BUS 553G - Supply Chain Management

GBS 234, Monday, Wednesday 10:00 – 11:15

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1 Course Overview

A supply chain is the system by which materials are transformed into products and services that are delivered to customers. In the past, this was primarily under the control of a single firm; a classic example of this structure was the Ford plant at Highland Park, where raw materials were delivered at one end of the facility and finished Model T’s left the other end. Today, competitive pressures and advances in communication and transportation have led to more complex supply chains that span organizations and continents. They are also required to adapt quickly to changing demands while providing high value to the customer.

This course will combine cases and readings to allow students to understand the operations and economics of supply chains, and how companies use supply chain management in creating a competitive advantage. This will require the development of some analytic tools for determining operating policies that effectively manage the numerous trade-offs in supply chains. We will also be careful, though, to put these decisions in the context of the overall strategy of the firm and the evolving business environment, where new developments can radically change the basis for competition (Amazon and Wal-Mart are retail examples, but fundamental changes are taking place in many other industries). And supply chains are a natural place to examine global operations, where links of the supply chain are located around the world in an attempt to successfully compete.

Students with an interest in careers in consulting or in the operations functions within a firm are the primary target for this course. But students interested in marketing will find this course useful since supply chain organizations are often closely tied to marketing functions, and students interested in finance will be served by understanding the impact supply chains have on the financial structure of the firm.

The course will be divided into two parts:

Inventories and Information. In this part of the course, we will develop the analytic models for evaluating decisions in supply chain design and operation. Inventories represent a large investment in many firms, and measuring the effectiveness of those inventories requires more than knowing the value: location, obsolescence, variability, and customer preferences are key decisions for supply chain managers. In addition, investments in information technology can allow supply chains to accomplish higher (or
sometimes lower) levels of performance, and it is not sufficient to merely apply tools used by other companies. Understanding how information flows up and down the supply chain is critical to success.

**Supply Chain Strategy.** The interactions between a company's strategy and the decisions made in the supply chain are numerous and sometimes difficult to understand. In this part of the course, we will look at specific company applications of supply chain concepts and learn from them when and how particular strategies are supported by different supply chain organizations. This would include issues associated with outsourcing, logistics, product design, and the nature of alliances in the supply chain. We will use case studies to look at the different firms with different strategies in order to build frameworks for understanding the tradeoffs in supply chain design and operation.

## 2 Teaching methods

I will lecture on some of the material associated with the class, but often I will assign readings and explore the topics in the context of a case study discussion. We will then use the specific setting of the case to explore analytic models that can be applied in supply chain management.

In such a structure, it is important that you are prepared to participate and that you feel comfortable taking positions with the rest of the class, even if that position turns out to be wrong. As managers, a critical skill is detecting flaws in the analyses that are given to you, and then working to correct that analysis. You should be aware that on occasion I may put forward arguments that are flawed, so you should critically evaluate all comments during the class.

## 3 Course Materials

The textbook we will use for the class is
Matching Supply with Demand
Gerard Cachon and Christian Terwiesch
Third Edition

We will cover many chapters in the book and I will provide some supplementary readings, but the book has broad coverage of supply chain management as well as more standard operations management topics. The book also has an extensive bibliography, and students interested in particular topics should talk to me about additional reading material.

Cases for the course are available on Study.Net (www.studynet.net), and you will need to purchase this material.

Communication during the course will be done through the BLACKBOARD course management software site for the course. I will put additional material (readings and spreadsheets) on a set of wiki pages for the class. You will have the opportunity to use blogs on BLACKBOARD, one to communicate with the rest of the class and the other to privately collaborate in your case preparation group.

Being an operations course that at some point has to focus on decisions of how much, when, where, and so on, I will expect students to be comfortable developing and understanding quantitative models for the cases. For the most part, I will use Microsoft Excel, but there are many other special purpose tools available and I will try to let you know about them. Much of what I will do is compatible with both the Windows and Mac versions of Excel, but I do not have a Mac and cannot guarantee that everything will be compatible with both (thanks to some design decisions of Microsoft).
4 Course Requirements and Grading

Grades for the course will be based on the following:

Class participation (50%). I will assess your participation during class periods. Higher evaluations will go to those who contribute constructively to our discussions, not just for how much you contribute. This can be in the form of providing clear insights for the rest of the class (you got the answer), but also in posing questions that indicate an attempt to more clearly understand the decision at hand. These "I don't understand" contributions should always include a description of why you have the question and what the answer to the question will provide. I will provide regular feedback about this part of the class, but feel free to contact me if you have concerns or questions.

I will also have a section of the BLACKBOARD site called “Class Blog” that will be available for participation. Here I would welcome comments after a case discussion about issues that were not raised, or any questions that you have about what we discussed. Once an issue has been raised, other students are welcome to address the issue, and I will jump in at some point to make sure the question is resolved.

Group assignments (50%). For the group activities, you can form groups (two or three students each) of your choosing. These write-ups should be written as a memo to a busy boss about what decisions should be made (and why). This should be easily done in six to ten pages (double spaced), plus attachments with modeling details.

These assignments should show your ability to perform the details of the analysis that would be required of managers responsible for supply chains. Some of the cases are more quantitative, while others require careful diagnostic reasoning and strategic analysis (but fewer numbers). Each group will select two of the cases we will discuss prior to the break, and then three of the cases from after the break. I will have a place on BLACKBOARD where your group can select the cases you will prepare.

Please note that a minimum (i.e., passing) level of performance on each of these components is required in order to receive a passing grade for the class.
Also recognize that the MBA program at Goizueta has an official grading policy that limits the number of the highest grades. There will be sufficient work to allow me to implement this policy and I will clearly communicate during the class where in the grade distribution you are located. If you have any questions or concerns about this policy, please feel free to contact me at any time during the class.

5 The Honor Code at Goizueta

Academic misconduct of any sort will not be tolerated and everyone should understand that I take this issue quite seriously. I will pursue violations of the honor code according to University policies, and all students in this class must comply with the Goizueta Honor Code. Please make time to talk with me or someone in the MBA office if you are unsure about these policies.

For this class, I expect the case write-ups done by a group to be the work of only that group, without assistance from other groups.

Also understand that a student who knowingly assists another student in committing an act of academic misconduct will be equally accountable for the violation and will be subject to sanctions.

6 Class Schedule

6.1 Introduction, Processes and Inventories

**Preparation:** Please read chapters one through three in *Matching Supply with Demand*. Some of this will be review from the operations management core course, the connections with inventory may be new. These are fundamental concepts for the rest of the semester, and we will build more technical material later on, so read those chapters and be prepared to ask questions in class.

**January 12: Course Introduction:** I will introduce the class and answer questions.
January 14: **Introduction to inventory systems**: I will lecture about inventory systems and the modeling approaches we will use for the class.

**Preparation**: Review chapters seven, nine and eleven in *Matching Supply with Demand*.

January 21: **National Cranberry Cooperative (HBS 688-122)**. This case will serve to connect processes and inventories. There is also many opportunities to illuminate the issues with quantitative analysis, so prepare for class by running some numbers. Here are some study questions to get you started:

- What is your analysis of the process fruit operation at Receiving Plant #1?
- What is the capacity of RP1?
- How long would a barrel of cranberries require to finish processing?

January 26: **National Cranberry Cooperative, continued**. These questions will be covered on Thursday after we start the discussion on Tuesday.

- Consider a busy harvest day when 18,000 barrels are unloaded (assume that 70% of them are wet harvested). How should the various parts of the process be operated.
- What can you say about truck delays?
- When will the processing be completed for the day?
- What recommendations would you make to Mr. Schaeffer? What would be the first things you would do?
- What long-run recommendations are important for the success of National Cranberry?

**Group Assignment**: Team member selection should be complete by now.

### 6.2 Variability and Lean

**Preparation**: Read chapter twelve in *Matching Supply with Demand*. 
January 28: Supply chain operation. We will discuss topics from chapters seven, nine and eleven, including lean, push/pull systems.

February 2: Toyota Motor Manufacturing (HBS 693-019). Toyota is a well-known pioneer in just-in-time production systems, but this is only a building block of the larger production philosophy called the Toyota Production System (TPS). While the case revolves around a particular problem, look at TPS more broadly and make sure to put the problem in that context. Some question to consider:

- How does the andon procedure work? How much does a line stoppage cost? What are the benefits of stopping the line?
- As Doug Friesen, what would you do to address the seat problem? Where would you focus your attention and solution efforts?
- What options exist? What would you recommend? Why?
- Where, if at all, does the current routine for handling defective seats deviate from the principles of the Toyota Production System?
- What is the real problem facing Doug Friesen?

6.3 Global Supply Chains and Optimization

Preparation: Read chapters thirteen and fourteen in Matching Supply with Demand.

February 4: Planning for uncertain demand. We will discuss the newsvendor model, which is another fundamental piece for thinking about inventories in supply chains.

February 9: Applichem A (HBS 694-030). This case looks at a network of plants that produce a commodity chemical product. The dates on the case are a little old, so the dollar values are a bit low, but the problem in the case is still quite topical. Consider the following questions:

- How do you explain the large differences in the performance of the four plants making Release-ease? Why do some plants appear to be much better than others?
To what extent can these differences be attributed to differences in scale, utilization rates, and other factors beyond the control of management? How much appears to be due simply to better management?

As Joe Spadaro, what would you do given the current over capacity situation and information provided by the recent productivity study? In particular, what would you do about the Gary facility?

### 6.4 Uncertainty, Make-to-Order and Quick Response

**February 11: Planning for uncertain demand.** We will continue the discussion of uncertainty in supply chains. We will also discuss some of the typical information systems used to manage supply chains. We will also extend the inventory problem to many items and to situations where the items are regularly replenished (not just once).

**February 16: Northco (A) (HBS 697-017).** Northco faces seasonal demand while it maintains inventories of school uniforms.

- What makes it difficult for Northco to match supply with demand?
- How should Michaels think about the costs of over or understocking? Identify the elements of over and understocking costs in this case.
- Identify changes to the way Northco does business currently that would enable it to better match supply with demand. Identify the costs and difficulties associated with implementing each of these changes.
- How should the cost of working capital impact over and understocking costs at Northco?

**Preparation:** Read chapters fifteen and seventeen in *Matching Supply with Demand.*

**February 18: Advanced inventory modeling** We will look at multi-item systems and how to model more complex inventory systems.

**February 23: Modeling summary.** We review the models from the first part of the class and prepare for the simulation and cases that come after spring break.
6.5 Service Levels and Lead Times

March 16: Sport Obermeyer (HBS 695-022). This high-end fashion ski wear design and merchandising company has to make decisions about which styles will be successful and how to produce the appropriate quantities in time for the buying season. They are also investigating lower cost production sources in China and must evaluate whether to shift production.

- What are the relevant costs for the production quantity decision?
- What are the appropriate production quantities if there were no minimum order quantities imposed by the manufacturers? Explain the logic associated with determining these quantities.

March 18: Sport Obermeyer (continued) After our first with no minimum quantities, we will add more and more of the complexity facing Wally to our analysis.

- How would your logic have to change in the face of production minimums? How many would you order if you face a minimum order quantity of 600 units?
- Costs of producing the wrong quantity (stockouts or markdowns) are affected by the way the system is currently configured. How would those costs change if production is moved to the supplier who requires a 1,200 unit minimum instead of 600?
- Explain how the costs change if the manufacturing lead time can be reduced.
- How would you recommend Wally think about the options of producing in Hong Kong versus in the new Chinese facility?
6.6  Supply Chain Technology

March 23: Exel plc - Supply Chain Management at Haus Mart (HBS 605-080)  This case looks at a company that provides supply chain management services as a third-party logistics provider.

• How is valued added in supply chain management through better planning versus better execution?
• Why do companies outsource freight management and contract logistics to third-party logistics providers (3PLs)? Why do 3PLs perform these activities better?
• How would a deep understanding of supply chain execution and stronger capabilities in execution allow companies to make better supply chain planning decisions? For example, who would a better understanding of execution lead to better inventory-management decisions?
• Should Exel move into joint planning with Haus Mart?

March 25: RFID at the METRO Group. (HBS 606-053)  This case looks at one of the technologies that has the potential to change supply chain management: radio frequency identification (RFID).

• What factors contribute to in-store logistics problems in grocery retailing? How would pallet- and case-level RFID reduce these problems?
• Examine the process flow in Metro's grocery supply chain and identify how these processes would improve with the implementation of RFID at the pallet level and the case level.
• Is RFID a good investment for Metro? In your analysis, use the benefits listed in Exhibit 8 of the case and any other benefits mentioned in the case. Quantify the total savings that Metro would realize from full-scale implementation of RFID (for both pallet-level and case-level implementations).
• Which of the three options do you recommend that Mierdorf and Wolfram propose to the RFID steering committee on December 13?
  - Expand the scope of the current pallet-level RFID roll out.
  - Move to case-level RFID with the manufacturers currently engaged in the pallet-level roll out.
Stop the expansion of RFID efforts and focus on traditional process improvement opportunities.

6.7 Supply Chain Strategy

March 30: Aviation Spare Parts at Cathay Pacific Airways Ltd (HKU823)  Demand for spare parts is highly uncertain and requires a very high service level.

• What are the supply chain management issues for spare parts operations that Robert and Paul need to consider in their recommendation proposal?
• What purchasing power does Cathay Pacific have in aviation spare parts procurement? What are the possible alternatives for improvements in the procurement process?
• How does Cathay Pacific handle Shortage Management? What are the problems in each option?
• Which types of aviation spare parts are suitable for procurement outsourcing? Why? What are the criteria for spare parts outsourcing?
• What are the advantages and disadvantages for Cathay Pacific to use third party logistics (3PL) partners for repair management and logistics management? What are the criteria for Cathay Pacific to choose 3PL partners?

April 1: Ford Motor Company: Supply Chain Strategy (HBS 699-198)  Managers try to think about whether it is possible to export Dell’s business model allowing customers to customize their computer.

• Consider the experience that you (or your friends) have had buying a car; compare these to the experience of buying a computer online. What do you think explains the differences?
• What advantages does Dell derive from virtual integration? How important are these advantages in the auto business?
• What challenges does Ford face that are not also faced by Dell? How should Ford deal with these challenges?
• If you were Teri Takai, what would you recommend to senior executives? To what degree should Ford emulate Dell’s business model?

April 6: Supply Chain Management at World Co., Ltd. (HBS 601-072). This Japanese fashion retailer has focused on replenishment lead times and has achieved performance that is not matched by other apparel companies. The company needs to evaluate further improvements in their supply chain practices.

- Examine the features of fashion apparel retailing in Japan. How can a company use its supply chain to compete in this environment?
- Identify salient aspects of World’s supply chain, focusing on the processes for manufacturing, demand forecasting, and inventory planning.
- How do the features of the supply chain explain the company’s remarkably short lead times (relative to US apparel supply chains)? Examine features of the supply chain, and identify why the company is able to respond so effectively.
- Can the World’s supply chain processes be replicated at other apparel companies? What about non-apparel supply chains? Identify potential barriers.

6.8 Supply Chains and Customer Service

April 8: The Home Depot, Inc. (HBS 608-093). This case looks at the transition of leadership at Home Depot and the adjustments to the supply chain strategy, especially at the lowest level in the stores. Customer service has the potential to affect the higher levels of the supply chain.

- What is your assessment of Nardelli’s changes at Home Depot? What had the greatest impact?
- How did Nardelli’s changes affect profitability, labor productivity, and customer service? What metrics would you use to assess these impacts?
- What caused the decline in customer service?

April 13: Zappos.com: Developing a Supply Chain to Deliver WOW! (Stanford GS65) This case will allow us to look at the operation of a supply chain associated with an Internet retailer.
• What are Zappos’ core competencies and sources of competitive advantage? How sustainable are they? What role does corporate culture play in these questions?

• How important is next-day air shipment to the customer experience? Is it worth the cost? How might you change it in the cost-conscious environment facing the company in late 2008?

• How would you expand the business? Would you add more products, more geographies, or by selling private labels? As you expand the business, how can the company become more profitable, particularly in light of the costs associated with the focus on service?

• How would you expect the environment of a more cost-conscious consumer to affect Zappos’ business? What can Zappos do in such an environment to maintain sales growth?

6.9 Supply Chains and Society

April 15: Nestle’s Milk District Model (HBS 906-406 and Supplement 906-411) This case explores the relationship between supply chain management and its impact on economic development. This will allow us to explore issues outside the normal for-profit environment.

• How is Nestle’s approach to creating a supply chain using the milk district model different from other approaches?

• What are the keys to this model’s success?

• Is there something special about milk, or can this model be applied in other food supply chains?

April 20: When Supply is of Public Interest: Roche & Tamiflu (HBS 609-061) The potential for an influenza pandemic requires that the resources to combat the crisis be available quickly and in the right place. Tamiflu is potentially a first line defense, and Roche faces challenges in maintaining an appropriate supply network.

• What factors drive the benefits of an influenza pandemic stockpile? The costs?
• How might the current global situation evolve and how might that evolution affect the benefits of an influenza pandemic stockpile?

• How should Roche think about setting inventory, production and capacity targets?

• How can Roche keep their supply network alive? Should it?

• If you could change the behavior of one of the stakeholders in the case, who would it be? How should the behavior change and with what intended effect?

April 22: Course Wrap-up