



**Columbia University
Graduate School of Business**

B7108 Supply Chain Management

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Course Description:

Supply chains have been around for as long as the business of production itself. What is new is their management. Activities such as purchasing, warehousing, inventory control and transport were once considered part of the cost of running a business. Now these activities come together as “supply-chain management”—a strategic function that has taken center-stage on CEO’s agenda. What explains the success of Wal-Mart in retailing, Dell in the personal-computer business, Zara in fashion, Toyota in automobile production and Li & Fung in the trading business? Efficient and responsive supply-chain management.

There are several reasons for supply chain function’s growing influence on the bottom line. First, businesses are doing less and less within their own organization and relying more and more on their supply chain partners. This may be due to increased complexity, scale economy or to focus on core competencies. Whatever the reason, the success of a firm is increasingly dependent on what happens outside its organizational boundaries. Second, supply chains are becoming longer and more complex. Stretched across several continents, spanned by road, rail, sea, air and now, by internet—the task of ensuring that all these things work together seamlessly is frustratingly difficult and requires constant attention. Third, supply chain is becoming more enveloping—it includes everything from buying raw materials to managing suppliers, warehousing, operating transport fleets, taking orders, collecting payments, repairing products and even reverse logistics—the task of recycling unused and end-of-product-life-cycle items. Finally, supply disruption

represents a significant danger for many firms and managing this risk is becoming a pressing issue. Ironically, as supply chains have become leaner this risk has only increased. The new JIT converts are celebrating their lean international supply chains, unaware that a dock strike in California or an earthquake in Turkey can have a calamitous effect on their business.

The Supply Chain Management course will focus on how to coordinate and integrate various activities into a seamless process. The emphasis will be on managing material and information flow across different partners in the chain. The alignment of incentives, design and evaluation of contracts and strategies to reduce and hedge uncertainties will receive significant attention.

This course will explore:

- Key variables, control levers, and critical tradeoffs in supply chains
- The enabling role of the Internet
- Matching supply chain strategies to market needs
- How to cope with uncertainties in supply chains
- Managing information flows for supply chains
- Diagnostics for supply chain performance
- Inventory/service tradeoffs
- Distribution strategies
- Sourcing and supplier management
- Role of intermediaries
- Supply flexibility
- Risks in supply chain

The course will include both individual and group work. Assignments will indicate if the work should be submitted as a group or individually. Case groups may have four or five members while individual assignments should be addressed individually. Grading will be based on case analyses, two exams and assignments as discussed below.

Grading:

Your grade in the course will be based on your individual, as well as group efforts and performance. We will use the following weighting scheme:

Class Participation	20%
Homework and Case Assignments	30%
Midterm	15%

Class discussion is an important part of the design of the course. Therefore your participation will be graded, and when necessary, people will be called on to add to the discussion. The quality of your participation in discussions will be judged based primarily on your ability to move the class discussion forward. The content, depth and relevance of comments to the discussion are important as well. So that we can accurately access your participation, you should bring your tent (name) card to class throughout the term.

Each week there will be an assignment related to the case and/or the subject. Guidelines for preparing for the cases as well as assignments will be distributed a week in advance. Sometimes these assignments will be group efforts while others must be prepared individually (the nature of the assignment will be specified). Assignments are due at the beginning of class.

You may discuss the cases and assignments with colleagues in your class. However, the work submitted for grading must reflect your own thinking and contribution. I will assume that each member of the team has contributed equally to a group assignment, unless noted otherwise.

Mid-term and final exams will be open-book with access to class notes.

Required Readings:

Readings are available in the course pack.

Optional Technical Reference:

1. *Inventory Management and Production Planning and Scheduling* by Edward A. Silver, David F. Pyke, and Rein Peterson, 1998, 0-471-11947-4
2. *Matching Supply with Demand: An Introduction to Operations Management* by Gerard Cachon, 2006, McGraw-Hill Irwin
3. *The Resilient Enterprise* by Yossi Sheffi, 2005, MIT Press

Session 1: Introduction, Matching Supply with Demand.

Class Plan:

- 1.1 Introduction
 - The Growing Influence of Supply Chain Management
 - Course Outline
- 1.2 Variability and Risk in Supply Chains: The Newsvendor Model

Reading (optional):

- 1. Growing influence of supply chain management, The Economist
- 2. Building the supply chain of the future, McKinsey Quarterly, January, 2011.

Session 2: Manufacturer-Retail Chain; Supply Chain Diagnosis

Case: Sorenson Research Co.:

Prepare the following questions for discussion (nothing to turn in).

- 1. What are the problems Sorenson Research Company is faced with in December 1976? What are the causes of these problems? Analyze various elements of Sorenson's supply chain: distribution channel, incentive system, inventory positioning, stocking policy, reshipment policy, mode of transportation, accuracy and timeliness of information.
- 2. What are the overall objectives of Sorenson's supply chain? Does it achieve these objectives?
- 3. Consider Larry Harmer's plan to improve the system. Summarize the plan and analyze the effects of this plan on Sorenson's operations.
- 4. Suppose you are asked to propose a plan to help Sorenson Research decrease inventories and costs and improve customer service. Propose a plan and analyze the impact of your plan.

Session 3: Coordination in Independent Manufacturer-Retailer Supply Chains; Linkage Between Inventory Management and Working Capital; Forecasting

Case: Northco

Prepare the following questions for discussion (nothing to turn in):

1. For Northco's products, identify characteristics that are relevant for supply chain management.
2. What makes it difficult for Northco to match supply with demand? How should Michaels think about the costs of over and understocking? Identify the elements of over and understocking costs in this case.
3. What should Michaels do to mitigate the effect of working capital shortage?
4. Examine Northco's forecasting process (look at the Exhibits 3-4 and the Appendix 1). How good is this forecast process? What modification would you suggest for a better forecast?

Session 4: Centralized vs. Decentralized Chains; Supply Chain Intermediaries; Return Contracts.

Case: Massimo Menichetti (nothing to turn in)

1. Analyze the Prato System. Does it work? Why does it work better than the integrated mill?
2. What is the role of an impannatori?
3. Compare the SPRINT project to CAD. What benefits do these IT tools bring? Should Massimo embrace them?
4. Do you know other industries that share similar characteristics as the decentralized textile production in the Prato region of Italy?

Reading:

1. Turning the Supply Chain into a Revenue Chain

Session 5: Sourcing Policy and Buyer-Supplier Relationship; Continuous Review Inventory Models.

Bose Corporation: The JIT II Program (A):

1. How do Bose's history, strategy, and sourcing policies affect supplier relations? Is Bose a good buyer?
2. Where is the buying and selling done in this context? Who are the people involved and what are their roles?
3. Should Bose participate in the JIT II program? Should G&F? What are the potential benefits and risks to each companies?
4. Should Bose vertically integrate into plastics? Why (why not)?
5. Should plants source their own components locally? Why (why not)?

Follow-up Reading:

Bose (B, C, D)

Group Assignment:

Concept Check 4

Session 6: Supply Chain Distribution; Beer Game

Mid-Term Examination

Session 7: Global Sourcing and Supplier Management; Extensions of Newsvendor Model

Case: Intercon Japan

Questions:

1. How has Intercon Japan's supplier relationships performed relative to its American counterpart?
2. How do these relationships create value for Intercon Japan? That is, how do they function?
3. Can this style of relating translate to the U. S.?

Reading:

"Building Deep Supplier Relationships," Jeff Liker and T.Y. Choi, Harvard Business Review, December 2004

Follow-up Reading: Supply Chain Challenges: Building Relationships

Group Assignment:

Concept check 5

Session 8: Tools for Managing Supply Chains: Continuous Review Model

Lecture on Tools for Managing Supply Chains

Session 9: Reengineering the Supply Chain; Dealing with Supplier Uncertainty

Barilla SpA (A):

Questions:

1. Why are orders placed by Cortese with Pedrignano so much more variable than the demand faced by Cortese? How does this affect Barilla?
2. What actions can Barilla take to rectify the situation? Do you anticipate any problems?
3. What conflicts or barriers internal to Barilla does the JITD program create? What causes these conflicts? As Giorgio Maggiali, how would you deal with these conflicts?

4. As one of Barilla's customers, what would your response to JITD be? Why?
5. In the environment in which Barilla operated in 1990, do you believe JITD (or a similar kind of program) would be feasible? Effective? If so, which customer would you target next? How would you convince them that the JITD program was worth trying? If not, what alternatives would you suggest to combat some of the difficulties that Barilla's operating system faces?

Read:

1. The Bullwhip Effect in Supply Chains.

Session 10: Virtual Integration; Value Chain Dissection; Vertical Integration

Reading: Global and Entrepreneurial: Supply Chain Management Hong Kong Style: An Interview with Victor Fung

1. How has the business model for Li & Fung changed over the last few decades?
2. How does Li & Fung add value as a supply chain intermediary?

Case: Zara

Questions:

1. What advantage does Zara derive due to vertical integration?
2. Compare Zara to Dell. What are the similarities and differences between their business models?
3. What challenges does Zara face going forward?

Session 11: Globalization: Role of Supply Chains

Case: Lenzing AG: Expanding in Indonesia

Questions:

1. What are the costs and benefits of expansion at South Pacific Viscose?
2. How attractive is Indonesia as a site for rayon production? As a domestic market for rayon? As a leading exporter of rayon?
3. In 1978, how well is Lenzing doing? Would you want to invest in Lenzing? How has this changed by 1994?
4. If you were in Mikel Dodd's shoe, what would you advise Lenzing's Board of Directors to do?

Case: Suzlon's Edge

Questions:

1. What is the future prospect of wind energy? How well is Suzlon placed compared to its competitors for the upside market potential?
2. What is Suzlon's edge? How well can it maintain its competitive advantage going forward?
3. Compare Suzlon's acquisition of Hansen Transmission to its acquisition of REpower.
4. What is the fundamental difference between the way vertical integration was pursued by Zara vs. Suzlon?

Final Examination