

A Course Material on

LOGISTICS AND SUPPLY CHAIN MANAGEMENT



Subject : LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Subject Code : BBA404

Class : BBA 4th Semester/ 2nd Year

Prepared by:
Dr. Chaitali Bhattacharya
Faculty of Commerce and Management
Rama University, Kanpur
2021

LECTURE -9

1.5 SCM - Performance Measures

Supply chain performance measure can be defined as an approach to judge the performance of supply chain system. Supply chain performance measures can broadly be classified into two categories –

- **Qualitative measures** – For example, customer satisfaction and product quality.
- **Quantitative measures** – For example, order-to-delivery lead time, supply chain response time, flexibility, resource utilization, delivery performance.

Here, we will be considering the quantitative performance measures only. The performance of a supply chain can be improvised by using a multi-dimensional strategy, which addresses how the company needs to provide services to diverse customer demands.

Quantitative Measures

Mostly the measures taken for measuring the performance may be somewhat similar to each other, but the objective behind each segment is very different from the other.

Quantitative measure is the assessment used to measure the performance, and compare or track the performance or products. We can further divide the quantitative measures of supply chain performance into two types. They are –

- **Non-financial measures**
- **Financial measures**

Non-Financials Measures

The metrics of **non-financial measures** comprise cycle time, customer service level, inventory levels, resource utilization, ability to perform, flexibility, and quality. In this section, we will discuss the first four dimensions of the metrics –

I. Cycle Time

Cycle time is often called the lead time. It can be simply defined as the end-to-end delay in a business process. For supply chains, cycle time can be defined as the business processes of interest, supply chain process and the order-to-delivery process. In the cycle time, we should learn about two types of lead times. They are as follows –

- Order-to-delivery lead time
- Supply chain lead time

The order-to-delivery lead time can be defined as the time of delay in the middle of the placement of order by a customer and the delivery of products to the customer. In case the item is in stock, it would be similar to the distribution lead time and order management time. If the ordered item needs to be produced, it would be the summation of supplier lead time, manufacturing lead time, distribution lead time and order management time.

The supply chain process lead time can be defined as the time taken by the supply chain to transform the raw materials into final products along with the time required to reach the products to the customer's destination address.

Hence it comprises supplier lead time, manufacturing lead time, distribution lead time and the logistics lead time for transport of raw materials from suppliers to plants and for shipment of semi-finished/finished products in and out of intermediate storage points.

Lead time in supply chains is governed by the halts in the interface because of the interfaces between suppliers and manufacturing plants, between plants and warehouses, between distributors and retailers and many more.

Lead time compression is a crucial topic to discuss due to the time based competition and the collaboration of lead time with inventory levels, costs, and customer service levels.

II. Customer Service Level

The customer service level in a supply chain is marked as an operation of multiple unique performance indices. Here we have four measures to gauge performance. They are as follows –

- **Order fill rate** – The order fill rate is the portion of customer demands that can be easily satisfied from the stock available. For this portion of customer demands, there is no need to consider the supplier lead time and the manufacturing lead time. The order fill rate could be with respect to a central warehouse or a field warehouse or stock at any level in the system.
- **Stock-out rate** – It is the reverse of order fill rate and marks the portion of orders lost because of a stock-out.
- **Back-order level** – This is yet another measure, which is the gauge of total number of orders waiting to be filled.
- **Probability of on-time delivery** – It is the portion of customer orders that are completed on-time, i.e., within the agreed-upon due date.

In order to maximize the customer service level, it is important to maximize order fill rate, minimize stock-out rate, and minimize backorder levels.

III. Inventory Levels

As the inventory-carrying costs increase the total costs significantly, it is essential to carry sufficient inventory to meet the customer demands. In a supply chain system, inventories can be further divided into four categories.

- Raw materials
- Work-in-process, i.e., unfinished and semi-finished sections
- Finished goods inventory

- Spare parts

Every inventory is held for a different reason. It's a must to maintain optimal levels of each type of inventory. Hence gauging the actual inventory levels will supply a better scenario of system efficiency.

IV. Resource Utilization

In a supply chain network, huge variety of resources is used. These different types of resources available for different applications are mentioned below.

- **Manufacturing resources** – Include the machines, material handlers, tools, etc.
- **Storage resources** – Comprise warehouses, automated storage and retrieval systems.
- **Logistics resources** – Engage trucks, rail transport, air-cargo carriers, etc.
- **Human resources** – Consist of labor, scientific and technical personnel.
- **Financial resources** – Include working capital, stocks, etc.

In the resource utilization paradigm, the main motto is to utilize all the assets or resources efficiently in order to maximize customer service levels, reduce lead times and optimize inventory levels.

V. Financial Measures

The measures taken for gauging different fixed and operational costs related to a supply chain are considered the financial measures. Finally, the key objective to be achieved is to maximize the revenue by maintaining low supply chain costs.

There is a hike in prices because of the inventories, transportation, facilities, operations, technology, materials, and labor. Generally, the financial performance of a supply chain is assessed by considering the following items –

- Cost of raw materials.
- Revenue from goods sold.
- Activity-based costs like the material handling, manufacturing, assembling rates etc.
- Inventory holding costs.
- Transportation costs.
- Cost of expired perishable goods.
- Penalties for incorrectly filled or late orders delivered to customers.
- Credits for incorrectly filled or late deliveries from suppliers.
- Cost of goods returned by customers.
- Credits for goods returned to suppliers.

In short, we can say that the financial performance indices can be merged as one by using key modules such as activity based costing, inventory costing, transportation costing, and inter-company financial transactions.