

Role of Modern Technology In Changing Supplies And Logistics Management

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Abstract

The term 'Logistics' have been taken from military where it is related to the procurement of arms and ammunitions and much needed supplies for the armed forces who are fighting with enemies at the front. Today, logistics is not only related to the movement of physical goods, but it is also related to the management of the relations of suppliers and customers. Logistics management means, the management of movement where the customers' needs are fulfilled and satisfied through integration and co-ordination of the supply chain. In this paper, the role of information technology, communication technology and auto-identification technology in managing the supplies and logistics has been discussed. A lot of innovations in this field have changed the way the goods are managed and they have made the things easier and faster. This paper discusses the impact of modern technology on in logistics and supply chain management. In this paper, it is concluded that technology has increased the effectiveness and competitiveness of supply chain management by identifying, managing and delivering the goods at a faster pace.

Keywords: Logistics, Supply Chain Management, IT and Logistics

Introduction

Logistics in a simple manner can be defined as availability of right product, in right time, at the right place, and in right condition every time. To satisfy the customer request there are a lot of stages that need to be passed and all these stages creates supply chain. To manage all these stages and the processes is called supply chain management. It starts right from manufacturing the goods and ends when the goods reach to the customer. Today new technologies are giving the organizations a competitive edge in almost all the areas of management and supply and logistics is not intact. Today, technology is playing a significant role in proper management and movement of goods from one place to another. Although, there are many technologies out there to identify, categorize and move the goods from one place to another but the degree of their success depends upon the selection of right technology adoption, availability of infrastructure, culture and management policies. In supply chain management and logistics, communication technology, information technology and automation technology has increased the speed of data processing and analysis and transmission with increased level of reliability and accuracy. There are mainly three kinds of technologies which are used in logistics and supply chain management and they are: Automatic Identification Technology, Communication Technology and Information Technology.

Objectives of the study

This study revolves around two main objectives.

1. To discuss the different types of technologies which are used in logistics and physical goods supply chain management.
2. To discuss the impact of technology on the supply chain management and logistics.

Research Methodology

This study is based upon the secondary data and information which has been collected from various sources like newspapers, magazines, research journals and the internet. All the data and the information used in this paper have already been collected and used by other scholars too.

Here we will discuss different types of technologies that are being used in logistics and supply chain management in today's era.

1. Automatic Identification Technology (AIT)

This is that technology which enables the direct entry of data or information in the computer system without operating the keyboard or inputting anything manually. Few technologies which use AIT are Radio Frequency Identification, Voice Recognition and Bar Coding etc. These technologies save time and cost and ensure speed and convenience of data storage as well as processing of information. These technologies can be discussed as under.

A. Radio Frequency Identification (RFID)

RFID is used as an alternative to Barcodes to communicate the data related to inventory to the reader via radio waves. This technology exchanges the information via radio waves from the object to the receiver.

The following components are there in RFID technology.

- Tags called Radio Frequency Tags (RFTs), which includes semi-conductor chip and an antenna.
- Readers which can write too.
- Antennas from which one is on the tag and other is on the reader.
- Application software

Radio Frequency Tags (RFTs) are simply the chips that can store variety of data in the microcircuits. These tags are programmable and they have erasable memory. The data which is stroed on the micro chips is communicated to the reader through waves and the basic principle of emitting the data is the antenna which emits the signals. Like the bar codes, it also contains a lot of information about the product like place of dispatch, place of arrival, temperature, time of stay and GPS information etc. It can be very helpful in reducing

the paperwork and clearing the custom and entry posts quickly and accurately. The RFTs can be applied to full containers and stocks and even the vehicles whereas the bar codes can be applied to the individual inventory items.

Impact of Radio Frequency Tags:

- The manufacturers can manage the levels of inventory in a better way.
- It eases out the complex operations of many services like courier services.
- It improves and makes it possible to track various services offered by different logistic sectors like railway and postal.

B. Bar coding – Bar Codes are the sequence of parallel lines of different thickness and different spaces in between. Those particular bars can be read through a scanner. There is a lot of information printed in the bars like country code, item description, manufacturer, date of manufacturer, price and contents etc. These bar codes are used in almost every industry like retail, pharma, electronics, automobiles and consumer goods etc.

Bar coding is used to take advantages like:

- Reduced paper work
- Reduced lead time
- Ease in identification of items
- Ease in inspection and dispatch
- Reduced human error
- Increase in the speed, accuracy and reliability of logistics systems

Impact of Bar code technology

- **Procurement** - The goods which are procured from the supplier have bar codes. When the goods are received, then a scanner puts all the information from the bar code to the computer so that the inventory can be easily tracked.
- **Processing** - When the goods are processed then again the information through the bar codes enter into the system and then it is stored in a central computer where the net requirement and inventory balance is calculated automatically.
- **Distribution** - At the time of distribution bar code technology reads and enters the information through scanner and keep records of the goods sent to customer in different orders.

C. Voice Interactive System

This technology enables the workers to add, find and remove the items from the database just through his voice commands. It makes the worker hands free and he can keep working while entering the data through this voice messages. Through this technology the worker

can read the information about a product while driving its indoor vehicle for moving the goods and even while moving from one warehouse to another within the storage space. The central computer keep updated because it can take commands and information from the multiple workers at the same time.

2. Communication Technology

Communication technology plays an important role in the logistics and supply chain management. With the help of a good communication technology, the flow of goods and services can be made better through greater speed and quick communication.

A. Electronic Data Interchange (EDI)

EDI technology is the technology which is used to transfer the documents like cheques, invoices and debit, credit notes from one computer to another. It reduces the paper work and make the communication faster. In EDI, the documents are composed by one software and transferred to another computer where the same or another software interpret the documents. Through this technology the documents are processed in fractions of seconds and can be sent at distant places within few seconds.

Impact of EDI technology in logistics and supply chain management:

- Decrease in transaction cost due to paperless transfer of documents.
- Reduction in the time of processing as the processing is done electronically.
- Competitiveness is increased with reduced processing time and delivery time of the goods.
- The network and the relations improve with quick processing of cheques, bills, invoices and other related documents and efficient handling of the orders.

B. Very Small Aperture Terminal (VSAT)

This is also a part of communication technology. This technology improves the communication between the driver, consignor and the consignee. In this technique, a small dish antenna is fixed on the top of the vehicle which transmits the information about the location of the vehicle, place, date and time of the vehicle to consignor and consignee. In this way, the accurate and upto date information can be sent to consignor and consignee about the delivery position and they can be better informed about the status of the goods.

C. Web Based Tracking

Almost all the logistic services in India like Bluedart and Fed-ex are providing web based tracking service to their clients. With the help of this service, clients can check the status of their deliveries online and can be informed about the current location and expected date of delivery. The reports regarding logistics can also be downloaded from the internet. The clients can also be communicated regarding payment and dispatch schedules through these services.

D. Geographical positioning System (GPS)

GPS is the most advanced technology used in the developed countries to know the position of any vehicle in an area. With the help of geo satellites the information about a vehicle is traced by measuring their position in respect of latitude and longitude. When the position of a vehicle is known then it can be transmitted to the consignor and consignee and they can be very well known about the delivery status and expected time of delivery.

E. Information Directed System (IDS)

This system improves the productivity and efficiency of the warehouses. Through this system, the material is handled in a sophisticated way. In this technique, a centralized computer controls the material handling equipment and the movements are recorded in the computer and then transmitted to the individual computers. It can also record the maximum loading capacity and handling speed of the vehicles. It results in easy handling of multiple order picking and numerous vehicle loading by the same equipment.

3. Information Technology (IT)

Information technology works with the help of hardware and software. Through Information technology, both of the components capture, analyze and gather information and disseminate the same whenever it is needed. Through IT the organizations are connected with each other with the help of a network and they can share information regarding supply chain and aligning supply chain activities.

There are so many tools of IT which are used in logistics and supply chain like:

A. Enterprise Resource Planning (ERP)

ERPs are the softwares which cater to specific needs of the businesses. ERP provides easy management of complex tasks and offers the following advantages to the user:

- Helps in optimization of supply chain and logistics.
- Requirement of the customers can be responded quickly.
- Reduction in paper cost as well as cost of inventory.
- Improvement in the inventory turnover ratio.
- Reduction in logistics cost and supply chain management.

B. Distribution Requirement planning(DRP)

This is a very sophisticated IT tool which helps in reducing the distribution cost in the form of Freight, Fuel and Manpower cost etc. This technique takes into consideration multiple distribution stages and the features of distribution system so that the demand of the customers can be fulfilled through multiple distribution centers located in different places. It helps in sending the shipments to various locations spread over vast geographical area.

C. Automated Inventory tracking system (AITS)

Using this technology, the supplier who makes the regular supplies comes to know about the various positions of inventory from different locations and main warehouse. When the information is conveyed to the supplier then the supplier may initiate the action to replenish the inventory item depending on the requirement information sent by AITS.

Impact of IT on functions of logistics and supply chain management are as follows

- Easy and quick procurement of goods through e-procurement with the help of centralized and digital information and with various tools which can automate a lot of tasks.
- The tools in IT like web-based collaboration enables the sharing of inventory information with supply chain partners to forecasts, replenishment and delivery of required items to keep the inventory levels in order.
- Before the use of IT in logistics, the scheduling was done manually, but with the advent of IT, the scheduling is done through softwares which create a very strong connection between partners and the customers. The best thing is that it improves the relationships with customers as they get their required inventories right in time through proper scheduling.
- As discussed earlier, with the advent of IT and use of the same in the logistics and supply chain management, the supplier get notification about the request of replenishment of the inventory. In this case, the supplies need not be forwarded from one department to another and it decreases the cost of shifting the inventories and helps in the management of the inventory as well.
- Earlier, the complaints sent by customers could not reach the concerned departments, but now when the logistics are managed through IT, the complaints regarding supply of inventory etc. can be filed online and they reaches to the departments automatically and instantly. It leads to quick removal of their grievances.
- In the initial period customer service was only reactive. The complaints or information was difficult to reach the concerned department and was time consuming process. However with the advent of IT, customer service is more proactive as it reaches the customer through internet and takes continuous feedback from them.

Conclusion

Today a lot of technologies are out there which are enhancing the effectiveness, competitiveness and performance of logistics and supply chain management. Choosing the right technology is a really crucial task to perform various activities in logistics. Today, technology is not only helping in correctly calculating and fulfilling the requirement of inventory, but it is playing huge role in the satisfaction of customers and reducing the cost for the supplier as well as for the business itself. The use of sophisticated technology is enabling the increased management of logistics and supply chain. If the business uses the right technology, then everyone like supplier, warehouses, customers and the business gets benefitted. The quality and the error free experience give the business opportunities to

expand and work beyond traditional limits. As more and more technologies are being innovated every day, it can be expected that in the years to come, technology is going to change the logistics and supply chain management completely.

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