

# An Introduction to Logistics

Indraneel Ray<sup>1</sup>

<sup>1</sup>Indraneel Ray: Student, Dept. of Mechanical Engineering, MGM's Jawaharlal Nehru Engineering College, Maharashtra, India.

\*\*\*

**Abstract** - 21<sup>st</sup> century is a century of fierce competition. There is cut throat competition in each and every field today, and 21<sup>st</sup> century is also the century of the customer where we all know that customer is the king and each and every new product in the market is completely customer centric. Making a great product by incorporating every good thing in it alone won't make the company richer or bigger as long as the product reaches its final customer on time, in the right quantity, of the right quality and within the price range of the customer. Hence for achieving this, logistics plays a very vital role in today's business world. Also the new and innovative technological changes in the logistics industry like Analytics, cloud computing and use of RFID technology is also discussed here.

**Key Words:** Logistics, Transport, Warehousing, Inventory Management, Packaging, RFID, Cloud computing, Analytics etc.

sold then Aurangabad becomes point 1 and Delhi becomes point 2 so in between the transit the goods/products may be stored in various warehouses/storage units and it may change its mode of transport during the transit, so all these aspects are looked after by the logistics company. [1]

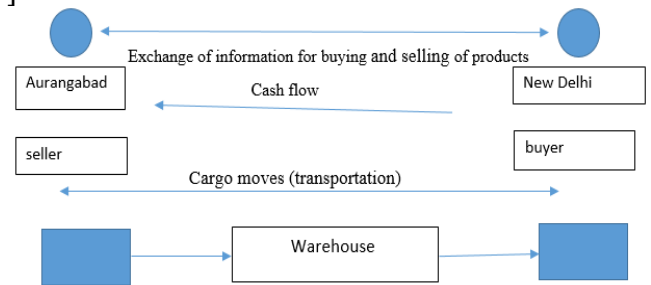


Fig -1: Simple Logistics Diagram [1]

## 1. INTRODUCTION

The term “logistics” originates from the ancient Greek word “lógoy” (logos-ratio, word, calculation, reason, speech, oration), and as such the word logistics has been in use for a much longer time than the current business logistics concept. The word logistics originated from the military discipline. There were divisions in the military who were responsible for the supply of necessary arms, ammunition and rations as and when they were needed. In that situation the logistics division would provide all the necessary support to move the arms, ammunitions, tents, foods etc not surprisingly the Oxford English dictionary defines logistics as; “The branch of military science having to do with procuring, maintaining and transporting material, personnel and facilities.” Another dictionary defines logistics as “The time related positioning of resources.” [1]

Logistics is nothing but adding place utility to a product i.e. if you want to move some product that is manufactured or produced in Aurangabad, Maharashtra to New Delhi, where it is consumed or

### 1.1 Elements of a Logistic System

There are five key elements of logistics: transport, warehousing, inventory, packaging, and information processing. Generally transport is the major component of most logistics services. The key aspects of transport management include modes of transport (such as road, rail, waterways, air, pipeline, multimodal or intermodal), transport infrastructure, geographical condition, type of delivery (such as overnight express, normal, long distance), load planning (in the cargo unit), routing and scheduling. The important considerations of warehouse management include the location, number (linked to the warehousing policy as to central versus decentralized concept), size (again linked to the warehousing policy), type of storage (such as for refrigerated cargo, electronics, garments) and material handling equipment. The crucial characteristics of inventory management include the strategic decisions as to what to stock, how much to stock, and where to stock. All products (raw material, semi-finished, finished) need packaging. Packaging and unitization are also important aspects of logistics. The key elements of packaging and unitisation include the type, cost, etc. that is linked to the value and the type of product. For example, for high value goods, the packaging and unitisation cost can be high whereas for the raw material the cost has to be relatively lower and more affordable. [1]

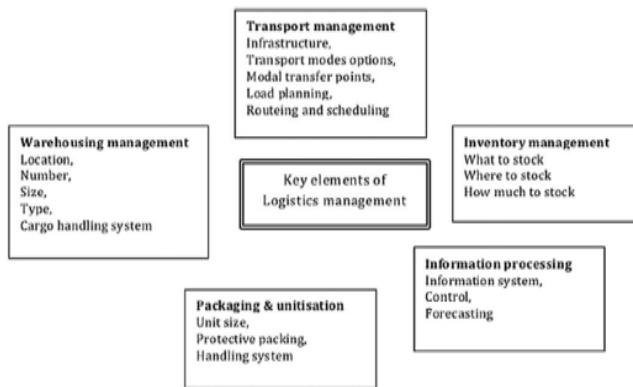


Fig -2: Elements of a Logistics System [1]

## 2. Modern Trends used in Logistics

### 2.1 RFID (Radio Frequency Identification) Technology:

After the revolutionary impact that the barcode technology brought decades ago to manufacturing and service industries, which helped with accurate data handling and product identification, the RFID technology was identified as the next big impact technology to be deployed across the supply chains of diverse industries. An RFID system consists of identification tags that can be attached to products, items, pallets or cases to store data, and which are read by installed radio frequency readers. Kelley and Erickson describe the RFID technology as a system that involves wireless communication between a transponder, the RFID tag, and a reader via radio frequency. [2]



Fig -3: RFID technology in Logistics Industries [2]

### 2.2 Supply Chain Analytics :

In a supply chain, there are physical, financial, and informational flows among different firms. Supply chain analytics focuses on the use of information and analytical tools to make better decisions regarding material flows in the supply chain. Put differently, supply chain analytics focuses on analytical approaches to make decisions that

better match supply and demand. Supply Chain Operation reference (SCOR) model is shown below. [3]

SCOR Domain	Source	Make	Deliver	Return
Activities	Order and receive materials and products	Schedule and manufacture, repair, remanufacture, or recycle materials and products	Receive, schedule, pick, pack, and ship orders	Request, approve, and determine disposal of products and assets
Strategic (time frame: years)	<ul style="list-style-type: none"> <li>Strategic sourcing</li> <li>Supply chain mapping</li> </ul>	<ul style="list-style-type: none"> <li>Location of plants</li> <li>Product line mix at plants</li> </ul>	<ul style="list-style-type: none"> <li>Location of distribution centers</li> <li>Fleet planning</li> </ul>	<ul style="list-style-type: none"> <li>Location of return centers</li> </ul>
Tactical (time frame: months)	<ul style="list-style-type: none"> <li>Tactical sourcing</li> <li>Supply chain contracts</li> </ul>	<ul style="list-style-type: none"> <li>Product line rationalization</li> <li>Sales and operations planning</li> </ul>	<ul style="list-style-type: none"> <li>Transportation and distribution planning</li> <li>Inventory policies at locations</li> </ul>	<ul style="list-style-type: none"> <li>Reverse distribution plan</li> </ul>
Operational (time frame: days)	<ul style="list-style-type: none"> <li>Materials requirement planning and inventory replenishment orders</li> </ul>	<ul style="list-style-type: none"> <li>Workforce scheduling</li> <li>Manufacturing, order tracking, and scheduling</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle routing (for deliveries)</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle routing (for returns collection)</li> </ul>
Plan	Demand forecasting (long term, mid term, and short term)			

Table -1: SCOR Model

### 2.3 Cloud computing as used in Logistics Industries:

Cloud computing is the development of Distributed Computing, Parallel Computing, Grid Computing, which is a super calculating model based on internet. In a remote data center, thousands of computers and servers connected to a computer cloud. "Supply chain information collaboration" is through technology information system to realize collaboration during supply chain partners, and sharing and exchange when the ones that realize operation data, market data such these information. Finally realize supply chain partners faster and better collaborate and response to the terminal customer needs. [4]

## 3. CONCLUSIONS

In today's world there is cut-throat competition amongst companies, one tries to outpace the other in this rat race. For a company to excel in these harsh market conditions Logistics and Supply-Chain Management is the key. It really doesn't matter whether you have an excellent product to sell unless it reaches your end customer at right time, that is whenever the customer wants and in right condition and state that too in affordable price. For these reasons a company should have good logistic systems. The logistics management has a great scope for the development in the Indian market and can do wonders beyond the Indian borders if properly planned. To face the demand the country has to build the infrastructure, manage the requirements of a changing demands from various sectors of supply chain, change industrial policies to smooth the progress of efficient production and movement of goods and services, implement effective managerial practices and technology to enhance the competitiveness through better management of logistics networks, and develop new models for different sectors.

## REFERENCES

- [1] Dewan Md Zahurul Islam , J. Fabian Meier b, Paulus T. Aditjandra , Thomas H. Zunder , Giuseppe Pace , Logistics and supply chain management (2012), Research in Transportation Economics 41 (2013) (3-16).
- [2] Sobhi Mejjaouli, Radu F. Babiceanu, University of Arkansas at Little Rock, Little Rock, AR 72204, USA and Embry-Riddle Aeronautical University, Daytona Beach, FL 32114, USA, RFID-wireless sensor networks integration: Decision models and optimization of logistics systems operations (2015), Journal of Manufacturing Systems 35 (2015) 234-245.
- [3] Gilvan C. Souza, Kelley School of Business, Indiana University, Bloomington, IN 47405, U.S.A, Supply Chain Analytics (2014), Business Horizons (2014) 57;595—605.
- [4] CHEN JUN, MA YAN WEI, Yangzhou Polytechnic College, Jiang su, China, 225000, The Research of Supply Chain Information Collaboration Based

## BIOGRAPHIES



Indraneel Ray: Final year student of Mechanical Engineering at MGM's Jawaharlal Nehru Engineering College, Aurangabad.