MGT/P 252: Managing for Operational Excellence

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Class Schedule: MGP 252 Wednesday 5:30-8:30pm
Office Hours: Wednesday 8:30-9:30pm or by appointment

Course Description

Operations management is concerned with the production and delivery of goods and services to meet customers' demands. It is one of the central functions of every business, government agency, and non-for-profit organization. Operational excellence can provide an important competitive advantage for firms in today's marketplace. It has long been realized that the operations must integrate into the overall corporate strategy and planning to achieve such an advantage. Therefore, a solid understanding of operations management is important for all managers, and a working knowledge about the operations function of a firm is an integral part of your MBA education.

The objective of this course is to study the core concepts in operations management. Successful companies must be able to develop and manage efficient business processes that are capable of delivering high-quality products and services to meet their ever-changing customer demands in a timely and cost-effective manner. We thus can view operations management as the design and management of effective business processes. Therefore, this course will focus on a number of concepts and techniques for analyzing and improving business process performance. Through critical analysis of business processes, you will gain a good understanding of the major issues that are critical to the successful management of both manufacturing and service operations.

This course provides a blend of qualitative and quantitative treatment for understanding process performance and operations issues. A combination of lectures, cases, videos and in-class exercises will be used to convey the basic concepts.

Course Materials

Packet of cases and readings (*Study.net*):

1. Kristen's Cookie Co. (A) (Abridged) (HBS, 9-608-037)
2. Natural Blends Inc. (HBS, 9-698-012)
3. Toyota Motor Manufacturing, U.S.A., Inc. (HBS, 9-693-019)
4. What Is the Right Supply Chain for Your Products? (HBR article, Product number 97205-PDF-ENG)

Textbook: *Matching Supply with Demand: An Introduction to Operations Management* by Cachon and Terwiesch, McGraw-Hill/Irwin, 3rd edition 2012. ISBN-10: 0073525200 ISBN-13: 978-0073525204.

Grading

Individual Homework (3 @ 5%)	15%
Individual Case Write-up (1 @ 5%)	5%
Group Case (2 @ 10%)	20%
Group Project	15%
Class Participation	5%
Final Exam	40%

Assignments are due at the beginning of the class on the due date. Students will form a group, up to 4 members, before the end of the first week. The members of each group are jointly responsible for the group assignments. At the end of the quarter, you will be asked to evaluate the contributions of your teammates; these evaluations will influence students' grades.

Individual Case Write-up

One short (less than two pages) individual case write-up is due. This short write-up should focus on the conceptual understanding gained from reading the case and answer the questions assigned with the case.

Group Case

The group case report should answer the questions assigned with the case. Each group submits one copy.

Group Project

Each group is required to observe, analyze and critique an operation/process of your choice. The operation of interest can either be a manufacturing or service process.

Guidelines:

1. The operation must be local, so that all of the team members can observe the operations in action.
2. Pick an operation of reasonable size: A one-person operation is too small to learn or the logistics operation of Wal-Mart is too large and complicated to analyze.
3. Narrow the scope to one or two key operations issues: Why the firm has so much inventory or how can the firm deliver its order in such a small timeframe?
4. Learn from either the good or the bad: The operation can be in chaos where the team studies the associated challenges, or the operation can be a best practice, where the team studies the tricks to achieve operational excellence (or most likely, somewhere in between).
5. Identify some quantifiable measures to evaluate the operational performance. Understand what aspects of the operation drive the underlying performance.
6. Suggest ways to improve the underlying operation and discuss any implementation challenges.

Each group is required to submit a one-page project proposal in **Week 6**. A written report is due in class in **Week 10.** Your report will be graded on its professionalism, in addition to its content. It must be clear, concise, and well-organized. The report should be **no more than 6 double-spaced pages**, plus exhibits. Make good use of exhibits such as tables and figures to support your analysis wherever appropriate.

Class Participation

In-class participation requires you to be active and participate in class. The class participation grade is based on the quality of each student's contribution. Good questions, relevant experiences, points that build on previous points and insights into the business issue under discussion are the best forms of participation.

Final Exam

The final exam is closed-book, closed-notes, closed-computer. You can consult a one page "cheat sheet" (double sided ok). There is no make-up exam.

Code of Academic Conduct

We are committed to the promotion of absolute integrity and high ethical standards of individual honesty in academic work. More information about Code of Academic Conduct at Code's webpage.

Case Preparation Questions

Kristen's Cookie Co. (A) (Abridged) (HBS, 9-608-037)

Assume the role of Kristen as you answer the following questions. For simplicity, assume for now that all orders are for one dozen cookies.

1. How long will it take you to fill an isolated rush order? In other words, what is the flow time: the time (in minutes) it takes to "produce" a batch of a dozen cookies from start to finish?
2. Identify how the various resources (you, your roommate, the oven, the baking trays, and the mixing bowl) are occupied over this flow time.
3. Assuming there are multiple trays because trays are cheap, calculate the capacity (measured in dozens/hour) of your cookie-making process, in "steady state" (*i.e., around 9 PM, so that you can ignore the inefficiencies in starting up and shutting* down the process). Identify the *bottleneck resource that limits your overall cookie production* capacity.
4. Calculate the utilization (in percent) for the three main resources (you, your roommate, and the oven), assuming that you are operating at full capacity and you're operating in "steady state," around 9 PM.
5. Under what conditions (if any) does it make sense to give a quantity discount to customers who order two or three dozen cookies? Does your answer depend on whether the cookies are identical or of differing types?
6. What changes could you make in the cookie production process to increase its capacity? To reduce the flow time? Would it help to hire a third person? To rent a second oven?

7. What would happen if your roommate moved out, and you had to do this by yourself? In particular, how (if at all) do your flow time and production capacity change?

Natural Blends Inc. (HBS, 9-698-012)
The case describes a continuous flow process that involves setups and changeovers.

Part A

Assume there is only one size of oranges. Consider extraction, filtration, and concentration steps only.

1. How much juice concentrate can be processed in an 8-hour day? Assume that extraction had previously been setup.
2. How much idle time will there be in extraction operation during 8 hours? (hint: The flow rate of a continuous flow process is determined by the stage with the minimum capacity. Also, when one stage is having setup/change-over, the other stages need to stop as well.)
3. If you could add storage capacity somewhere between steps two and four in this production line in order to increase daily output, where would you place it? How much storage would you add?
4. Which action would you recommend in order to maximize the output?
    a. the cost of adding storage was $30/pound
    b. the cost of reducing setup time by 50% was $20,000 for the filter
    c. the cost of reducing setup time by 50% was $10,000 for the extraction
5. How much will your recommended improvement cost? How much additional capacity do you create?

Part B

Assume that the system is running all three orange sizes. Nothing from Part A is implemented. Each orange size must be processed at least once/day. Equal amounts of all three sizes needs to be processed during a week (not necessarily during a day)

1. How often during an 8-hour day would you have a setup change in extraction process?
2. What quantity of oranges of a particular size would you process before switching to another size?
3. What is the total amount of juice concentrate you can process through the three process steps (extraction-filtration-concentration) in one 8-hour workday?

Part C (Modified)

Assume nothing from Part A is implemented. The plant operates 8 hours a day, 6 days a week. Blending can process 22000 lbs/hour, and requires 40 min setup for each order, even multiple orders from the same customer, as well as between orders from different customers. The characteristics of the concentrate stored in the four tanks was adequate to accommodate the blend variations required to fill any orders from Table A. The firm ends each week with the same level of tested concentrate in storage. Consider the plant has the same operations each week (in steady state). Suppose it is optimal to do Contracts C and D and use the remaining capacity for Contract S.

1. How much time does it take for the blending operation to process one 8000-pound order from Company A?
2. Which step is the bottleneck? Note that blending is buffered from the upstream processes by four storage tanks.
3. Which one would you recommend to maximize the plant output?
    - Adding storage between process steps 2, 3, or 4, at a cost of $30 per pound
    - Reducing the extraction changeover time from 20 min to 10 min at cost $10,000
    - Reducing the filtration setup time from 30 min to 15 min at cost $20,000
    - Reducing the blending setup time from 40 to 30 min at cost $50,000

Toyota Motor Manufacturing, U.S.A., Inc. (HBS, 9-693-019)
In class, we will discuss where, if at all, the current routine for handling defective seats deviate from the principles of the Toyota Production System. In your write-up, please focus on the questions below:

1. You are Doug Friesen. What concrete actions are you going to take on Monday morning (May 4) to address the seat problem? (The case describes a series of meetings held on Friday May 1, and the exhibits summarize the information obtained through those meeting. So, please do not offer an answer such as: "I would talk to so-and-so"

or “I would hold a meeting with so-and-so”. Your boss wants *action*.) As a more general matter, where would you focus your attention and solution efforts?
2. What is the cause of the seat problem?
3. What is the real problem (i.e., the deeper underlying problem) facing Doug Friesen?

MGT/P 252 Course Schedule (subject to change)

Session	Date	Topic	Assignment Due
1	9/26	Introduction, Syllabus Textbook: Ch. 1, 2.2-2.4, 2.6 Strategy and Process Choice	
2	10/3	Process Analysis, Capacity Analysis Bottlenecks, Process Capacity and Flow Rate Textbook: Ch. 3.1-3.4	HW #1 (Little’s Law)
3	10/10	Process Variability: Waiting Time Problems Variability on Process Performance Textbook: Ch. 8	Group Case: Kristen’s Cookie
4	10/17	Case: Kristen’s Cookie Company Inventory Management (EOQ Model) Textbook: Ch. 2.5, 7	HW #2 (Capacity Analysis, Waiting Time)
5	10/24	Newsvendor Model and Forecasting Textbook: Ch. 12.1-12.5, 12.7	Group Case: Natural Blends (Part C is modified)
6	10/31	Case: Natural Blends Managing Process Quality Textbook: Ch. 10	HW #3 (EOQ, Newsvendor) Group Project Proposal
7	11/7	Lean operations, JIT and MRP/ERP Case: Toyota Motor Manufacturing, U.S.A. Textbook: Ch. 11	Individual Case: Toyota
8	11/14	Linear Programming & Constrained Optimization *Solver Practice Session* (*optional*)	
9	11/28	Supply Chain Management, The Beer Game HBR Article: What Is the Right Supply Chain…? Textbook: Ch. 17.1-17.2	HW #4 (Linear Programming)
10	12/5	Group Project Presentation	Group Project Report
11	12/12	Final Exam	