

# An Approach to Logistics Systems Planning and Control

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**Abstract**— Logistics is concerned with the organization, movement and storage of material and people. The term logistics was first used by the military to describe activities associated with maintaining a fighting force in the field and, in its narrowest sense, describes the housing of troops. Over the years the meaning of the term has gradually generalized to cover and service activities. The domain of logistics activities is providing the customer of the system with right product, in the right place, at the right time. This ranges from providing the necessary subcomponents for manufacturing, having inventory on the shelf of a retailer, to having the right amount and type of blood available for hospital surgeries. A fundamental characteristic of logistic is its holistic, integrated view of all the activities that it encompasses. So, while procurement, inventory management, transportation management, warehouse management and distribution are all important components, logistics is concerned with the integration of these and other activities to provide the time and space value to the system. Excess global capacity in most types of industry has generated intense competition. At the same time, the availability of alternative products has created a very demanding type of customer, who insists on the instantaneous availability of a continuous stream of new models. So the providers of logistics activities are asked to do more transactions, in smaller quantities, with less lead time, in less time for less cost, and with greater accuracy. New trends such as mass customization will only intensify these demands. The accelerated pace and greater scope of logistics operations has made planning-as-usual impossible. Even with increased number and speed of activities, the annual expenses associated with logistics activities in the United States have held constant for the last several years around ten percent of the gross domestic product. Given the significant amounts of money involved and the increased operational requirements, the planning and control of logistics systems has gained widespread attention from practitioners and academic researchers alike. To maximize the value in a logistics system, a large variety of planning decisions has to be made, ranging from the simple warehouse-floor choice of which item to pick next to fulfill a customer order to the corporate-level decision to build a new manufacturing plant. Logistics planning supports the full range of those decisions related to the design and operation of logistics systems.

**Index Terms**— Logistics Systems, Excess global capacity, Logistics planning supports.

## I. INTRODUCTION

Logistics deals with the planning and control of material flows and related information both in public and private

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sectors. Broadly speaking, its mission is to get the right materials to the right place at the right time, while optimizing a given performance measure (e.g. minimizing total operating cost) and satisfying a given set of constraints (e.g. budget constraint). Logistics is key to the modern economy. Almost every organization whether in public sector or in private sector are facing the problem of getting the right materials to the right place at the right time? Increasingly competitive markets are making it imperative to manage logistics systems more and more efficiently. There exists a vast amount of literature, software packages, decision support tools and design algorithms that focus on isolated components of the logistics system or isolated planning in the logistics systems. In the last two decades, several companies have developed enterprise resource planning (ERP) system in response to the need of global corporations to plan their entire supply chain. In their initial implementations, the ERP system were primarily used for the recording of transactions rather than for the planning of resources on enterprise-wide scale. Their main advantage was to provide consistent up-to-date and accessible data to the enterprise. In recent years, the original ERP system have been extended with advanced planning systems (APSs). The main function of APSs is for the first time the planning of enterprise wide resources and actions. This implies a coordination of the plans among several organizations and geographically dispersed location. Logistics planning and control requires an integrated, holistic approach, it provides a comprehensive and modeling-based treatment of the complete distribution system and process, including the design of distribution centers, terminal operations and transportation operations. Basically there are three major components of logistics systems-inventory, transportation and facilities are playing vital role as a whole.

## II. WORK-PLAN

This study will provide in depth knowledge on logistics and supply chain management that will be most useful to the engineering, computer science, and management science students. The goal of this study is to give students a solid understanding to reduce costs and improve service levels in logistics systems by using modern analytical tools. The key issue is to decide how and when raw materials, semi-finished and finished goods should be acquire, moved and stored. Logistics problems also arise in firms and public organizations producing services. For example we take the case of garbage collection, mail delivery, public utilities and after sales services.

## III. HOW LOGISTICS SYSTEMS WORK:

Logistics systems are made up of three main activities:  
i) Order processing

- ii) Inventory management
- iii) Freight transportation.

#### IV. ORDER PROCESSING

Order processing is strictly related to information flows in the logistics system and includes a number of operations. Customers may have to request the products by filling out an order form. These orders are transmitted and checked. The availability of the requested items and customer's credit status are then verified. Later on, items are retrieved from the stock (or produced), packed and delivered along with their shipping documentation. Finally, customers have to be kept informed about the status of their orders.

Traditionally, order processing has been a very time-consuming activity (up to 70% of the total order-cycle time). However, in recent years it has benefited greatly from advances in electronics and information technology. Bar code scanning allows retailers to rapidly identify the required products and update inventory level records. Laptop computers and modems allow salespeople to check in real time whether a product is available in stock and to enter orders instantaneously. EDI allows companies to enter orders for industrial goods directly in the seller's computer without any paperwork.

#### V. INVENTORY MANAGEMENT

Inventory management is a key issue in logistics system planning and operations. Inventories are stockpiles of goods waiting to be manufactured, transported or sold. Typical examples are

- Finished products stocked in a DC prior to being sold.
- Finished products stored by end-users (consumers or industrial users) to satisfy future needs.
- Components and semi-finished products (work-in-process) to be manufactured or assembled in a plant.

There are several reasons why a logistician may wish to hold inventories in some facilities of the supply chain.

- Improving service level.
- Reducing overall logistics cost.
- Coping with randomness in customer demand and lead times.
- Making seasonal items available throughout the year.
- Speculating on price patterns.
- Overcoming inefficiencies in managing the logistics system.

The aim of inventory management is to determine stock levels in order to minimize total operating cost while satisfying customer service requirements. In practice, a good inventory management policy should take into account the following five issues:

- The relative importance of customers
- The economic significance of the different products.
- Transportation policies.
- Production process flexibility.
- Competitors' policies.

#### VI. FREIGHT TRANSPORTATION

Freight transportation plays a key role in today's economies as it allows production and consumption to take place at locations that are several hundreds or thousands of kilometres away from each other. As a result, markets are wider, thus stimulating direct competition among manufacturers from different countries and encouraging companies to exploit economies of scale. Moreover, companies in developed countries can take advantage of lower manufacturing wages in developing countries. Finally, perishable goods can be made available in the worldwide market. Freight transportation often accounts for even two-thirds of the total logistics cost and has a major impact on the level of customer service. It is therefore not surprising that transportation planning plays a key role in logistics system management.

#### VII. CONCLUSION

In logistics system transportation services play a key role. Transportation services come in a large number of variants. There are five basic modes – **ship, rail, truck, air and pipeline**, which can be combined in several ways in order to obtain door-to-door services such as those provided, for example, by intermodal carriers and small shipment carriers. It is most compulsory to a shipper to must take two fundamental parameters into account: **price (or cost) and transit time**. As a result of globalization, transportation needs have increased. In recent years, several strategic and technological changes have had a market impact on logistics. Among these, three are worthy of mention: **globalization, new information technologies and e-commerce**. In nutshell, we may say that a perfectly designed logistic system is playing a very vital role in the progress of any enterprise/organization of public or private sector.

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