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A study on the effectiveness of logistics information system in Automobile Industry

Submitted to the School of Maritime Management, Indian Maritime University, in partial fulfilment of the requirements for the award of degree of "Master of Business Administration"

In

International Transportation and Logistics Management

By

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DECLARATION

The project work titled **"A study on the effectiveness of logistics information system in Automobile Industry"** has been carried out under the direction of Dr. SREEJITH in partial fulfillment of the requirements for the award of degree of Master of Business Administration in International Transportation and Logistics Management to be submitted to the School of Maritime Management, Indian Maritime University, Cochin Campus.

Date: 29 June, 2021 MEHABOOB C J

Place: Cochin

CERTIFICATE

This is to certify that, this project titled "**A study on the effectiveness of logistics information system in Automobile Industry**" submitted to **School of Maritime Management, Indian Maritime University, Cochin Campus** by "**MEHABOOB C J**" for the partial fulfilment of the requirements for the award of the degree of **MASTER OF BUSINESS ADMINISTRATION IN INTERNATIONAL TRANSPORTATION AND LOGISTICS MANAGEMENT** is a bonafide record of work carried out by 'Dr. SREEJITH' under my guidance.

DATE: 29 June, 2021 **Dr. SREEJITH**

(HOD, SMM)

PLACE: COCHIN

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MEHABOOB C J

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EXECUTIVE SUMMARY

The Council of Supply Chain Management defines logistics as “the process of planning, implementing and controlling the efficient and effective flow of goods, services and other related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements.” Logistics operations can arguably be stated as one of the most important aspects to any industry. It ensures that the goods reach on time, to the right person, in the right condition at the most reasonable cost.

The study is conducted to understand the effectiveness of Logistics Information System in the firms. The study is carried out with the secondary data collected. Required information and data is collected through online sources, journals, published books and articles. It is clearly understood that the organizations has an effective implementation of LIS.

Every organization should have an effective implementation of LIS for more effective use of information. A logistics information system (LIS) is a system of records and reports used to aggregate, analyze, validate and display data (from all levels of the logistics system) that can be used to make logistics decisions and manage the supply chain.

CHAPTER I

INTRODUCTION

CHAPER-1

INTRODUCTION

1.1 TITLE OF THE STUDY

A study on the effectiveness of logistics information system in Automobile Industry.

INTRODUCTION

Logistics is generally the detailed organization and implementation of a complex operation. In a general business, sense logistics is the management of the flow of things between the point of origin to the point of consumption in order to meet requirement of customers or corporations. The resources managed in logistics can include physical items such as food, materials, animals, equipment and liquids; a well as abstract items, such as time and information. The logistics of physical items usually involves the integration of information flow, material handling, production, packaging, inventory, transpiration and often security handling.

In military science, logistics is concerned with maintaining army supply lines while disrupting those of the enemy, since an armed force without resources and transportation is defenseless. Military logistics was already practiced in the ancient world and as modern military have a significant need for logistics solutions, advanced implementations have been developed. In military logistics, logistics officers manage how and when to move resources to the places they are needed.

Logistic information system is nothing but a part of Management Information System to manage, control and measure the logistical activities. These activities occur within the organization or as well as overall across the supply chain. Logistics information systems are important for achieving logistics efficiency and effectiveness.

In an enterprise, logistics information system seeks to achieve the following:

- It ensures of logistics functional operations into a process pursuing customer satisfaction at the lowest total cost.
- Information system facilitates planning and control of the logistical activities related to order fulfillment.
- It makes the firm more competitive, by making better tactical and strategic decision for the benefits of the firm and its customer.
- Helps provide customers information regarding product availability, order status, and delivery schedules promoting customers service.
- It reduces the requirements of inventory and human resources by enabling requirements planning.
- It interfaces with marketing, financial, and manufacturing information systems and provides information to top management to help formulate strategic decisions for the whole firm.
- The use information technology in information systems has enabled quick response to demand making forecasting redundant. This has also helped in implementing "pull" systems like just-in-time making the firm more competitive.
- It promotes systems that link the operations of the firm, such as manufacturing and distributing, with the suppliers operations on the one hand the customer on the other.
- In the other cases, organizations are finding that through information they can manage dispersed inventories as if they were single inventory. The benefits of this can be considerable. If inventory management is centralized and decisions on replenishment and other quantities are taken or the basis that is a single stock, then only one safety stock instead of many required. The stock itself can be carried anywhere in the system, either near the point of production or the consumption. This is the concept of 'virtual' inventory management or electronic inventory management.

1.2 OBJECTIVES OF THE STUDY

1.2.1 GENERAL OBJECTIVE:

To study the effectiveness of Logistics Information system (LIS) in Automobile Industry.

1.2.2 SPECIFIC OBJECTIVES:

1. To identify the various LIS strategies used by Automobile Industry.
2. To analyze the factors influencing LIS strategies.
3. To study the impact of those LIS strategies.

1.3 SCOPE OF THE STUDY

The scope of study is to identify the effectiveness of logistics information system and identify the various strategies used, to analyses the factors influencing these strategies and to study the impact of these strategies on the overall effectiveness of the industry.

1.4 SIGNIFICANCE OF THE STUDY

In the climbing conditions of competition, companies must take strategic steps in order to make profits. From this point of view, those companies, which possess information in the right way and utilize it efficiently and timely will have more advantages in reaching their goals than their rivals. Along with technology, which develops each day, information which forms the core of an effective logistics management has become a factor, which enables companies to establish their logistics strategies competitively. As it is known, distinguish knowledge resources from the process of trying to manage them is become crucial issue for the companies. Logistics information technologies and knowledge management capabilities have been seen as a compelling organizational capability to enhance performance of intermediaries.

Logistics information systems are important for achieving logistics efficiency and effectiveness. In an enterprise, logistics information system seeks ensures of logistics functional operations into a process pursuing customer satisfaction at the lowest total cost. An information system uses informative key figures to aid the rapid detection of existing problem areas and analyze their origin. The information system in logistics are flexible tools for collecting, aggregating and analyzing data from the operative applications, they thus enable you to continually control target criteria and to react in time to exceptional situations.

The function of the information system is to allow you to view the information from your operative applications from any perspective you wish. You are free to define the level of detail in which the information is displayed. In the logistics information system, data can be analyzed either as a standard analysis or as a flexible analysis.

1.5 RESEARCH METHODOLOGY

The study uses secondary data to derive to the conclusions of the study. The study uses secondary data from various sources like research papers, reports, journals, websites, reference books, magazines, newspapers, and various related articles of cruise tourism industry.

- **PRIMARY DATA**

- **SECONDARY DATA**
  - Published books
  - Journals
  - Articles
  - Online sources.

TOOLS FOR DATA COLLECTION

- **Secondary Data Source**: The information is also collected from the internet, company brochures and books.

TOOLS FOR DATA PRESENTATION

The tools used for the study are diagrams, bar graphs, charts, and tables.

STATISTICAL TOOLS FOR ANALYSIS

The statistical tool used for the study is percentage analysis.

1.6 LIMITATION OF THE STUDY

This study will have all the limitations of research work. These are the following limitations of the study

- The study is limited automobile industry which may not be applicable to other industries.
- Limited access to the data.
- Lack of available and/or reliable data.
- Time constraints.
- Due to the unanticipated Covid19 epidemic, primary data collection was difficult.

CHAPTER II
THEORETICAL FRAMEWORK & LITERATURE REVIEW

CHAPTER-2

THEORITICAL FRAMEWORK & LITERATURE REVIEW

INTRODUCTION

Information systems are the systems which are created by humans, hardware, software, network and data altogether in order to realize the common goals of and which ensure that data are collected, stored and processed for a certain purpose and that the information obtained is transferred.

Logistics Information System are a subset of the firm's total information system, and it is directed to the particular problems of logistics decision making. They are important for achieving logistics effectiveness and efficiency. There are three distinct elements that make up this system. They are:-

1. The input- The inputs are data terms needed for planning and operating logistics system obtained from sources like customers, company records, and published data and company personnel.
2. The database and its associated manipulations- Management of the database involves selection of the data to be stored and retrieved, choice of the methods of analysis and choice of the basic data processing procedures.
3. The output- The outputs can be the summary reports of cost of performance statistics, status reports of inventories and order progress and also reports that compare desired performance with actual performance. Outputs may also be in the form of documents such as transportation bills of lading and freight bills.

Logistics information system is nothing but a part of management information system to manage, control and measure the logistical activities. These activities occur within the organization or as well as overall across the supply chain.

The companies operating in the logistics industry should invest in information and automation systems which are suitable to their business characteristics in order to provide their customers with a more efficient and effective service. As logistics companies mostly work with numerous products and data, the performance of processes such as data

collection and procession by information technologies significantly decreases error rates, costs and can also expedite the processes.

Logistics information technologies are expert systems where information about the order and inventory are stored and which enable to coordinate stock plans, demand predictions, strategic plans, establish communication with customers and suppliers, check transporters and system performance. Examples of the information systems utilised by the companies in the logistics industry are listed below:

• **Electronic Data Interchange (EDI):** It is defined as a structural data exchange between applications in different organisations. Thanks to this system, companies can access the data they need in an easier and more accurate way and documents which are required to be prepared according to certain standards can be drawn up faster.

• Barcode / RFID: These systems are some kind of information systems which are use for automated yard management, optimization of container stowage to increase profits, optimization of ground support equipment operations and lower capital expenditures, streamline break bulk and general cargo operations and vehicle tracking.

• **Vehicle Tracking Systems (VTS):** These systems provide information about the status of products which are transported by logistics companies, their location and vehicle speed and they can even enable route adjustments when necessary.

• **Enterprise resource planning (ERP):** These systems are utilised for follow-up and organization purposes to ensure a more efficient use of materials which are needed for the manufacturing processes of companies to run smoothly.

Another advantage of Information Systems is that they can be shaped according to the needs of companies and thus they have a flexible structure. Systems which can be integrated into each other for this purpose can function for different purposes in many different work processes.

The scope of the logistics industry is not limited with only transportation and the performance of logistics companies is dependent on a proper management of different logistics functions. Especially those logistics service providers which possess 3PL features have often actualised themselves in the two basic logistics functions of transportation and storage. The crucial role of the information systems increase in proportion to the complication of the industry in which they are used.

Therefore, these systems are extremely important for complicated logistics operations which can involve many elements such as logistics service providers, sub-carriers, intermediaries, etc.. In a complicated structure and operation, the performance of logistics operations by logistics service providers similarly, continuously and in a tractable way is crucial for increasing customer satisfaction in logistics services

Information system is involved with the gathering, processing, storing, distributing and use of information. In the current pulling system business environment, the difference between mediocre and excellent logistics is often the firm's logistics information technologies capabilities .In general Logistic Information systems is involved with the entire order processing. Logistics information system is involved with the order preparation, order transmittal, order entry, order filling and order status reporting. Now a days, these works are integrating with the advance Information Technologies like; Internet, EDI (Electronic Data Interchange), etc. Moreover, at different stages technologies like bar code reader, optical scanners, laser-beam bar coding, etc are plying critical role to provide expedite and excellent services.

Over the years, the cost of providing information throughout supply chain is reducing but competition is increasing regarding the quality and strategic perspective. Business is dominated by the consumer group. Moreover, in short terms firm have limited capacity to use to serve. As Globalization has broaden the opportunity for the consumers, failure of a firm to provide the product or services at a right time will increase the opportunity costs.

The influence of dynamic environment and rapid information technology advances during the 1596· Proceedings of the 7th International Conference on Innovation &Management1990s led that knowledge is the only resource that has longevity in achieving a sustainable competitive advantage. We also think that existing resources of organization can work with logistics information systems together to build a good logistics Information system.

1950 – 1960	1960 – 1970	1970 – 1980	1980 – 1990	1990 – 2000	2000 – Present
Data Processing	**Management Reporting**	**Decision Support**	**Executive Support**	**Knowledge Management**	**E-Business**
Collects, stores, modifies and retrieve day-to-day transactions of an organization	Pre-specified reports and displays to support business decision-making	Interactive ad-hoc support for the decision-making process	Provide both internal and external information relevant to the strategic goals of the organization	Supports the creation, organization and dissemination of business knowledge	Greater connectivity, higher level of integration across applications
Help workers	Helps middle managers	Helps senior managers	Helps Executives	Help available enterprise wide	Helps global e-business

DIAGRAM 3.1: Evolution of Logistics Information System

EVOLUTION OF LIS:

1950 – 1960: Electronic Data Processing, Transaction Processing System

During this period, the role of IS was mostly to perform activities like transaction processing, recordkeeping and accounting. IS was mainly used for electronic data processing (EDP).

EDP is described as the use of computers in recording, classifying, manipulating, and summarizing data. It is also called information processing or automatic data processing.

Transaction Processing System (TPS) was the first computerized system developed to process business data. TPS was mainly aimed at clerical staff of an organization. The early TPS used batch-processing data which was accumulated over a period and all transactions were processed afterward.

TPS collects, stores, modifies and retrieves day-to-day transactions of an organization. Usually, TPS computerize or automate an existing manual process to allow for faster

processing, improved customer service and reduced clerical costs. Examples of outputs from TPS are cash deposits, automatic teller machine (ATM), payment order and accounting systems. TPS is also known as transaction processing or real-time processing.

1960 to 1970: Management Information Systems

During this era, the role of IS evolved from TPS to Management Information Systems (MIS). MIS process data into useful informative reports and provide managers with the tools to organize evaluate and efficiently manage departments within an organization. MIS delivers information in the form of displays and pre-specified reports to support business decision-making. Examples of output from MIS are cost trend, sales analysis and production performance reporting systems.

Usually, MIS generates three basic types of information which are:

- Detailed information reports typically confirm transaction-processing activities. A detailed Order Report is an example of a detailed report.
- Summary information establishes data into a format that an individual can review quickly and easily.
- Exception information report information by filtering data that is an exception inventory report. Exception reports help managers save time because they do not have to search through a detailed report for exceptions.

This period also marked the development when the focus of organizations shifted slowly from merely automating basic business processes to consolidating the control within the data processing function.

1970 to 1980: Decision Support Systems

In this era, a major advancement was an introduction of the personal computers (PC). With the introduction of PCs, there was the distribution of computing or processing power across the organization. IS function associated strongly with management rather than a technical approach in an organisation. The role focused on “interactive computer-based system” to aid decision-makers in solving problems.

This new role of information systems to provide interactive ad-hoc support for the decision-making process to managers and other business professionals is called Decision Support Systems (DSS). DSS serve the planning, management and operations level of an organization usually senior management.

DSS uses data from both internal and/or external sources. Internal sources of data might include inventory, sales, manufacturing or financial data from an organization's database. External sources could include pricing, interest rates, population or trends. Managers use DSS to manipulate the data to help with decisions. Examples of DSS are projected revenue figures based on new product sales assumptions, product pricing and risk analysis systems.

1980 to 1990: Executive Information Systems

This period gave rise to departmental computing due to many organisations purchasing their own hardware and software to suit their departmental needs. Instead of waiting for indirect support of centralized corporate service department, employees could use their own resources to support their job requirements. This trend led to new challenges of data incompatibility, integrity and connectivity across different departments. Further, top executives were neither using DSS nor MIS hence executive information systems (EIS) or executive support systems (ESS) were developed.

EIS offers decision making facilities to executives through providing both internal and external information relevant to meeting the strategic goals of the organization. These are sometimes considered as a specific form of DSS. Examples of the EIS are systems for easy access to actions of all competitors, economic developments to support strategic planning and analysis of business performance.

1990 to 2000: Knowledge Management Systems

During this era, the rapid growth of the intranets, extranets, internet and other interconnected global networks dramatically changed the capabilities of IS in business. It became possible to circulate knowledge to different parts of the world irrespective of time and space.

This period also saw an emergence of enterprise resource planning (ERP) systems. ERP is an organization-specific form of a strategic information system that incorporates all

components of an organization including manufacturing, sales, resource management, human resource planning and marketing.

Moreover, there was a breakthrough in the development and application of artificial intelligence (AI) techniques to business information systems. Expert systems (ES) and knowledge management systems (KMS) interconnected to each other.

Expert systems (ES) are a computer system that mimics the decision-making ability of human experts. For example, systems making financial forecasts, diagnosing human illnesses and scheduling routes for delivery vehicles. Knowledge management system (KMS) is an IT system that stores and retrieves knowledge to support creation, organization and dissemination of business knowledge within the enterprise. Examples of KMS are feedback database and helpdesk systems.

ES uses data from Knowledge Management Systems to generate desirable information system's output for example loan application approval system.

2000 – present: E-Business

The Internet and related technologies and applications changed the way businesses operate and people work. Information systems functions in this period are still the same just like 50 years ago doing records keeping, reporting management, transactions processing, support management and managing processes of the
organization. It is used to support business process, decision making and competitive advantage.

The difference is greater connectivity across similar and dissimilar system components. There is great network infrastructure, higher level of integration of functions across applications and powerful machines with higher storage capacity. Many businesses use Internet technologies and web-enable business processes to create innovative e-business applications. E-business is simply conducting business process using the internet.

Logistics information system (LIS) involves the integration of information, transportation, inventory, warehousing, material handling and packaging. Logistics information system, information can be as lifeblood of a logistics and distribution system. The effectiveness

and accuracy of distribution systems depend on the transfer of information. Logistics information system holds the whole system and coordinates all the components of logistics operations: planning, coordination, and operation. Planning and coordination defines nature and location of customers that supply chain operations seek top match to planned product and services and promotions.

LIS is an information system that provides management with relevant and timely information related to logistics. Implementing information technology in retail outlets to bring number of benefits in that industry. LIS as a computer-based information system that supports every aspect of the logistics management process, which involves the coordination of activities, such as scheduling, inventory replenishment and material flow planning. Through Information System, suppliers, manufacturers, and customers are integrated into a logistics network for efficient supply chain management. The global nature of logistics now requires Information systems that enhance inventory control, track orders and materials and monitor resource utilization. Information systems andcomputer technologies are vital to the development of an organization willing to understand and attain to customers' requirements and needs.

The ability of a company to optimize its logistics costs and levels of customer service is affected by the LIS it uses. Add that these systems are extremely important in reducing inventory and lead time along the supply chain. The effectiveness andaccuracy of distribution systems depend on the transfer of information. Logistics information system holds the whole system and coordinates all the components of logistics operations: planning and coordination and operation. Planning and coordination defines Nature and location of customers that supply chain operations seek top match to planned product and services and promotions.

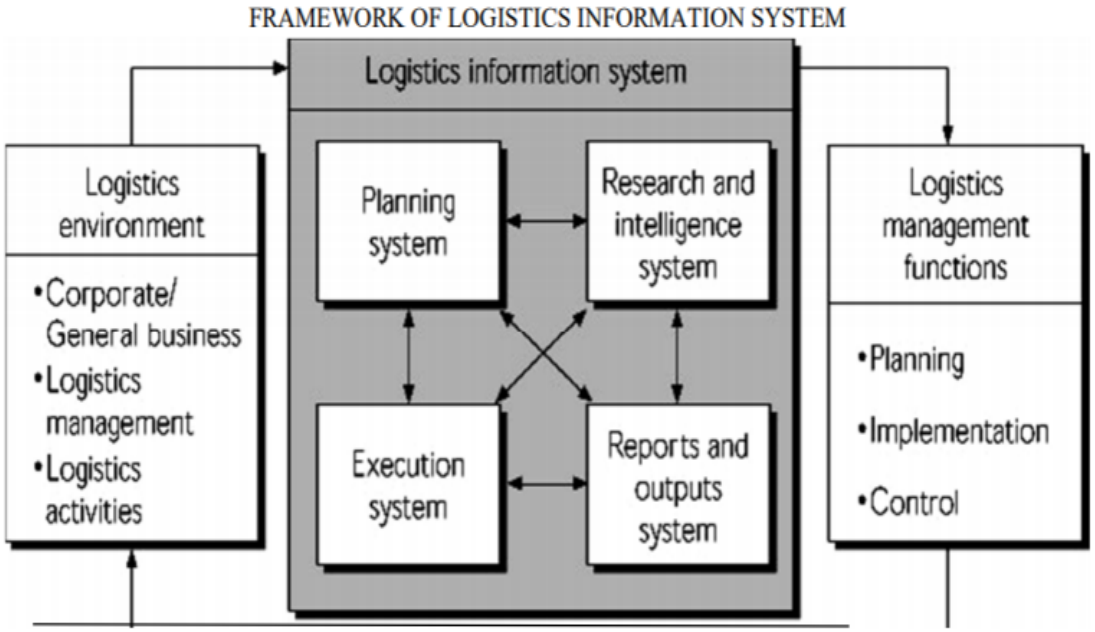


FIGURE 3.2: Framework of Logistics Information System

CHAPTER III

INDUSTRIAL STUDY

CHAPTER-3
INDUSRTRY PROFILE

AUTOMOTIVE INDUSTRY:

The Automotive industry is the key driver of any growing economy. A sound transportation system plays a pivotal role in a country's rapid economic and industrial development. The automobile industry comprises automobile and auto component sectors. It includes passenger cars; light, medium and heavy commercial vehicles; multi-utility vehicles such as jeeps, scooters, motorcycles, three-wheelers and tractors; and auto components like engine parts, drive and transmission parts, suspension and braking parts, and electrical, body and chassis parts.

Therefore, the automotive industry is a wide range of companies and organizations involved in the design, development, manufacturing, marketing and selling of motor vehicles.

It is one of the world's largest economic sectors by revenue. The automotive industry does not include industries dedicated to the maintenance of automobiles following delivery to the end user such as automobile repair shops and motor fuel filling stations.

The word automotive was coined from the Greek word *autos* (self) and Latin *motives*(of motion) to refer to any form of self powered vehicle. This term, as proposed by Elmer Sperry (1860-1930), first came into use with reference to automobiles in 1898.

HISTORY:

The automotive industry began in the 1860s with hundreds of manufacturers that pioneered the horseless carriage. For many decades, the United States led the world in total automobile production. In 1929, before the Great Depression, the world had 32,028,500 automobiles in use, and the U.S. automobile industry produced over 90% of them. At that time the U.S. had one car per 4.87 persons.

After World War II, the U.S. produced about 75 percent of world's auto production. In 1980, the U.S. was overtaken by Japan and then became world's leader again in 1994. In

2006, Japan narrowly passed the U.S. in production and held this rank until 2009, when China took the top spot with 13.8 million units. With 19.3 million units manufactured in 2012, China almost doubled the U.S. production, with 10.3 million units, while Japan was in third place with 9.9 million units. From 1970 (140 models) over 1998 (260 models) to 2012 (684 models), the number of automobile models in the U.S. has grown exponentially.

SAFETY:

Safety is a state that implies to be protected from any risk, danger, damage or cause of injury. In the automotive industry, safety means that users, operators or manufacturers do not face any risk or danger coming from the motor vehicle or its spare parts. Safety in the automotive industry is particularly important and therefore highly regulated. Automobiles and other motor vehicles have to comply with a certain number of norms and regulations, whether local or international, in order to be accepted on the market. The standard ISO 26262, is considered as one of the best practice framework for achieving automotive functional safety.

In case of safety issues, danger, product defect or faulty procedure during the manufacturing of the motor vehicle, the maker can request to return either a batch or the entire production run. This procedure is called product recall. Product recalls happen in every industry and can be production-related or stem from the raw material.

Product and operation tests and inspections at different stages of the value chain are made to avoid these product recalls by ensuring end-user security and safety and compliance with the automotive industry requirements.

RECENT FEATURES IN AUTOMOBILE INDUSTRY:

1. **Self driving features**

   Pioneered by companies like Google, many automakers are now starting to adopt and implement autopilot features into their engineering, all in an attempt to make the driving process safer and more enjoyable. Volvo is one company that is spearheading the advance and should have vehicles on the market within a couple years.

2. **Parking assist**

   Similar to self-driving technology, parking assistance is a feature that many new models are starting to adopt as standard. Companies like Ford, Chevrolet, BMW, and others are bringing the feature into the fold, and before long it will probably be standard across all segments.

3. **Aluminum construction**

   One of the more widely-reported new developments in the auto industry is the adoption of new construction materials. The most obvious is aluminum, which has been adopted by a number of manufacturers. Most consumers are looking forward to the new aluminum-based Ford F-150, which is being seen as a big gamble in the eyes of many. The F-150 is America's perennial best-selling vehicle.

4. **On-board Wifi**

   the world's automakers are turning vehicles into wifi hotspots, allowing for streaming and continuous connection no matter where you go. Chevrolet and Ford are two of the leaders in this category.

5. **Interactive computer systems**

   Computer systems in today's vehicles are becoming much more intuitive and interactive than in previous generations, but what is truly making them special is the ability to connect with other devices. Some cars are able to sync with wearable technology, like Google Glass, to make the driving experience incredible.

6. **Fuel saving tech**

   As we saw before, aluminum construction could be added to the pile, but other features, like plug-in technology, direct-injection engines, and more. In fact, the average fuel economy for vehicles across the board is on the up and up, all the way to more than 24 miles per gallon.

7. **Night-vision assist**

   night vision has finally made its way to the streets, and is being used in cars produced by companies like Audi and Mercedes.

8. **360 degree cameras**

   it's an advantage that many drivers can now use. Some vehicles have had this feature for a while, like certain Infiniti models, but it's now trickling down into more consumer-class vehicles. There are also third-party cameras that you can buy and install yourself.

9. **Collision avoidance technology**

   BMW and Cadillac are two manufacturers that have been lauded for their systems, which work by using camera and radar to predict when a crash is imminent, and take control of the vehicle to try and avoid it. Again, many people are uncomfortable with having control taken from them when behind the wheel, but with more time to gestate, this technology — when paired with self-driving features as well — could become incredibly popular.

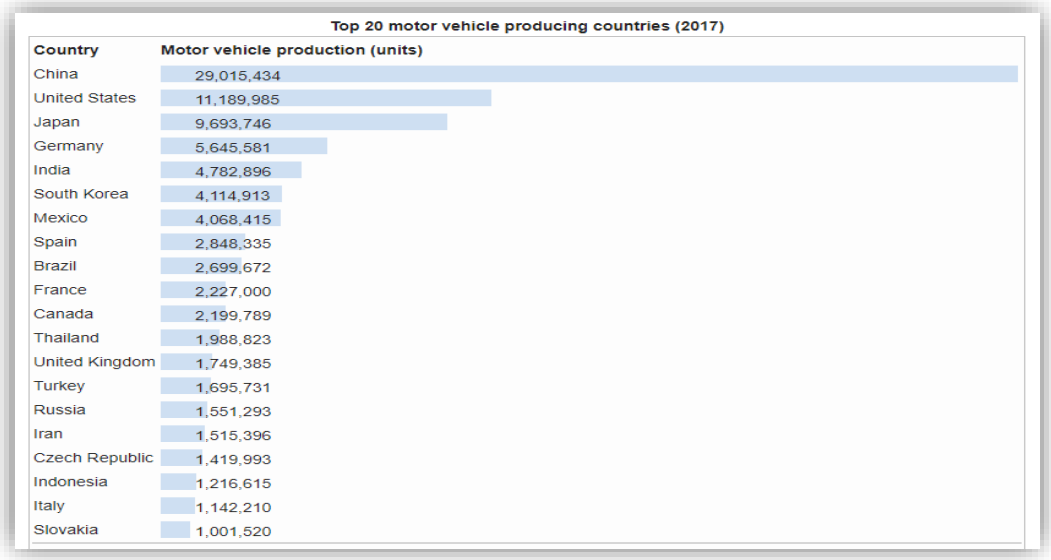
10. **Attention assist**

    For drivers who are feeling drowsy or having trouble keeping focused behind the wheel, attention assist technology can prompt you to pull over or take a
    short break.Chrysler and Mercedes are both starting to implement it.

ECONOMY:

Around the world, there were about 806 million cars and light trucks on the road in 2007, consuming over 980 billion litres (980,000,000 m3) of gasoline and diesel fuel yearly. The automobile is a primary mode of transportation for many developed economies. The Detroit branch of Boston Consulting Group predicts that, by 2014, one-third of world demand will be in the four BRIC markets (Brazil, Russia, India and China). Meanwhile, in the developed countries, the automotive industry has slowed down. It is also expected that this trend will continue, especially as the younger generations of people (in highly urbanized countries) no longer want to own a car anymore, and prefer other modes of transport. Other potentially powerful automotive markets are Iran and Indonesia. Emerging auto markets already buy more cars than established markets.

Power study, emerging markets accounted for 51 percent of the global light-vehicle sales in 2010. The study, performed in 2010 expected this trend to accelerate. However, more recent reports (2012) confirmed the opposite; namely that the automotive industry was slowing down even in BRIC countries.



Top 20 motor vehicle producing countries (2017)

Country	Motor vehicle production (units)
China	29,015,434
United States	11,189,985
Japan	9,693,746
Germany	5,645,581
India	4,782,896
South Korea	4,114,913
Mexico	4,068,415
Spain	2,848,335
Brazil	2,699,672
France	2,227,000
Canada	2,199,789
Thailand	1,988,823
United Kingdom	1,749,385
Turkey	1,695,731
Russia	1,551,293
Iran	1,515,396
Czech Republic	1,419,993
Indonesia	1,216,615
Italy	1,142,210
Slovakia	1,001,520

DIAGRAM 2.1: Top 20 motor vehicle producing countries

REGULATIONS:

Like other industries, the automotive industry is also subjected to numerous governmental regulations within virtually every country. Most of these regulations are related to vehicle safety, emission levels, fuel economy, vehicle imports, and consumer protection. There are also a number of trade barriers, taxes, import duties and standards, and tariffs that affect international automotive transactions. For example, some of the regulations that the auto mobile manufacturers are required to follow in the US include the Federal Motor Vehicle Safety Standards (FMVSS), and the Corporate Average Fuel Economy regulations. The strict implementation of these regulations and others by the US government has resulted in higher initial costs for American car-owners. This is an obvious consequence of the use of the more sophisticated technologies that are necessary to achieve better fuel economy, adherence to more stringent safety standards, and lessened emissions of greenhouse gases. Today, many automotive manufacturers are manufacturing hybrid, clean diesel, and electric cars to boost their sales. This trend has come in the wake of further emissions standards and shifts towards a more environmentally conscious automotive consumer base.

CHALLENGES:

The automotive industry is one of the key adopters of advanced technologies, resulting in rapid innovations and disruptions in this sector. , the future looks bright for automobile companies. Especially with the recent technological advancements, the industry is grooming itself to take customer experience to the next level. But on the flip side, the journey to success will not be a bed of roses for

companies in the automotive industry. The consumers are changing and evolving from an ownership-centric mindset to service-centric demand. This demands businesses to keep track of the changing demands of their market continually. Keeping tabs on the consumer's demands coupled with the dynamic market trends could prove to be a daunting task for automotive companies.

Here is a list of top challenges faced by automotive industries:-

1. **Rise in globalization**

   The increasing rate of globalization is undoubtedly good news for the growth of the automotive industry. However, expanding operations at a global level could be a challenging task for companies. Drastic shifts in global sources of supply, combined with strategies to take advantage of emerging markets, gives rise to new challenges related to global trade and international finished vehicle logistics fulfillment. Which means the players in this sector have to ensure that their knowledge about foreign markets, supply chain, and other operational strategies have to be impeccable in order to survive in a global scenario.

2. **Innovation is the need of the hour**

   The automotive industry is one of the biggest sectors in the world, which means there is no shortage of competition in this industry. Also, the growing inclination of customers towards the latest technologies and customization is forcing players in the industry to update themselves and efficiently cater to customers' needs. In this situation, it becomes highly challenging for automakers to find new ways to get closer to meeting customer demands while simultaneously maintaining their profitability to gain an edge over other players in the industry.

3. **Increasing regulations**

One the most pressing hurdle for the automotive industry is the need to meet rising restrictive emissions and fuel-consumption regulations in the Western world. It's easy enough for automakers to build a single car model that meets

these requirements. However, in the U.S. the problem is that an automaker's entire model lineup, including SUVs and light trucks, have to maintain an average level of higher mpg and lower emissions. Automobile companies are expected to improve fuel efficiency by at least 20% and as much as 60% by 2025, depending on the company and regulations.

4. **Maintaining costs**

Players in the automotive industry have recognized that most of their customers are attracted to the rapidly progressive intelligence and connectivity in vehicles. But designing and producing these smart cars and trucks is no easy task, and it poses real risks. Additionally, the cost of incorporating and managing new technologies and data is skyrocketing. This poses a major challenge for automotive companies when it comes to integrating new technologies cost-effectively.

RECENT TRENDS:

The automotive industry is being affected by changes and trends which are reshaping key aspects of the traditional business, both core and auxiliary. Some of the aspects that can have a significant impact in the automotive industry are:

- The ever increasing economic power of emerging economies, which can significantly impact not only the markets, but the whole supply chain.
- The introduction and broad acceptance of sharing economies is changing consumer behaviors in terms of lifestyle, travel and work, which has rising implications for current business models.
- An immediate implication of the above is that investments and growth potential are shifting in geographies. Some companies are better prepared than others to adapt.
- Technological innovations in particular are affecting the industry. More powerful and enabling technologies in the value chain are enhancing the
  customer experience, with capabilities far beyond the reach of science only a few years ago are now realities in the marketplace.

AUTOMOTIVE INDUSTRY IN INDIA:

The automotive industry in India is one of the largest in the world with an annual production of 23.96 million vehicles in 2015-2016, following a growth of 2.57 percent over the last year.

The Two Wheelers segment dominates the market in terms of volume owing to a growing middle class and a young population. Moreover, the growing interest of the companies in exploring the rural markets further aided the growth of the sector.

In order to keep up with the growing demand, several auto makers have started investing heavily in various segments of the industry during the last few months. The industry has attracted Foreign Direct Investment (FDI) worth US$ 19.29 billion during the period April 2000 to June 2018, according to data released by Department of Industrial Policy and Promotion (DIPP).

Some of the recent/planned investments and developments in the automobile sector in India are as follows:

- Ashok Leyland has planned a capital expenditure of Rs 1,000 crore (US$ 155.20 million) to launch 20-25 new models across various commercial vehicle categories in 2018-19.
- Mahindra & Mahindra (M & M) is planning to make an additional investment of Rs 500 crore (US$ 77.23 million) for expanding the capacity for electric vehicles in its plant in Chakan.
- Hyundai is planning to invest US$ 1 billion in India by 2020. SAIC Motor has also announced to invest US$ 310 million in India.
- Mercedes Benz has increased the manufacturing capacity of its Chakan Plant to 20,000 units per year, highest for any luxury car manufacturing in India.

The automobile industry is supported by various factors such as availability of skilled labour at low cost, robust R&D centres and low cost steel production. The
industry also provides great opportunities for investment and direct and indirect employment to skilled and unskilled labour.

Indian automotive industry (including component manufacturing) is expected to reach Rs 16.16-18.18 trillion (US$ 251.4-282.8 billion) by 2026. Two-wheelers are expected to grow 9 per cent in 2018.

The major players in the automobile industry include Tata, Mahindra, Daewoo Motor India, Hyundai Motors India and General Motors India, Maruti, Ashok Leyland, Bajaj, Hero Honda, Ford, Fiat and few other players.

AUTOMOBILE PRODUCTION IN INDIA:

The automotive industry in India is one of the largest in the world with an annual production o 23.96 million vehicles iin fiscal year. The largest automotive manufacturers ranked by their production volume is in 2004.India is also the prominent auto exporter and has strong export growth expectations for the near future. Several initiatives by the government of India and the major automobile players in the Indian market are expected to make India a lead in the two wheeler (2W) and four wheeler (4W) market in the world by 2020.

Hindustan Motors is n Indian automotive manufacturer based in Kolkata, west Bengal, India. It is a part of the Birla Technical Service Industrial Group.

MARKET SIZE:

The industry produced a total 14.25 million vehicles- including passenger vehicles (PV), commercial vehicles (CV), and three-two wheelers in April- October in 2015 as against 13.83 in April- October 2014 registering a marginal growth of 3.07% year to year.

INVESTMENTS:

In order to keep up with the growing demand, several automakers have started investing in various segments of the industry during the last few months. The industry has attracted foreign direct investment worth US dollar 17.4 billion during the period April 2000 to June 2017. According to data released by Department of Industrial Policy and Promotion (DIPP).

GOVERNMENT INITIATIVES:

The government of India encourages foreign investment in the automobile sector. Some of the major initiatives taken by the government of India are:

1. the government of India aims to make automobile manufacture the main driver of "make in India initiative".
2. the government promotes to plan ecofriendly cars in the country that is CNG based vehicles, hybrid vehicles and electric vehicles.
3. the government has announced plan to provide credit of rs 850000 crore to farmers which is expected to boost sales in the tractor segment.

MANUFACTURING FACILITIES:

The majority of India's car manufacturing industry is evenly divided into three "clusters". Around Chennai is the southernmost and largest, with a 35% revenue share, accounting for 60% of the country's automotive exports, and home of the operations of Heavy Vehicles Factory, Engine Factory Avadi, Ford, Hyundai, Renault, Mitsubishi, Nissan, BMW, Hindustan Motors, Daimler, Caparo, Mini, and Datsun.

An emerging cluster is the state of Gujarat, with a manufacturing facility of General Motors in Halol, and a facility for Tata Nano at their plant in Sanand. Ford, Maruti Suzuki, and Peugeot-Citroen plants are also planned for Gujarat.

EXPORTS:

India's automobile exports have grown consistently and reached $4.5 billion in 2009, with the United Kingdom being India's largest export market, followed by Italy, Germany, Netherlands, and South Africa. According to The New York Times, India's strong engineering base and expertise in the manufacturing of low-cost, fuel-efficient cars has resulted in the expansion of manufacturing facilities of several automobile companies like Hyundai, Nissan, Toyota, Volkswagen, and Maruti Suzuki.

In recent years, India has emerged as a leading center for the manufacture of small cars. Tata Motors exports its passenger vehicles to Asian and African markets, and is preparing to sell electric cars in Europe in 2010. The firm is planning to sell an electric version of its affordable car the Tata Nano in Europe and in the U.S. Mahindra & Mahindra is preparing to introduce its pickup trucks and small SUV models in the U.S. market.While the possibilities for the Indian automobile industry are impressive, there are challenges that could thwart future growth. Since the demand for automobiles in recent years is directly linked to overall economic expansion and rising personal incomes, industry growth will slow if the economy weakens.

AUTOMOTIVE RESEARCH OF INDIA- STANDARDS:

The Government of India felt the need for a permanent agency to expedite the publication of standards and development of test facilities in parallel with the work of the preparation of the standards - as the development of improved safety critical parts could be undertaken only after the publication of the standard and commissioning of test facilities. The Ministry of Surface Transport (MoST) constituted a permanent Automotive Industry Standards Committee (AISC) . The Standards prepared by AISC will be approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, the Automotive Research Association of India (ARAI) will publish this standard.

Intelligent Transport Systems (ITS) are globally proven systems to optimize the utilization of existing transport infrastructure and improve transportation systems in terms of efficiency, quality, comfort and safety. Having realized the potential of ITS, Government bodies and other organizations in India are presently working towards implementing various components of ITS across the country.

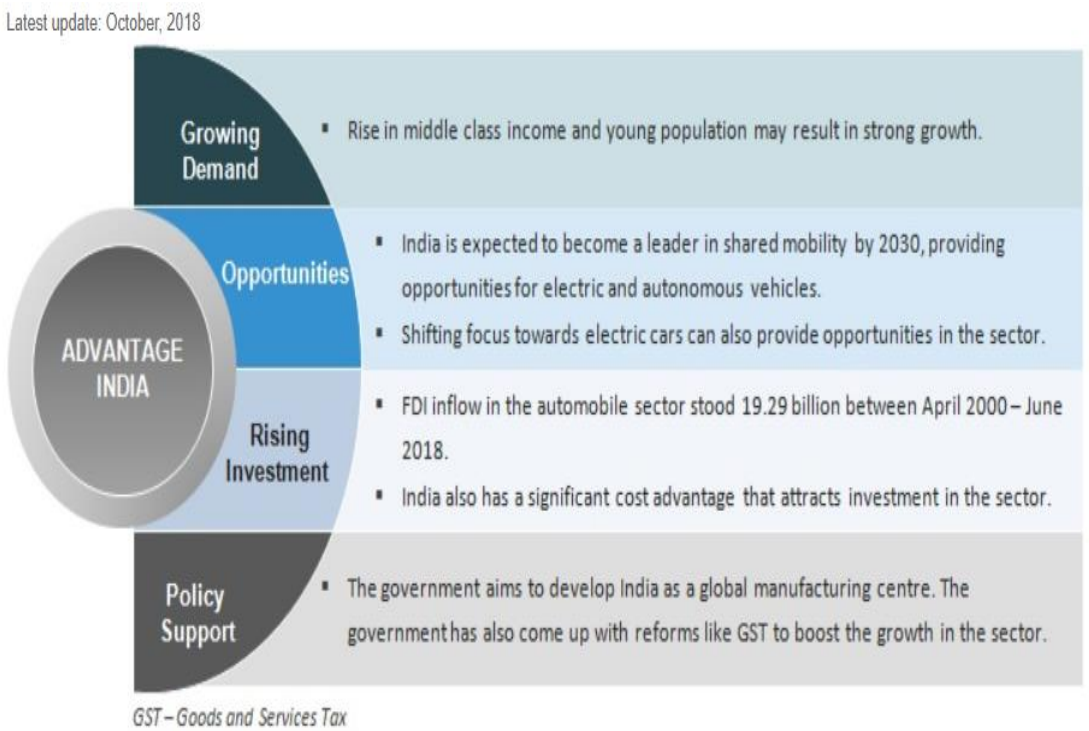


DIAGRAM 2.2:

Advantages of ITS

PRESENT SCENARIO OF AUTOMOTIVE INDUSTRY:

Real growth journey of automobile industry started in 1991 by the announcement of New Industrial Policy deli censing of Automobile industry by Govt.Of India. The New Industrial Policy of 1991 provided that except in some special cases industrial license is not required for setting I of automobile manufacturing unit. Progressive liberalization was made by Govt. Of India in the norms for Foreign Investment and import of technology. This was done with a view to make the automobile industry globally competitive. Continuous economic liberalization since1991 witnessed a rapid growth of automobile industry in India, thereby making India as one of the sought after destination by global automotive players. Due to continuous growth of the industry in India, the automobile sector has been aptly described as the sunrise sectors of the Indian economy. Due to relaxed restrictions, positive support by Government and increased competitiveness, the Indian automobile industry has demonstrated sustained growth in last two decades. Continuous rapid growth of automobile industry resulted in further expansion of domestic automobile market.

As of now, India is the seventh largest vehicle manufacturer, second largesttwo wheeler manufacturer and the fifth largest commercial vehicle manufacturer inthe world. Following are some of the facts which witness the India's position in the World's automobile production:

- Indian auto ancillary industry is well developed and globally competitive.
- Established automobile testing and R&D centers are set up in various parts of the country.
- India is among one of the lowest cost producers of steel.
- As of now, India is World, second largest manufacturers of two wheelers, fifth largest commercial vehicle manufacturer and seventh largest vehicle manufacturer in the world.

FUTURE OF AUTOMOBILE INDUSTRY IN INDIA:

Incumbents in the automotive industry should prepare for a changing landscape as India grows into the world's third-largest passenger-vehicle market and global trends disrupt the sector.

India is expected to emerge as the world's third-largest passenger-vehicle market by 2021.1 It took India around seven years to increase annual production to four million vehicles from three million.2 However, the next milestone—five million—is expected in less than five years. Hitting that mark will depend on today's rapid economic development continuing, with a projected annual GDP growth rate of 7 percent through 2020,3 ongoing urbanization, a burgeoning consuming class, and supportive regulations and policies.

With this growth in mind, we set out to build a perspective on the trends shaping the Indian market, the value proposition for the automobile industry in India, and imperatives for winning in the market.

Currently, the automotive sector contributes more than 7 percent to India's GDP.4 The Automotive Mission Plan 2016–26 sets an aspiration to increase the contribution to 12 percent.5

A number of economic trends could help in meeting this target. Rapid urbanization means the country will have over 500 million people living in cities by 2030—1.5 times the current US population. Rising incomes will also play a role, as roughly 60 million households could enter the consuming class (defined as households with incomes greater than $8,000 per annum) by 2025. At the same time, more people will join the workforce. Participation could reach 67 percent in 2020, as more women and youth enter the job market, raising the demand for mobility.

Some of them would leap straight into four-wheeler segment, and others will graduate from two- to four-wheelers. Over 44 percent of the consuming-class households will be in 49 growth clusters—for example, Delhi is expected to have the same GDP per capita at purchasing power parity as the entire country of Russia in 2025.6 Cities like Delhi are a sweet spot for car manufacturers to target.

In the future, these macroeconomic and demographic trends could shift pockets of growth in passenger-vehicle market. Mini cars and hatchback cars have been the mainstay for the automobile industry in India, with share around 50 percent and growth of 6 to 7 percent between financial year 2014 and 2017. These segments will continue to maintain a dominant position, but the majority of growth is expected to come from new segments such as compact SUVs, sedans, and luxury vehicles.

Through the Automotive Mission Plan, the National Electric Mobility Mission Plan (NEMMP), and other initiatives, the government seeks to achieve two objectives—facilitate long-term growth in the industry and reduce emissions and oil dependence.

In the Automotive Mission Plan 2026, the government and industry set a target to triple industry revenues, to $300 billion, and expand exports sevenfold, to $80 billion. To meet these aims, it is estimated that the sector could contribute more than 60 million additional direct and indirect jobs, and the result could be improved manufacturing competitiveness and reduced emissions.

To tackle emissions, the government seeks to bring local standards up to par with global standards, enabling India to leapfrog from BS-4 to BS-6 emissions (the Euro 6 equivalent) by 2020 . Additionally, India has implemented Corporate Average Fuel Efficiency norms in which the manufacturers have to improve their fuel efficiency by 10 percent between 2017 and 2021 and by 30 percent or more from 2022.

Additionally, to address pollution from old vehicles, the government is working on an initiative that focuses on formulation of end-of-life or scrappage policies. It
plans to give incentive for the adoption of these policies with the help of lower taxes, discounts on purchase prices, and simple compliance processes.

To reduce dependency on oil imports, the government is promoting adoption of alternative fuels through FAME2, which is an extension of the original FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) initiative. Where “FAME1” offered incentives to electric vehicles (EV) and hybrid EV buyers, FAME2 is expected to incentivize electrification of the public-transport fleet of buses and taxis, as well as facilitate demand for all types of alternative fuel. Furthermore, to enable immediate

adoption, a lower goods and services tax of 12 percent is applied to battery electric vehicles, compared with 31 to 48 percent for other vehicles.

The World Economic Forum ranks India 30th on the global manufacturing index, which assesses the manufacturing capabilities of more than 100 countries. The government's "Make in India" initiative has played an important role in elevating country's position. In the past three to four years, India improved on nine out of ten parameters for ease of doing business.

Although there is still a long way to go before India becomes a leader in the manufacturing arena, companies in the automotive sector are embracing this opportunity to leverage India as a hub for low-cost, high-quality products. After creating a strong value proposition in mini cars, India is gaining global recognition in the compact sedan and SUV category.

For a number of years, multinationals have been using India as a hub for low-cost talent. However, in the past few years, India has also been recognized for high-quality managerial talent. Indians are starting to occupy major positions across industries such as consumer goods, automotive, pharmaceutical and banking, among others. Moreover, many such companies are also leveraging local talent for driving innovation through R&D centers. In the case of a leading global conglomerate, more than a quarter of their innovations are done by the team in India. Likewise, in the case of an automotive manufacturer, the local team of managers and engineers are working on products that will drive growth in the medium to long run.

Projecting the various development paths of the four disruptive trends—and their impact on the industry—led us to define six potential mobility scenarios for 2030. Four scenarios were built using the same degree of technology diffusion for all four trends, since we found that all trends are mutually reinforcing and the success or failure of one affects the others. Given that the key drivers of diffusion for electrification (consumer pull, technological readiness, and regulation push) can be independent from those of the other three trends, we added two additional scenarios in which we vary the diffusion trajectory of the trends.

Indian automobile has lot of scope for both two wheelers and four wheelers due to the developmental infrastructure of the company. The Indian auto marketers still untapped the majority of the people in country who don't own a four wheeler and all the major auto companies are trying to increase their sales by several moves.

CHAPTER IV
DATA ANALYSIS & INTERPRETATION

CHAPTER-4

DATA ANAYISIS & INTERPITATION

Production

In April-March 2021, the industry produced 22,652,108 vehicles, including passenger vehicles, commercial vehicles, three-wheelers, two-wheelers, and quadricycles, compared to 26,353,293 in April-March 2020, a decrease of (-) 14.04 percent over the same period the previous year.

Domestic sales

In April-March 2021, the sale of passenger vehicles fell by (-) 2.24 percent compared to the same period the previous year. Sales of passenger cars and vans dropped by (-) 9.06 percent and (-) 17.62 percent, respectively, in April-March 2021, while sales of utility vehicles grew by 12.13 percent over the same period previous year.

In April-March 2021, the total Commercial Vehicles segment had a decline of (-) 20.77 percent as compared to the same period the previous year. In April-March 2021, the number of Medium & Heavy Commercial Vehicles (M&HCVs) and Light Commercial Vehicles (LCVs) fell by (-) 28.40 percent and (-) 17.30 percent, respectively, compared to the same period the previous year.

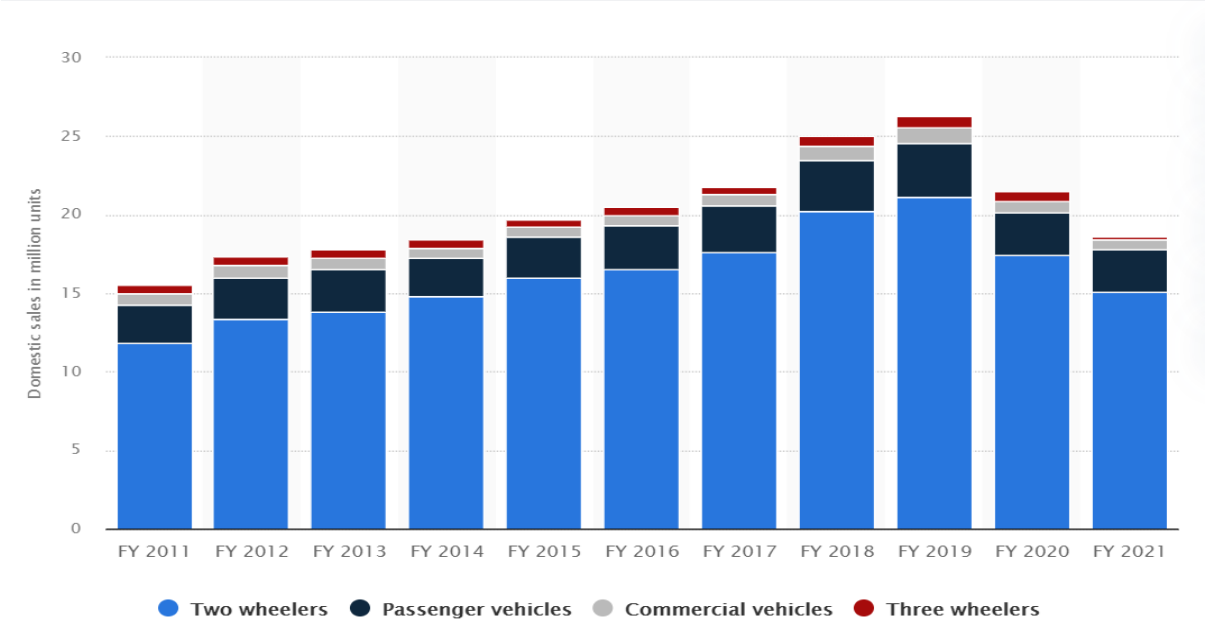
In April-March 2021, sales of Three Wheelers fell by (-) 66.06 percent compared to the same period the previous year. Passenger Carrier and Goods Carrier fell by (-) 74.49 percent and (-) 26.38 percent, respectively, in April-March 2021 over April-March 2020 in the Three Wheelers.

In April-March 2021, sales of two-wheelers decreased by (-) 13.19 percent compared to April-March 2020. Scooters, Motorcycles, and Mopeds all fell by (-) 19.51 percent, (-) 10.65 percent, and (-) 3.07 percent, respectively, in April-March 2021 over April-March 2020 in the Two Wheelers sector.

EXPORT

Overall, vehicle exports decreased by (-)13.05 percent from April to March 2021. Exports of passenger vehicles, commercial vehicles, three-wheelers, and two-wheelers fell by 38.92 percent, 16.64 percent, 21.67 percent, and 6.87 percent, respectively.

Sales of automobiles in India from financial year 2011 to 2021, by type *(in million units)*



Two-wheeler domestic sales in India from financial year 2011 to 2021*(in million units)*

Two-wheeler sales in India fell to 15.12 million units in fiscal year 2021, a drop from prior years. In 2019, India's car sector sold an all-time high of 21 million vehicles, setting a new record. This is nearly double the number of two-wheeler units sold in India in 2011, when just 11.77 million were sold.

Two-wheeler industry in India

Two-wheeler vehicles, followed by passenger cars, made up the bulk of vehicles produced in India in 2021. Scooters, motorbikes, and mopeds are among the various two-wheeler vehicles accessible in India. Hero MotoCorp was India's leading two-wheeler manufacturer as of 2021.

TABLE 4.1: SHOWING THE AUTOMOBILE DOMESTIC SALES TREND

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Passenger Vehicles	2789208	3047582	3288581	3377389	2773519	2711457
Commercial Vehicles	685704	714082	856916	1007311	717593	568559
Three Wheelers	538208	511879	635698	701005	637065	216197
Two Wheelers	16455851	17589738	20200117	21179847	17416432	15119387

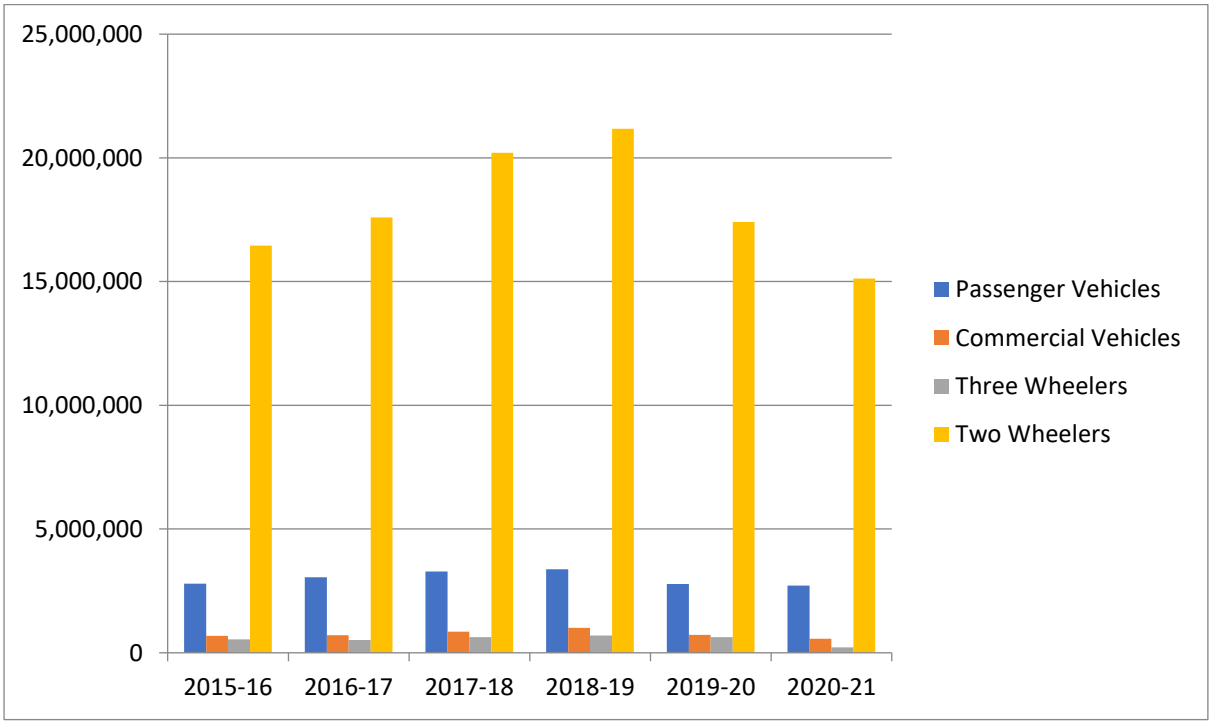


DIAGRAM 4.1: SHOWING THE AUTOMOBILE DOMESTIC SALES TREND

INTERPRETATION:

The above analysis shows that the two wheelers have lot more sales than the passenger vehicles, commercial vehicle and three wheelers, which have fewer sales in all the years. In the year 2018-19, the sales is in highest of all years and 2020-21 is the lowest in sales (it the cause of COVID-19).

TABLE 4.2: SHOWING THE AUTOMOBILE PRODUCTION TRENDS

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Passenger Vehicles	3465045	3801670	4020267	4028471	3424564	3062221
Commercial Vehicles	786692	810253	895448	1112405	756725	624939
Three Wheelers	934104	783721	1022181	1268833	1132982	611171
Two Wheelers	18830227	19933739	23154838	24499777	21032927	18349941

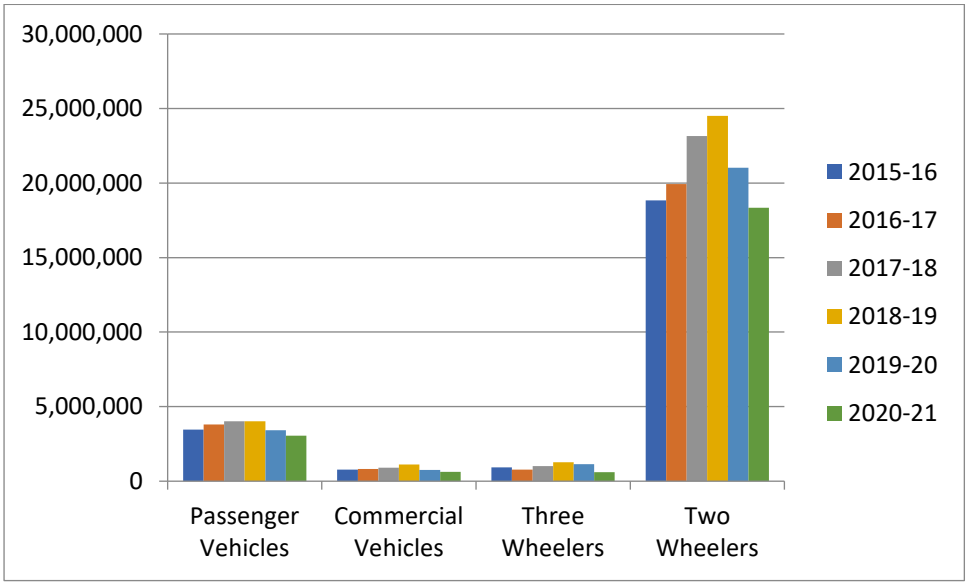


DIAGRAM 4.2: SHOWING THE AUTOMOBILE PRODUCTION TRENDS

INTERPRETATION:

The above analysis shows that the two wheelers have lot more production than the passenger vehicles, commercial vehicle and three wheelers, which have less production in all the years. In the year 2018-19, the production is in highest of all years and 2020-21 is the lowest in production (it the cause of COVID-19).

TABLE 4.3: SHOWING THE AUTOMOBILE EXPORTS TRENDS

Category	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Passenger Vehicles	653053	758727	748366	676192	662118	404400
Commercial Vehicles	103124	108271	96865	99933	60379	50334
Three Wheelers	404441	271894	381002	567683	501651	392941
Two Wheelers	2482876	2340277	2815003	3280841	3519405	3277724

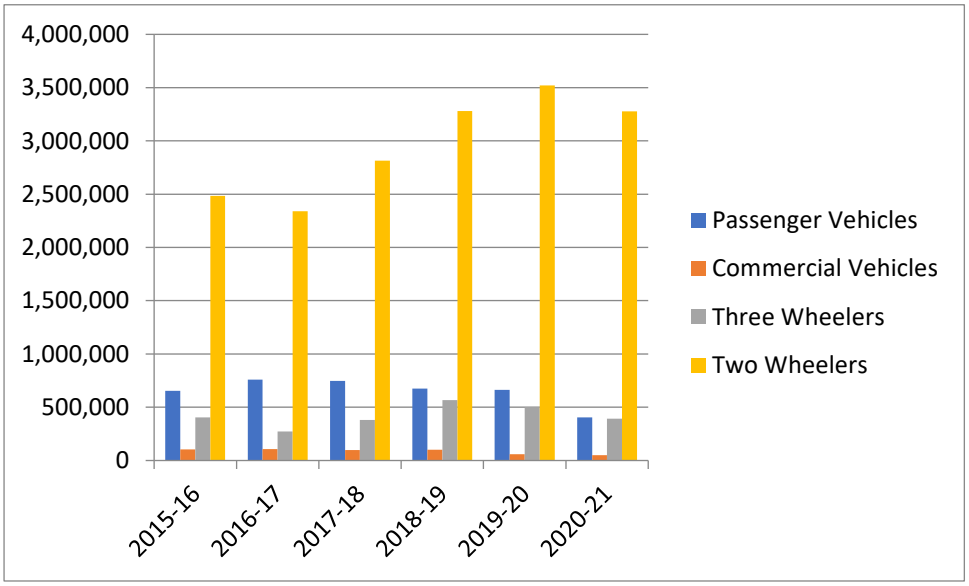


DIAGRAM 4.3: SHOWING THE AUTOMOBILE EXPORTS TRENDS

INTERPRETATION:

The above analysis shows that the two wheelers have lot more export than the passenger vehicles, three wheelers and commercial vehicle, which have less export in all the years. In the year 2018-19, the export is in highest.

TABLE 4.4: SHOWING THE DOMESTIC MARKET SHARE FOR 2019-20

Passenger Vehicles	13
Commercial Vehicles	3
Three Wheelers	3
Two Wheelers	81
Grand Total	100

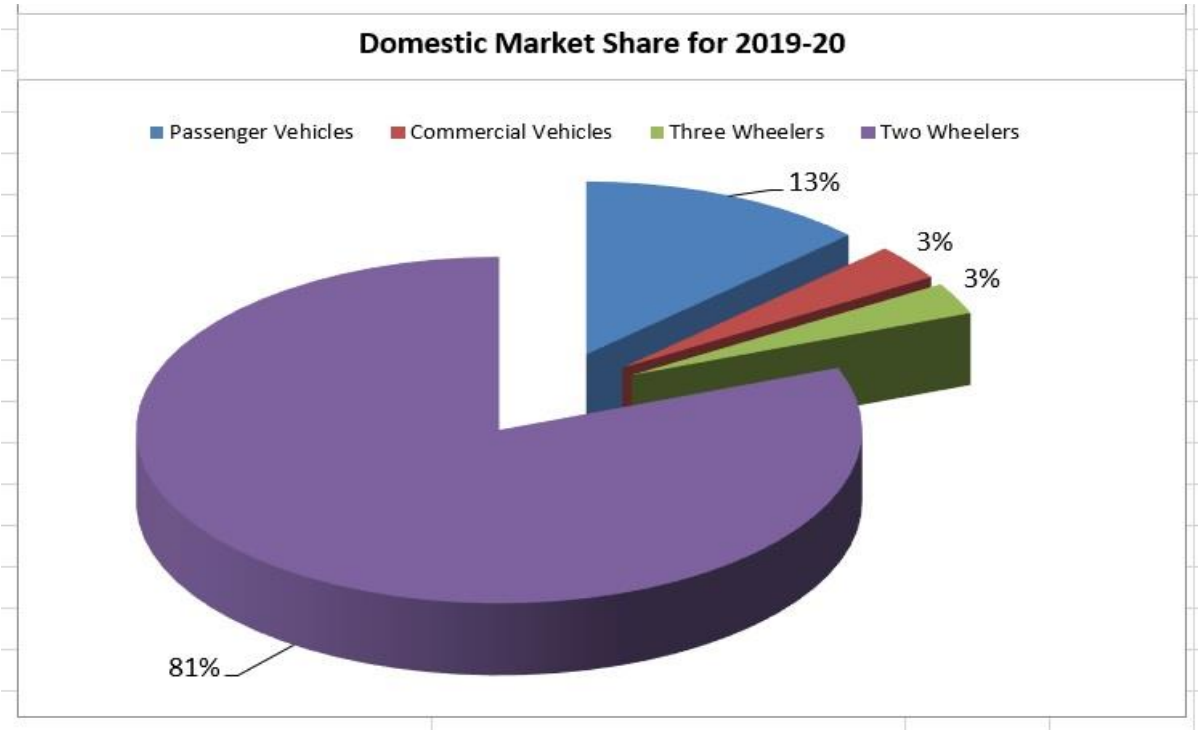


DIAGRAM 4.4: SHOWING THE DOMESTIC MARKET SHARE FOR 2019-20

INTERPRETATION:

The above analysis shows that 81% of the domestic market share is by two wheelers, whereas 13% of it is passenger vehicles, 3% of it is commercial vehicles, and the remaining 3% of it is three wheelers.

TABLE 4.5: SHOWING THE EMPLOYEES RATE IN TRAINING

PARTICULARS	RESPONDENTS	PERCENTAGE
1	0	0
2	0	0
3	5	9%
4	23	42%
5	27	49%
TOTAL	**55**	**100%**

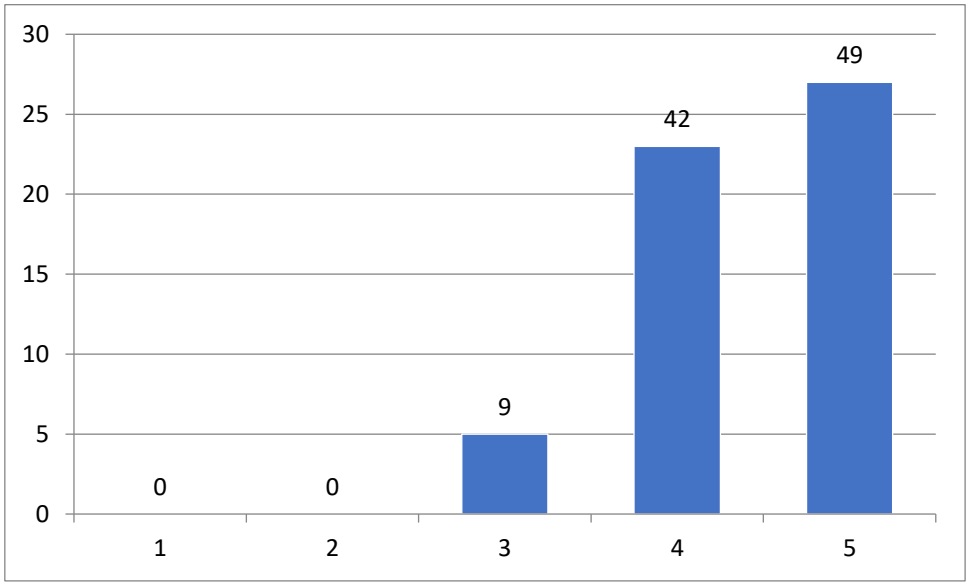


DIAGRAM 4.5: SHOWING THE EMPLOYEES RATE IN TRAINING

INTERPRETATION:

The above analysis shows that 49% of the employees give 5 scale rating in the field of training provided, whereas 42% of the employees opt for 4 scale rating and the remaining 9% of the employees provide 3 scale rating for the training provided.

TABLE 4.6: SHOWING THE AREA IN WHICH LOGISTICS INFORMATION SYSTEM (LIS) IS APPLIED THE MOST

PARTICULARS	RESPONDENTS	PERCENTAGE
Customer clearance	6	11%
Documentation	32	58%
Transportation	7	13%
Warehousing	10	18%
TOTAL	**55**	**100%**

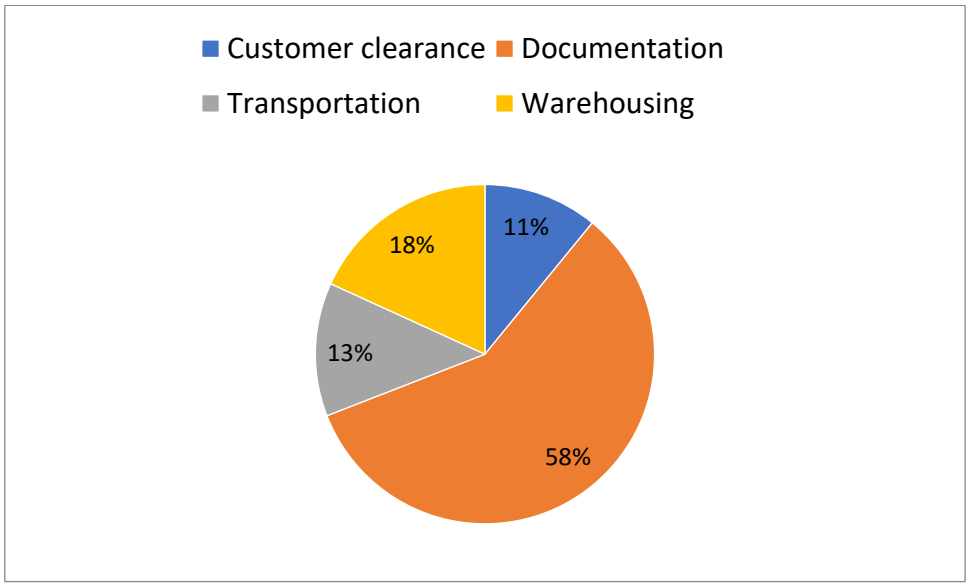


DIAGRAM 4.6: SHOWING THE AREA IN WHICH LOGISTICS INFORMATION SYSTEM (LIS) IS APPLIED THE MOST

INTERPRETATION:

LIS is applied 58% in documentation, 18% in warehousing, 13% in the field of transportation and the remaining 11% in customer clearance.

TABLE 4.7: SHOWING THE METHOD USED TO TRACK MATERIALS CONSUMED

PARTICULARS	RESPONDENTS	PERCENTAGE
LIFO	0	0
FIFO	55	100%
WEIGHTED AVERAGE	0	0
OTHER	0	0
TOTAL	**55**	**100%**

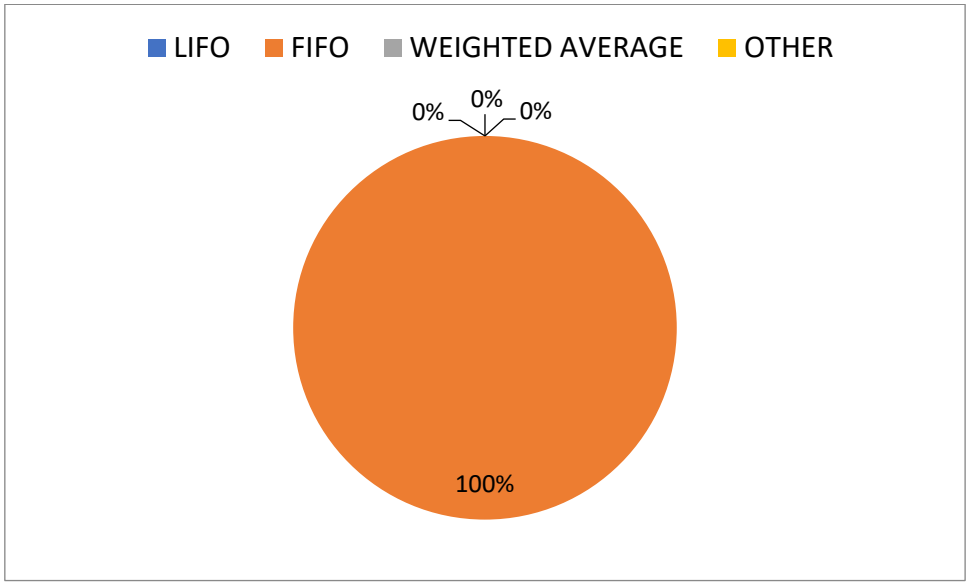


DIAGRAM 4.7: SHOWING THE METHOD USED TO TRACK MATERIALS CONSUMED

INTERPRETATION:

The method used to track the materials consumed in the warehouse is FIFO (First In First Out).

TABLE 4.8: SHOWING THE EFFECTIVENESS OF LIS FOR COMPETITIVE ADVANTAGE

PARTICULARS	REPONDENTS	PERCENTAGE
Cost Reduction	8	14%
Less Paper Work	12	22%
Just In Time	6	11%
All of the above	29	53%
TOTAL	**55**	**100%**

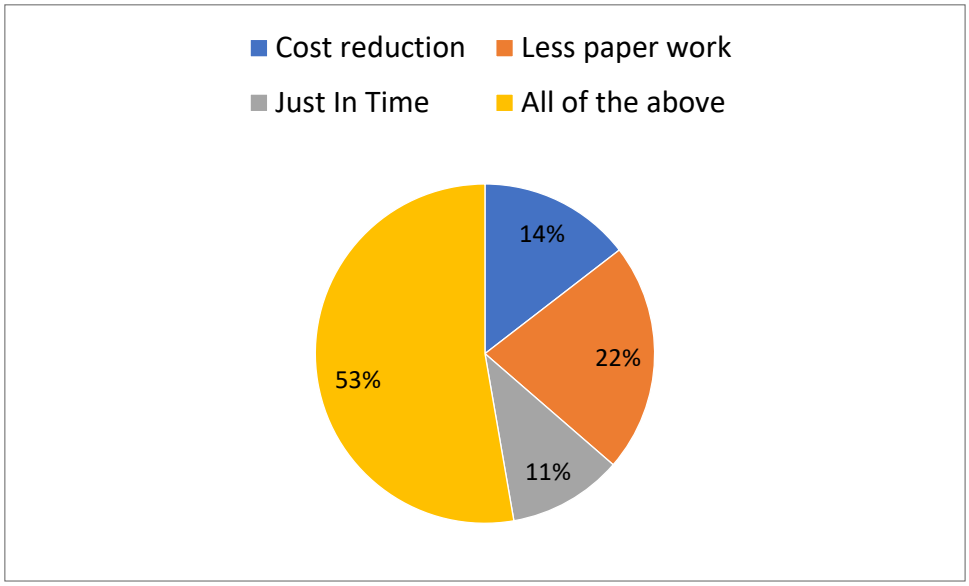


DIAGRAM 4.8: SHOWING THE EFFECTIVENESS OF LIS FOR COMPETITIVE ADVANTAGE

INTERPRETATION:

53% of the respondents say that LIS has helped in reducing costs, making paper work less and also Just In Time, whereas 22% of the respondents says that it helps only in lowering paper works, 14% of them says it helps only in cost reduction and the remaining 11% says it helps for just in time.

CHAPTER V

FINDINGS, SUGGESTIONS & CONCLUSIONS

CHAPTER-5

CONCLUSION

5.1 FINDINGS

- Two-wheeler is more in production, sales, export in India for the past 5 years.
- The COVID-19 has reduced the production as well as the sales of vehicles in 2020.
- Most of the employees working in the Industry are highly satisfied with job environment and working conditions.
- 85% of the employees are satisfied with the working hours in the Industry.
- LIS is applied the most for documentation. However, it is also used for warehousing and transportation.
- LIS brings a competitive advantage to industry in cases of cost reduction, less paper work and also Just In Time.
- The technology used for inventory control is Data Management System (DMS)
- The method used to track the materials consumed is FIFO (First In First Out)
- The problem faced during material handling is mainly due to transportation issued and natural calamities.
- Spare parts are procured on a regular basis.
- The quantities of products are tracked by using Database, Ledgers and Spreadsheets.

5.2 SUGGESTIONS

- Linking of super cededss parts in DMS is creating a time lag and ease of completing the task is not done.

- Materials can be given more care and attention so that the chances of damage can be reduced in the course of transportation, and also precautions can be taken in order to withstand the natural calamities.

- The company should improve participation of employees and encourage them to express their opinion regarding the working of the company.

- Dynamic changes adopted should be ensured as it is been carried out as efficient as possible.

5.3 CONCLUSION

The study was focused on the effectiveness of Logistics Information System. There is frequent flow of information within the organizations. The paper works have been reduced with the use of information systems. The technology mainly used all over the world is that of Data Management System (DMS).Regular training is been provided to all levels of employees for a better and efficient working of the company, also regular inspection is been carried out by the major officials in most of the companies. Thus, ensure the quality of services, facilities provided and enhance the wellbeing of the company. LIS is well established in the firm as effective technology helped in reducing costs and paper works and increased their efficiency.

It has already made the firm more competitive, by making better tactical and strategic decision for the benefits of the firm and its customer. It has also helped in providing customers information regarding product availability, order status, and delivery schedules promoting customers service, The Company has ensured the employees better working environment so that most of the employees are well satisfied. The quality of services of the company has improved over time. Even though there are some limitations in many areas and thus has to improve for better efficiency, company has succeeded in bringing an effective logistics information system for ease of transferring and recording of data.

Therefore, through this study, it is found that the companies run their activities through a proper Logistics information system efficiently with regard to Automobile industry.

CHAPTER-6

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ABBREVIATIONS

EDI	Electronic Data Interchange
RFID	Radio Frequency Identification
DSS	Decision Support System
3PL	Third party logistics
EIS	Executive Information System
ERP	Enterprise Resource Planning
MIS	Management Information System
EDP	Electronic Data Processing