

Introductory Notes on Supply Chain Management

Text Book: Both Editions, Chapter 6

Slides: A version of Nahmias and Olsen (7th Ed) Instructor's Resources

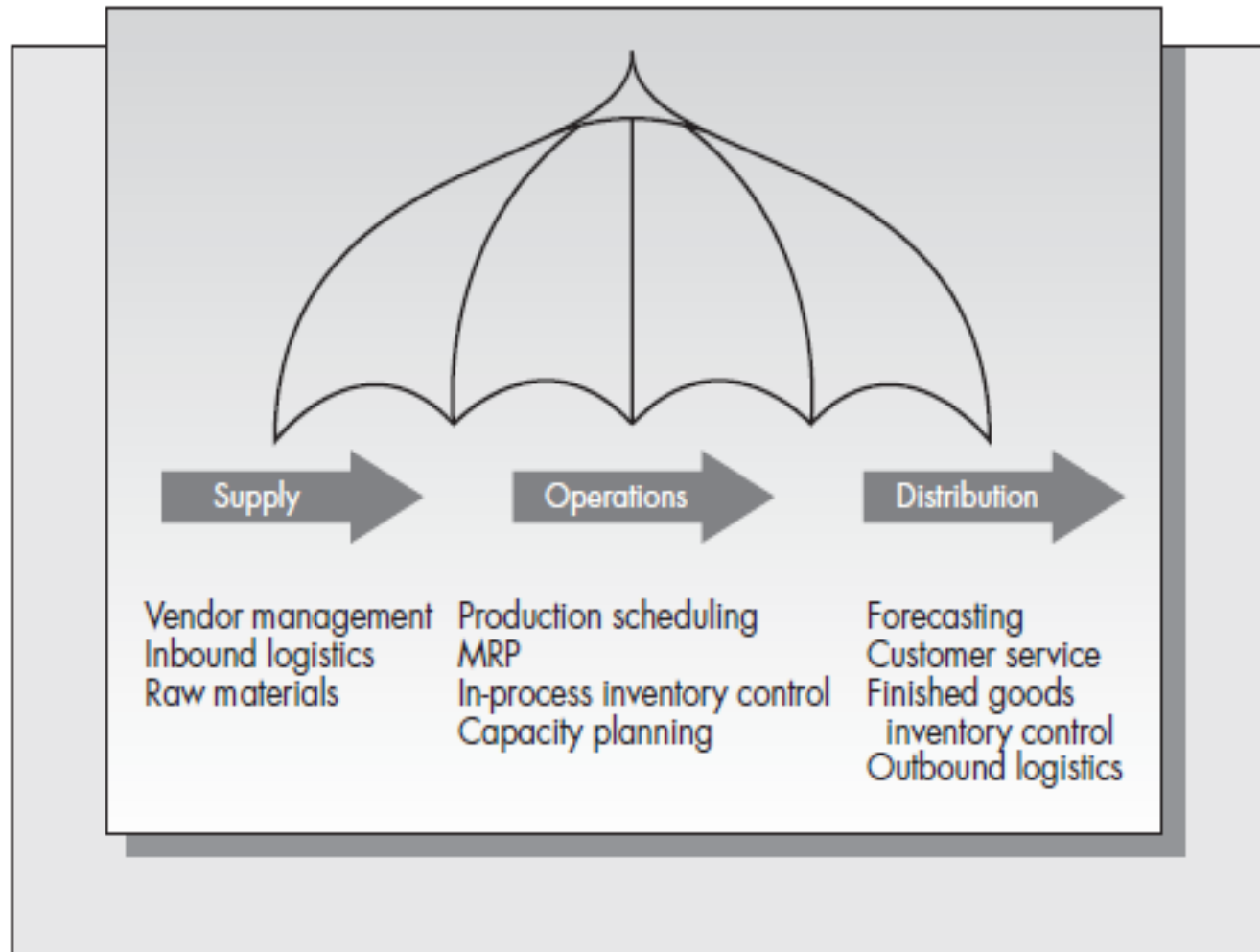
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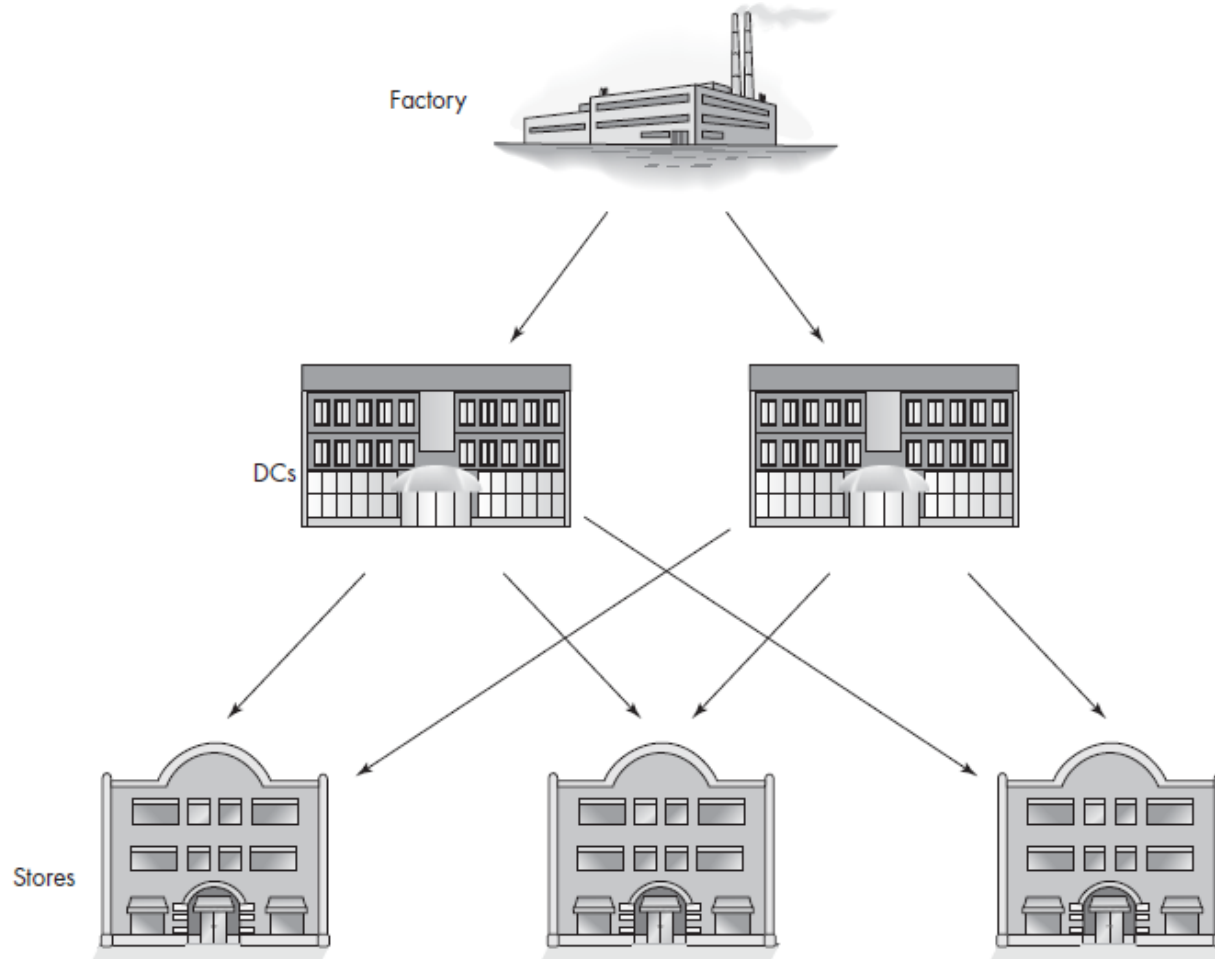
What is Supply Chain Management?

- *Supply Chain management deals with the control of materials, information, and financial flows in a network consisting of **suppliers**, **manufacturers**, **distributors**, and **customers** (Stanford Supply Chain Forum Website.)*

The Supply Chain Umbrella



Example: Inventory/location pooling. Multi-level Distribution Systems



Why So Much Interest in Supply Chain Management?

- **Independent decisions of the entities**
- Considers the broad, integrated, view of materials management from purchasing through distribution
 - As manufacturing becomes more efficient (or is outsourced), companies look for ways to reduce costs
- Several significant success stories. Efficient SCM gives Walmart, HP, others, an important edge

Trends in Supply Chain Management

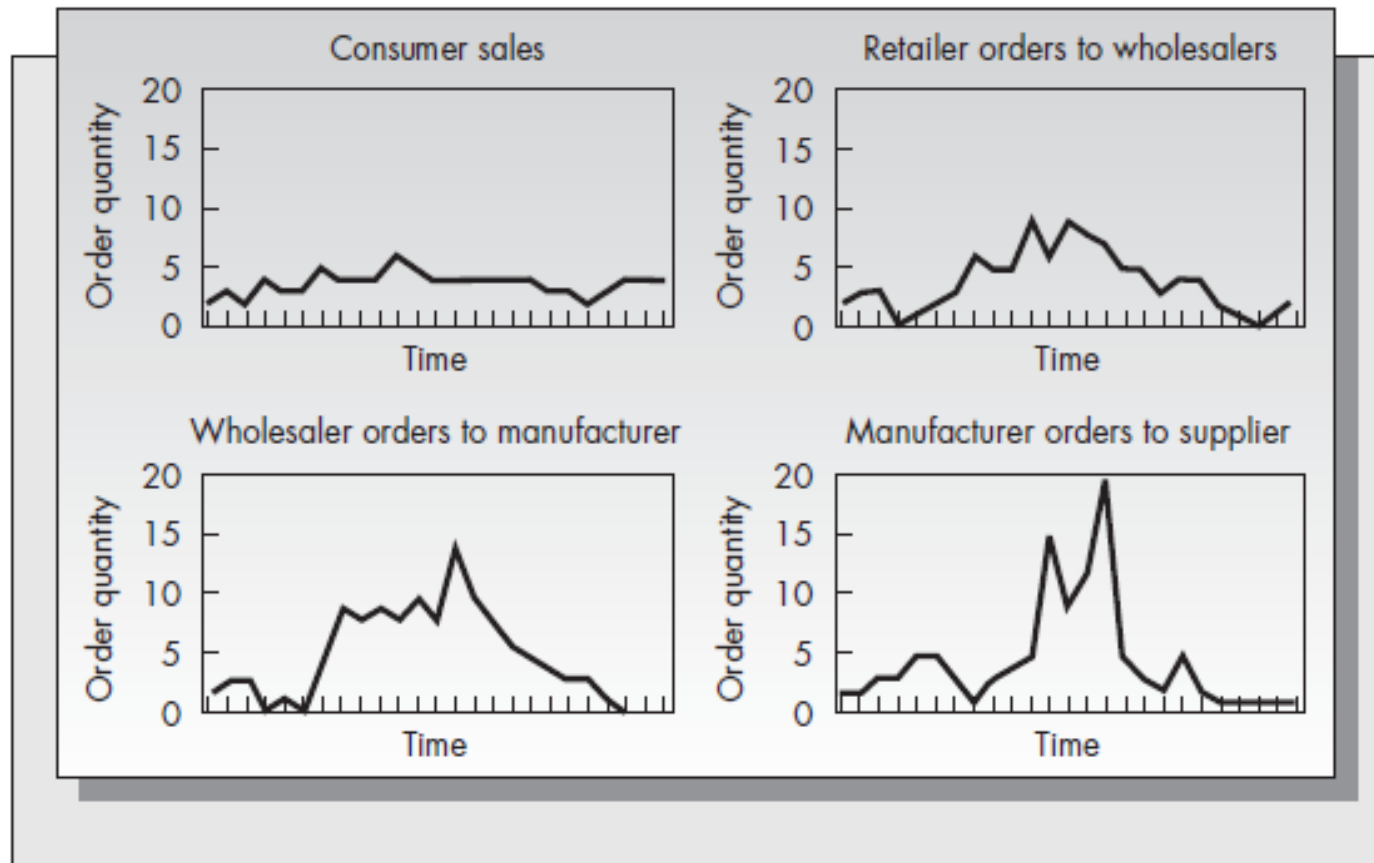
- Outsourcing of the logistics function +
Outsourcing of manufacturing
- Moving towards more web-based transactions systems
- Improving the information flows along the entire chain

Analytical Methods to Support SCM Implementation

- Successful supply chain management relies on information, analytics, and aligned incentives
- Analytical methods include:
 - The transportation problem and more general network formulations for describing flow of goods in a complex system
 - Inventory management and demand forecasting models such as those discussed in this course + more
 - Analytical methods for determining delivery routes for product distribution.

Information Transfer in Supply Chains

The Bullwhip Effect: Increasing Variability of Orders up the Supply Chain



Source: H. L. Lee, P. Padmanabhan, and S. Whang, 1997. 8

Scale: Supply Chain – Allocation and Transportation Problem

- A mathematical model for optimally scheduling the flow of goods from production facilities to distribution centers
- The goal is to find the optimal flow paths and the amounts to be shipped on those paths to minimize the total cost of all shipments
- What if this “central” solution is not acceptable by the facilities and/or DC’s?

Example: Inventory/location pooling.

Multi-level Distribution Systems

Advantages

- Risk pooling
- Distribution centres that can be designed to meet local needs
- Economies of scale in storage and movement of goods
- Faster response time

Further possibilities:

- **Postponement in Supply Chains:** postponing the final configuration of the product until the latest possible point in the supply chain.
- **Capacity Pooling: Flexibility Configurations**
- **Design for Logistics**
- **Incentives in the Supply Chain – Contracting**