2012

MGMT 691-94S Operational Analysis

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INTRODUCTION TO OPERATIONS

Operations Analysis refers to the systematic design, direction, and control of processes that transform inputs into services and products for external, as well as internal customers. The course is one of the few MBA core courses required by AACSB. We will introduce various concepts and decision-making models related to core issues such as operations strategy, performance evaluation, process improvement, quality control, lean management, inventory, and supply chain management.

COURSE OBJECTIVE

The purpose of this introductory course is to provide MBA students with a thorough introduction to the concepts and analytical skills of operations management needed to understand and improve the business of various organizations. In particular, the course aims to expand their managerial (soft) skills as well as hands-on analytical (hard) skills so that they understand how and when to implement the tools of operations management, ensuring that resources are used as efficiently as possible, operations can be redesigned such that performance can be improved along multiple dimensions simultaneously.

STUDENT LEARNING OUTCOMES (SLO)

At the conclusion of the course our manager or to-be-manager students are expected to be able to:

1. Explain the basic issues, concepts, and terminologies in operations management theory
2. Categorize different business models and explain how and why they differ, and make inferences about the operational and financial implications
3. Demonstrate fundamental skills as how to measure performance, analyze and improve processes, control process quality, manage inventory, and improve customer service
4. Describe the impact of process variability and demand uncertainty and present relevant mitigation strategies
5. Illustrate capability to apply theory to practical business scenarios and propose possible solutions
6. Develop perspectives on how and where today’s business and environmental trends fit into the ethical, global atmosphere

PREREQUISITES AND FOLLOWING COURSES
MGMT 500 and basic knowledge of calculus and probability (i.e., STAT 500); or consent of the instructor. Related further courses at XU include MGMT 633 Global Supply Chain Management, BUAD 623 Health Care Operations, and MGMT 654 Project Management.

**DELIVERY METHODS**

This hybrid course is delivered in face-to-face (f2f) and online formats. We will have about 6 f2f classes and 6 online sessions. In particular, we will mostly use asynchronous activities for teaching online classes (see tentative teaching schedule for details). As a result, there is no location and time restriction on taking your online classes (You do need to complete the assigned activities before their due dates though).

**COURSE COMMUNICATION**

Students need much more support and feedback in the online environment than in a traditional course. This is because the potential threat that students might feel alienated is quite high in the virtual classroom. More importantly, a high volume of meaningful communication is absolutely required for ensuring a deeper level of understanding and the application of knowledge to real-life situations. We plan to use various feedback strategies which enable the instructor to identify and meet individual student needs as well as encourage students to participate at a high quality level. Here are strategies for providing feedback: (1) We use this syllabus to clearly communicate exactly how the course will be taught and how students will be graded. For example, you can find the course assignments, the weight each assignment carries, due dates, and detailed evaluation criteria for the course as well as for each assignment. (2) Student providing feedback (especially asking questions) is part of the learning process and will be graded. I will have real and virtual office hours which allow us to interact synchronously. (3) Student in-class interactions (f2f classes) will be highly needed and graded. (4) We intend to create multiple communication channels to facilitate student-faculty interactions and help address student questions and feedback. Online interactions (email, discussion board entries, Skype chat, Wimba Classroom, etc.) are also highly desirable and will be used frequently. Normally I will reply to your message within 24 hours of receipt. (5) If you want to contact me but cannot get online please call my office phone (513) 745-3928 (your voice message will be forwarded to my email account immediately if I am not in my office). I will call you back if necessary. (6) Call Xavier MBA office (513) 745-3525 for program related issues, and call Xavier help desk (513) 745-help for any blackboard technical issues, for example, when the Blackboard website is down. (7) Weekly updates will be provided on student grade status (for online sessions only). (8) If the online portion of the course is delayed by factors beyond students’ control, for example, website is down for an extended time, then the instructor will make accommodation accordingly.

**COURSE MATERIALS**

**Text Book (Required):**

**Course Packet (Required):** The packet includes the following items from Harvard Business School Publishing: (1) Teaching Note: Process Fundamentals. (HBS# 6-696-023); (2) Teaching Note: Customer-Introduced Variability in Service Operations, Frances X. Frei (HBS# 9-606-063); (3) Online Simulation: Benihana V2 (HBS# 7003). This packet is available for purchase from hbsp.harvard.edu. You can search for individual items or the entire course packet (2012 Summer 601-94S Operational Analysis; course pack link: http://cb.hbsp.harvard.edu/cb/access/13789411).
Other Materials:
1. All lecture slides, which are solely developed by the instructor for this course, will be posted on our course website blackboard.xavier.edu. Additional cases, examples, teaching notes, practice problems, and articles will be posted on this website as well. (I developed a macro in PowerPoint for better managing the PPT slides, however, this feature is useless to you. When opening up the slides, please choose “disable macros” to avoid any security concerns).
2. I will also supplement the course with latest articles/examples from newspapers and journals as the course progresses. Students are also encouraged to recommend/post any interesting articles on the online discussion board area.

Computer and Internet Connection: Students need to have access to an adequate computer (with appropriate software installed such as Word and PowerPoint). Broadband internet connection (DSL, LAN, or cable) is required (Remember that some narrated PowerPoint files we will use are pretty big, i.e., up to 110 Megabytes). Students should have access to a computer equipped with a microphone and are required to access the course blackboard website and their email account on a regular basis. Lack of functioning computer equipment and internet connection will not be an acceptable excuse to makeup work.

Laptop Policy for f2f Classes: To maximize the benefits while minimizing the distraction, I do not encourage you to bring your laptop to our f2f classes. However, if you really need to use your laptop to take notes or look at PowerPoint slides, you can use laptops or other mobile devices in class, but only for legitimate classroom purposes. E-mail, instant messaging, surfing the Internet, reading the news, or playing games are not considered legitimate classroom purposes; such inappropriate laptop use is distracting to those seated around you and is unprofessional. Further, the first row of the classroom is reserved as a laptop-free zone. When using these electronic devices your screen has to stay on class document pages.

COURSE REQUIREMENTS

This is a hybrid course which utilizes readings, lectures, discussions, online simulation, and a series of assignments to assist students in achieving the course learning outcomes. All students are normally expected to attend each face-to-face (f2f) class on campus but it is flexible to schedule your online session learning time and location as long as you do not miss the due dates. Students missing two or more f2f classes will automatically get an “incomplete” for the course. Please bring your own copy of course documents (normally including PPT slides, teaching notes, examples, practice problems, cases, etc) and a scientific calculator to every class. If you have an urgent need to miss one f2f class, you are still responsible for the materials covered and expected to complete the required work. To maximize learning efficiency, everyone is strongly encouraged to work in a study group of no more than 3 students in class. In most f2f classes, all groups will be asked to analyze some short cases/do practice problems. Every team member is expected to make active contributions on an equal basis.

In-Class Participation: 50 points (Individual Based)

Student learning outcomes #1, #2, #3, #4, #5, #6
To foster a productive learning environment, it is important that everyone comes to each f2f class prepared and willing to contribute to discussion (Complete all pre-class assignments for each session outlined in this syllabus before coming to class, you may skip any technical details at this time). I will expect you to raise/answer questions and/or make organized and concise comments
in every class. In particular, your speech needs to be based on real life experience, journal articles, own insights, and business applications related to the course materials.

Assessment method: Your participation grade for f2f classes will be based on factors such as the quantity and quality of speeches, online engagement, after-class communications, anything I hear from you, etc. The tentative grading rubric is (10 points for each f2f class, 50 points total):

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-50 points</td>
<td>Made multiple high quality speeches in every class. Speeches demonstrate one of the following: provide insightful answers, raise a great question, offer an excellent practical example.</td>
</tr>
<tr>
<td>30-40 points</td>
<td>Made at least one speech in most classes. Speeches demonstrate some level of analysis or understanding.</td>
</tr>
<tr>
<td>20-30 points</td>
<td>Provides minimal response but is actively involved in all other class activities.</td>
</tr>
<tr>
<td>0-20 points</td>
<td>Sitting in class but without paying attention.</td>
</tr>
</tbody>
</table>

Keep in mind in order to be more objective in issuing points, I will need all participants to write a few words or even grade themselves about their in-class involvement, such as the speech they made in the class before they leave. Failure to do so may result in lower than expected score (if I do not remember your speech or other involvement). If you miss the opportunity to participate in-class discussions, you can always turn to online channel for participation (You have to do so before next class starts. All entries will be counted). Please look for the specific discussion forum in Blackboard system. In particular, you are encouraged to post your common question(s) in the Common Q&A forum. I expect everyone will post at least one question before the midterm exam. Your question has to be different from others, and cover an issue may interest peer-students, for example, concerning grading policy, exam reference sheet, online simulation timing, etc. We hope to use this common Q&A forum to address many common questions students tend to ask repeatedly, so as to improve class learning efficiency.

Online Discussion Contribution: 100 points (Individual Based)

Student learning outcomes #1, #2, #3, #4, #5, #6
For all online sessions, each student is required to be an active and engaged participant in discussion forums. This is the main tool for me to understand (1) if you have finished the learning activities, (2) if you understood the materials and be able to apply. Discussion topics will be structured so that they meet course objectives and do not invite meaningless digression. The instructor will participate in discussion and provide frequent feedback to keep students involved and focused on the discussion topic. In the meantime, students must make their contribution for each class session no later than the next class. Late contributions will not be accepted. The instructor will finish grading your online contribution before next online class starts. The discussion forums are related to the topics covered in lecture notes (PPT presentations) and relevant reading materials. It is anticipated that many discussion questions will be posted each class for all online classes.

Assessment method: Each discussion forum will be graded using the following rubric. Content, timeliness, and quality of the responses during the discussion will be considered in the grading. In general it is difficult to provide quality input with only one or two short comments. Better input earns better points.

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 18-20 points  | Responses follow the netiquette we defined in this syllabus and
demonstrate knowledge of the subject and a detailed analysis of a relevant issue (i.e., a practical example). Use course readings as well as external sources to support position. External sources must be properly cited.

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-16</td>
<td>Responses demonstrate some level of analysis of the topic and link readings and/or other course activities to support position.</td>
</tr>
<tr>
<td>10-12</td>
<td>Responses demonstrate minimal knowledge and a limited level of analysis of the topic. Responses violate the netiquette we defined later.</td>
</tr>
<tr>
<td>0-8</td>
<td>Responses lack clarity or demonstrate no analysis at all (zero point for late responses or no participation)</td>
</tr>
</tbody>
</table>

Here is a list of expectations I have for teaching online sessions in regards to socializing online (netiquette).

- Clarify to whom you are replying by using names.
- Be brief but clear in your postings (touching the points).
- Avoid posts that only say, “I agree”. If you agree, why? What else can you add to the discussion?
- It’s okay to disagree with someone, but keep the discussion civil.
- Be polite and respectful to fellow online participants by avoiding
  - obscene language
  - all-caps type, which is perceived as shouting
  - repeating the same sentence continuously
  - “flaming” others with emotional or angry messages
- To communicate effectively in the online environment,
  - use smiles, or emoticons, to show tone of voice or emotion ;)
  - use symbols such as asterisks (*) to emphasize words
  - use acronyms such as "brb" (be right back) or "afk" (away from keyboard)
- Keep private comments private by using personal e-mail.

Several suggestions for writing discussion posts online are:

- Understand the purpose of the discussion and keep postings informal and concise
- On discussion boards, don’t just settle for opinions. Require that opinions be supported by data and/or rationale and re-examine those opinions throughout the discussion
- You are encouraged to ask probing questions, build on each other’s ideas, think in new ways, construct conclusions, etc
- You can help create some of the discussion topics, if possible
- Apply that class’s course content to actual company situations
- Apply that class’s course content to personal work experiences
- Ask meaningful questions with regard to other posts, respond to other students’ posts, or comments
- Cite authoritative sources - e.g., published articles, known authors, etc.
- Make multiple, substantive, original contributions or just bring a new, insightful perspective to the discussion

Quizzes: 240 points (Individual Based)

Student learning outcomes #1, #3, #4
At the beginning of most f2f classes you will need to take a closed-book quiz covering materials discussed in the previous class (some multiple questions may be also testing if you have finished
the pre-class reading assignments for that class). Online quizzes will be provided for online sessions as well. Please note that online quizzes will have time limits (for example, 45 seconds per multiple-choice question). You need to be familiar with the materials before taking the quiz. Otherwise you won’t have enough time to finish it. You will have approximately 9 quizzes overall (Only 8 best quizzes will be chosen). The questions will be mostly from the teaching materials we used in the previous module. Some questions for f2f class quiz will be from the pre-class reading assignment as well.

Assessment method: Quizzes will be given throughout the semester to assess the material/topics covered in associated course readings and/or course activities. Quizzes will be multiple choice and/or short essay responses (Each quiz is worth 30 points). Quiz score will be computed based on the ratio of the number of the correct answers you got and the total number of questions.

Problem Solving Homework: 70 points (Individual Based)

Student learning outcomes #3, #4
Students will demonstrate a systematic approach in solving problems associated with process analysis, supply chain, and quality issues or analysis. Microsoft Excel and Word can be utilized to prepare and present the analysis and solution report. There will be one homework assignment consisting of workout problems. It is essentially important for everyone to do all these problems on an individual basis in order to fully understand the methodology and perform well in the writing exam. You may discuss homework problems with others, but you must write up by yourself with the full understanding of what you write. Please be advised that you need to submit your homework at the beginning of the class on the due date (one copy per student, can be printed or hand written, make sure I can read). Students handing in identical assignments will be violating university regulations and will not receive credit! Late homework is not allowed unless you negotiate with the instructor at least one day in advance.

Assessment method: Correct answers presented in a professional appearing and well-labeled format will be 80% of the grade. The professional appearance and ease of understanding of the associated explanatory summary will make up the remaining 20% of the grade. The HW due date is provided in the course calendar section.

Case Reports: 100 Points (Individual Based)

Student learning outcomes #1, #2, #3, #4, #5, #6
There will be two case reports due, one for every two online classes. Each case report requires at least one page in length, with single space and font size #11. I believe that the process of composing the paper is a valuable part of your learning process. Late report is normally not accepted unless you negotiate with the instructor at least one day in advance. Case report usually includes 1-3 pages of text (and several pages of exhibits if necessary). Exhibits should contain specific types of analyses, such as quantitative analysis, calculations, flow charts, cost items, etc. They should contain any relevant supporting information that is too detailed for the body of the paper. Exhibits must not be simply an extension of the text.

Select two of the following items to develop your case report #1 (50 points) and report #2 (50 points) (due dates are indicated in the course calendar):

- BankUSA: Credit Card Division Case Study (pages 62-63 of CE text)
- Sustainable Lawn Care Case Study (pages 83 of CE book)
- Hopewell Hospital Pharmacy Case Study (page 145 of CE book)
• Virtual Field Trip of Module 2: Visit Dell and Samsung product support websites and compare your experience, write about ideas for possible service process improvement
• Community Medical Associates Case Study (pages 358-359 of CE text)
• Sunshine Enterprise Case Study (pages 321-323 of CE text)
• Online Book Retailing: Operations strategy (A). (Wharton school case posted online). Please analyze the competitive advantages of both online and bricks-mortar business models and offer possible suggestions for the underdog to turn around.

Assessment method: The papers should be well organized and include appropriate sections for the analysis work. Case reports must be emailed to the instructor no later than the due dates (see course calendar section, U.S. Eastern Time). Case reports are evaluated based on the following three criteria:

1. Case Analysis (50%)
   • Does the paper identify the main fighting issue correctly?
   • Does the analysis apply the proper theoretical methods?
   • Does it present author’s own arguments explicitly?
   • Is the analysis complete and comprehensive?
   • Does the paper present enough depth of analysis?

2. Conclusion or Recommendations (25%)
   • Is the paper logically consistent and effectively structured to sell its recommendations?
   • Are conclusions in the paper convincing?

3. Format (25%)
   • Does the paper appear to be professional?
   • Does the paper follow case writing requirements carefully?

Online Simulation: 150 points (Individual Based)

Student learning outcomes #1, #2, #3, #4, #5
The game is developed to simulate the more complex (thus more realistic) operations decision settings. The following learning objectives are emphasized during the simulation:

• How to analyze capacity, demand rate, flow time, and flow rate in an operation
• How batching strategies improve flow rate and importance of increasing capacity at bottlenecks
• How to optimize capacity in an operation (idle capacity is lost forever)
• How to minimize or eliminate demand variability
• How to optimize across multiple variables in an operation and ensure consistency in the overall operations strategy

Assessment method: Students will need to finish running the online simulation (1 to 1.5 hours), and turn in 1-2 page paper summarizing their strategies, actions taken, and justifications for their actions. Student performance will be evaluated based on the operational performance (including profit) they generated (40%, 60 points), and also the quality of the paper they submitted (60%, 90 points). While running the simulation, references are limited to reinforce the idea that students are “on their own” as they might be in a real-life scenario.

Final Exam: 250 points (Individual Based)

Student learning outcomes #1, #2, #3, #4, #6
There will be one writing exam in this semester. The exam would cover concepts and analytical techniques presented in lectures. Students are responsible for all materials covered in classes
(including any session they did not attend). *For the final exam, each student will be allowed to bring in one 8.5 by 11 inch (double-sided) note sheet containing whatever he or she chooses for reference during the exam.* A calculator is required for taking the exam. Make-up exam will require documentation of illness or other unavoidable emergency, in which case please contact me as early as possible. Please note the makeup exam will only be given during daytime and will be administered by our department secretary.

Assessment method: After taking the final exam, students will have chance to review what they did and identify the mistakes they made during the exam. Doing so allows them to know how they perform in the exam, and more importantly, to further improve their understanding of the critical methodologies and strategies of operations management.

**GRADING SCALE**

<table>
<thead>
<tr>
<th>Grade Percentages</th>
<th>Points</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In-class Participation</td>
<td>50</td>
<td>Only for f2f classes</td>
</tr>
<tr>
<td>2. Online Discussions</td>
<td>100</td>
<td>Only for online classes</td>
</tr>
<tr>
<td>2. Quizzes</td>
<td>240</td>
<td>For both class types, 8 quizzes X 30 points each</td>
</tr>
<tr>
<td>3. Homework Set</td>
<td>70</td>
<td>Only for f2f classes</td>
</tr>
<tr>
<td>4. Case Reports</td>
<td>100</td>
<td>For both class types</td>
</tr>
<tr>
<td>5. Final</td>
<td>250</td>
<td>For both class types</td>
</tr>
<tr>
<td>6. Simulation</td>
<td>150</td>
<td>Comprehensive, for both class types</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>960</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Grading on a Curve (tentative)**

- A: for the top 20% of students
- A – : for the next 20% of students
- B (including + /–): the remaining 60% as long as their scores are above 75%
- C (including + /–): scores of 60 – 75%
- F = below 60%

Note this grading scale is tentative and can be adjusted according to the overall class performance.

**COURSE CALENDAR**

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topics</th>
<th>Text Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(CE Book)</td>
</tr>
</tbody>
</table>
| 1     | 07/03/2012 | Syllabus
Introduction to Operations
Performance Measurement | Ch. 1 OM
Ch. 3 |
| online|        |                                      |               |
| 2     | 07/05/2012 | Variability Analysis
Risk Pooling Strategy
Process Strategy | Ch. 6
Ch. 7 |
TENTATIVE COURSE MODULES

Module 0 (Before class starts)

Before the class starts, please complete the following activities.

- Read article: What makes a successful online student? (posted online)
- Get familiar with Blackboard, make sure the technological requirements are met
- Make sure you get the right text book and the course packet (both are required)
- Post your biography and introduce yourself briefly on the discussion board of Blackboard
- Read the course syllabus very carefully and take the orientation quiz. You must have 100% in order to move to Module 1 (Do not turn in)
- Note that the first two classes are online, which means you need to finish ALL the learning activities specified in the next two modules. Remember we do not have face2face meetings in the first week.

Module 1 (07/03/2012)
Overview:
The goal of this online module is to discuss our course syllabus and introduce operations management as a business field. We will define process view concepts, business model and operations key decisions. We will provide students with concepts and a strategic framework to analyze business models of various organizations. In particular, we present business performance measures including the popular balanced scorecard method to gain understanding of different performance measures and to be able to assess different business models.

Learning Objectives: After finishing this teaching module you will be able to
- Describe what we will do in the class and the respective requirements
- Explain operations management and how it is related to other business fields
- Understand fundamental concepts of process and business model
- Describe the types of measures used for performance assessment
- Explain how internal and external measures are related
- Explain how to design a good performance measurement system

Learning Activities and Assignments:
Online learning supports the self-directed learner in pursuing individualized, self-paced learning activities. The learner, working at a convenient time and pace, is able to enjoy much of the benefits online module can offer. However, students must be highly self-motivated to be effective in taking online classes. In particular, the challenge is how to facilitate the transition between the mindset that was reinforced in the traditional lecture-based learning environment and the one required to be an engaged online community member. We expect you will finish the required learning assignments on time and be involved in online interactions accordingly. Please do expect to spend more time on learning activities than taking the f2f classes. The learning activities listed here include (Please note these are ALL you need to do to complete this course module, you do not have a face-to-face class to attend. I will judge the quality of your work based on your online discussion board entries, case reports and online quiz answers. Most of the work related to these learning activities does not need to be turned in unless specified explicitly. Instead, you are encouraged to use them as information source to create discussion board entries or posts):

1. First please read CE Chapter 1 (Goods, Services, and Operations Management) and Chapter 3 (Measuring Performance in Operations). You can skip any technical details such as calculations. Just focus on understanding fundamental concepts, terminologies, and supporting examples. Your total work load is about 39 pages which require at least two hour reading time. Check this box if you have finished this part of the work. □

2. Watch voice-narrated PowerPoint presentation: Performance Measurement. This presentation is designed to help you focus on the most important measurement issues we intend to cover in the module. Please check “play narrations” and “use timing” options under the “slide show” tab in PowerPoint to watch the presentation. If you do not check “use timing”, you will need to click by yourself to proceed to the next slide. (Time expectation: 15 minutes) □

3. Complete one of the following two learning activities (Time expectation: 20 minutes)
   a) Go to the Baldrige web site (www.nist.gov/baldrige) and find the links to award winners. Review some of their application summaries and summarize the types of performance measures that these companies use. □ (Unless stated explicitly, you do not have to turn in the work you complete here. But you are strongly recommended to report your work on online discussion board.)
   b) The Balanced Scorecard was originally developed by Arthur M. Schneiderman at Analog Devices. Visit his Web site, www.schneiderman.com and read the articles to answer the following questions:
i. How was the first balanced scorecard developed? (Click The Scorecard link under the Contents link. Find “ADI: The First Balanced Scorecard”) □

ii. What steps should an organization follow to build a good balanced scorecard? (Find “How to Build a Balanced Scorecard”) □

iii. Why do balanced scorecards fail? (Find “Why Balanced Scorecards Fail”) □

4. Create at least one entry for answering one or more the discussion questions posted on our online discussion forum. Your entry can be from the learning activities you finished earlier as well (Time expectation: 20 minutes). You can also create your own threads if you like. □

5. You will need to write a case report no later than 07/19/2012. Please start early and be cautious about the deadline. You can select any case from the case list provided early (in the course requirement section of this syllabus). □

6. Complete online quiz #1 before the due date (07/05/2012). The quiz will cover the key concepts you learned from this online module. Please note that you need to complete all 10 multiple-choice questions in one sitting, and you have about 45 seconds to finish one question on average. Read other instructions before you take the quiz. (Time expectation: 10 minutes) (check this box if you have finished this part) □

Module 2 (07/05/2012)

Overview:
In this online module, we analyze the impact of variability on customer waiting times and process capacity utilization. We show that variability causes congestions, even if the underlying process operates at a utilization rate of less than 100 percent. Reducing variability therefore improves operational efficiency, but may at expense of the customer service experience. Navigating this tradeoff effectively is a critical part of service management and design. We will outline concepts and strategies (including the risk pooling strategies) that allow us to mitigate the negative impact caused by variability. In particular, we consider strategic decisions in managing processes for creating long-term competitiveness, including process structure, customer involvement, resource flexibility and capital intensity. We will exam how process can be structured such that the impact of variability on operational efficiency can be reduced without compromising the service experience.

Learning Objectives: After studying this module students will be able to

- Explain variability and its impact on process performance
- Understand how process decisions can be made to maintain efficiency and create customer satisfaction at the same time
- Explain how risk pooling can mitigate the impact of variability and uncertainty
- Describe the process structure used in manufacturing and service industries
- Explain the elements of service delivery system design
- Describe how the level of customer contact influences process performance and how front-office and back-office can be used to improve processes

Learning Activities and Assignments:
Online learning doubtlessly supports the self-directed learner in pursuing individualized, self-paced learning activities. As usual, I expect you will finish the required learning assignments on time and be involved in online interactions accordingly. Please do expect to spend more time on learning activities than taking the f2f classes. The required learning activities for this module include:

2. Read teaching note: Customer-introduced variability in service Operations (HBS#9-606-063) (This is one of the course packet items you purchased). Please focus on the five types of variability and the respective management strategies. (Time expectation: 60 minutes) □

3. Choose a service process for a business (such as restaurants, banks, car dealers, etc) with which you are familiar and list the main types of variability which are present. Discuss how variability influences process performance, and explain how to manage the variability identified there. (Time: 20 minutes) □

4. Read CE text chapter 7: Process selection, design, and analysis (pages 124-141). Please focus on the process choice decisions in manufacturing and service industries and their relationship with process characteristics and performance. (Time expectation: 60 minutes) □

5. Watch narrated PowerPoint presentation: Process strategy (Time expectation: 15 minutes) □

6. Reflective moment (you are encouraged to write something for online discussion participation): Think about how back-office processes are used to help improve process efficiency and control cost in practice. For example, you want to order a spare part or anything else for your laptop or any other home appliance product, what are the back processes available there to help you? How do they work? How are they being used to support the front-office process? Are you satisfied? (15 minutes) □

7. Virtual field trip: Suppose you need to get Windows re-installation and system driver software to re-install operating systems on two of your computers: one Dell desktop with service tag of 24D06J1, and one Samsung laptop (Model: NP700Z5A-S04US). Please visit both companies’ websites for getting these. Compare your experience and share your thoughts on service process design and improvement. How about if you want to order some spare parts from these companies, say, an optical disk driver for these computers? How does the experience differ? Any insights for process improvement? This assignment can be used as an option to develop your case report #1, or you can write discussion board posts based on your experience. (30 minutes)

8. Make sure you complete case report #1 before 07/19/2012. □

9. Complete online quiz #2 before 07/09/2012. □

Module 3 (07/10/2012)

Overview: In this f2f class, the primary goal is to introduce the basic concepts and analytical tools for process capacity analysis. We will start with process mapping tools and then focus on bottleneck analysis and efficiency analysis (such as utilization).

Learning Objectives: After the class, students should be able to
- Calculate capacity and relevant process performance measures such as utilization, flow rate for single and multiple flow unit processes
- Compute implied utilization and identify bottleneck for multiple flow type processes
- Identify bottleneck and summarize the role of bottleneck plays in various processes
- Explain the basic elements for analyzing and improving process capacity and utilization of various multi-stage business processes in practice

Topics and Learning Activities: The covered topics include process flowcharting, capacity, bottleneck analysis, flow rate, utilization, and capacity management. Traditional f2f teaching methods will be employed to facilitate our learning process. In particular, Students are expected
to complete pre-class and after-class assignments accordingly. In particular, lecturing is the predominant pedagogical method we use for teaching this module. The number of PPT slides used will be kept at minimal and student involvement is especially encouraged. The instructor will try to promote active learning by engaging students, requiring/promoting interaction and small group activities. By engaging students more, we hope to bring in more perspectives and angels to enrich our learning process. The goals of these teaching activities will be promoting reflection, interaction, collaboration and deep learning.

Assignments:
Pre-class reading assignments:
1. CE text chapter 1 and 10
2. PowerPoint slides: Process Capacity Analysis
4. Teaching examples for process capacity analysis
5. For each class, please prepare a folder to hold teaching documents like PPT handouts, teaching examples, practice problems, etc.

After-class assignment (Due date is indicated on course calendar. However, it is highly recommended that you finish the homework within two days after the class):
1. Process analysis homework (HW problems 1, 2, 3)
2. Also, please remember to review and digest the materials we covered in this class in a timely manner. You will be tested if you have done so in the next in-class quiz.

Model 4 (07/12/2012)

Overview:
We will introduce flow time analysis techniques in this class. Specifically, we will learn how to measure process waiting time with various types of variability and explain the relationship among inventory, flow time and flow rate. Both single unit and multiple flow unit processes will be covered. Further we focus on the technical aspects of managing projects, covering topics such as project work breakdown structure and critical path analysis. We aim at establishing your basic understanding about planning, scheduling and controlling projects in a way that project resources are utilized effectively and efficiently. In the meantime, we compare project techniques with repetitive process techniques to complement our understanding of process analysis.

Learning Objectives: Students are expected to
- Understand flow time concept and its calculation methods
- Describe Little’s Law and apply it for analyzing various processes
- Summarize ideas of reducing customer waiting time and flow time
- Explain how project processes differ from repetitive processes
- Describe the basic concepts and methodology for managing project processes such as WBS and CPM methods

Topics and Learning Activities:
Traditional f2f teaching methods will be used. In particular, lecturing is the predominant pedagogical method we use for teaching this module. Instructor will try to promote active learning by engaging students, requiring/promoting interaction and small group activities. By engaging students more, we hope to bring in more perspectives and angels to enrich our learning process.
Assignments:
Pre-class reading assignments:
1. Read PowerPoint slides for flow time analysis and project management
2. Read CE chapter 18 (project) and chapter B (queuing)
3. Flow time teaching examples (PDF)
4. (Further reading) Little's Law teaching note, 2008, Springer Science

After-class assignment (Due date indicated on course calendar):
1. HW process problems 4, 5, 6

Module 5 (07/17/2012)

Overview:
In this module we introduce theory of constraints (TOC) as a new management approach to focus on attacking the current constraint which is constraining our output performance. Assuming the goal of the organization has been clearly specified, the TOC steps are:
- Identify the constraint (the resource or policy that prevents the organization from obtaining more of the goal)
- Decide how to exploit the constraint (get the most capacity out of the constrained process)
- Subordinate all other processes to above decision (align the whole system or organization to support the decision made above)
- Elevate the constraint (make other major changes needed to break the constraint)
- If, as a result of these steps, the constraint has been removed, return to Step 1. Don't let inertia become the constraint.

The five focusing steps aim to ensure ongoing improvement efforts are centered around the organization's constraints, which makes TOC particularly effective in achieving operational goals. We then discuss lean thinking in general, to cover various concepts and techniques to eliminate wastes and promote quality.

Learning Objectives: After studying this module you should be able to
- Explain the basic principles of constraint management (TOC)
- Describe the procedures for constraint management approach
- Generate ideas for improving some practical processes or systems based on TOC
- Identify the typical sources of waste in practical working environment
- Describe the basic lean tools and approaches
- Explain how lean principles are used in manufacturing and service organizations
- Describe Toyota production system and its fundamental characteristics
- Apply value stream mapping and 5S to practical scenarios

Learning Activities and Assignments:
1. Complete online quiz #2 before the due date. (Time expectation: 15 minutes)
2. Watch narrated PPT presentation of Constraint Management. (Time expectation 15 minutes)
3. Read the Wikipedia entry on theory of constraints: (Time expectation: 20 minutes)
4. Watch the following YouTube video online. Dr. Goldratt will talk about theory of constraints and his more recent systematic thinking (Time expectation: 10 minutes):
   http://www.youtube.com/watch?v=tWvMODJ9cVc
5. Reflective moment: Think about your job or any work system you are familiar, try to define system goal first, then determine the system constraints. How are you going to elevate the constraint? The bottom line of these approaches is “doing more with what you have”. (Expected time: 15 minutes)
6. Read CE text Chapter 17: Lean operations systems (pages 344-356) (60 minutes)
7. Watch narrated PowerPoint presentation: Lean management. (15 minutes)
8. Watch the following YouTube video about 5S (Time expectation: 10 minutes): http://www.youtube.com/watch?v=c0QxaYior0
9. Read teaching note: The Toyota Way by Jeffrey Liker. (Time expectation: 60 minutes)
10. Reflective moment: provide some examples of different types of waste in an organization with which you are familiar, such as an automobile repair shop or a fast food restaurant. Please focus on those resources or activities which do not add customer value. (Expected time: 20 minutes)
11. Finish online quiz #3 before 07/19/2012.

Module 6 (07/19/2012)

Overview:
In this class, we will present concepts and framework for quality management. We focus on quantitative methods for measuring process quality (variations) for manufacturing and service processes, specifically, on sigma quality. We will also explore the root causes for quality variations and introduce the statistical process control tools—the same techniques used at many leading companies to achieve high quality standards. Please remember to bring in one quarter coin (for each group) to play an in-class game.

Learning Objectives: After the class you will be able to
- Explain the concepts and definitions of quality (design and process quality)
- Describe sigma quality and other process quality measures
- Explain types of process variation and the root causes
- Discuss the role of statistical process control and other practical issues
- Describe how to construct and interpret simple control charts for both continuous and discrete data

Topics and Learning Activities:
Traditional f2f instruction methods will be used to teach this module. In particular, lecturing is the predominant pedagogical method we use for teaching this module. Instructor will try to promote active learning by engaging students, requiring/promoting interaction and small group activities. By engaging students more, we hope to bring in more perspectives and angels to enrich our learning process.

Assignments:
Pre-class reading assignments:
1. PowerPoint slides for quality management and SPC
2. Read CE chapters 15 and 16
3. HBR article: Competing on the eight dimensions of quality, 11-12/1987
4. SMR article: How do customers judge quality in an e-tailer? Fall 2006
5. Bring in one quarter coin for playing exercise A
6. Read Excel Logistics Service case
After-class assignment (due date indicated on course calendar)
1. Do quality analysis homework problems (HW problems 7, 8, 9)

Module 7 (07/24/2012)

Overview:
The goal of this online module is to provide students with concepts and a strategic framework to analyze strategic decisions of various organizations. In particular, we describe the role of operations strategy and demonstrate how operational decisions can be made based on marketing research and competitive analysis to help businesses create sustainable competitiveness in marketplace.

Learning Objectives: After finishing this teaching module you will be able to
- Describe approaches for understanding customer wants and needs
- Explain how organizations seek to gain competitiveness
- Explain the key competitive priorities
- Understand the link between process decisions and upper level financial performance
- Explain how operations decisions can be used to provide competitive advantage

Learning Activities and Assignments:
We expect you will finish the required learning assignments on time and be involved in online interactions accordingly. Please do expect to spend more time on learning activities than taking the f2f classes. The learning activities listed here include (these are all you need to do to complete this module, you do not have a face-to-face class to attend):

1. First please read CE Chapter 4 (Operations Strategy) and Chapter 5 (Technology and Operations Management). You can skip any technical details such as calculations at the moment. Just focus on understanding fundamental concepts, terminologies, and supporting examples. Your total work load is about 36 pages which require at least one and half hour reading time. Check this box if you have finished this part of the work. □

2. Watch voice-narrated PowerPoint presentation: Operations strategy. This presentation is designed to help you focus on the most important strategic issues we intend to cover in the module. (Time expectation: 15-20 minutes) □

3. Read posted Xavier teaching case: “Grocery store operations strategies” and create at least one online discussion entry on business models of grocery retailing operations. (Time expectation: 40 minutes) □

4. Choose one of the following organizations with which you are familiar:
   - sporting goods store
   - haircut salon
   - college bar or restaurant
   - pizza business
   - a sports team
   - wireless telephone service
Define the firm's operations strategy and competitive priorities. What are the order qualifiers and winners? What would operations have to be good at to make this a successful business or organization? □

5. Create at least one entry for answering one or more the discussion questions posted on our online discussion forum. Your entry can be from the learning activities you finished earlier as well (Time expectation: 20 minutes). □
6. You will need to write the case report #2 no later than 08/07/2012. You can select any case from the case list provided early (in the course requirement section of this syllabus).

7. Finish online quiz #4 before 07/26/2012.

Module 8 (07/26/2012)

Overview:
In this class, we discuss the functions, types, costs and management of physical inventory. We then introduce the basic EOQ model for making inventory decisions, which is followed by lecturing on safety inventory and inventory performance measures. Then we will introduce the fundamental framework of quantitative decision making in business management. In particular, we introduce how to formulate LP-based problems for real applications and then how to solve the problem using Excel. Managerial insights from the analysis will be further discussed.

Learning Objectives: After studying this module you should be able to
- Understand various inventory-related concepts and costs
- Describe the major characteristics that impact inventory decisions
- Explain multiple-period inventory systems and how to use the EOQ model
- Describe optimization model formulation and relevant concepts like shadow price
- Explain how to formulate Linear Programming model

Topics and Learning Activities:
Traditional f2f instruction methods will be used to teach this module. In particular, lecturing is the predominant pedagogical method we use for teaching this module. Instructor will try to promote active learning by engaging students, requiring/promoting interaction and small group activities. By engaging students more, we hope to bring in more perspectives and angels to enrich our learning process.

Assignments:
Pre-class assignment:
1. PowerPoint slides for inventory and decision analysis
2. Read CE chapters 12 and C
3. Teaching note: Spreadsheet modeling basics, 01/2010
4. (Further reading) Teaching note: The EOQ model by Prof. Leroy Schwarz of Purdue University, 2008

After-class assignment (due date indicated on course calendar):
1. Do homework problems (HW problems 10, 11, 12)

Module 9 (07/31/2012)

Overview:
This simulation models a typical night at a Benihana restaurant which can be found in many metro areas of the U.S. The simulation runs through a single evening demand cycle from 6:00pm to 10:30pm. The simulation is a tool that helps students unlock in a quantitative manner the secrets of Benihana’s profit formula and helps them digest key operational insights. It is organized as a series of challenges, each with a different set of options for managing the operation and demand. In all of these challenges, the goal is to manage the bar and dining area in order to maximize utilization, flow rate, and most important, total profit for the evening.
In this single-player simulation, students explore the principles of operations and service management while working through a series of challenges set during a single evening at a busy Benihana restaurant. Customers start in the bar area for drinks and then move into the dining room where chefs prepare the food right at the table. Each simulation challenge examines a particular aspect of the restaurant operation beginning with the effect of batching customers from the bar into the dining room. Other challenges examine the effect of redesigning the bar area, reducing dining time, and boosting demand through advertising and special promotions. The final challenge requires students to consider the lessons learned in the previous challenges to design a strategy that maximizes utilization, flow rate (throughput), and total profit for the evening. The simulation is designed to expand on the learning objectives of the Benihana of Tokyo case study (#673057). The second release of this popular simulation provides students with enhanced animation tools for exploring the challenges of running a service operation and provides faculty with streamlined tools for conducting an effective debrief.

Learning Objectives:
In the simulation process, students learn how to apply important principles of operations management and become familiar with the vernacular of this management discipline. Students come to realize how terms like capacity, flow rate, capacity utilization, demand variability, and flow time (service time) impact operations performance. They need to:

- Analyze capacity, demand rates, bottleneck, and throughput (flow rate) in a service operation
- Understand how batching strategies improve throughput and how increasing capacity improves bottlenecks
- Optimize capacity in an operation
- Minimize or eliminate demand variability (cyclical, stochastic, batch size, and service time), optimize multiple variables in an operation and ensure consistency in the overall strategy

Topics and Learning Activities:

1. You need to read the introduction materials and especially watch the game demo online before starting the simulation. It is also helpful to review the relevant process terms and terminologies. The simulation includes the following specific challenges:
   i. Batching dining room customers: How does batching strategy affect flow rate?
   ii. Optimally designing the bar: What’s the optimum size of the bar for maximum profitability?
   iii. Reducing dining time: What is the optimal dining time across an evening?
   iv. Boosting demand with advertising and special programs: How will marketing efforts affect operations and profitability?
   v. Scheduling different types of batching at different times: How do more complex forms of batching affect operations and profitability?
   vi. Designing your best strategy: What is the best combination to maximize profitability?

2. After the game, each student turns in a 1-2 page simulation report describing their actions during the game, a rationale for those actions and additional actions that would have resulted in better financial performance in retrospect (lessons they learned). Discussion board entry for this online module is optional (not required).

Technical Requirements for Simulations
- Computer with minimum 1024x768 screen resolution
- High speed internet connection (DSL / cable modem quality)
Windows 2000, XP, Vista, 7 / Macintosh OS 10.x operating systems
Internet Explorer 7+ / Firefox 3.6+ / Safari 4+ / Chrome web browsers with javascript and cookies enabled.
Optional: Microsoft Excel 2003+ (several courses and simulations allow students to export data/files for manipulation in Excel)

If you have any questions regarding these technical specifications, please contact Tech support of Harvard Business School Publishing.

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E-mail: techhelp@hbsp.harvard.edu.

Bottom-Line:
The success key for students is to systematically unearth the elements of Benihana’s profitability, determining how each aspect of the operation contributes to superior financial performance. Students need to understand and utilize the tight link between the process flow and operations strategy and financial performance.

Module 10 (08/02/2012)

Overview:
We present various forecasting techniques to predict future demand and estimate their performance. Then we consider supply strategies to meet uncertain product demand. Starting from the traditional Newsvendor model, we discuss and compare the financial performance of make-to-stock strategies without and with perfect demand information. The profit gap is defined as mismatch cost (or value for perfect demand information). Then we explain the impacts (both positive and negative) of quick response strategy as an effort to shrink the mismatch cost. We will also provide a midterm exam review at the end of this module.

Learning Objectives: After completing this module students should be able to
- Explain basic concepts of forecasting and relevant methodologies
- Describe how to apply time series models
- Define single period inventory system (newsboy problem)
- Describe how to solve newsboy problems
- Explain the value of perfect demand information
- Know how to make the optimal decision without perfect demand information
- Compare different mitigation strategies and select the appropriate one to improve profit

Topics and Learning Activities:
Traditional f2f instruction methods will be used to teach this module. In particular, lecturing is the predominant pedagogical method we use for teaching this module. Instructor will try to promote active learning by engaging students, requiring/promoting interaction and small group activities. By engaging students more, we hope to bring in more perspectives and angels to enrich our learning process.

Assignments:
Pre-class assignment:
1. Read posted PowerPoint slides
2. Read chapter 11 and chapter 12 section 6.
3. Teaching example posted online
4. Teaching note: The newsvendor problem by Dr. Evan Porteus of Stanford University, 2008
5. (Further reading) IJLRA article: The optimal quantity of quick response manufacturing for an onshore and offshore sourcing model, 2005.

After-class assignment
1. Do quick response problem (HW problem 13 parts 1-4)

Module 11 (08/07/2012)

Overview:
We will cover the famous six sigma strategy in this module. Specifically, we explain the relevant concepts and techniques in the domain of sigma process improvement. You will understand the key for process improvement is how to reduce process variability and six sigma strategies are mostly data-driven for solving real operational problems. We then discuss the framework of supply chain management. We will describe main terminologies and concepts of global supply chain management, including bullwhip effect and supply chain coordination.

Learning Objectives: After completing this module you will be able to
- Explain the Six Sigma DMAIC strategy
- Explain how the seven quality tools can be used for improving process quality
- Apply some of the fundamental tools and concepts to practical scenarios
- Explain the concepts of supply chain and supply chain management
- Describe the key issues in designing and managing supply chains

Learning Activities and Assignments:
1. Read Six Sigma Teaching note (posted online). (Time expectation: 30 minutes)
2. Watch narrated PowerPoint presentation: Six sigma strategy. (Expected time: 15 minutes) □
3. Read SMR article: Process management and the future of Six Sigma (posted online). (Expected time: 20 minutes) □
4. Reflective moment (online discussion entry): Explain how each of the 7 QC tools would be used in the five phases of the Six Sigma DMAIC problem-solving approach. For example, in which phase(s) would you expect to use flowcharts, check sheets, and so on? (Expected time: 15 minutes) □
5. Read Chapter 9: Supply chain design of CE text (pages 168-187). (Expected time: 60 minutes) □
6. Watch narrated PowerPoint presentation: Supply chain management. (Expected time: 15 minutes) □
7. Search the internet for information on one of the following companies that provide supply chain solutions: Oracle (www.oracle.com) or SAP (www.sap.com). Write a short summary of their supply chain approaches and capabilities. □ (30 minutes)
8. Complete case report #2 before 08/09/2012. □
9. Complete online quiz #5 before the due date (08/09/2012). (Expected time: 10 minutes) □

Module 12 (08/09/2012)

This is our final assessment module. Students will take the writing exam between 6:00pm and 8:30pm on 08/09/2012.
SUPPLEMENTAL BOOKS AND JOURNALS

- Bloomberg BusinessWeek, Fortune, and the other journals you have free access through Xavier University library: Harvard Business Review, Supply Chain Management Review, and Interface.

CODE OF ACADEMIC HONESTY

The mission of the Graduate School of Business at Xavier University is to educate students of business, enabling them to improve organizations and society, consistent with the Jesuit tradition. The pursuit of truth demands high standards of personal honesty. Academic and professional life requires a trust based upon integrity of the written and spoken word.

Plagiarism is a serious offense. The faculty and administration of Xavier University wish to make it clear that the following acts are regarded as serious violations of personal honesty and the academic ideal that binds the university into a learning community:

Submitting as one's own:
- material copied from a published source: print, Internet, CD-ROM, audio, video, etc.
- another person's unpublished work or examination material.
- a rewritten or paraphrased version of another person's work.
- allowing another or paying another to write or research a paper for one's own benefit.
- purchasing, acquiring, and using for course credit a pre-written paper.

The critical issue is to give proper recognition to other sources. To do so, is both an act of personal, professional courtesy and of intellectual honesty. If, after giving proper recognition to sources other than one's own, the student has nothing left to call his or her own, insufficient work has been done.

All work submitted for academic evaluation must be the student's own. Certainly, the activities of other scholars will influence all students. However, the direct and unattributed use of another's efforts is prohibited as is the use of any work untruthfully submitted as one's own.

Penalties for violations of this policy may include one or more of the following:
- a zero for that assignment or test,
- an "F" in the course,
- and expulsion from the University.

FACULTY BIO

Dr. Lifang Wu is an associate professor of Operations Management at Xavier University, Cincinnati, Ohio. He teaches operations management and global supply chain management courses at undergraduate, MBA and executive levels. He received his PhD degree in Operations Management from the University of Iowa, Iowa City, Iowa in 2004. He also holds dual Bachelor’s degrees (in Electrical Engineering and Management Science) from Tianjin University and an MBA degree from Zhejiang University, both leading universities in China. Before starting
his PhD study at the University of Iowa in 2000, Dr. Wu worked as an assistant engineer, operations manager, vice president of operations, and member of supervisory board for one of the top 500 private companies in China. His research interests include global supply chain management, operations management, process improvement, and operations strategy. His research work has appeared in journals such as IEEE Transactions on Engineering Management, Supply Chain Management Review, Total Quality Management, Business Process Management Journal, and International Journal of Electronic Business. He was the first place winner of APICS Operations Management Doctoral Dissertation Research Competition in 2004 and more recently, his coauthored paper (with Dr. Daewoo Park) on dynamic outsourcing through process modularization has been chosen as the Best Paper Award Winner for Business Process Management Journal in 2010. While teaching at Xavier, Dr. Wu also consults with several leading manufacturing and service organizations in greater Cincinnati area and mainland China.

(The End)