

MANAGEMENT OF INTERNAL AND EXTERNAL LOGISTICS FLOW OF MATERIALS

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Abstract. All models, processes and means of handling, storage, internal transportation, management of raw materials in an enterprise, necessary to developing the production process are considering industrial logistics. For an enterprise, its logistics management system and integration in partner systems, constitutes a strategic advantage. Through its activities, logistics is vital in creating such an advantage, it can positively affect market share and profitability of the undertaking, if is seen as a strategic resource, not only as a simple activity. By this paper is aims reporting logistics at different activities as the planning, management and control the flow of goods and services, people and information. This includes all the necessary steps to achieve timely delivery of products, goods and services from initial point to destination.

Keywords: supply chain, cross-dock, milk run, internal logistics flow, external logistics flow

1. Introduction

Operations management of logistics shows how to plan and manage the company production process, starting right from selection of suppliers, material movement within the company and distributing finished products to final consumer. Studying this area requires knowledge of inventory management, production planning and control, management of quality, transportation and distribution management. So, the logistics flow provides integrated management of all materials and finished products of company. The fundamental objective of logistics is to provide services to customers with lowest cost. Integrated management of enterprise operational cycle including: design, supply, production, distribution, transport and storage, delivery and post-sales assistance [1, 2].

The management of the supply chain means the coordination of the product, service and information flow inside and outside of networks in order to reach consumer satisfaction. Consequently, the supply chain indicates all those organizations and their activities, which forward the product from the raw material source to the end user, at the same time, include the information system, assuring communication among the participants of this process [3, 4].

2. Synchronous material flow

The main component of industrial logistics subsystem is handling, which is often essential part of other basic functions like transportation, storage, storage, which all are industrial logistics. Material handling is to provide the necessary

quantities of suitable material, under appropriate conditions, to place and right time, with appropriate guidance and at minimal cost, using effective methods of moving them. Handling is typical material flow. Handling subsystem consists of handling facilities that perform functions handling [5].

Synchronous material flow is a process or system that produces a continuous flow of material and products driven by a fixed, sequenced and leveled vehicle schedule, utilizing flexibility and lean manufacturing concepts. Are four sub-processes of synchronous material flow: plan and implement logistics, schedule component production, manage internal logistics and manage external logistics.

2.1. Management logistics plan

Management logistics plan is a disciplined process used to develop a plan for every part, coordinate the internal and external logistics process, using a packaging plan, development of a workstation plan, create delivery strategy, set-up of market areas (market place), development of replenishment plan, establishing material handling routes and facilitating development of external logistics plan (milk run) [10].

2.2. Schedule component production

This process will ensure that production whit the manufacturing plants is properly coordinated to support customer requirements, inventory is maintained at minimum levels, material is ordered on a timely basis to support production, it planning constraint operations, it ensure small

repeatable batches, work in process buffers (that are planned and controlled through minimum and maximum levels) and allow actual usage (relative to min/max) trigger part changeovers.

For set minimum and maximum quantities of materials needed, need to calculate the daily demand (daily customer demand is equal with parts / day), size of released quantity (batch size), manufacturing frequency (how often it produce the batch size and how many days from each to batch), lead time (time needed to produce the released quantity). Safety stock depends by variability of the demand, internal inefficiencies, lead time and manufacturing frequency. Increasing manufacturing frequency (therefore reducing set-up times) increases customer service and reduces inventory [10].

2.3. Manage internal logistics

This process is based on a disciplined in-plant replenishment process used to pull material to the point of fit (pull system), involving both the production employee and the material handler in the replenishment process, using a disciplined material replenishment system within the four walls of the plant, using visual factory techniques and monitoring the process to ensure the process is continually improved [10].

To achieve this, I considered it important to plan relevant indicators that should be permitted to verify optimizations.

Table 1. Setting indicators

Objectives of management logistics flow	Indicators
Supply of materials by machinery operators	from 12 to 0%
Number of accidents caused by trucks	from 8 to 0
Maintenance costs for carriers	from 8 to 3T€
Surfaces to provide material	from 59 to 30%
Loading of conveyors	from 40 to 85%
Number of forklifts	from 38 to 1
Number of logistics operators	from 47 to 41

2.4. Manage external logistics

This process is based on shipment of material more frequently, shipments in smaller quantities, delivery of material at specific times, shipping smaller quantities, more frequently, and validating shipments at the point of pick-up and is managed by a lead logistics provider.

Frequent shipment reduces inventory and non-value added moves and will increase

flexibility. The main docks are unloading by behind, unloading from one side and unloading on both sides. Visual management show all the docks and material areas have to be clearly identified and marked for facilitating where to find material and avoiding mistakes. A control board has to be used in every dock to follow the loading and unloading operations are done on time. The timings for the unloading operations (window times) should be based over the stock to be unloaded. The time has to be shown on the board [3, 10].

3. Management of internal and external logistics flow

Purpose of frequent deliveries is to reduce inventory, support the customer and give the customers what they want, when they want it and in the quantity they want. Monthly delivery leads to blocking of cash, storage space to contain, and likely hood that there will be scrap as milk sours. Daily delivery lead to minimal cash investment, small storage space, and product is always fresh.

The inbound or outbound flow are milk run, direct freight, cross-dock, vendor managed inventory, distribution center and external warehouse.

3.1. Cross-dock management

The term cross docking refers to moving product from a manufacturing plant and delivers it directly to the customer with little or no material handling in between. Cross docking not only reduces material handling, but also reduces the need to store the products in the warehouse. In most cases the products sent from the manufacturing area to the loading dock has been allocated for outbound deliveries.

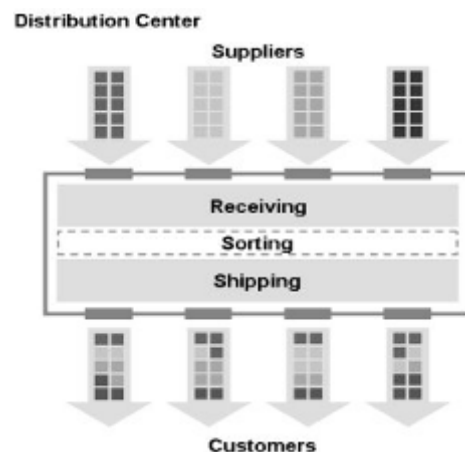


Figure 1. Cross-dock process [11]

Table 3 presents the steps on the route of a product from supplier to customer. For this I realized a sheet which showing the external logistics flow of materials. The first step refers to the distribution center suppliers, where the materials are ready to be sent to the client. The next step refers to transport, route of materials

from the supplier to the central cross-dock. In this step occurs the download of entry pallets, the pallets are transported then to a waiting area, then the materials are received and redistribution. Finally the pallets are uploading to be sent to customers.

Table 3. External logistics flow sheet

Steps	Logistics flow	Task description	
1		Distribution centre suppliers	
2		External transport	
3		Download entry pallets	
		Internal transport	
		Waiting	
4		Internal receiving	
		Waiting	
5		Redistribution	
		Waiting	
		Internal transport	
6		Upload output pallets	
7		External transport	
8		Customer receiving	

A common example is a facility operated by a manufacturer with many plants in order to efficiently gather materials from many suppliers. When a truck loaded with pallets of goods from suppliers arrives on one side of the dock, the pallets are immediately unloaded and taken to several shipping lanes for loading onto outbound trucks bound for different facilities. A cross-dock is not a warehouse because it does not store goods. Instead, goods are usually unloaded from inbound vehicles and moved to shipping lanes for outbound vehicles in one step. The systems for a successful cross-docking on a large scale include automated material handling, warehouse management systems, order processing systems, quality controls systems and strong relationships between supply chain partners [8, 9].

3.2. Milk run

A method to extend the flow of materials between rounding vehicles is to make multiple pick-ups and drop-offs at many facilities. Using this technique with milk run vehicles is possible to reduce inventories and response times along a value stream. Milk run between facilities is similar in concept to material handling routes within facilities [8].

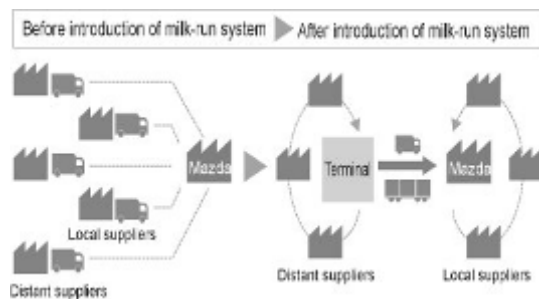


Figure 2. Milk run process [11]

4. Conclusions

Management logistics flow lead to standard rules to shift from stock management to flow management. With frequent deliveries are less products in work (WIP), less storing and handling of material, less space required for material, less scrap if the customer changes the design of the product, or if we have a problem in our process and problems are visualized faster.

Cross-docking favours the timely distribution of freight and a better synchronization with the demand. It is particularly linked with the retail sector (often within large retailers), but can also be apply to manufacturing and distribution. Cross-docking is mainly dependant on trucking [9].

A cross-dock is a practice in management logistics flow, intended to disconnect the frequency and timing of inbound and outbound trucks. The purpose of a cross-dock is to optimize the logistic flow. A cross-dock is not a warehouse, it does not store goods, and goods move from inbound directly to the, outbound shipping lanes and the cross-dock floor is cleared every twenty-four hours.

This paper presents a sheet, which is showing the external logistics flow of materials, the steps on the route of a product from supplier to customer. Many companies have benefited from using cross-docking. Some of the benefits include reduction in labour costs, as the products no longer requires picking and put away in the warehouse, reduction in the time from production to the customer, which helps improve customer satisfaction and reduction in the need for warehouse space, as there is no requirement to storage the products.

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