CHAPTER V

SUPPLY CHAIN MANAGEMENT-DEMAND AND SUPPLY PLANNING, DELIVERY PLANNING AND SOURCING

This chapter deals with demand and supply planning, delivery planning and sourcing in DR Reddy’s Laboratories Ltd.

Delivery Planning & Sourcing – Introduction
Dr. Reddy’s Laboratories is an established and reputed manufacturer of APIs and formulations with manufacturing facilities at various locations across the world. It has in-house as well as contract manufacturing facilities for manufacturing its products. Its customer base is spread all over the world. Formulations Technical Operations is one of their strategic business units responsible for manufacture and supply of formulations, both Branded Formulations and Generics. In order to streamline the operations of supply of their products to the market, Dr. Reddy’s has established a Supply Chain. Delivery Planning and Sourcing form a part of this supply chain. As a part of its strategy formulated for its viable vision, a supply chain project implemented the earlier policy of demand forecast and supply planning has now been changed to replenishment of stocks at depots and CFAs. For finished goods, the stock position at each of the CFAs and depots is updated on a daily basis which is monitored through software called Symphony.

The minimum stock to be maintained along with the actions to be initiated at the various levels of stocks is programmed in the ERP software SAP. Similar programming is done for Raw materials and packing materials also. Through this system, the
entire process of planning of raw and packing materials required for replenishment is automated. Sourcing is further divided into Strategic Sourcing (RM / PM / MRO / Promotional items) and Capital Sourcing (Capital equipments and Project purchases). Capital Sourcing takes care of the capital purchase requirements of the entire Dr. Reddy's group.

Considering the present business challenges and the focus on the customer satisfaction, total quality management, continuous improvement, there is a clear need to create an environment in which the Delivery Planning and Sourcing becomes a strategic process and will have the ability to make a major contribution to achieve improvements in corporate profitability. As a first step in that direction, the system was streamlined in line with the requirements of ISO 9001:2000 and was certified for the same in the year 2007. The change being incorporated now is a step towards realization of the supply chain project “Viable Vision”.

Procedure for Delivery Planning & Scheduling
The objective of the department is to lay down a procedure for Delivery Planning so as to ensure that the requirements of market are adequately covered while planning production. The procedure covers delivery planning and material planning for all manufacturing units of formulations including LL/TPs and Generics of Dr. Reddy’s Laboratories.

Delivery Planning
The system of “Supply Planning” followed earlier was focused on building up stocks at the various CFAs and depots based on the demand forecast furnished by demand planners. As the actual sale may not match the forecast, the above approach was
often resulting in stock outs of certain items and excess stocks in others. Now, in line with the viable vision, the focus for planning has been shifted from building up stocks to maintaining predefined stocks through daily monitoring and replenishment. This planning is fully automated through SAP / SYMPHONY. For each SKU of finished goods, a base stock level is defined and set in SYMPHONY CFAs & Depots update their daily stocks in SAP. The stock levels are displayed in color code based on their percentage of the base level. The coding used is: Above 100% - Minus Green, from 67 to 100% - Green, from 34 to 66% - Yellow, from 1 to 33% - Red and 0% - Black

Daily at 1200 Hrs. this data is analyzed by SYMPHONY and communicates results to SAP. When the stock reaches the “Green / Yellow” band (Select whichever is appropriate), SAP generates a “Production Order” for the product for the respective manufacturing unit. These orders are accessed and acted upon by both Delivery planner and plant scheduler. The quantities of the orders are always based on the minimum acceptable batch size and lot size.

Production Planning
The scheduler prepares production plan based on the coded displays, work in process and availability of resources. Priorities are fixed based on the colors, Black getting the top priority followed by Yellow and Green. The manufacturing unit undertakes production according to the plan

Progress review & Change Management:
Progress is reviewed weekly. Deviations / delays are investigated and actions to correct them are planned. Root cause analysis of the delays is undertaken to eliminate the
same and avoid similar delays in future. Expected delays in delivery if any are communicated to marketing team for onward communication.

As and when any special priority arises, the same is considered as an exception and included in production plan. Any change in delivery dates due to the inclusion of the prioritized product is communicated to marketing for onward communication. At the end of the month, the hit miss ratio is analyzed and required actions planned.

Material Planning:
Material planning is also automated in the same method as for finished goods. For each item of the raw and packing material, a base stock level is defined and set in SYMPHONY. The warehouses at the respective locations update their stocks in SAP according to their receipts and issues. The stock levels are displayed in color code based on their % of the base level. The coding used is: above 100% - Minus Green, from 67 to 100% - Green, from 34 to 66% - Yellow, from 1 to 33% - Red 0% - Black

Inventory Control:
The slow and non-moving stocks are listed, analysed and action plan drawn up.

Logistics and inventory
Logistics, Warehousing and inventory compare with best in the industry key performance indicators Vis a Vis performance metrics of the company.
Role of inventory in the Supply Chain

Inventory exists in the supply chain because of a mismatch between supply and demand. This mismatch is intentional at a pharmaceutical manufacturer, where it is economical to manufacture in large lots that are then stored for future sales. The mismatch is also intentional at a retail store, where inventory is held in anticipation of future demand.

An important role that inventory plays in the supply chain is to increase the amount of demand that can be satisfied by having the product ready and available when the customer wants it. Another significant role inventory plays are to reduce cost by exploiting any economies of scale that may exist during both production and distribution.

Inventory is spread throughout the supply chain from raw materials to work in process to finished goods that suppliers, manufacturers, distributors and retailers hold. Inventory is a major source of cost in a supply chain, and it has a huge impact on responsiveness. If we think of the responsiveness spectrum discussed, the location and quantity of inventory can move the supply chain from one end of the spectrum to the other. For example, a pharma supply chain with high inventory levels has a high level of responsiveness, since a consumer can walk into a pharma store and walk out with the drug he or she was looking for.

In contrast, a pharma supply chain with little inventory would be very unresponsive. A customer wanting a drug would have to order it and wait several weeks or even months for it to be manufactured, depending on how little inventory existed in the supply chain. Inventory also has a significant impact on the
material flow time in a supply chain. Material flow time is the
time that elapses between the points at which material enters
the supply chain to the point at which it exits. Another
important area where inventory has a significant impact is
throughput, the rate at which sales to the end consumer occur.
If inventory is represented by \( / \), flow time by \( T \), and
throughput by \( R \), the three can be related using Little's law as
follows:
\[ / = RT \]
For example, if the flow time of a pharma process is 10 hours
and the throughput is 60 units an hour, Little's law tells us
that the inventory is \( 60 \times 10 = 600 \) units. If we were able to
reduce inventory to 300 units while holding throughput con­
stant, we would reduce our flow time to five hours (300/60).
Note that in this relationship, inventory and throughput must
be in the same units.

The logical conclusion here is that inventory and flow time are
synonymous in a supply chain. Because reduced flow time can
be a significant advantage in a supply chain, managers should
use actions that lower the amount of inventory needed without
increasing cost or reducing responsiveness.

Role in the Competitive Strategy
Inventory plays a significant role in a supply chain's ability to
support a firm's competitive strategy. If a firm's competitive
strategy requires a very high level of responsiveness, a
company can use inventory to achieve this responsiveness by
locating large amounts of inventory close to the customer.
Conversely, a company can also use inventory to make itself
more efficient by reducing inventory through centralized
stocking. The latter strategy would support a competitive strategy of being a low-cost producer.

The trade-off implicit in the inventory driver is between the responsiveness that results from more inventory and the efficiency that results from less inventory. Nordstrom’s competitive strategy targets upper-end customers with high responsiveness requirements. These customers are willing to pay a premium to have the products they want when they want them. To support this competitive strategy, Nordstrom uses inventory; the company stocks a large variety and quantity of products to ensure a high level of availability. In fact, Nordstrom stocks a significantly larger amount of inventory than other department stores. Nordstrom incurs higher costs because of its large inventory, but it gains extra margin from its customers, who are willing to pay for the level of service that Nordstrom's inventory makes possible.

Components of Inventory Decisions
There is a great need to identify major inventory-related decisions that supply chain managers must make to create more responsive and more efficient supply chains effectively.

Cycle Inventory
Cycle inventory is the average amount of inventory used to satisfy demand between receipts of supplier shipments. The size of the cycle inventory is a result of the production or purchase of material in large lots. Companies produce or purchase in large lots to exploit economies of scale in the production, transportation, or purchasing process. With the increase in lot size, however, also comes an increase in carrying costs. As an example of a cycle inventory decision,
consider an on-line drug store. This retailer's sales average around 10 truckloads of drugs a month. The cycle inventory decisions the retailer must make involve how much to order for replenishment and how often to place these orders. The e-retailer could order 10 trucks once each month or it could order one truck every three days. The basic trade-off supply chain managers face is the cost of holding larger lots of inventory (when cycle inventory is high) versus the cost of ordering product frequently (when cycle inventory is low).

**Safety Inventory**

Safety inventory is inventory held just in case demand exceeds expectation; it is held to counter uncertainty. If the world were perfectly predictable, only cycle inventory would be needed. However, because demand is uncertain and may exceed expectations, companies hold safety inventory to satisfy an unexpectedly high demand. Managers face a key decision when determining how much safety inventory to hold. For example, a retailer must calculate its safety inventory for the holiday buying season. If it has too much safety inventory, drugs go unsold and may have to be discounted after the holidays. However, if the company has ordered too little safety inventory, then will lose sales and the margin those sales would have brought. Therefore, choosing safety inventory involves making a trade-off between the costs of having too much inventory and the costs of losing sales due to not having enough inventory.

**Seasonal Inventory**

Seasonal inventory is inventory that is built up to counter predictable variability in demand. Companies using seasonal inventory will build up inventory in periods of low demand.
and store it for periods of high demand when they will not have the capacity to produce all that is demanded. Managers face key decisions in determining whether to build seasonal inventory and, if they do build it, in deciding how much to build. If a company can rapidly change the rate of its production system at very low cost, then it may not need seasonal inventory because the production system can adjust to a period of high demand without incurring large costs. However, if changing the rate of production is expensive (e.g., when workers must be hired or fired), then a company would be wise to have a smooth production rate and build up its inventory during periods of low demand. Therefore, the basic trade-off supply chain managers face in determining how much seasonal inventory to build is the cost of carrying the additional seasonal inventory versus the cost of having a more flexible production rate.

**Overall Trade-off: Responsiveness versus Efficiency**
The fundamental trade-off managers face when making inventory decisions is between responsiveness and efficiency. Increasing inventory will generally make the supply chain more responsive to the customer. However, this choice comes at a cost, as the added inventory decreases efficiency. Therefore, a supply chain manager can use inventory as one of the drivers for reaching the level of responsiveness and efficiency that the competitive strategy targets.