

ISyE 3103: Introduction to Supply Chain Modeling: Logistics
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Solutions for Homework #1

Chapter 1

Question 3:

Following are some of the decisions that must be made at an apparel manufacturer like Gap.

- Strategic decisions:
 - Warehouse related – where to locate warehouses; whether to manage them using in-house expertise or hire a 3rd-party?
 - Store related – where to locate stores; questions regarding the ownership of stores.
 - Transportation related – manage its own fleet or hire someone else?
 - Manufacturing/supplier related – where to locate plants; whether manufacturing should be done overseas; contractual terms to be negotiated with suppliers.
 - Long-term marketing strategy.
 - Installation of company wide ERP systems.
- Tactical decisions: some of the tactical decisions could be related to demand forecasts, the clothing lines/fashions to be introduced in the coming seasons, warehouse/retail-outlet pairings etc. Also, seasonal marketing drives.
- Operations decisions: operation decisions can occur at several levels. At the store level, they could involve maintenance of account books, staff/worker scheduling and allocation etc. At the warehouse level, there could be decisions like order picking, restocking of sku's etc. At the manufacturing plant, operational decisions could involve production scheduling, maintenance operations etc.

Question 4:

The supply chain of a typical bookstore will involve the following cycles:

- Customer order cycle – this involves the visit of the customer to the bookstore and the book purchase.
- Replenishment cycle – this involves placing of orders with publishers and/or whole-sellers for replenishment of store inventory.
- Manufacturing cycle – this involves the physical production of the books by the publishing company (or a 3rd party service provider for them)
- Procurement cycle – this involves the procurement of the raw materials needed for the book fabrication (paper, ink, glue, etc.)

In this supply chain, only the customer order cycle operates in a pull mode. Books are pushed all the way to the bookstore.

Question 5:

Amazon does not have retail outlets. The customer orders are received at its internet storefront. These orders are fulfilled from its stocks in the various warehouses that Amazon maintains throughout the world. As far as replenishment of warehouse inventory goes, Amazon does not deal with whole-sellers or other middle-men. Instead, it orders directly from the publishers. For orders fulfilled from stock kept in the company warehouses, only the customer order cycle is operated in a pull mode. On the other hand, if Amazon places an order with a publisher or seeks to find a used copy as a result of a customer order, then the push-pull interface is pushed further

upstream (to the stage that is responsible for getting the books from the publisher or from some other intermediary).

- Two functions in the push section: planning for amount and composition of inventory to be stocked in warehouses; determining the arrangement of inventory in the warehouses for optimal order picking.
- Two function in the pull section: maintaining the web storefront, receiving the customer orders and updating the information systems; order picking in the warehouses when a customer order is received.

Chapter 2

Question 1:

The Neiman Marcus Group's website describes its competitive strategy as follows: "...to become renowned retailers offering upscale assortment of apparel, accessories, jewelry and decorative home products to the affluent consumers". Thus the competitive strategy of the company is to target the high-price segments, and concentrate on quality, range and providing an unmatched customer experience, as opposed to providing the best prices.

Question 2:

The emphasis of Neiman Marcus' competitive strategy on high product differentiation and high service level, combined with the highly dynamic world of fashion specialty stores, where new products are brought out at an increasingly faster rate, imply that Neiman Marcus supply chain will have a high implied demand uncertainty.

Question 3:

Since most of the merchandise provided by Neiman Marcus supply chain are fashion items, the company operations must seek to provide high responsiveness to the market trends, even though this might involve higher costs and lower efficiencies.

Question 4:

The Neiman Marcus Group's website states that it operates specialty retail stores as well as direct marketing operations. It owns multiple brands, and also has stake in other designer resources. Clearly, Neiman Marcus has to deal with a lot of other businesses in its operations. Moreover, as noted earlier, the business environment that Neiman Marcus operates in, is fraught with continuous change, both in terms of product innovation and customer tastes. This leads to the conclusion that Neiman Marcus should work closely with the other parts of its supply chain in its effort to expand its strategic fit. Even if it does not own these different players, it must work out contracts and arrangements with a view towards increasing the responsiveness, and eventually the profitability, over the entire supply chain, not merely across its own individual functions. The contractual terms must strike a compromise between stability and flexibility, so that Neiman Marcus is able to adapt to changing customer tastes and a competitive landscape while at the same time maintaining and nurturing its relationship with some selected strategic partners.

Admittedly, this kind of a strategic fit will involve a lot of players in the supply chain, many of whom might have conflicting individual interests. Therefore, it is going to be difficult to bring them all on one table and make them work together so that the profitability as well as re-configurability of the overall supply chain can be raised. At some point one must consider also the cost of expanding the strategic scope versus the benefits derived out of such an expansion.

Question 5:

Publix website states that it "...intends to be the premier quality food retailer in the world." As a result, we would expect it to have a wider selection, higher quality and greater service levels compared to some other supermarkets, while price might not its main selling point. On the other hand, most of the merchandise carried by Publix is commodity items with pretty stable demand and quality attributes. Also, the supply chains providing these products are well developed and operated. Therefore, the implied demand uncertainty is rather small, and the company should focus on achieving high operational efficiencies in order to maintain a profitable operation.

As far as the expansion of the strategic fit goes, we should note that Publix is primarily a reseller, although it does carry its own brands too. Thus, the supply chain spans many different businesses, both large and small. However, as noted above, the world of food retailers is not as dynamic as that for some other products. Because of that, the supply chains involved are more easily coordinated, and indeed, they have already attained extensive levels of efficiency. Yet, there might be some opportunities for enhanced coordination and better integration of the company operations to its supporting supply chains, at the tactical and operational level, by taking advantage of the emerging information technologies. For instance, these technologies can enable the company to track more closely inventories within its own operations as well as across the supply chain, and in this way, further decrease the impact and cost of uncertainty in its operations.

Chapter 3

Question 1:

A grocery retailer can hold inventory in anticipation of future demand. Level of inventory held by the retailer is tied to the level of satisfaction of incoming customers. High inventory levels at retail stage create high level of supply chain's responsiveness because customers can get the items they want. To achieve this, the grocery retailer must stock a large variety and quantity of items to ensure a high level of availability. However, one must note that high level of inventory increases holding cost to the retailer.

Question 2:

An auto manufacturer must make decisions on: (1) the mode of transportation to be used for moving the products to the various distributors, (2) the selection of routes and networks along which products are shipped, and (3) the company(-ies) that will undertake this task, in a way that establishes a trade-off between the attained responsiveness and the incurred operational cost. A manufacturer who is more focused on operational efficiencies will use a cheaper transportation mode like ship for global shipments and truck or rail for local shipments, and will arrange for less frequent but larger shipments that take better advantage of the transportation medium (e.g., truck capacity). Also, outsourcing the transportation function to a 3rd party logistics provider that can consolidate the manufacturer shipments to some larger shipments and in this way reduce the total operational cost is another possibility.

Question 3:

In the more traditional regime, the bicycle manufacturer should maintain a network of distribution centers / warehouses strategically positioned so that they provide fast access to its target markets. Also its manufacturing facilities should possess adequate production capacity and sufficient stock of raw materials to meet emerging demand in a timely fashion. More recently, with the advent of mass customization, the manufacturer might want to use the internet as an electronic store for receiving customized orders, allowing the customer to configure its bicycle in terms of materials,

colors, dimensions, etc. This bicycle will be subsequently fabricated to order in a flexible production facility that utilizes highly flexible numerically controlled equipment.

Question 4:

The industrial supplies distributor can use information technology to better track and analyze the trends in her demand and, in this way, increase her responsiveness to those trends. She can also use information technology to pass along (some of) this information to her suppliers. At the same time, she can provide her customers with real-time information on availability of items and their price, and in this way, accommodate emerging developments in the market.

Question 6:

The life cycle of high-tech and consumer electronic products have shortened recently. Some key challenges for companies in these industries are to keep up with the emerging market trends and technological developments, and at the same time, control the obsolescence of their facilities and stocks. As a result, the corresponding supply chains must operate with smaller inventory levels *and* shorter lead times for all the involved stages. Some crucial factors for meeting these more stringent requirements are (i) the establishment of more accurate and expedient information flow across the entire supply chain and (ii) the development of strategic partnerships in order to strengthen the core competencies of the involved partners and take advantage of economies of scales. Maintaining a highly diversified portfolio of products and services, all of them building upon a common set of core competencies, is another tool that these companies use in their effort to mitigate the risks resulting from the aforementioned developments.

Question 7:

c.f to the Dell case study discussed in class.