

Introduction to Supply Chain Management

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What Is A Supply Chain?

- * The system of suppliers, manufacturers, transportation, distributors, and vendors that exists to transform raw materials to final products and supply those products to customers.
- * That portion of the supply chain which comes after the manufacturing process is sometimes known as the distribution network.

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What Is the Goal of Supply Chain Management?

- * Supply chain management is 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
 - At the right time
- * In order to
 - Minimize total system cost
 - Satisfy customer service requirements

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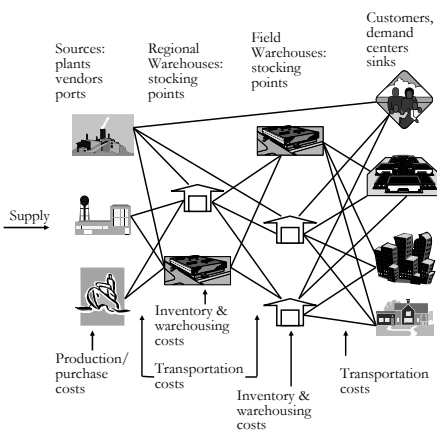
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Notice:

- * Who is involved?
- * What is the goal?
- * What level of activities are involved?
- * What do we mean by integration?

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Strategies for SCM

All of the advanced strategies, techniques, and approaches for Supply Chain Management focus on:

- Global Optimization
- Managing Uncertainty

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Optimization

- * What is it?
- * Why is it important?
- * What tools and approaches help?

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Tools and Strategies for Optimization

- * Decision Support Systems
- * Inventory Control
- * Network Design
- * Design for Logistics
- * Cross Docking

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Global Optimization

- * What is it?
- * Why is it different/better than local optimization?
- * What are conflicting supply chain objectives?
- * What tools and approaches help with global optimization?

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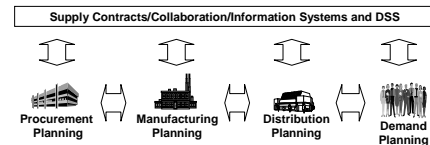
Sequential Optimization vs.

Global Optimization

Sequential Optimization



Global Optimization



Source: *Duncan McFarlane*

Why is Global Optimization Hard?

- * The supply chain is complex
- * Different facilities have conflicting objectives
- * The supply chain is a dynamic system
 - The power structure changes
- * The system varies over time

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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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Tools and Approaches for Global Optimization

- * Everything for optimization, plus...
- * Strategic Alliances/Supplier Partnerships
- * Supply Contracts/Incentive Schemes

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Uncertainty

- * What is variation?
- * What is randomness?
- * What tools and approaches help us to deal with these issues?

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Can't Forecasting Help?

- * Forecasting is always wrong
- * The longer the forecast horizon the worse the forecast
- * End item forecasts are even more wrong

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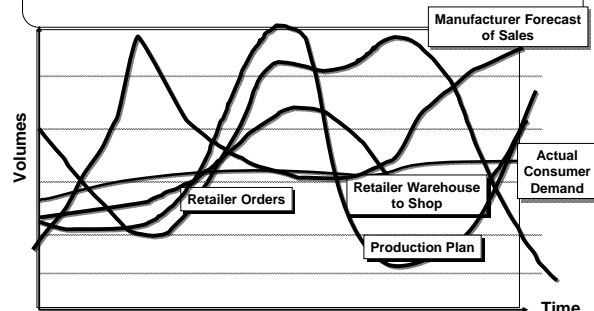
Why Is Uncertainty Hard to Deal With?

- * Matching supply and demand is difficult.
- * Forecasting doesn't solve the problem.
- * Inventory and back-order levels typically fluctuate widely across the supply chain.
- * Demand is not the only source of uncertainty:
 - Lead times
 - Yields
 - Transportation times
 - Natural Disasters
 - Component Availability

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Supply Chain Variability

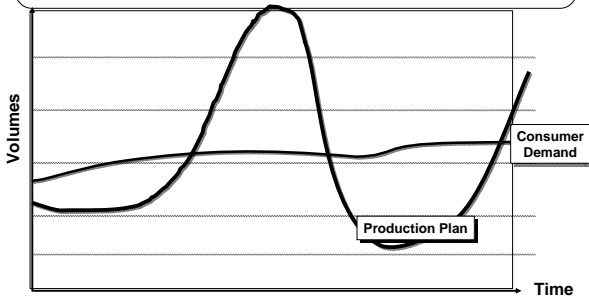


Source: Tom Mc Guffry, *Electronic Commerce and Value Chain Management*, 1998

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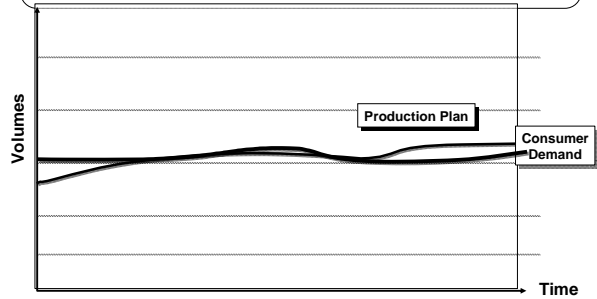
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What Management Gets...



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



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

- * Pull Systems
- * Risk Pooling
- * Centralization
- * Postponement
- * Strategic Alliances
- * Collaborative Forecasting

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Supply Chain: the Magnitude

- * In 1998, American companies spent \$898 billion in supply-related activities (or 10.6% of gross domestic product).
 - Transportation 58%
 - Inventory 38%
 - Management 4%
- * Third party logistics services grew in 1998 by 15% to nearly \$40 billion

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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 more than three months getting from factory to supermarket.
- * A typical new car spends 15 days traveling from the factory to the dealership, although actual travel time is 5 days.

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Supply Chain: The Magnitude

- * 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 write downs of \$2.6 billion in October 1997, due to "Raw material shortages, internal and supplier parts shortages..."

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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

- * 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.
- * 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 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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What's New?

- * 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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Key Issues

- * Issues span
 - Strategic
 - Tactical
 - Operational
- * What are the tradeoffs and issues?
 - Distribution Network Configuration
 - Inventory control
 - Supply Contracts
 - Distribution Strategies
 - Integration and Partnerships
 - Procurement Strategies and Outsourcing
 - Product Design
 - Information Technology

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New Concepts

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

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