Operations Management
EMBA – Global Asia
Fall 2013

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Course Overview and Objectives

Operations Management is the design and management of the processes that transform inputs into finished goods or services. The operations function is one of the primary functions of a firm. Whereas marketing focuses on the demand for the product, and whereas finance provides the capital for the product, operations actually produces and delivers the product.

This course provides a foundation for understanding the operations of a firm. Our objective by the end of the course is to provide you with the basic skills necessary to critically analyze a firm’s operating performance and practices. Such knowledge is important for careers in a variety of areas, including general management, entrepreneurship, investment banking (e.g. business restructurings, mergers and acquisitions), venture capital (e.g. evaluating new business plans) and management consulting (business restructuring improvement).

Unlike many courses in the core, which tend to treat the firm as a "black box", we will be primarily concerned with "opening up" the black box and discovering what makes a firm "tick" - or, for that matter, "stop ticking". In contrast to your management courses, our focus is on the technological rather than human dimension of a firm's internal operations - though there are obvious connections between the two that we will explore. In contrast to the measurement focus of your accounting courses, our concern is to understand what elements of a firm's operations enable it to produce quality outputs at a competitive cost structure. That is, we will focus on how the "physics" of material, work and information flows and the design and management of a firm's processes interact to determine a firm's cost structure and its ability to compete effectively in terms of non-cost measures such as quality, variety and speed.

Because the operations of a firm vary widely from one industry to the next, a course like this cannot cover all topics that are relevant to any given industry. Rather, we have selected a set of topics that are fundamental to understanding operations in a wide range of industries. These concepts are then illustrated using cases from a diverse set of businesses.
Methods and Materials

The course uses a variety of teaching methods and materials. Classes will consist of lectures, discussions, and video presentations. Fundamental concepts are contained in lecture notes and readings. Analytical tools are presented in notes, discussed in lectures, and reinforced by group as well as individual assignments. Cases are also used to illustrate the context and complexity of operations issues.

Readings
Assigned material should be read before class to facilitate comprehension, discussion, and coverage. Many of the readings are short, and some you will be asked to merely skim through. All readings are contained in a customized textbook that will be distributed before the first class. Use the syllabus as a guide for readings.

Groups
Please form a learning team for doing the written group assignments, in-class exercises/discussions and general class preparation. Each team should be around 5 people with, ideally, complementary skills. Teams should be formed as soon as you get to know each other.

Class Preparation
We have made a sincere effort to keep the amount of reading for each class reasonable; in turn, however, we expect you to read the required materials and be well prepared for each class. Cases, in particular, typically require a detailed reading and will often require analysis of relevant data.

Conduct
Business School classes take place in an environment that supports learning and encourages the exchange of ideas. Behavior that distracts students and the professor negatively affects the learning environment. For example,
- using electronic devices (including laptops) for purposes not authorized by the professor,
- arriving late to class or leaving early, and
- walking in and out during class
are particularly detrimental to the classroom environment. Such conduct violates the School's Code of Professional Conduct and/or the School's Electronic Device Policy and is disrespectful to classmates and instructors. Students that fail to conduct themselves properly face, at a minimum, a substantial penalization in the class participation portion of their grade.

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

- Class Participation: 20%
- Group Assignments (1): 10%
- Individual Assignments (4): 20%
- Final Examination (Take-home): 50%

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**Class Participation**

We will judge class participation on the extent to which you appear prepared, the relevance and depth of your comments, the degree to which you listen carefully and respond to your peers, and your willingness to take chances in order to further the educational experiences of others. Please bring your name card to class. Please notify your instructor by email in advance if you have to miss a class, or if you will be late or leaving early from class. Conduct that is unprofessional or otherwise fails to show respect for students or the professor should be avoided.

**Group Assignment**

There will be one group assignment. It will consist of an "executive summary" write-up of a case study which will include a quantitative analysis. The assignment should be typed. An executive summary should not exceed one page, plus 1-2 additional pages of exhibits with supporting documents.

**Individual Assignments**

Unlike group assignments, which are primarily intended to promote case discussions prior to a class, individual assignments are intended to review the material after the class. These are individual assignments roughly at the same degree of difficulty as exam questions. These provide additional opportunities for you to assess your own understanding of the basic ideas. You can talk about the individual assignments to your group members, but the final work must reflect your own understanding and efforts. There will be a total of four individual assignments over the semester.

Regarding both group and individual assignments, assignments are due at the start of class, and late assignments will not be accepted. You should hand in a hard copy of your assignment at the start of class; if you are unable to attend class, you should email your assignment to the professor by the start of class. In addition to the assignment that you turn in at the beginning of class, each student should bring an additional copy of the assignment to reference during class.

**Schedule of classes**

**Part I: The physics and economics of production**

**Class 1 (Saturday, Sept. 14, HKU, 16:30-19:30)**

**Topics:**
- The operations function
- Process types
- Process Analysis and Vocabulary

**Plan:**
- Course introduction and overview
- Introduce the different types of processes
- Discuss Kristen’s Cookie Company (A). Do the assigned reading and think about Questions 1 to 6 on the last page of the case.
Preparation:
- Read “Production Processes”, “Kristen’s Cookie Company (A)”, “Types of Processes” in the Readings Book.
- Based on your work experience, consider the following questions:

1. What exactly are a firm's operations? What do they entail?

2. What techniques can be used to make a process efficient? What tradeoffs are involved?

Class 2 (Sunday, Sept. 15, HKU, 9:00-12:00)
Topics:
- Bottleneck analysis
- Little’s Law
- Process flow analysis and capacity investment decisions

Plan:
- Further discussion of the Kristen’s case. In the previous class, we discussed Kristen’s cookie operation with her roommate using one oven. As we discovered, the single oven limits Kristen’s production capacity. Now suppose that Kristen has obtained a second oven (just like the first one.) Each order is for a dozen of cookies. (For simplicity, you can assume that both ovens are “self-loading,” so they don’t require the roommate to load them; however, the total baking time is still 10 minutes.)

Try to answer the following questions:
1. What are the cycle times or capacities for each operation?
2. Where is the new bottleneck? What is the process’s capacity?
3. What is the throughput time for an order?
4. What is the maximum number of orders that can be satisfied in one evening (4 hours)? (As we discussed in class, the “start up” time and the “shut down” time matter in this calculation. But for this exercise, it is OK if you choose to ignore these subtleties.)
- Introduce Little’s Law, work with examples.
- Discussion of National Cranberry Cooperative (NCC)

Preparation:
- Read “National Cranberry Cooperative (NCC)” in the Readings Book, and do the following.

Please develop a process flow diagram for NCC and use it to analyze the fruit processing operation at Receiving Plant #1. The purpose of this case discussion is to demonstrate how process flow analysis can be used to both diagnose an operating problem and analyze various options for solving the problem.
In your preparation, try to answer the questions below. You can ignore the light meter in your analysis. (There will be class time set aside for you to compare notes with your group-mates.)

1. Draw a process flow diagram showing the major process steps, inventories and flows. Indicate the capacity at each of the process steps. You should assume:
   a. 16,000 barrels per day is the average of deliveries over the 20 days from 9/20-10/9.
   b. Each truck carries 75 barrels on average
   c. Trucks arrive uniformly over a 12-hour period
   d. Trucks carry 70% wet berries and 30% dry berries.

2. Which operation (or operations) is the bottleneck?

3. How late does the plant need to be open (i.e., when does the plant shut down) during this peak season?

4. How bad is the truck delay at the loading dock during this peak season?

5. What are the basic options for improving the operation? Which options would you recommend and why? In justifying your recommendation, be sure to include a simple quantitative analysis (i.e., include an intelligent back of the envelope calculation).

**Part II. Dealing with variability in operations**

**Class 3 (Sunday, Sept. 15, HKU, 13:00-16:00)**

*Topics:*
- Queuing theory and queuing psychology

*Plan:*
- In-class experiment, and lecture on queuing theory.
- Work with examples to illustrate the impact of system-design choices on performance.
- Discuss different ways to manage customers’ perception about waiting lines.

*Preparation:*
- Read “Queuing Management and Models” in the Readings Book.
- Think about the following question for class discussion: How important is response time in the businesses you are familiar with? What are the causes of the response time problems in these businesses? How can a firm effectively manage response time?

**Individual Homework I (process analysis) & II (queuing theory): Both due Sept. 30.**

**Group Assignment (Manzana Case): Due Nov. 13.**

**Class 4 (Wednesday, Nov. 13, CBS, 13:00-16:00)**

*Topics:*
- Queues and process design
Plan:
- Discussion of the Manzana Insurance case.

Preparation:
- Read “Manzana Insurance” in the Readings Book, and do the following.
  - For the Class Discussion:
    Manzana Insurance is based on the operations of a real insurance company, though certain details have been simplified. Be prepared to answer the following questions in class:
    1. What operational problems is Manzana facing? How might they be connected to the deteriorating profits experienced over the past year?
    2. What are some possible alternatives for improving Manzana's performance? How might these specifically help to eliminate the causes of the problems facing Manzana?

- For the Group Assignment:
  You are Bill Pippin. On the memo on the first page of the case, Tom Jacobs identifies various problems facing the Fruitvale branch. He then asks for “a memo with concrete suggestions.” Write that memo.

  You must meet two conditions:
  • You cannot hire additional staff (Tom Jacobs believes you are already overstaffed).
  • At least one of your suggestions must rely on queuing theory in some way. (In this regard, an effective analysis only needs the calculation of utilizations and the application of insights from our class discussions.)

Due: The Executive Summary for Manzana Insurance (Group Assignment) is due at the beginning of class on Nov. 13.

Class 5 (Thursday, Nov. 14, CBS, 13:00-16:00)
Topics:
- Introduction to quality management
- Statistical Process Control
- Process capability and six sigma quality

Plan:
- Discuss the following issues:
  1. What is statistical quality control, and why is it important?
  2. What is special and common cause variation? Why is it important to distinguish between the two?
3. How is process capability defined? What is six sigma quality?

Preparation:
- Read “Statistical Process Control” in the Readings Book.

Class 6 (Friday, Nov. 15, CBS, 16:30-19:30)
Topics:
- Quality management in service industry

Plan:
- Discuss the Ritz Carlton case.
- Course summary.

Preparation:
- Read “Ritz Carlton” in the Readings Book.
- The Excel file ritz.xls (downloadable from Canvas) contains a listing of a subset of all defects reported in the DQPR for the Ritz-Carlton Buckhead over the period from January 1997 to November 1997. The subset contains all defects for twelve categories of defects that directly impact the customer and are identified as causes for customer dissatisfaction.

- Think about the following issues:

1. Does the data in the file ritz.xls indicate any significant quality problems?
2. If you were to select a category of defect to address from the DQPR data, which category would you address? Why?
3. Using the data and your common-sense knowledge of hotel operations, generate hypotheses about the possible root causes of the defect category that you selected.

Explanation of fields in the ritz.xls file:

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>Unique ID number assigned to each defect in report</td>
</tr>
<tr>
<td>Date1</td>
<td>The date the defect was recorded in the DQPR</td>
</tr>
<tr>
<td>Date2</td>
<td>The date the defect occurred</td>
</tr>
<tr>
<td>Time</td>
<td>The time the defect occurred</td>
</tr>
<tr>
<td>Count</td>
<td>The number of defects of this type</td>
</tr>
<tr>
<td>Keyword</td>
<td>The category of defect type that the defect is assigned to</td>
</tr>
<tr>
<td>Memo</td>
<td>Detailed description of the defect</td>
</tr>
<tr>
<td>Source</td>
<td>Source of information of this defect to the DQPR</td>
</tr>
<tr>
<td>Room</td>
<td>The room number of guest</td>
</tr>
<tr>
<td>Department</td>
<td>Department where suspected cause of the defect</td>
</tr>
</tbody>
</table>

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The "Summary Counts" workbook contains total counts of defects by keyword for each date (Date 2). This workbook also has the occupancy data (estimated number of guests in the hotel on each day).

Individual Homework III (quality management): Due Nov. 30.

Part III. Supply Chain Management

Class 7 (Thursday, Dec. 12, HKU, 13:00-16:00)

Topics:
- Introduction to supply chain management
- Demand forecasting
- Matching supply with demand

Plan:
- Discuss the challenges and opportunities in supply chain management and the recent trends.
- Discuss the L. L. Bean case.
- Introduce the Newsvendor Model

Preparation:
- Read “L. L. Bean” in the Readings Book, and think about the following questions:
  1. How does L. L. Bean use past demand data and a specific item forecast to decide how many units of that item to stock?
  2. What item costs and revenues are relevant to the decision of how many units of that item to stock?
  3. What information should Scott Sklar have available to help him arrive at a demand forecast for a particular style of men’s shirt that is a new catalog item?
  4. How would you address Mark Fasold’s concern that the number of items purchased usually exceeds the number forecasted?
- Skim through “Betting on Uncertain Demand: The Newsvendor Model.”

Class 8 (Friday, Dec. 13, HKU, 16:30-19:30)

Topics:
- Matching supply with demand: Accurate response.
- Multi-stage production and distribution systems.

Plan:
- Discuss the Sport Obermeyer case.
- Introduction to the Beer Game.

Preparation:
- Read “Sport Obermeyer” in the Readings Book, and think about the following questions for class discussion:
1. Using the sample data given in Exhibit 10, make a recommendation for how many units of each style Wally Obermeyer should order during the initial phase of production (a spreadsheet with Exhibit 10 is posted in Angel). Assume there are no limits in the total size of the order (i.e. there is unlimited capacity), and ignore the minimum order quantity constraint in your analysis. Also, assume that there would be no future production for these parkas (i.e., only one production decision is taken to satisfy the demand).

2. As indicated in the case, there are two production runs in Asia. The first production takes place six months before the Las Vegas show (production early), and the second one right after the show (production late). The production capacity after the show is limited and therefore some production must be done early. What are the factors that Wally Obermeyer should consider in deciding which parkas to produce early and which to produce late?

- Read “Beer Game: A Supply Chain Simulation” in Readings Book.

- Download the Beer Game software from Canvas, and bring your computer to class.

Class 9 (Saturday, Dec. 14, HKU, 9:00-12:00)
Topics:
- The management of multi-stage production/distribution systems
- The bullwhip effect

Plan:
- Play the Beer Game.
- Debrief:

1. What happened when you played the beer game? How easy was it for your supply chain to accurately track market demand?

2. What factors made achieving your objectives difficult? As a result of playing the game, what suggestion do you have for improving the performance of a supply chain?

Preparation:
- None.

Class 10 (Saturday, Dec. 14, HKU, 16:30-19:30)
Topics:
- Supply chain design
- Outsourcing and supply chain evolution

Plan:
- Discuss the Zara case
- Discuss the Flextronics case.
Preparation:
- Read “ZARA” in the Readings Book, and think about the following questions for class discussion:
  1. What makes Zara different from other specialty apparel retailers?
  2. Where are competitive threats to Zara likely to come from?

- Read the Flextronics case and think about the following questions for class discussion:
  a) What factors account for the dramatic growth of the electronics manufacturing services (EMS) industry during the 1990s? How would you rate Flextronics’ performance during this period?
  b) What are the most important operational issues that Flextronics must consider as it moves into product design?
  c) Do you believe that moving into product design is a good idea for Flextronics? If yes, explain your rationale and decide whether you would want an exclusive relationship for Phone 4. If no, what alternate strategy would you recommend?

Individual Homework IV (inventory management): Due Dec. 20.