

# Managing Supply Chain At Mergan Pharmaceuticals (A Division of Zydus Cadila)

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This article is a field case study undertaken by the author that looks into the various problems pertaining to the supply chain management of a pharmaceutical company in India (i.e., Mergan Pharmaceuticals). The case focuses on the challenges of Mergan in maintaining a supply network for a national response initiative.

On the supply chain management (SCM) front, Mergan's major challenge is the integrated management of flow of goods and related information. Transportation of goods and inventory management are two areas the company is trying for further improvement. With the implementation of SCM, the company hopes to achieve significant changes in the domestic market than ever before.

Mergan executives are continually looking into ways to better monitor and measure how well their supply chain decisions align with broader strategy-to ensure that their supply chain stays aligned with strategy even as strategic priorities change. In this endeavor, some questions crop up: What are our priorities? What are we sacrificing in the pursuit of something else? Where are we exposed?

Specifically, while doing the case, the student should be able to (i) describe the concepts and objectives of supply chain management; (ii) identify the specific fundamental objectives of supply chain management in Mergan and Zydus Cadila; (iii) identify the main role players (stakeholders) in Mergan's supply chain management; and (iv) identify issues in Mergan's supply chain management.

In reality, the term "supply chain" is a misleading term as a chain typically implies linear, sequential relationships from one link to the next. According to Sherer (2005), there are two problems with this term. First, not all products flow sequentially. Some supply chains involve concurrent material flow. For example, Dell's monitors ship concurrently with its computers. Second, the information flow does not always flow sequentially. For example, with new information systems, information can be shared with many companies at once in real-time. (Sherer 2005.)

Most supply chains are actually networks, since there are normally multiple suppliers and, indeed, suppliers' suppliers (upstream) as well as multiple customers and customers' customers (downstream) to be included in the total system (Cox 1997, Christopher 1998, Mentzer et al. 2001, Chandra & Kumar 2001).

According to Christopher (1998), instead of the term "supply chain", it would be more accurate to use the terms "supply network" or "supply web" to describe the net-structure of most supply chains. He emphasizes the network-nature of his supply chain definition:

"Supply chain is a 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 the ultimate customer".

The term "demand-supply chain" is used today when it is necessary to emphasize that the chain is market-driven, not supplier driven (Hoover et al. 2001). A demand chain transfers demand information from end customer markets to suppliers, whereas a supply chain creates products and services that are transferred from suppliers to end customers. Together they create the demand-supply chain, which is an end-to-end network where demand knowledge is passing from markets to supply sources and value offerings are passed from supply sources to customers (Collin 2003).

According to Bovet & Martha (2000), a supply chain includes activities such as material sourcing, production scheduling, and the physical distribution system, backed up by the necessary information flows. Procurement, manufacturing, inventory management, warehousing, and transportation are typically considered part of the supply chain

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organization. Marketing, sales, finance, and strategic planning are not. Product development, demand forecasting, order entry, channel management, customer service, and accounts payable and receivable lie in a grey area; in theory, they are part of the supply chain process, but they are seldom included within the supply chain organization. Importantly, it also embodies the information systems so necessary to monitor all of those activities. (Bovet & Martha 2000.)

Today, many companies have recognized the Supply-Chain Operations Reference model (SCOR) as a powerful and robust tool to describe, analyze, and improve the supply chain. (See Exhibit 1).

Based on the SCOR approach, the Supply Chain Council (2005) defined a supply chain as follows:

“The supply chain encompasses every effort involved in producing and delivering a final product, from the supplier’s supplier to the customer’s customer. Fiver basic processes - plan, source, make, deliver and return - broadly define these efforts, which include managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer.”

The supply chain involves five distinct basic processes, as the Supply Chain Council has defined. (See Exhibit 2). These processes are (Supply Chain Council 2005): plan (processes that balance aggregate demand and supply to develop a course of action which best meets sourcing, production and delivery requirements), source (processes that procure goods and services to meet planned or actual demand), make (processes that transform product to a finished state to meet planned or actual demand), deliver (processes that provide finished goods and services to meet planned or actual demand, typically including order management, transportation management, and distribution management, and return (processes associated with returning or receiving returned products or their parts, such as pallets, for any reason). The SCOR model is actually a process reference model that has been developed and endorsed by the Supply Chain Council as the cross-industry standard diagnostic tool for SCM. It is the only supply chain framework found that links

performance measures, best practices, and software requirements to a detailed business process model (Supply Chain Council 2005).

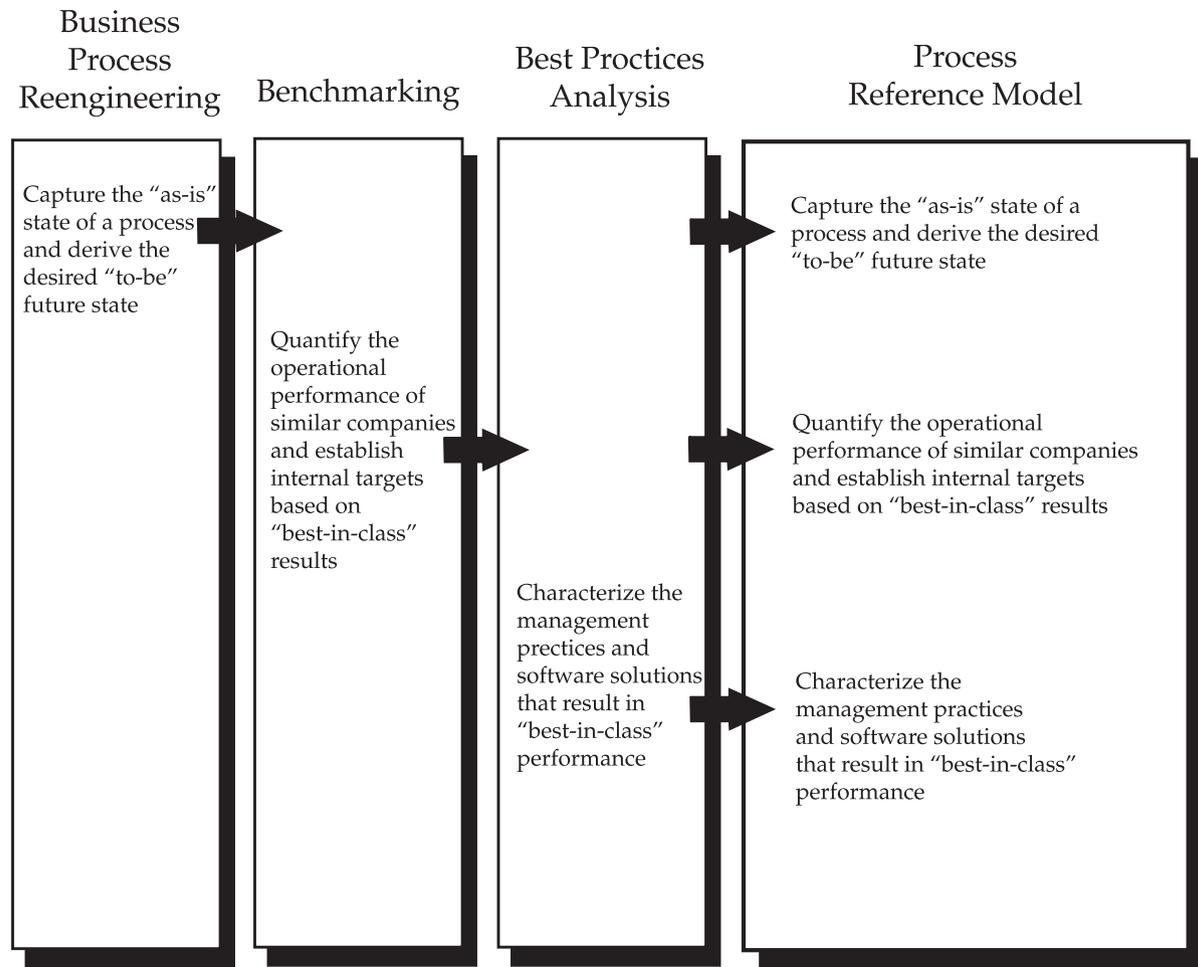
## Background

It was a warm May afternoon in 2008. Bidesh Bose, President (Operations) of Mergan Pharmaceuticals (a division of Ahmedabad-based pharma giant Zydus Cadila), was reviewing the new distribution system soon to be implemented throughout the company. The broad objectives behind the adoption of the new system were to improve customer service and sales promotion, and to bring down the cost of distribution so as to improve profitability. He was especially concerned about the order processing time and the stock levels at different points in the distribution system (the hub, the carry forward agents (CFAs), and distributors)

Bose had been aware now, for some time, about the supply chain integration problem at Mergan in Mumbai. Bose realized that only a CEO who was up to date on supply chain practices and trends could properly evaluate a supply chain executive’s performance. He admitted to himself that he faced a challenging task in this regard, and that managing the supply chain had become a complicated set of activities - covering many business functions and processes, reaching beyond the company. This would give the executive in charge of distribution/ logistics supply chain a lot of work and the accompanying headaches that came with it. That person happened to be S.S. Kutty, deputy general manager (supply chain).

Kutty’s primary job at Mergan was to manage its supply chain from his office at Mumbai, and coordinate his efforts through Zydus Cadila’s head office in Ahmedabad by telephone, internet, and once-a-week meeting at Ahmedabad to interact with his immediate boss, Hemant Solanki, who was the vice president (Purchase and Supply Chain Management [PSM]). Kutty’s job, thus, was to effectively manage Mergan’s supply chain. If he failed in this, the risks were enormous: he would alienate customers (retailers and hospitals) and suppliers, erode shareholder value, and lose control of fixed costs. It was as simple as that.

### Exhibit 1



#### Context of Supply Chain in Pharmaceutical industry

Traditionally, supply chain practices have been developed from the context of consumer goods and services that does not fully capture the realities of the pharmaceutical industry. Attempts to treat non-over-the-counter (OTC) pharmaceutical products as consumer goods and applying the above practices could lead to ineffective management of supply chain in the pharmaceutical context.

According to Arijit Sarkar, the aspects in which the context of pharmaceutical industry differs are (i) nature of product consumption, (ii) product substitution, and (iii) product obsolescence.

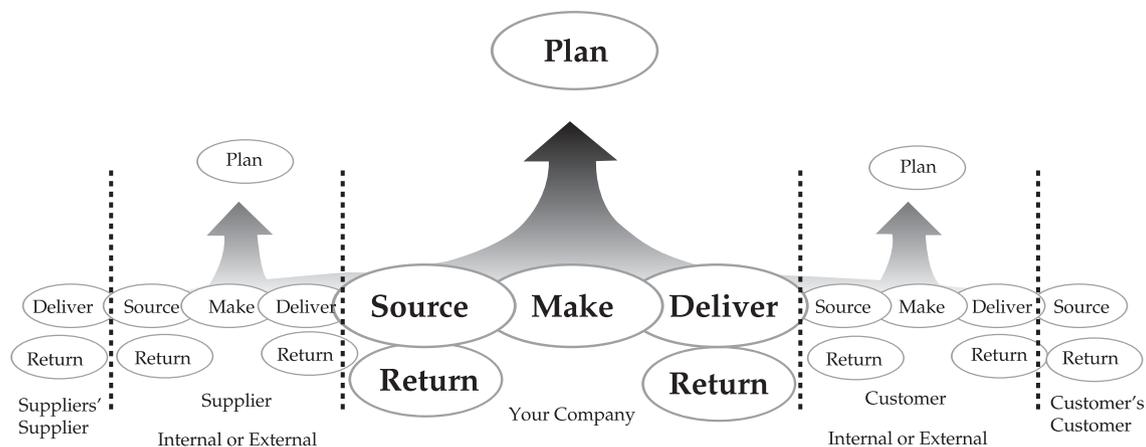
**Product consumption:** The actual user of the pharma product is the patient (consumer), whereas the customer or demand generator is the doctor. Due

to reasons such as drug prices, drug side effects, drug effectiveness, non-compliance of prescribed drug usage, etc., there is a problem in assessing the correlation between perceived demand and actual demand.

**Product substitution:** In the Indian pharmaceutical industry, there is no brand awareness among ultimate users and the law prevents manufacturers from advertising their products. Further, the patients don't have control over the choice of the product: that is left to the doctors (this is where the reps from pharma companies enter the picture). Product substitution can also happen due to high prices of the drugs (where cheaper drugs are chosen over more expensive substitutes), and the retailers pushing the brands due to their own selfish interests (thanks once again to the selling techniques adopted by the reps of pharma companies).

## Exhibit 2

### SCOR is Based on Five Distinct Management Processes



**Product obsolescence:** The expiry date of pharma product is very important, hence no consumption of the same is allowed under law beyond the prescribed date. The implications of this on the pharma supply chain is enormous: pharma companies have to continuously battle with reducing obsolescence costs, and simultaneously ensure that there is no stock-out. Obsolescence also leads to the phenomenon of 'reverse logistics', where the obsolete products are recalled back to the company to be destroyed. This is a part and parcel of the pharmaceutical industry.

Exhibit 3 shows a typical pharma supply chain. The key stakeholders in this supply chain include multiple government agencies, hospitals, clinics, drug manufacturers, drug distributors, pharmacy chains, retailers, research organizations, and the FDA. To complicate matters further, the same supply chain is responsible for the distribution of prescription drugs, over-the-counter (OTC) medicines, and generics.

### Supply Chain at Mergan

As a group, Zydus Cadila is ranked fourth in India in terms of sales (2008). The challenge is to retain and improve this position.

A simple supply chain flow chart pertaining to the company is given in Exhibit 4. A snapshot schematic organization structure of Zydus Cadila is given in Exhibit 5.

Zydus Cadila's own plants are situated in the following locations:

- (i) Moriya (Ahmedabad)
- (ii) Panjim (Goa)
- (iii) Baddi (Himachal Pradesh)
- (iv) Sikkim
- (v) An active pharmaceutical ingredient (API) plant in Ankleshwar (Gujarat)
- (vi) Zydus Research Center (ZRC) in Ahmedabad.

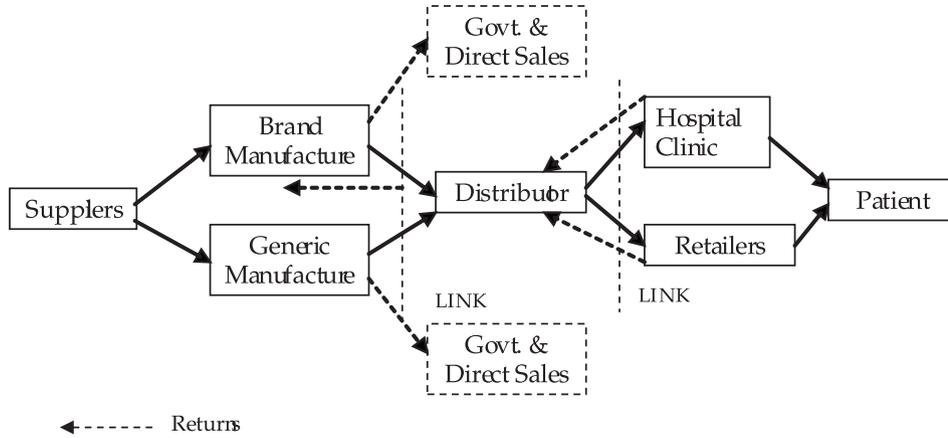
The Panjim plant in Goa partly dealt in exports, and supplied injectibles and suppositories to the domestic market. Baddi had a formulation plant which provided injections, tablets, and capsules - primarily oral solids and injectibles. The Sikkim plant also dealt with oral solids and injectibles.

At a more functional level, Kutty's primary job was to ensure availability of stocks with all carry forward agents (CFAs) based on monthly sales plan. In this endeavor, he was supported by a staff of five people, besides the help from a peer-colleague, B.H. Vartak, (Sr. Manager - Logistics) who worked with him at Mergan's Mumbai office (see Exhibit 6).

### Supply Chain Activities

At the factory level, bond-release stock information (excise bond) is issued at the factory. From the production line, the stock is received in the bond warehouse (situated in the factory premise). Then, the excise formalities and documentations are completed, and the stock is ready for delivery at the hub.

Exhibit 3



The Pharmaceutical Supply

Kutty's distribution/logistics department is usually informed on these developments, so that that he can club many products together, including those

released from the bond on that particular day for onward dispatch to CFAs.

Exhibit 4

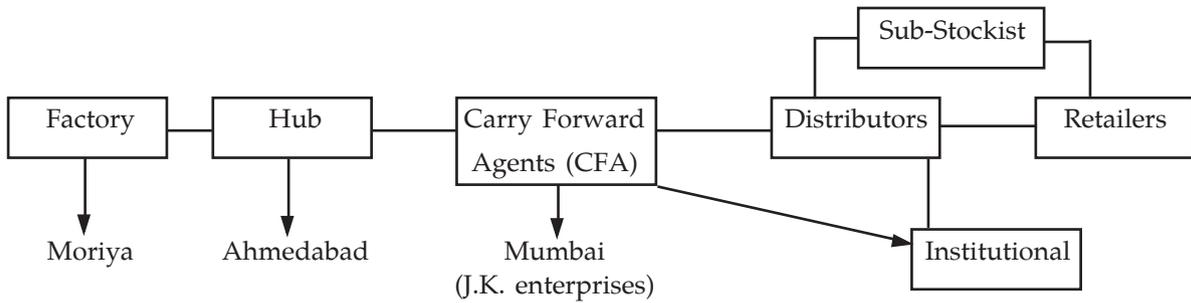
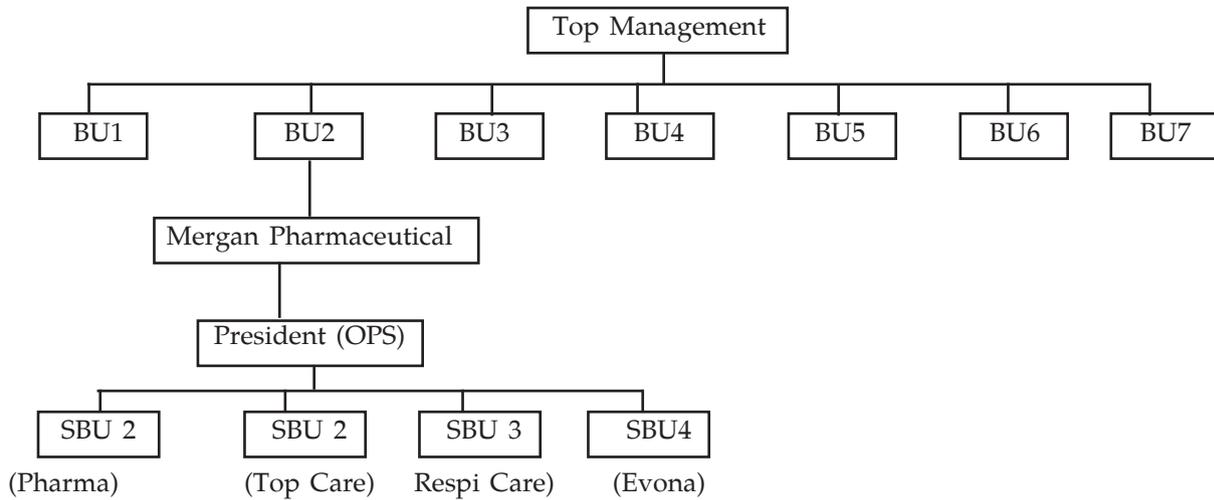


Exhibit 5



At the factory, data (the excise invoice) is keyed in before the drugs leave the factory to go to the hub. This information typically covers: when the drug has left the factory, stock movement as per delivery plan under the guidance of the production planning and coordination (PPC) department which is based at head office and factory.

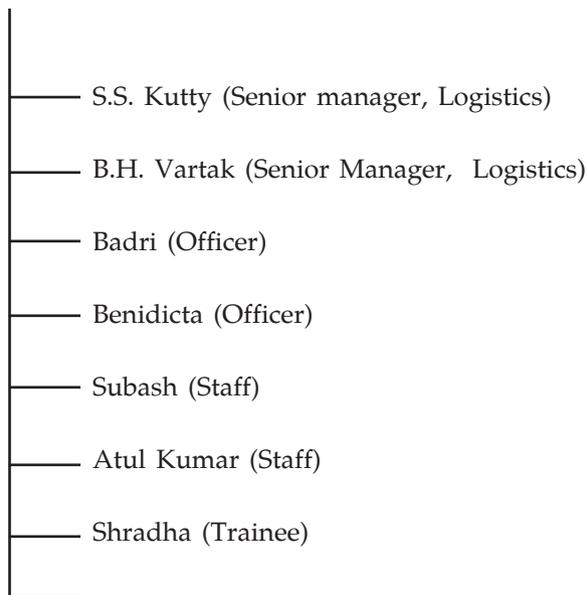
Excise invoice received at the hub and the information to the costing department is given for updating the rates (MRP, price to the distributor [PTD], and price to the retailer [PTR]) are entered in the system. Then the inward entry of stock are made at the hub which can be monitored by distribution/logistics department for subsequent invoice generation and dispatch.

An explanation to the supply chain activities at Mergan in Mumbai and its interconnected elements is elaborated here. For example, how do stocks come to the hub? It comes from the manufacturing plants as per delivery plans based on monthly sales plan given by the marketing department to the production department, popularly known in the company as the rolling sales plan (RSP).

### Exhibit 6

Department : Distribution/Logistics

Mr. Bidesh Bose (President, Ops)



The business manager provides the order information via e-mail (called "Zydus Frontline"), which contain formats such as daily call reporting, tour programs, RSPs, expense statements, etc.

The purchase and sales management (PSM) team decides about what to produce and when to produce, based on the opening stock statement of individual products received from the distribution department. The stock is then delivered at the hub. The stock position at the hub is accessible real-time on the computer (online).

The distribution department receives allocation plan from the marketing department and starts replenishment of various stocks to the CFAs. This activity of informing and advising happens twice a week - on every Monday and Thursday. No distribution requests were entertained after the 20th of the month. The distribution department had to ensure at least 30% availability of stocks for all CFAs beginning of the month.

Transportation of goods was carried out in three modes: lorry (trucks), surface courier (by road, but faster than trucks), and by air (for cold chain items). After the 20th of the month, no distribution requests were entertained. The distribution department had to ensure at least 30% availability of stocks at all CFAs at the beginning of the month.

The forward allocation worked like this: for example, the opening stock at a CFA was compared against the monthly sales plan of that CFA. In case excess stock was found with the CFA, then forward transfer of the excess stocks was made to another CFA, who faced a shortfall, or was in need of the same.

Distributors who placed orders to the CFAs had to get the orders signed or authorized by the concerned person, and also enclose the order with a blank cheque which would be filled in later by the CFA, depending on the value of the order. This system worked effectively as it was based on trust and commitment built over the years between the parties.

#### Tracking the Product

Let us take the example of a drug called Panzinorm. It is a digestive enzyme, and a combination drug, containing 2-3 ingredients. The ingredients of Panzinorm is procured from abroad as well

**Table 1**

Product Code	Product Name	Packing Unit	Balance Qty.	Saleable Qty.	Hold Qty.
P2 TA0105	Alupent Tabs [10 mg.]	1 x 100s	8384	8361	23

as locally by the purchase and supply chain management (PSM) division headed by Hemant Solanki, vice president (PSM), that operated from the head office in Ahmedabad.

The ingredients (such as lipase and pancreatin) are an input to the factory and is processed there to become a finished product (i.e., medicine), that is finally available in a tablet form, which is packed in blister packs, boxes or cartons.

How is the shipment of Panzinorm tracked? Assuming a total number of 28 CFAs in the country, the all-India requirement for Panzinorm, based on the RSP, is monitored by logistics department under Kutty. This is illustrated in Table 1.

The "Hold Qty." of 23 nos. needs replenishing by Kutty to fulfill the total requirement of 8384 units. In short, logistics department analyzes the stock positions of all products at all CFAs, and accordingly ensures replenishment to meet the RSP requirements. This is known as primary allocation.

If excess stocks are found (that is more than the RSP) at any CFA, the logistics department initiates transfer of the excess stocks amongst the CFAs to fulfill the demand of the respective RSPs. This takes into account the figures available at the production

department, the monthly requirement, and the stock already available for the particular month.

Continuing with the above example, let us assume that the all-India RSP for Alupent is 10,000 packs. So, the production department would deliver  $10,000 - 8361 = 1639$  packs, and forward allocation is initiated for meeting the individual RSP requirement of various CFAs.

Another example is given in Table 2 below. In this illustration, the monthly RSP is taken to be 6500 units, denoting an excess of  $8821 - 6500 = 2321$  units across the CFAs. In this case, the production department will not consider any deliveries during the month to the hub.

Also, production department would plan for deliveries during the second half of the next month, since their priorities would be to plan for the manufacture of products in demand where they have not fulfilled the current month's RSP.

Hence, distribution (logistics) department would initiate recall of the excess units against the RSP at individual CFAs to the hub, for allocation during the next month. What is considered also is that some CFAs would have already sold their stock as per their plan, resulting in zero balance at the beginning of the next month.

**Table 2**

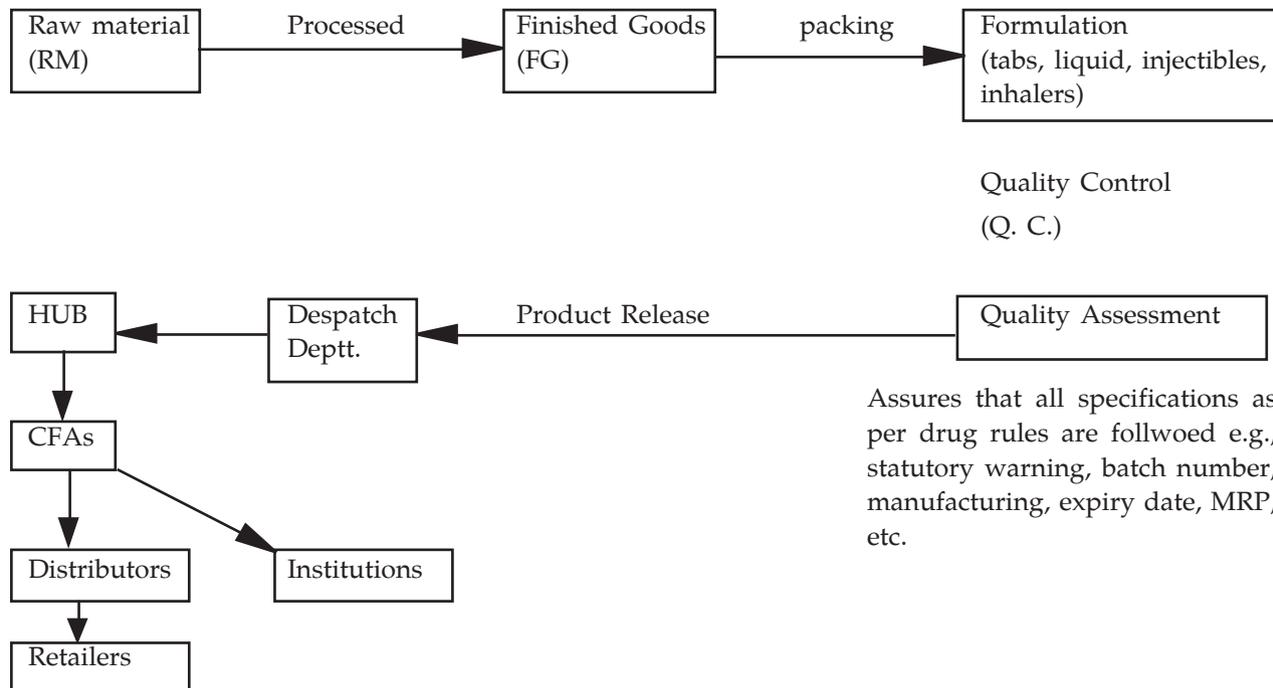
Product Code	Product Name	Balance Qty.	Saleable Qty.	Hold Qty.
F8 AAA960	ACEPRED IM Injection [1 ml.]	8821	8821	Nil

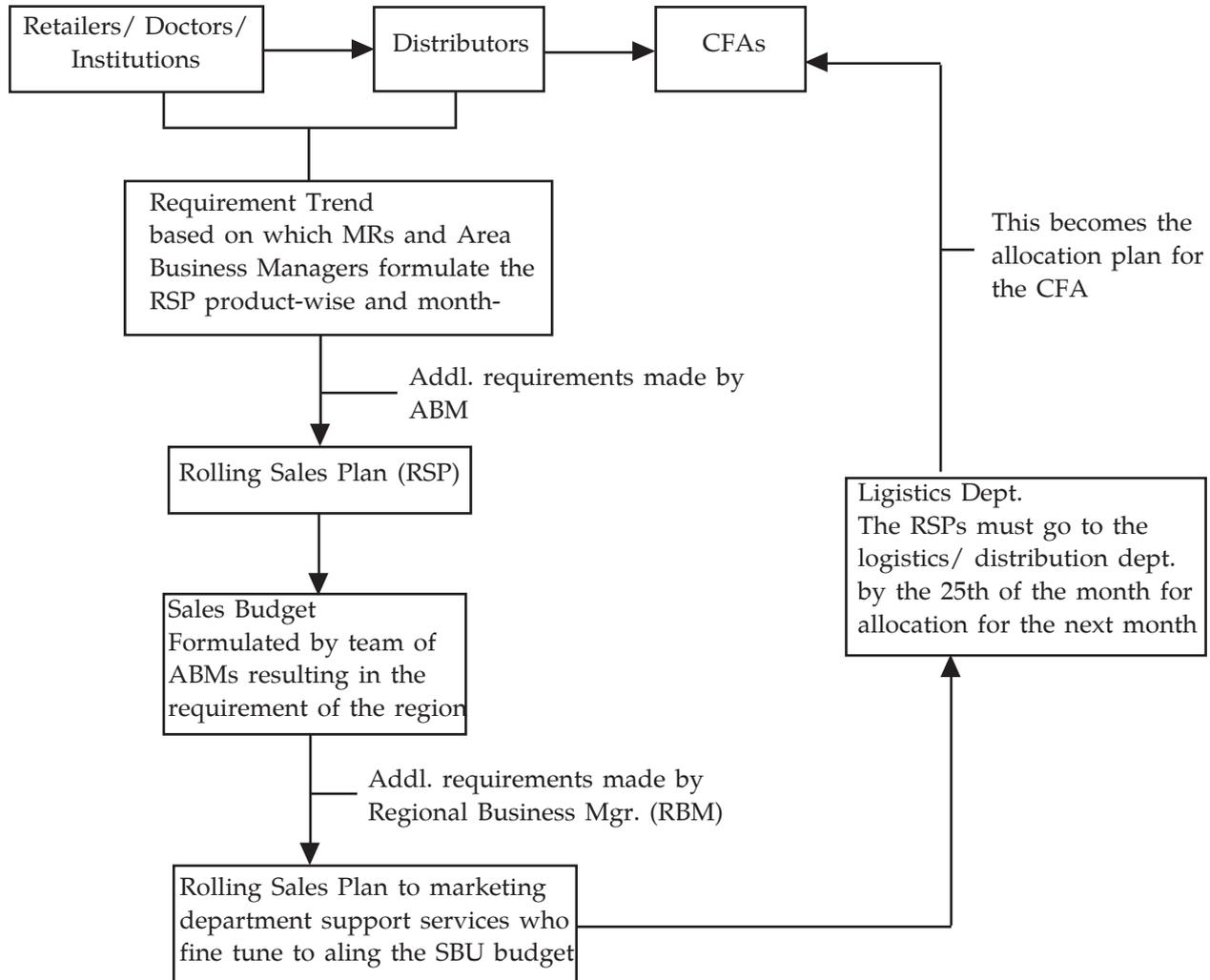
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## Appendix

### Exhibit 7

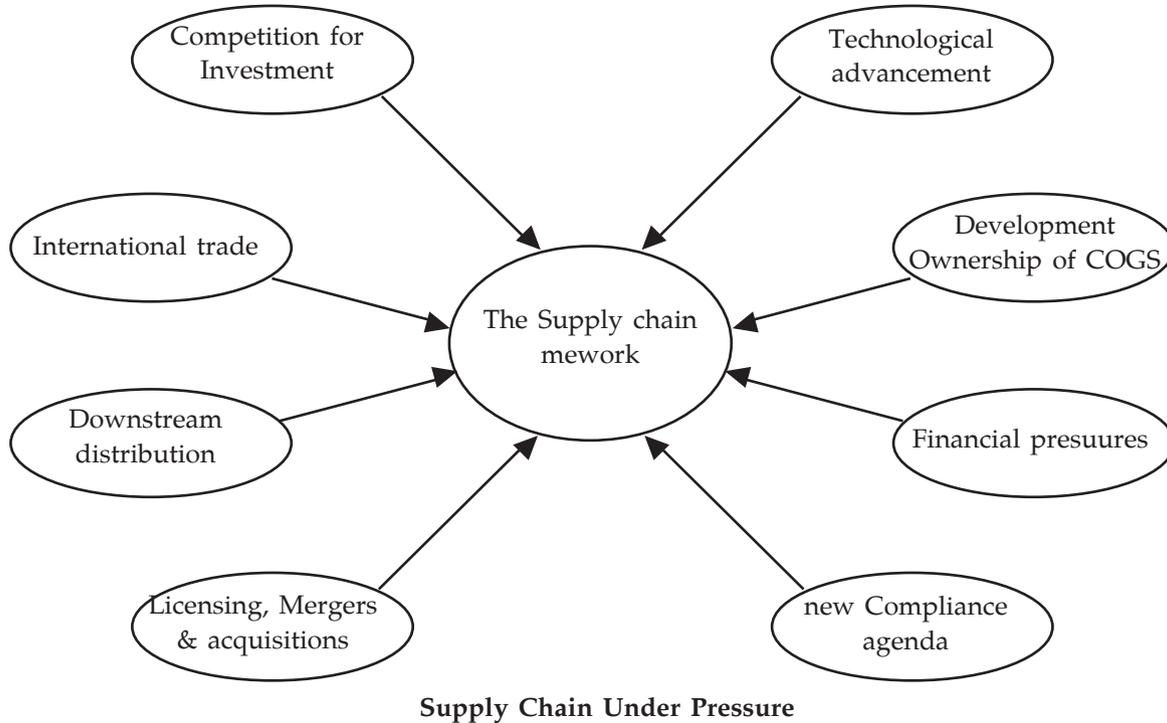


**Exhibit 8****Exhibit 9****Rapid response to a marketplace opportunity**

The morning newspaper reported that our leading competitor was cited at last week's medical conference in Geneva for having a product that was suddenly creating negative side effects in chronic patients who had used the drug for more than six months. On Friday the Food and Drug Administration (FDA) ordered a stop to its use until the Geneva report results could be studied. Recommending that doctors use alternative treatments. Three million patients regularly used the suspended product-in the past, it had proven difficult to convert them to ours, which does not have the reported side effects. We quickly convened a meeting of the supply chain and manufacturing management teams that morning to consider how best to react to the news from Geneva and the FDA. Manufacturing could not produce enough additional products to replace its rival, but its alliance with another pharmaceutical firm could provide plant capacity to do the job. So, management placed an immediate order for large volumes. Working with marketing that night, supply chain management announced to doctors and pharmacies all over the world that additional supplies would be available within a couple of days. Overnight mail transporters, already under contract to supply individual users of the products to patients, were told when and where to pick up the new quantities of medicines.

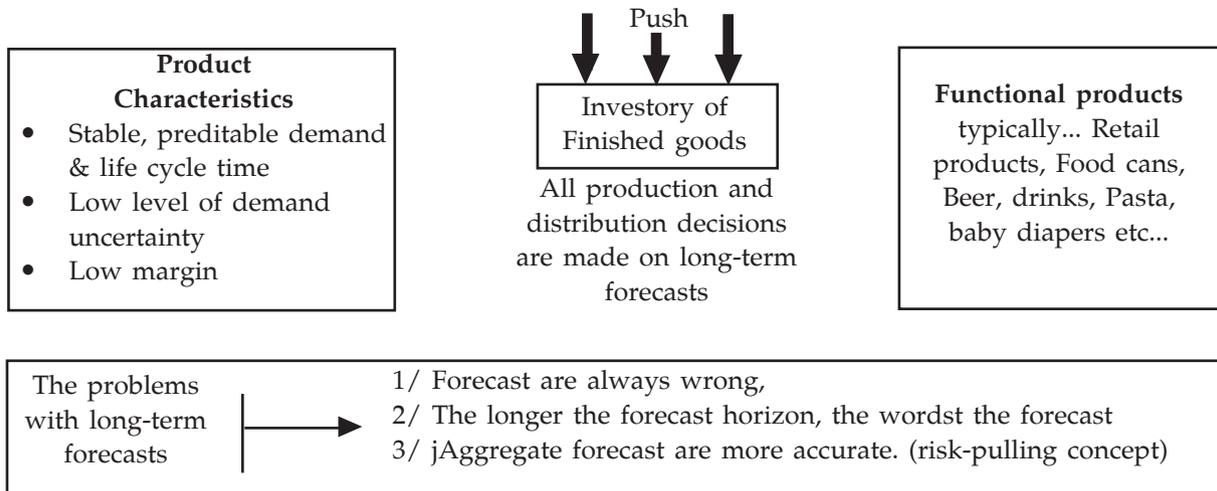
Within 48 hours, hundreds of thousands of additional doses were on their way into the market. Doctors had been informed about the characteristics of the drugs and pharmacies were already processing prescription changes. Within two weeks, the rival's lost business had been replaced with our product. Such quick action was possible thanks to an infrastructure created to support reliable, focused response to unanticipated changes-an eloquent, revenue-boosting example of doing business on demand

**Exhibit 10**



**Exhibit 11**

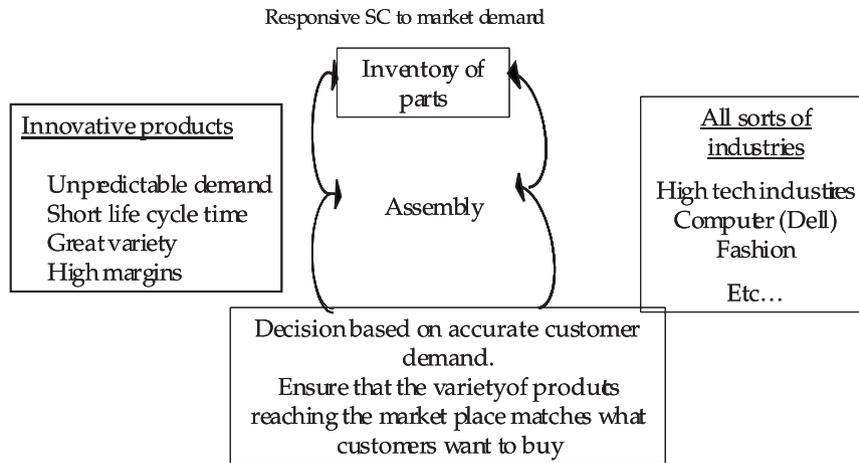
**Supply-Chain strategies Made to stock environment  
Efficient SC to market**



The problems with long-term forecasts →

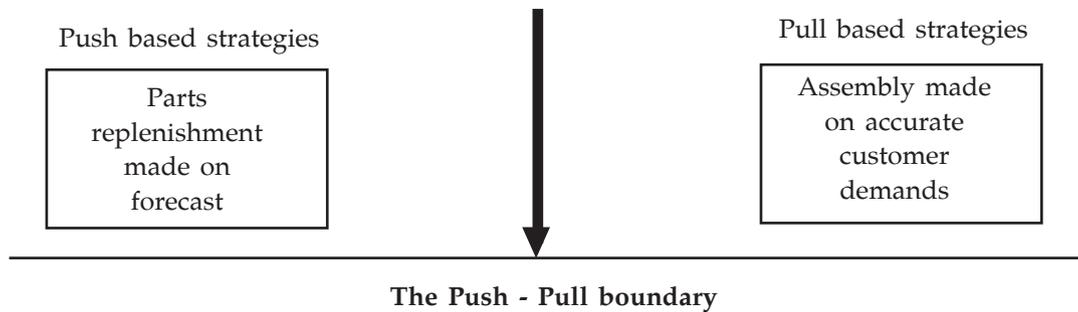
- 1/ Forecast are always wrong,
- 2/ The longer the forecast horizon, the worst the forecast
- 3/ Aggregate forecast are more accurate. (risk-pulling concept)

**Exhibit 12**



**Exhibit 13**

**The Push - Pull Strategy**



It is the point at which the product goes from being pushed in anticipation of customer order, to being pulled by actual demand.

**Exhibit 14**

**What is the appropriate strategy for a company?**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• The higher the demand uncertainty, the more we want to use Pull based strategies.</li> </ul>   | <ul style="list-style-type: none"> <li>• The lower the demand uncertainty, the more we want to use Push based strategies (high predictability)</li> </ul> |
| <ul style="list-style-type: none"> <li>• The higher the transport costs*, the more we want to make use of Push based strategies. (aggregate shipments possibility)</li> </ul> | <ul style="list-style-type: none"> <li>• The lower the transport costs*, we more are willing to use Pull based strategies.</li> </ul>                     |

(\*Transport costs as a percentage of a unit cost)

- < 5%      —————> Pull base
- 5% ~ 10% —————> Pull or push depend on market situation
- > 10%     —————> Push base