

## **MBA Elective Course – Supply Chain Management**

### **Module Leader and Lecturer**

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### **Time and Place**

May 17<sup>th</sup>, 2010, Monday, 02–06pm, Lecture Theatre 3  
May 18<sup>th</sup>, 2010, Tuesday, 02–06pm, Lecture Theatre 3  
May 19<sup>th</sup>, 2010, Wednesday, 02–06pm, Lecture Theatre 3  
May 20<sup>th</sup>, 2010, Thursday, 02–06pm, Lecture Theatre 3  
May 21<sup>st</sup>, 2010, Friday, 02–06pm, Lecture Theatre 3  
May 22<sup>nd</sup>, 2010, Saturday, 10am–02pm, Lecture Theatre 3

### **Course Website**

The web page for the course can be found on the Lancaster MBA bulletin board.

### **Course Description**

In this course we will view the supply chain from the point of view of a general manager. Logistics and supply chain management is all about managing the hand-offs in a supply chain – hand-offs of either information or product. The design of a logistics system is critically linked to the objectives of the supply chain. Our goal in this course is to understand how logistical decisions impact the performance of the firm as well as the entire supply chain. The key will be to understand the link between supply chain structures and logistical capabilities in a firm or the entire supply chain.

The function of supply chain management is to design and manage the processes, assets, and flows of material and information required to satisfy customers' demands. Supply logistics related costs account for 20–25% of a typical firm's total cost. On the revenue side the supply chain decisions have a direct impact on the market penetration and customer service. Globalization of economy and electronic commerce has heightened the strategic importance of supply chain management and created new opportunities for using supply chain strategy and planning as a competitive tool. Electronic commerce has not only created new distribution channels for consumers but also revolutionized the industrial marketplace by facilitating inter-firm communication and by creating efficient markets through trading communities. Moreover combination of enterprise information infrastructure and the Internet has paved the way for a variety of supply chain optimization technologies. Therefore, the objectives of this course are:

1. To develop an understanding of key drivers of supply chain performance and their inter-relationships with strategy and other functions of the company such as marketing, manufacturing and accounting.
2. To impart analytical and problem solving skills necessary to develop solutions for a variety of supply chain management and design problems and develop an understanding for use of information technology in supply chain optimization.
3. To understand the complexity of inter-firm and intra-firm coordination in implementing programs such as e-collaboration, quick response, jointly managed inventories and strategic alliances.
4. To develop the ability to design logistics systems and formulate integrated supply chain strategy, so that all components are not only internally synchronized but also tuned to fit corporate strategy, competitive realities and market needs.
5. To understand which information should be exchanged in a supply chain and how it should be used to benefit the entire supply chain.
6. To identify improvement opportunities that exist within supply chains in different industries and to quantify the improvements that various supply chain strategies offer.
7. To understand which barriers companies face during the implementation of new supply chain strategies.

### **Course Assessment**

There is one piece of assessed coursework:

- A case report or problem set at the end of the course (individual assignment).

### **Reports**

The reports are graded for both content and presentation. A good paper should clearly and succinctly state the recommendations in an executive summary at the beginning to provide the reader with an overview and a framework. The main text should each present a major part of the rationale for the recommendation in terms of the desirable and undesirable consequences of adopting it. The rationale must consider capabilities that the logistics system under study needs to excel at, and how the current system either provides these capabilities or fails to provide them.

Reports should be typed with double spacing and should not exceed 10 pages (or 2,500 words), not including appendices and exhibits. Some common problems in preparing reports:

- Executive Summary:**  
Your detailed report should be preceded by a one page executive summary. In this summary, highlight your findings as you would in an internal document aimed for senior management. Therefore, assume that the reader is intimately familiar with the company background and the decision situation. Focus only on your

recommendations and your analyses. Be very careful not to waste space by just repeating facts from the case.

□ **Presentation:**

A good report is not a chronology of analysis (i.e., answering the questions listed in sequence), but a clearly articulated statement of recommendation and support. If there are options under consideration in the case that are rejected by you, a clear rationale for your decision should be provided. Facts stated in the case need not be restated unless used to make a point. I will assume that the most important issues are raised in the report and that all else is less important to the writer. Both desirable and undesirable consequences should be factually stated and supported. In the overall evaluation of the report the discussion of all consequences of the recommendation is of the greatest importance. You must clearly discuss how your recommendations aid in the development of capabilities that are important for the logistics system under study.

□ **Analysis:**

Other reports suffer from inadequate analysis. Analysis for a report is a time consuming and intellectually challenging task. Each case has a set of questions that are essentially a guide to help you with the analysis. The objective is to evaluate a complete range of alternatives and anticipate and discuss the full consequences of your recommendation. However, please note that these questions are just providing a starting point for your analysis; so answering the questions only may not be sufficient for a complete report.

## Reading and Lecture Notes

I will roughly follow this text:

- Chopra, S., P. Meindl (C&M). 2006. *Supply Chain Management (3<sup>rd</sup> Edition)*. Pearson Prentice Hall, New York. While the library has some copies on reserve, I would recommend that you purchase this useful book.

The remainder of the course is self-contained; I will license and print all the cases. Participants will be able to pick them up from the MBA office two weeks prior to the start of the course.

## Additional optional reading

- Stadtler, H., C. Kilger. 2004. *Supply Chain Management and Advanced Planning: Concepts, Models, Software and Case Studies (3<sup>rd</sup> Edition)*. Springer-Verlag, Berlin, Germany.
- Simchi-Levi, D., P. Kaminsky, E. Simchi-Levi. 2007. *Designing and Managing the Supply Chain: Concepts, Strategies, and Test Studies (3<sup>rd</sup> Edition)*. McGraw-Hill, New York.
- de Kok, A.G., S.C. Graves (Editors). 2003. *Supply Chain Management: Design, Coordination and Operation*. Elsevier Publishing Company, Amsterdam, Netherlands.
- Stock, J.R., D.M. Lambert. 2001. *Strategic Logistics Management (4<sup>th</sup> Edition)*. McGraw-Hill, New York.
- Coyle, J.J., E.J. Bardi, C.J. 2002. *Langley: The Management of Business Logistics (7<sup>th</sup> Edition)*. South-Western College Publications, Mason.
- Bowersox, D.J., D.J. Closs, M.B. Cooper. 2002. *Supply Chain Logistical Management*. McGraw-Hill, New York.
- Ballou, R.H. 2003. *Business Logistics: Supply Chain Management (5<sup>th</sup> Edition)*. Prentice Hall, New York.
- Silver, E.A., D.F. Pyke, R. Peterson. 1998. *Inventory Management and Production Planning and Scheduling (3<sup>rd</sup> Edition)*. Wiley, New York.

Other books that will be of interest to students taking this course include

- Fine, C.H. 2001. *Clock Speed*. Little, Brown Book Group, London, UK.
- Pine, B.J. 1999. *Mass Customization*. Harvard Business School Press, Boston.
- Gilmore, J.H., B.J. Pine. 2000. *Markets of One: Creating Customer-Unique Value through Mass Customization*. Harvard Business School Press, Boston.
- Poirier, C.C. 2003. *Using Models to Improve the Supply Chain*. CRC Press, London, UK.
- Blackburn, J.D. 1990. *Time Based Competition: The next Battleground in American Manufacturing*. McGraw-Hill, New York.

- ❑ Stalk, G., T.H. Hout. 2003. *Competing Against Time: How Time-Based Competition is reshaping Global Markets*. Free Press, New York.

## Detailed course outline

### Disclaimers

This is a new course offered in the Lancaster MBA Program, hence the following schedule is tentative and I will make adjustments to the topics covered along the course. Your feedback in this process is valuable, and motivates continuous course improvement. Please do not hesitate to let me know, throughout the course, how I can improve the course and the learning experience it provides!

### Session 01

In the first session we will discuss supply chain management and its importance to the success of a firm. We will discuss different ways to view a supply chain. We will also raise a variety of supply chain related questions that need to be answered by any firm. We will provide a framework within which supply chain drivers may be analyzed appropriate tradeoffs considered. We will define key performance measures for a supply chain and establish initial links to logistical drivers that a supply chain designer or manager may control.

We will consider the changing environment and look at some of the key challenges for logistics today. We will discuss the notion of *Tailored Logistics* and its importance in today's environment. This will be an important concept that we will refine in the context of different logistical drivers in the course of the quarter. We start discussion on how a firm can manage inventories to ensure a fit between strategic supply chain objectives and inventory management.

We will illustrate the strategic framework for supply chain decisions in the context of the Seven Eleven Japan case. Please read the case before class.

Preparation for class:

- Read: Chapters 1–3 in C&M
- Read: Seven Eleven Japan. Consider the following questions and be prepared for discussing your answers:
  1. How would you characterize the business strategy at 7-Eleven? What level of responsiveness are they aiming to achieve?
  2. What risks does a retailer aiming for this level of responsiveness face?
  3. How has 7-Eleven structured its facilities, information, transportation, and information strategies to diminish its risks and develop a supply chain structure that is well suited for its business strategy?
- Read: Marshal L Fisher, *What Is the Right Supply Chain for Your Products?* (HBR March 1997). Never has so much technology and brainpower been applied to improving supply chain performance. But the performance of many supply chains has never been worse. Why haven't the new ideas and technologies led to improved performance? Because, Marshall Fisher says, companies lack a framework for deciding which ones are best for their

particular situation. This paper offers such a basic framework to help managers understand the nature of the demand for their products and devise the supply chain that can best satisfy that demand.

## Session 02

The focus of this session is the understanding of the effects of demand forecasts and forecast errors on a tactical decision policy for a supply chain. Assessing future product demand is critical for capacity planning, purchasing and inventory management. In this session we will examine two cases and see how the concepts of forecasting and safety-stock are applied in practical situations.

- Read: Chapters 4–6 in C&M
- Prepare: LL Bean (HBS Case 9-893-003). LL Bean must make stocking decisions on thousands of items sold through its catalogs. In many cases, orders must be placed with vendors twelve or more weeks before a catalog lands on a customer's doorstep, and commitments cannot be changed thereafter. As a result, LL Bean suffers annual losses of over \$20 million due to stock outs or liquidations of excess inventory. Provides a context in which buying decisions that balance costs of overstocking and under stocking when demand is uncertain are made and implemented on a routine basis. Please read the case and be prepared to discuss the following questions in class:
  1. What is LL Bean's business and what is its marketing philosophy?
  2. Why has this marketing approach been successful?
  3. How does LL Bean forecast demand?
  4. What lead times are required for forecasts? Why?
  5. How does LL Bean decide on the number of units to stock? What costs are relevant and how are they determined?
  6. What information does Scott Sklar require to arrive at a demand forecast for a new catalog item?
  7. How would you address Mark Fasold's concern that the number of items purchased exceeds the number of items forecasted?
  8. Why are inventory decisions based on the distribution of A/F ratios rather than the distribution of the differences A-F?
  9. What changes will the Internet and bring to LL Beans business. How will it enable it to improve forecasting?
- Prepare: Hewlett-Packard: DeskJet Printer Supply Chain (A). Hewlett-Packard's (HP) Vancouver Division faced a challenge in 1990. Although its new inkjet printers were selling well, inventory levels worldwide were rising as sales rose. In Europe, high product variety was making inventory levels especially high. HP considered several ways to address the

inventory issue: air freighting printers to Europe, developing more formalized inventory planning processes, or building a factory in Europe. Please read the case and be prepared to discuss the following questions in class:

1. What has caused the so-called inventory/service crisis?
2. What industry characteristics, product characteristics, and supply chain characteristics are particularly important to Brent Cartier's problem?
3. List the important drivers of 'safety stock.'
4. How would you evaluate the various alternatives available to Brent Cartier to address the inventory and service problems? (If needed, use  $z = 2.05$  to calculate a safety stock level for a 98% service level.)

### Session 03

In this session we will illustrate the notion of Accurate Response using the *Sport Obermeyer* case. This is most appropriate for product categories with highly uncertain demand. We will discuss the role that high cost, low cycle time suppliers can play for a firm that may be competing on low cost. This will relate back to the role of a small order emergency supplier in a supply chain.

We will develop the notion of *Tailored Purchasing* based on the uncertainty of product demand and discuss its application across different product categories as well as for a single product. This will be discussed in the context of global sourcing. We will also discuss the role that contracts play in accurate response and actions that a supply chain can take to increase profits through accurate response.

We are also going to examine the role of transportation in the supply chain and raise various tradeoffs that need to be considered when designing and operating a transportation network.

Preparation for class:

- Read: Chapter 11 in C&M
- Prepare: *Sport Obermeyer* (HBS Case 9-695-022). The case describes operations at a skiwear design and merchandising company and its supply partner. It introduces production planning for short-life-cycle products with uncertain demand and allows students to analyze a reduced version of the company's production planning problem. In addition, it provides details about information and material flows that allow students to make recommendations for operational improvements, including comparisons between sourcing products in Hong Kong and China. Use the following questions as guidance when preparing your case report and recommendations:
  1. Using the sample data in Exhibit 10, make a recommendation for how many units of each style Wally Obermeyer should order during the initial phase of production. Assume that all ten styles in the sample problem are made in Hong Kong (a minimum commitment of 600 units per style ordered), and that Obermeyer's initial production

commitment must be at least 10,000 units. Ignore price difference among styles in your initial analysis. Clearly spell out the methodology you have used to make your ordering decisions in an exhibit. Spell out the logic behind your methodology. *Note that I am not looking for one optimal solution. My evaluation of your report will be on your thinking about how such an issue can be approached.*

2. Can you come up with a measure of risk associated with your ordering policy? This measure of risk should be quantifiable.
3. What operational changes would you recommend to Wally to improve performance? Clearly list the expected benefits from each change. Please try and be very specific in terms of the changes and benefits in response to this question.
4. How should Obermeyer management think (both short term and long term) about sourcing in Hong Kong versus China? What sourcing policy would you recommend?

We will conclude this session by discussing the domestic transportation industry and consider the different modes available. We will motivate the link between transportation and inventory costs in the design of transportation networks. We will also consider different problems that are relevant when making transportation decisions.

#### **Session 04**

Now that we understand most of the key issues in supply chain, we will explore the role of the Internet in supply chains, specifically in the context of e-commerce and e-business. We will start with business-to-consumer models.

The goal of this session will be to discuss the structure of various supply chains in the context of the various supply chain drivers discussed over the last sessions. We will apply the ideas in the context of e-commerce to see what are the opportunities that the Internet provides from a supply chain perspective. First, we will explore the design of direct-to-consumer model using Dell Computers. Then we will also take the Ford Motor Company case to see if the Dell structure is appropriate for Ford and look for reasons why it may or may not be so.

Preparation for class:

- Read: The Power of Virtual Integration: An Interview with Michael Dell, Harvard Business Review, March–April 1998. This interview offers a deeper look inside Dell's highly publicized success and offers managers a model of how traditional relationships in a value chain can be reconceived in the Information Age. The individual pieces of Dell Computer's strategy – customer focus, supplier partnerships, mass customization, just-in-time manufacturing – may all be familiar. But Michael Dell's business insight about how to combine them is highly innovative: Technology is enabling coordination across company boundaries to achieve new levels of efficiency and productivity, as well as extraordinary returns to investors. In this HBR interview, Michael Dell describes how his company is achieving 'virtual integration' with its customers and suppliers. Direct relationships with customers create valuable information, which in turn allows the company to coordinate its entire value chain back

through manufacturing to product design. Dell describes how his company has come to achieve this tight coordination without the 'drag effect' of ownership.

- Prepare: Ford Motor Co, Supply Chain Strategy (HBS Case 9-699-198). Describes Ford's examination of its supply chain to evaluate whether the company should 'virtually integrate' on the Dell Computers model. Please read the case and be prepared to discuss the following questions in class:
  1. Consider the experience that you (or your friends or members of your family) had had buying a car; compare these to the experience of buying a computer online (if you have never done this, do to Dell's or Apple's website and explore how online computer buying works). What do you think explains the differences?
  2. What advantages does Dell get from virtual integration? How important are these advantages in the automobile business?
  3. What challenges does Ford face that are not also faced by Dell? How should Ford deal with these challenges?
  4. If you were Teri Takai, what would you recommend to senior executives? To what degree should Ford emulate Dell's business model?

## **Session 05**

We will start discussion on the key supply chain concept of supply chain coordination. In the class, until now, we have developed the building blocks of supply chain performance. Synchronization of supply chain performance is, however, critical to leverage the drivers effectively. Some of you might have played the famous Beer Distribution Game in another class. Our discussion will begin with it and continue on to the causes and managerial implications of the Bull-Whip Effect. The context will be the Barilla, SpA case.

- Prepare: Barilla, SpA (A) (HBS Case 9-694-046). Barilla SpA, an Italian manufacturer that sells to its retailers largely through third-party distributors, experienced widely fluctuating demand patterns from its distributors during the late 1980s. This case describes a proposal to address the problem by implementing a continuous replenishment program, under which the responsibility for determining shipment quantities to the distributors would shift from the distributors to Barilla. Describes support and resistance within Barilla's different functional areas and within the distributors Barilla approached with the proposal. Please read the case and be prepared for discussing your answers to the following questions:
  1. What do you think are the main causes for large fluctuations in orders observed at the Pedrignano CDC? Diagnose the underlying causes of the difficulties that the JITD program was created to solve.
  2. What do you think of the JITD program? What actions should Barilla take to reduce fluctuations in demand? What kind of products is such a program best suited for? What are the benefits and drawbacks of the proposed JITD program?

3. Do you anticipate any problems if the JITD program is implemented? 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?
  4. As one of Barilla customers, what would your response to JITD be? Why? What would make for you worth trying it?
  5. In the environment in which Barilla operated in 1990, do you believe JITD (or a similar kind of program) would be feasible? Will it be effective? If so, which customers 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: An Interview with Victor Fung 'Fast, Global and Entrepreneurial: Supply Chain Management, Hong Kong Style', HBR. In this interview, Li & Fung Chairman Victor Fung explains both the philosophy behind supply-chain management and the specific practices that Li & Fung has developed to reduce costs and lead times, allowing its customers to buy 'closer to the market.' Li & Fung, Hong Kong's largest export trading company, has been an innovator in supply-chain management – a topic of increasing importance to many senior executives. Li & Fung has also been a pioneer in 'dispersed manufacturing.' It performs the higher-value-added tasks such as design and quality control in Hong Kong, and outsources the lower-value-added tasks to the best possible locations around the world. The result is something new: a truly global product. To produce a garment, for example, the company might purchase yarn from Korea that will be woven and dyed in Taiwan, then shipped to Thailand for final assembly, where it will be matched with zippers from a Japanese company. For every order, the goal is to customize the value chain to meet the customer's specific needs. To be run effectively, Victor Fung maintains, trading companies have to be small and entrepreneurial. He describes the organizational approaches that keep the company that way despite its growing size and geographic scope: its organization around small, customer-focused units; its incentives and compensation structure; and its use of venture capital as a vehicle for business development. As Asia's economic crisis continues, chairman Fung sees a new model of companies emerging – companies that are, like Li & Fung, narrowly focused and professionally managed. Please be prepared to discuss the following questions:
1. Why does Li & Fung 'break up the value chain and rationalize where they do things'? How does this add value to the supply chain?
  2. How does Li & Fung make the supply chain more responsive (i.e. reduce response time)?
  3. What is the role of the 'little John Waynes'?
  4. Identify salient features of a 'global' supply chain and how an intermediary like Li & Fung can add value to such a chain.

Until now we have discussed the six primary drivers of supply chain performance, facilities, inventory, transportation, information, sourcing, and pricing and emphasized the need for coordination. In this session we focus on the changes that resulted on the flow of information in supply chains from recent developments in IT. The Zara case will highlight the opportunities that arise from a well thought-out, innovative supply chain strategy. The i2 case will serve as basis to discuss the role of IT in supply chains specifically with regard to the recent evolution of ERP systems.

Preparation for class:

- Prepare: Zara, IT for Fast Fashion (HBS Case 9-604-081). In 2003, Zara's CIO must decide whether to upgrade the retailer's IT infrastructure and capabilities. At the time of the case, the company relies on an out-of-date operating system for its store terminals and has no full-time network in place across stores. Despite these limitations, however, Zara's parent company, Inditex, has built an extraordinarily well-performing value chain that is by far the most responsive in the industry. The case describes the value chain, concentrating on its operations and IT infrastructure, and demonstrates how information and IT support a business model. The question Zara always asks about IT is not 'What can we do?' but 'What do we need to do?' Please read the case and be prepared to discuss the following questions in class:
  1. What is the market that Zara is targeting products/services at?
  2. What is Zara's business strategy for serving this market? What is the business model of Zara?
  3. Does the present IT infrastructure support the current needs of Zara?
  4. Should Zara switch from its present DOS-based POS system to a modern POS system? Would Zara gain any strategic benefits from upgrading its POS system?
  5. Would the new POS system better support the needs of (i) marketing, and (ii) operations?
- Prepare: i2 Technologies, Inc (HBS Case 9-699-042). Describes the emergence and growth of i2 Technologies and the supply chain planning software industry. In December 1998, i2's market capitalization was in excess of \$2 billion; the supply chain planning software industry had annual sales of approximately \$1 billion and was expected to grow at 57% annually. By describing i2's products and the process that the company followed to sell and implement its software at companies, the case provides students with the background needed to understand why i2 was successful. This understanding enables students to address issues like what i2 should do in the future, and whether new competition such as SAP poses a substantial threat to i2's future success. Please read the case and be prepared to discuss the following questions in class:
  1. Identify the factors behind i2's success. Why is the company's stock valued so highly by investors? Examine the company's products, its sales and implementation process, its SOA process, and so on.

2. Hasso Plattner, co-CEO of SAP, was quoted saying, “We’re SAP. We dominate the most important category of enterprise software. We intend to control *all* the enterprise software our customers use. We will select a handful of partners. If our partners cross us, we will crush them into the dust.” (The E-Ware War: Competition Comes to Enterprise Software, David KirkPatrick, in Fortune, December 7, 1998). Given SAP’s ambitions, comment on i2’s future in the Enterprise Application Market (at the time of the case).
3. Comment on i2’s plans to become an e-BPO company.

After the case discussions, we will briefly review the entire course to re-emphasize the key points and the frameworks developed.