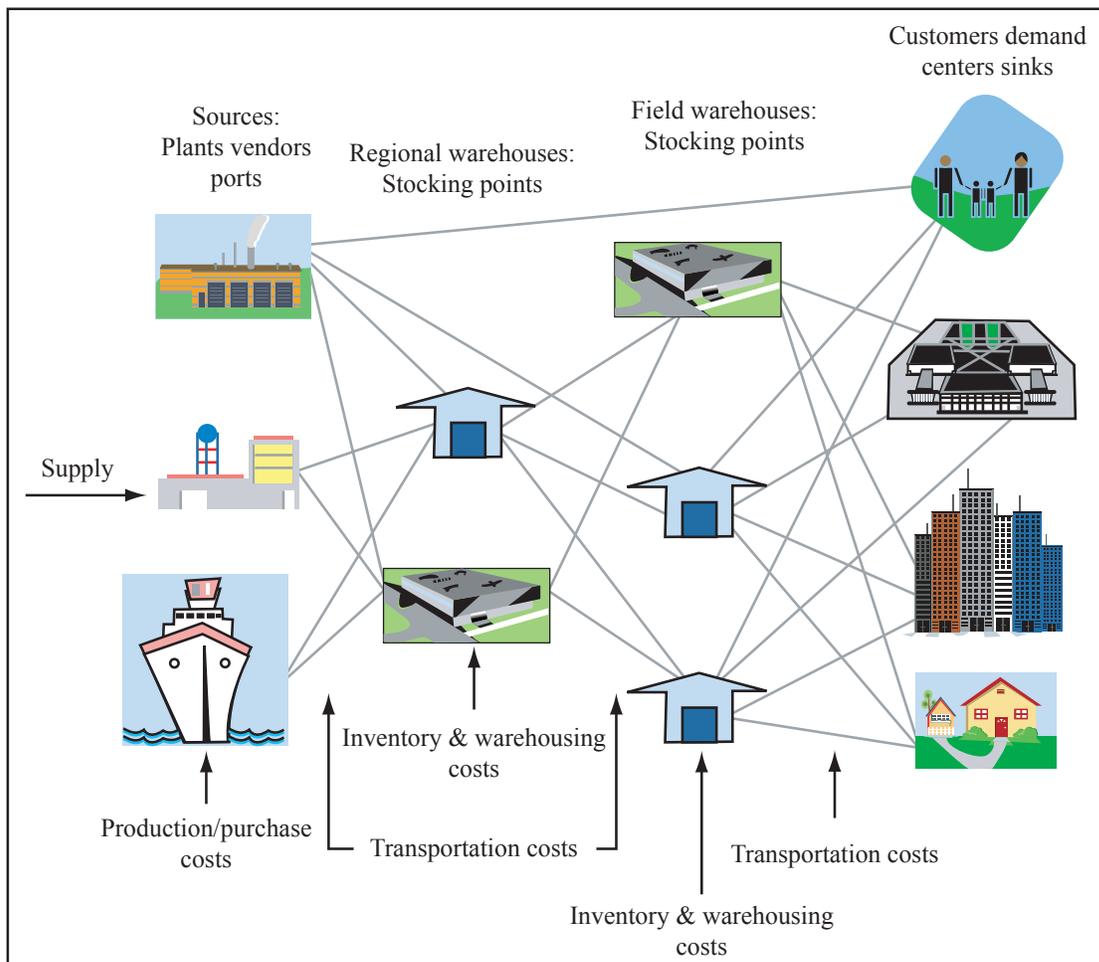


Introduction to Supply Chain Management

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Supply Chain Management

- **Definition:**

Supply Chain Management is primarily concerned with the efficient integration of suppliers, factories, warehouses and stores so that merchandise is produced and distributed in the right quantities, to the right locations and at the right time, and so as to minimize total system cost subject to satisfying service requirements.

- **Notice:**

- Who is involved
- Cost and Service Level
- It is all about integration

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Conflicting Objectives in the Supply Chain

1. Purchasing

- Stable volume requirements
- Flexible delivery time
- Little variation in mix
- Large quantities

2. Manufacturing

- Long run production
- High quality
- High productivity
- Low production cost

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Conflicting Objectives in the Supply Chain

3. Warehousing

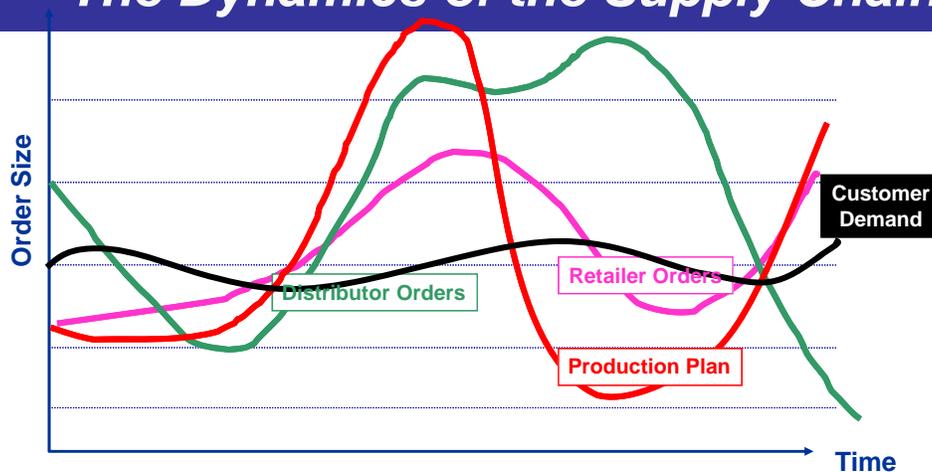
- Low inventory
- Reduced transportation costs
- Quick replenishment capability

4. Customers

- Short order lead time
- High in stock
- Enormous variety of products
- Low prices

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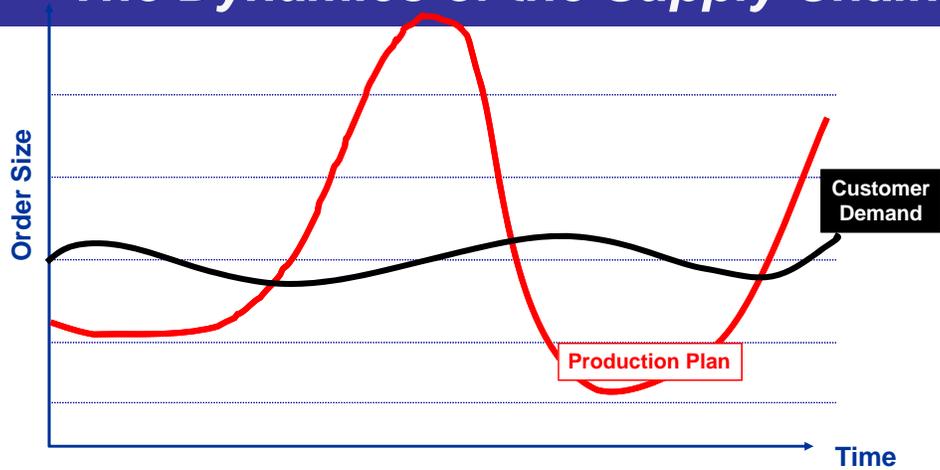
The Dynamics of the Supply Chain



Source: Tom Mc Guffry, *Electronic Commerce and Value Chain Management*, 1998

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The Dynamics of the Supply Chain



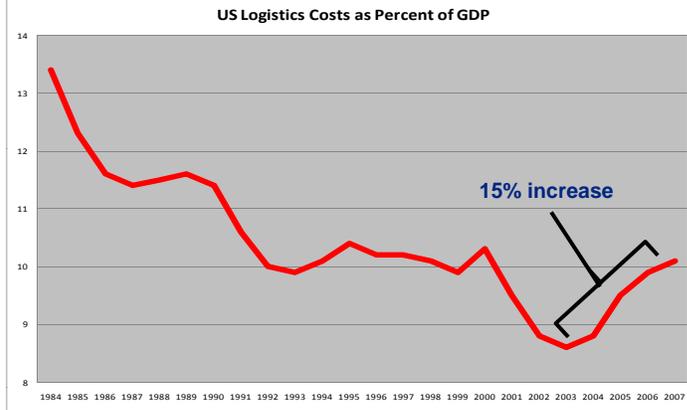
Source: Tom Mc Guffry, *Electronic Commerce and Value Chain Management*, 1998

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Today's Supply Chain Challenges

- Global supply chain with long lead times
- Rising and shifting customer expectations
- Increase in labor costs in developing countries
- Increase in logistics costs

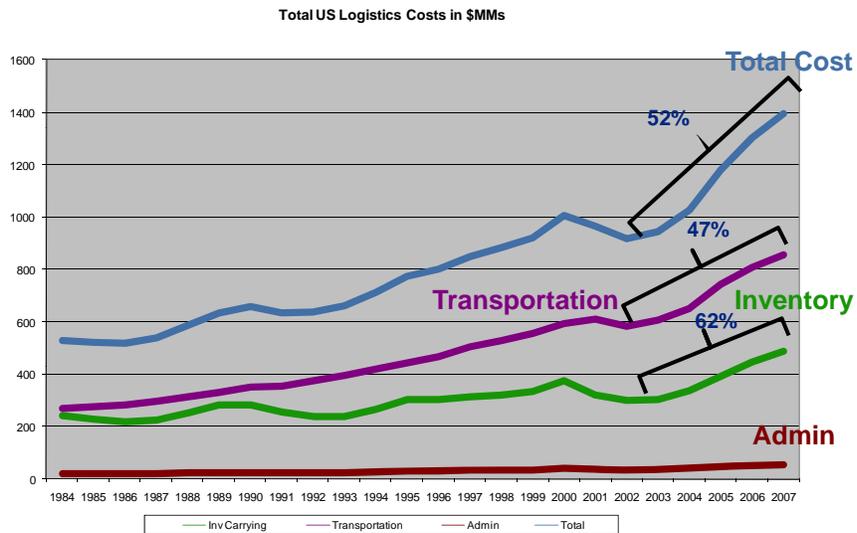
Increase in Logistics Costs



- Rising energy prices
- Rail capacity pressure
- Truck driver shortage
- Security requirements

9

Total US Logistics Costs 1984 to 2007 (\$ Billions)



Source: 19th Annual Logistics Report

10

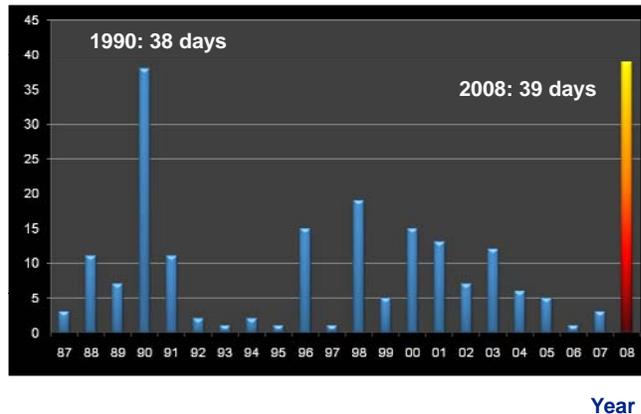
Today's Supply Chain Challenges

- Global supply chain with long lead times
- Rising and shifting customer expectations
- Increase in labor costs in developing countries
- Increase in logistics costs
- Importance of sustainability
- Unprecedented Volatility

11

Unprecedented Volatility

Number of days the price of oil changed 5% or more



In 2008 the price of oil changed 5% or more from its previous close on 39 days making it the most volatile year since 1990.

Source: NYT

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Supply Chain: The Magnitude

- It is estimated that the grocery industry could save \$30 billion (10% of operating cost) by using effective logistics strategies.
 - A typical box of cereal spends 104 days getting from factory to supermarket.
 - A typical new car spends 15 days traveling from the factory to the dealership.

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Supply Chain: The Magnitude *(continued)*

- Compaq computer estimates it lost \$500 million to \$1 billion in sales in 1995 because its laptops and desktops were not available when and where customers were ready to buy them.
- Boeing Aircraft, one of America's leading capital goods producers, was forced to announce writedowns of \$2.6 billion in October 1997. The reason? "Raw material shortages, internal and supplier parts shortages...". (Wall Street Journal, Oct. 23, 1997)

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Supply Chain: The Potential

- Procter & Gamble estimates that it saved retail customers \$65 million through logistics gains over the past 18 months.

“According to P&G, the essence of its approach lies in manufacturers and suppliers working closely together jointly creating business plans to eliminate the source of wasteful practices across the entire supply chain”.

(Journal of Business Strategy, Oct./Nov. 1997)

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Supply Chain: The Potential

- Dell Computer has outperformed the competition in terms of shareholder value growth over the eight years period, 1988-1996, by over 3,000% (see Anderson and Lee, 1999) using
 - Direct business model
 - Build-to-order strategy.

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Supply Chain: The Potential

- In 10 years, Wal-Mart transformed itself by changing its logistics system. It has the highest sales per square foot, inventory turnover and operating profit of any discount retailer.

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Supply Chain: The Complexity

National Semiconductors:

- **Production:**
 - Produces chips in six different locations: four in the US, one in Britain and one in Israel
 - Chips are shipped to seven assembly locations in Southeast Asia.
- **Distribution**
 - The final product is shipped to hundreds of facilities all over the world
 - 20,000 different routes
 - 12 different airlines are involved
 - 95% of the products are delivered within 45 days
 - 5% are delivered within 90 days.

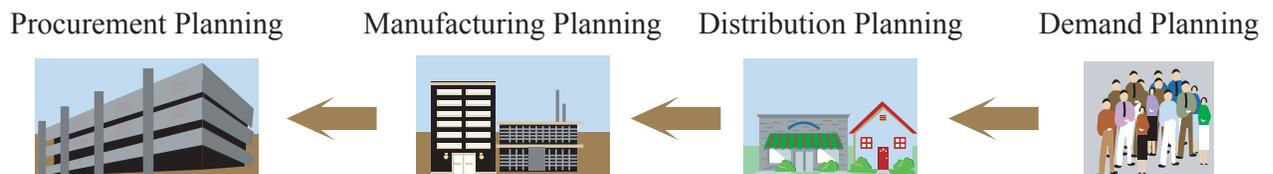
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Supply Chain Challenges

- Achieving Global Optimization
 - Conflicting Objectives
 - Complex network of facilities
 - System Variations over time

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Sequential Optimization



Global Optimization

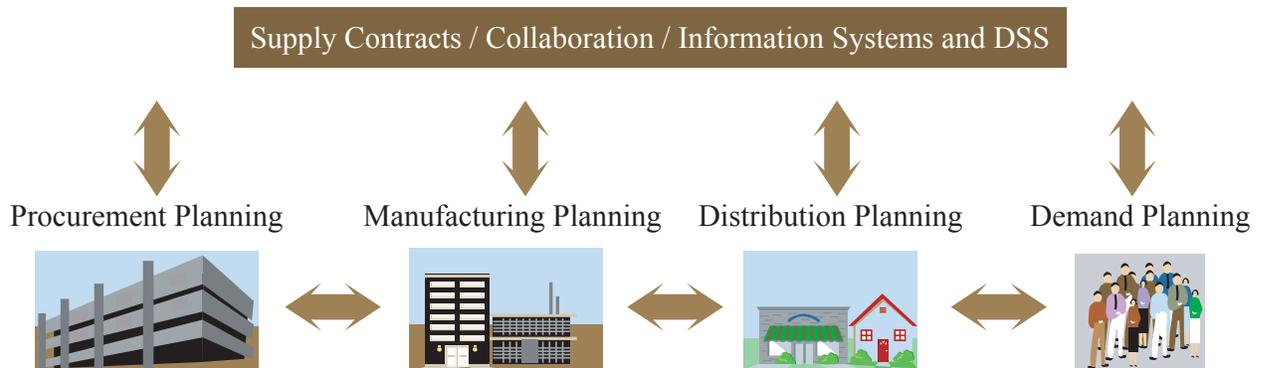
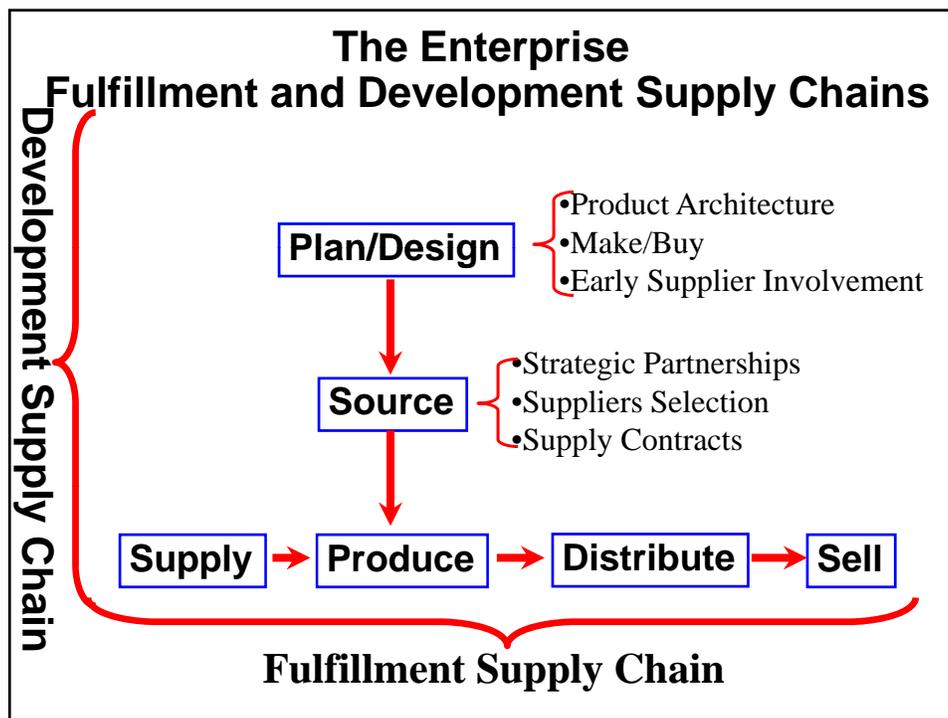


Image by MIT OpenCourseWare.

Supply Chain Challenges

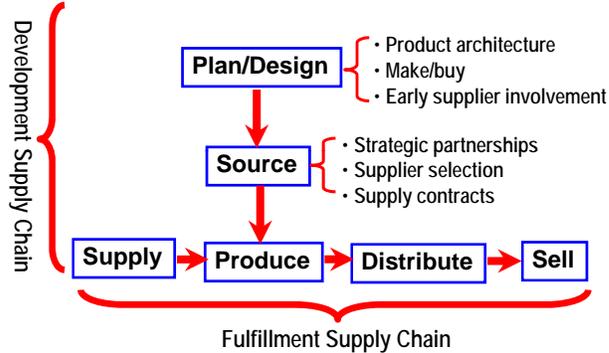
- Achieving Global Optimization
 - Conflicting Objectives
 - Complex network of facilities
 - System Variations over time
- Managing Uncertainty
 - Matching Supply and Demand
 - Demand is not the only source of uncertainty

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Fulfillment and Development Supply Chain

- Industry clock speed
 - Innovative vs. functional products
- Core competencies
 - Make vs. buy
- Product design
 - Modular vs. integral



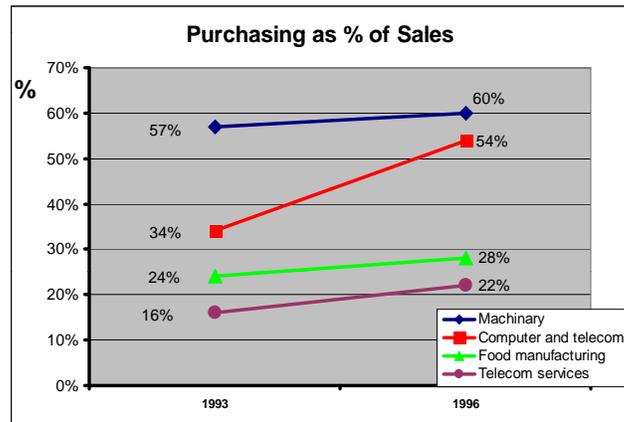
- Uncertainty and variability
 - Demand and supply
- Lead time
 - Offshoring vs. onshoring
- Economies of scale
 - Production and transportation

What's New in Logistics?

- Global competition
- Shorter product life cycle
- New, low-cost distribution channels
- More powerful well-informed customers
- Internet and E-Business strategies

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Significant Increase in Outsourcing

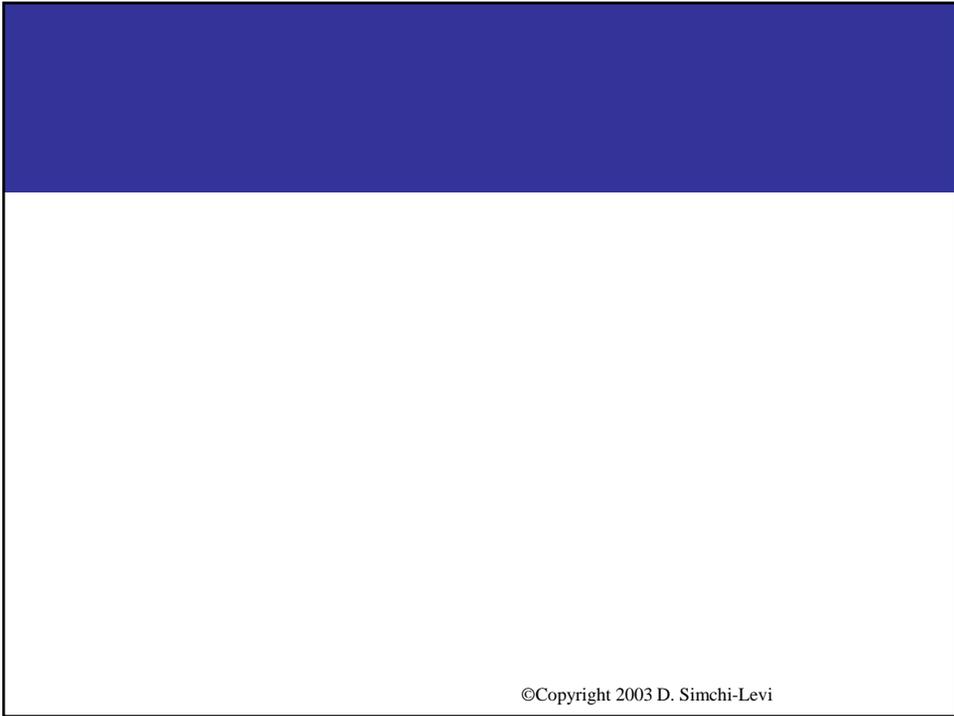


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New Concepts

- Push-Pull strategies
- Direct-to-Consumer
- Strategic alliances
- Manufacturing postponement
- Dynamic Pricing
- E-Procurement

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ESD.273J / 1.270J Logistics and Supply Chain Management
Fall 2009

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