ISM 125, Lecture #2 (1/7/10)

Agenda:

- Key lessons from Lecture 1
- How do you design a SC network?
- SC Drivers & SC Network
- SC strategy
  - Performance
  - Implied Demand Uncertainty
  - SC Responsiveness
  - Aligning SC strategy with competitive strategy
- HW #1 & Project
Key lessons from Lecture 1

A Supply Chain consists of all the stages that are involved either directly or indirectly, in fulfilling a customer request.

Supply chain cycles exist between any two stages.

![Diagram: Retailer to Customer order fulfillment cycle]

Cycles can have operations.
Operations in an order fulfillment cycle

Cycles can be

Push → anticipate customer request

or

Pull → respond to customer request

Example: PCs

- Build to stock
  - Other PC manufacturers (push)

- Build to order
  - DELL (pull)
Companies which excel at SCM:

Toyota, Dell, Walmart, Apple, (Cisco, HP, ...)

How do you design a SC network?

(see next page)
Design your competitive strategy (and other strategies) (ISM 105/205 MGT 1, HW #1)

Design the supply chain configuration (or structure or network) to meet certain desired performance objectives

- how responsive should the SC be?
- how efficient should the SC be?

- customer needs
- product platform/lines
- product variety

- managing inventory
- facilities
- transportation
- information
- sourcing
- pricing

4 key drivers
DRIVERS

1. Inventory (Δ): raw materials, work-in-process (manufacturing), finished goods

2. Facilities (□): places where inventory is stored, or manufactured, or assembled

3. Transportation (→): the movement of inventory from one facility to another

4. Information (---): data and analysis regarding inventory, facilities, and transportation

Combine these drivers to create the supply chain network appropriate for a particular company.
SC Network

Warehouse
  △ (Raw material 1)

Warehouse
  △ (Raw material 2)

Warehouse
  △ (Raw material 3)

Manufacturing Plant
  △ Components

Assembly plant

Mfg. Plant
  △ Components

DC: distribution center

Information System

to Retailer
SC Strategy

(a) Performance

There are 2 key performance attributes (or metrics)

(i) SC efficiency: cost of making, storing, and delivering the product to the customer. High efficiency $\iff$ low cost

(ii) SC responsiveness: ability of the SC to respond (rapidly) to the following customer needs:
- Large changes in the quantity demanded?
- Large range of products (product variety)
- Highly innovative products
- Short lead times
- High service levels

We capture the efficiency/responsiveness balance using a "Responsiveness spectrum"
Responsiveness Spectrum

- Highly responsive SC
- Somewhat responsive SC
- Somewhat efficient SC
- Highly efficient SC

DELL: Customized PC's in a few days

Automobile Production: Large variety of products in several weeks to several months

Apparel manufacturer: Hanes; lead times of several weeks

Integrated Steel Mills: Narrow well-defined products; production can be scheduled several months in advance
(b) **Implied Demand Uncertainty (IDU)**

(i) Demand uncertainty: uncertainty in the quantity of the products demanded by the customer

\[
\text{Demand} = \frac{100,000 \text{ units} \pm 20\%}{\text{nominal uncertainty}}
\]

(ii) **Implied Demand Uncertainty** refers to the uncertainty in demand implied by the customer needs for the product.
High IDU

Entirely new products (disruptive technologies) developed in ISM 105/205 hybrid automobiles (first introduced)

Somewhat uncertain IDU

New models of existing products

New car models

Somewhat certain IDU

Established products

Detergent (risk)

Functional products:

Gasoline, milk

In order to function

Necessary

IDU spectrum

Low IDU