**MBA Comprehensive Exam Questions for SCM 6070 – AY 20-21**

**1. A) Name three decision phases in a supply chain. B) Explain each phase in terms of the time horizon, the impact of the decision on the supply chain, and the considerations when making a decision in each phase. C) Now, consider an e-commerce company like Wayfair. Explain at least two decisions that have been made in each of the three phases of the Wayfair supply chain.**

Answer: A) Supply chain decisions may be characterized as **strategic (design), planning, or operational**, depending on the time horizon over which they apply.

B) Strategic decisions relate to **supply chain configuration**. These decisions have a **long-term impact** that lasts for **several years**. Strategic decisions define the **constraints for planning decisions**, and planning decisions define the **constraints for operational decisions**. Planning decisions cover a period of a **few months to a year** and include decisions regarding production plans, subcontracting, and promotions over that period. Operational decisions span from **minutes to days (weeks)** and include sequencing production and filling specific orders.

* Supply chain design decisions are **long-term and expensive to reverse** (strategic decisions) – must take into account **market uncertainty**
* Supply chain planning decisions must consider **demand uncertainty, exchange rates, competition over the time horizon** in planning decisions
* Supply chain operational decisions **have much less uncertainty due to short time horizon**

C) E-commerce company like Wayfair: (should write 2 out of followings – might be similar terminology)

* Strategic supply chain decisions
  + Outsource supply chain functions
  + Locations and capacities of facilities
  + Products to be made/stored at various locations
  + Modes of transportation
  + Information systems
* Planning supply chain decisions:
  + Which markets will be supplied from which locations
  + Planned buildup of inventories
  + Subcontracting
  + Inventory policies
  + Timing and size of market promotions
* Operational supply chain decisions
  + Allocate orders to inventory or production,
  + set order due dates
  + generate pick lists at a warehouse
  + allocate an order to a particular shipment
  + set delivery schedules
  + place replenishment orders

**2. To achieve the strategic fit, a company must understand both the needs of the target customers and the capabilities of all supply sources. After knowing the customer needs, the company should understand the supply chain’s capabilities in terms of efficiency and responsiveness. A) Name at least three capabilities of a responsive supply chain. B) Compare an efficient supply chain with a responsive supply chain in terms of their primary goal, lead time strategy, manufacturing strategy, inventory strategy, and pricing strategy.**

Answer: A) should write three out of followings (might use similar terminologies)

* Supply chain responsiveness is the ability to
  + Respond to wide ranges of quantities demanded
  + Meet short lead times
  + Handle a large variety of products
  + Build highly innovative products
  + Meet a high service level
  + Handle supply uncertainty

B)

|  |  |  |
| --- | --- | --- |
|  | **Efficient Supply Chains** | **Responsive Supply Chains** |
| Primary goal | Supply demand at the lowest cost | Respond quickly to demand |
| Pricing strategy | Lower margins because price is a prime customer driver | Higher margins because price is not a prime customer driver |
| Manufacturing strategy | Lower costs through high utilization | Maintain capacity flexibility to buffer against demand/supply uncertainty |
| Inventory strategy | Minimize inventory to lower cost | Maintain **buffer inventory** to deal with demand/supply uncertainty |
| Lead-time strategy | Reduce, but not at the expense of costs | Reduce aggressively, even if the costs are significant |

**3. A) What are the three components of the "total logistics costs" in a supply chain? B) Explain how and why the design of the distribution network affects each of these components separately as well as the total logistics costs. C) Draw the relationship between the number of facilities and each of the three components you mentioned in part A of the question.**

Answer: A) Facility, inventory and transportation costs

B) As the number of facilities in a supply chain increases, the inventory and resulting **inventory costs** also increase. To decrease inventory costs, firms try to consolidate and limit the number of facilities in their supply chain network. Outbound transportation costs per unit tend to be higher than inbound costs because inbound lot sizes are typically larger. Increasing the number of warehouse locations decreases the average outbound distance to a customer and makes outbound transportation distance a smaller fraction of total distance traveled by the product. Thus, as long as inbound transportation economies of scale are maintained, increasing the number of facilities decreases total **transportation cost.** **Facility costs** decrease as the number of facilities is reduced, because a consolidation of facilities allows a firm to exploit economies of scale. As the number of facilities increases, **total logistics costs** first decrease and then increase. It is because of the effect of inbound and outbound transportation costs. Each firm should have at least the number of facilities that minimize total logistics costs.

C)

A graph plots a curve showing the relationship between number of facilities and inventory costs. As the number of facilities increases, so does the inventory cost.

A graph shows the relationship between the number of facilities and transportation cost. The graph is a curve showing the relationship between the number of facilities and transportation cost. Initially the transportation cost decreases as the number of facilities increases. However, after as certain point, the line curves and begins to increase.

A graph shows the relationship between number of facilities and facility costs. The curve increases gradually at the beginning. After a certain point, the slope of the curve begins to increase at an increasing rate.