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Supply Chain Management as A Process in Distribution Channel

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Abstract

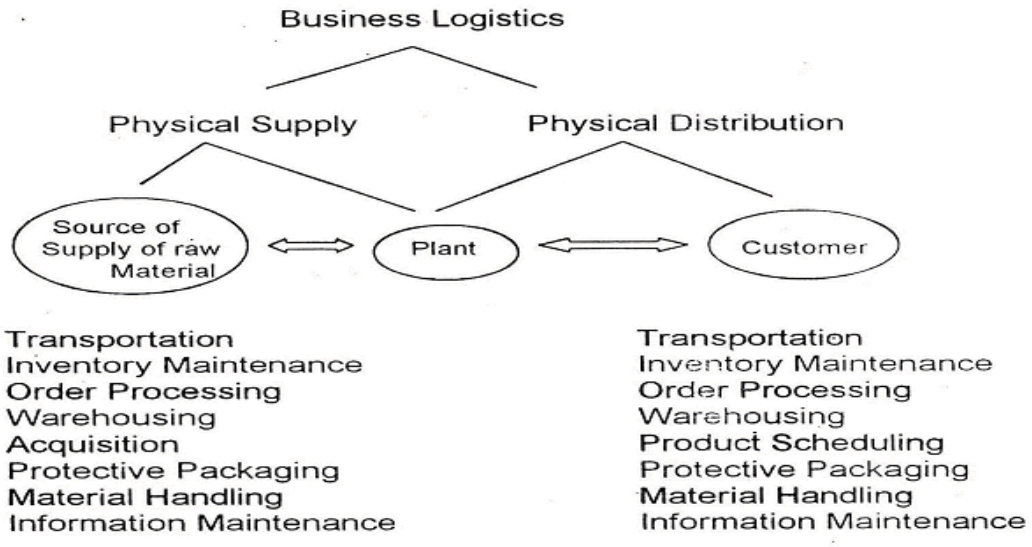
Supply Chain Management and Logistics refer to the art and science of managing the flow of materials and products from source to user. The logistics system includes the total flow of materials, from the acquisition of raw materials to delivery of finished products to the ultimate users. As such, it includes the activities of sourcing and purchasing; conversion (manufacturing) including capacity planning, technology solution, operations management, production scheduling, and materials planning (MRP II), distribution planning and management of industry warehouse operations; inventory management and inbound and outbound transportation; and linkage with customer service, sales, promotion, and marketing activities.Sometimes organizations facing a major problem of huge amount of inventory at different echelons and high imbalance in the distribution of the product volume. This makes inventory available at the points where there is no demand and the branches where there is demand lack sufficient stock. Further the improper distribution of the stocks leads to expiry. This paper studied the the use of basic principles, problems, methodology and various tools and techniques available to handle the above scenario.

Keywords: MRPII, logistics, Bottom up

Introduction

A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished goods and supply it to customers. Supply Chain exists in

both service and manufacturing organizations. The supply chain is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of ultimate consumer. Thus for example a shirt manufacturer is a part of a supply chain that extends upstream through the weavers of fabrics to the manufacturers of fibers, and downstream through distributors and retailers of final consumer. Each of these organizations in the chain are dependent upon each other by definition and yet paradoxically by tradition do not closely co-operate with each other.



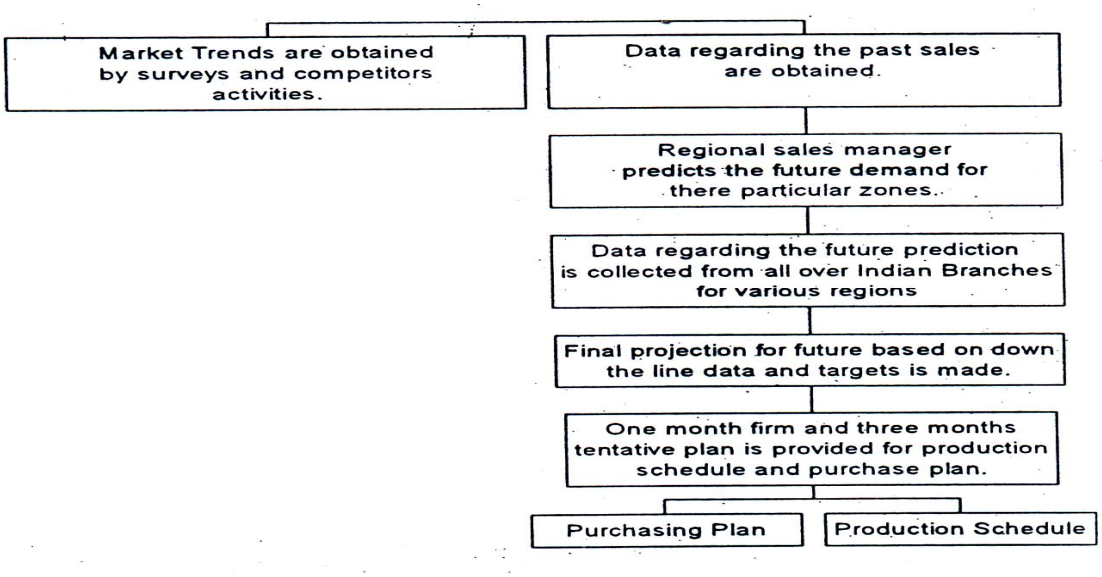
Aims and Objectives of the present research:

Following are the objectives of this study:

- To study the existing Supply Chain, Forecasting system and distribution planning of the organization.
- Delayering of the Distribution Channel, in order to ensure proper and balanced distribution of stocks.
- Examine implications of compressing the lead-time on inventory in the entire Supply Chain.

Methodology

The methodology adopted here is that of 'Bottom Up' approach. All the branch managers project the future need based on the past sales trend and intuitive judgement. This judgement is primarily based on the market reaction, which is obtained by frequent surveys. This whole process is carried out for three months tentative and one month fixed.. A typical forecasting system, which is followed by the organization, is shown in Figure 1.1.



Demand is higher than forecast causes us to revise the average upward, and demand that is lowers than the forecast causes a downward revision.

The equation for a single exponential smoothing forecast is simply

$$F_t = F_{t-1} + \alpha (A_{t-1} - F_{t-1}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

where F_t = The exponentially smoothed forecast made for the period t

F_{t-1} = The exponentially smoothed forecast made for the prior period.

A_{t-1} = The actual demand in the prior period

α = The desired response rate, or smoothing constant.

This equation states that the new forecast is equal to the old forecast plus a portion of the error (Chase et.al 2004).

Inventory Distribution

For fixed order quantity system, the various levels can be fixed for the following conditions:

1. Variable Demand and Constant Lead Time
2. Constant Demand and Variable Lead Tlime
3. Variable Demand and Variable Lead Time

In this research, variable demand and variable lead time is considered because the damand of the item is continuously changing and the lead time is also not fixed.

Control Levels for Variable Demand and Variable Lead Time

The Various levels are as follows:

$$\text{Re-order Level} = R = \bar{U} + Z\sigma_U \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

$$\text{Buffer Stock} = B = Z\sigma_U \quad \ldots\ldots\ldots\ldots\ldots\ldots 2$$

$$EOQ = \sqrt{2C_oD/C_h} \quad \ldots\ldots 3$$

$$\bar{U} = (\bar{d}) \times (\bar{t}_L) \quad \ldots\ldots 4$$

$$\sigma_U = \sqrt{Var\ U} \quad \ldots\ldots 5$$

$$Var\ U = (Var\ d) \times (t_L) + (Vart_L) \times (d)^2 \quad \ldots\ldots 6$$

Where, U=random variable representing demand during lead time
σ= standard deviation of demand during lead time
-U= expected lead time demand
R= re-order level
B= Buffer Stock
Z= number of standard deviations needed for a specific confidence level (in this study, service level is assumed to be 95%, Z=1.645)
_d= average daily demand
tL= lead time
_tL= average Lead time
σU= standard deviation of U
Var d= Variance of Daily Demand
VartL= Variance of Lead time

Conclusion

Effective and efficient distribution network, for a consumer goods industry, is very essential for a responsive supply chain. The focus in the present study has been on the following elements of distribution network in supply chain context:

- Forecasting the future demand.
- Balancing and delayering of the distribution network setup.
- Scientific assortment of stocks