Rural area as their preferred area for warehousing.

5.2 SUGGESTIONS:

- ✓ Efficient warehouse management ensures accurate tracking of inventory levels, minimizing stockouts, overstock situations, and obsolete inventory. This optimization leads to reduced carrying costs and better utilization of storage space.
- ✓ Utilizing warehouse management systems ensures precise inventory tracking and traceability. This minimizes errors, reduces the risk of lost inventory, and enables easier recall or traceability in case of product issues.
- ✓ Proper warehouse management strategies such as optimized space utilization, inventory tracking, and efficient processes contribute to reduced operational costs. This includes lower labor expenses, decreased carrying costs, and minimized inventory write-offs.
- ✓ Ultimately, efficient warehouse management contributes to timely and accurate order fulfillment, leading to higher customer satisfaction, repeat business, and positive brand reputation.

5.3 CONCLUSION :

Warehousing is the part of supply chain and its requirement is must need for each and every day, warehouse is used instead of manufacturing. A warehouse is an important linkage in the supply chain flow. The warehouse location is must be near the high ways, market areas, near to the port and airport. And warehouse place is requiring availability of manpower, electricity, warehouse space, safety and security. The considerations of warehouse site selection revolve around four major factors as location, infrastructure, access, availability, market. However, transportation cost, which is a major element in logistic, it depends on the location of the warehouse. Locations of the warehouse depend on the products and customers. So, company can consider location of because warehouse location cost is standard and other costs are variable like transportation cost.

CHAPTER – 6

ANNEXURE

BIBLIOGRAPHY:

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- **Pearson**, second edition, logistics management, sople second edition pg.no.61- 63.
- **Attheirawong, W., MacCarthy B.L., (2003)**, Factors affecting location decisions in international operations. A Delphi study, International journal of Operations & Production Management, Volume 23 No. 7, pp. 794-818.
- **H.Min., (2006)**, The applications of warehouse management systems: an exploratory study.
- **Michael Hompel, Thorsten Schmidt, (2008)**, Warehouse Management.

QUESTIONNAIRE

1. Name of the respondent : _____
2. Gender
 - a) Male b) Female
3. Martial status
 - a) Married b) Unmarried
4. Age
 - a) Below 20 b) 21 – 30 years c) 31 – 45 years d) More than 45 years
5. Experience in the field
 - a) Less than 1 year b) 1 – 3 years c) 3 – 5 years d) More than 5 years
6. According to you, which type of goods are your customer or client storing in the warehouse?
 - a) Perishable goods b) Electronic goods c) Agriculture goods d) Chemical goods e) Others
7. What is the most important feature or factor which your client or consumer look while approaching Warehouse?
 - a) Location b) Transport c) Infrastructure d) Cost e) Offers f) Others
8. What is the time taken by the goods on average to reach the customers from warehouse?
 - a) 0 – 15 mins b) 15 – 30 mins c) 30 mins – 1 hr d) More than 1 hr
9. How do your clients or customers would rate basic facility provided by the warehouse like a transport, manpower, electricity, safety, etc.?
 - a) Excellent b) Good c) Average d) Poor
10. Do you think location is the most important factor of Warehouse?
 - a) Yes b) No
11. According to you mention the choice of location of the warehouse so that is efficient and profitable
 - a) Near to Industrial Area b) Near to market area c) Near to the port d) Near to the city e) Near to Agriculture area f) Out of the city

12. Transportation Infrastructure Rate by your client or customer

a) Excellent b) Very good c) Good d) Average e) Poor

13. Does the warehouse provide advance facility like RFID , GPS etc..

a) Yes b) No

14. To what extent have advancements in automation and robotics influenced your organization's warehouse location decision-making process?

a) Significantly influential b) Moderately influential c) Slightly influential
e) Not influential

15. What is the primary method of arranging storage within the warehouse?

a) Shelves b) Racks c) Open floor storage d) Others

16. How is inventory tracked and managed within the warehouse?

a) Manual b) barcoding c) RFID d) Others

17. Does the layout of the warehouse support the flow of goods from receiving to shipping efficiently?

a) Yes b) No

18. How familiar are you with the advancements in warehouse automation and robotics?

a) Very familiar b) Familiar c) Somewhat familiar d) Not familiar

19. What type of bottleneck do you face in the Warehouse?

a) Transport b) Location c) Cost d) Others

20. Which location is mostly preferred by you for warehousing?

a) Urban b) Sub urban c) Rural