2012

MGMT 601-01 Operational Analysis

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XAVIER UNIVERSITY
MGMT 601-SECTION 01
OPERATIONAL ANALYSIS
Spring 2012

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Class Time: Monday 6:00PM-8:30PM
Class Location: Smith G27

INSTRUCTOR WEBPAGE
http://www.xavier.edu/campusuite/modules/faculty.cfm?faculty_id=1888&grp_id=2708

PURPOSE OF THE COURSE
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 performance of various organizations. My main goal is to educate managers or to-be-managers so that they can provide big picture ideas and back them up with rigorous analysis for operations issues they may encounter.

INTRODUCTION TO OPERATIONS MANAGEMENT
Operations Management 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 issues such as operations strategy, process improvement, quality control, inventory, and supply chain management.

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 include MGMT 633 Global Supply Chain Management, BUAD 623 Health Care Operations, and MGMT 654 Project Management.

COURSE MATERIALS
No required textbook, if you need a book please consider one of the following recommended books:

- CE: Collier and Evans, OM3, 2011-2012 edition, South-Western, Cengage Learning (ISBN: 9780538479134) (Great entry level OM text, sold on Amazon at less than $50)

Case packet (Required): The packet includes the following Harvard Business School Cases: (1) Manzana Insurance Fruitvale Branch (HBS# 9-692-015), (2) Six Sigma Quality at Flyrock Tires (HBS# KEL 028). This packet is available for purchase from www.study.net. You can search for individual cases or the entire course packet.
Other Materials:
1. All lecture slides, which are solely developed by the instructor for this course, will be posted on our course website blackboard.xu.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.

COURSE REQUIREMENTS

Attendance: All students are normally expected to attend each class. Please bring your own hardcopy of course documents (normally including PPT slides, teaching notes, examples, practice problems, cases) and a scientific calculator to every class. If you have an urgent need to miss one class, you are still responsible for the materials covered and expected to complete required work. In this case please contact me in advance if possible. (Special note on laptop: Please do not use your laptop in class unless requested. Using tablets such as iPad is OK.)

Participation: To foster a productive learning environment, it is important that everyone comes to class prepared and willing to contribute to discussion (Complete all pre-class assignments for each session contained 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. Your participation grade will be based on factors such as the quantity and quality of speeches, group work effort, after-class communications, anything I hear from you, etc.

Quizzes: At the end of most classes you will need to take a closed-book quiz covering materials discussed in the previous class. You will have approximately 5 quizzes in each of the half semesters (Only 4/5 best quizzes will be chosen for determining your final grade). The questions will be mostly from the PPT slides we lectured in the previous class.

Homework: There will be two homework assignments in this semester which mainly include 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 exams. 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 hard copy per student, can be printed or hand written, make sure I can read. Do not submit via emails). Pass or Failure grade will be used. 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.

Teamwork: I prefer group to individual work on case assignments as I have found that groups develop significantly better solutions (with better grades), and that you learn from one another in group interactions. To maximize learning efficiency, everyone is strongly encouraged to work in a study group of no more than 3 students. During some class sessions, 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. Peer evaluation forms are expected to be returned to me at the end of the semester and the result will be counted toward each individual student’s group-based work.
Case Reports: There will be two case reports due (Each requires about 3 pages in length, with single space and font size #11) in this semester. Both will be counted toward your final grade. I believe that the process of composing the paper is a valuable part of your learning process. Teamwork is also encouraged, therefore, I encourage you to develop and submit case reports in groups (one hardcopy submission per group). Late report is normally not allowed unless you negotiate with the instructor at least one day in advance. Case report usually includes three 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.

Exams: There will be two exams in this semester. The exams would cover concepts and analytical techniques presented in lectures (The final exam is not cumulative). Students are responsible for all materials covered in classes (including any session they did not attend). 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 exams. 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 day time.

GRADING SCALE

<table>
<thead>
<tr>
<th>Grade Percentages</th>
<th>Note (Excellent: E; Good: G; Fair: F; Bad: B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Participation</td>
<td>10% E: 10%; G: 8.5%; F: 7%; B: 6%</td>
</tr>
<tr>
<td>2. Quizzes</td>
<td>10% Each selected quiz is worth 1.25%*quiz score</td>
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<tr>
<td>3. Homework</td>
<td>7% Each assignment: Pass is 3.5%, Failure is 0%</td>
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<tr>
<td>4. Case Reports</td>
<td>18% Each case report is worth 9%* report score</td>
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<td>5. Midterm</td>
<td>25%</td>
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<tr>
<td>6. Final Exam</td>
<td>30%</td>
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<tr>
<td>Total</td>
<td>100%</td>
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Grading Scale (tentative)
A = 89 – 92%  A=92–100%
B (including +/−) = 79 – 89%
C (including +/−) = 70 – 79%
D = 60 – 69%
F = below 60%

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

COURSE CALENDAR

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topics</th>
<th>Due Dates</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>01/09/2012</td>
<td>Syllabus Introduction to Operations</td>
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</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Notes</td>
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<tr>
<td>01/16/2012</td>
<td>MLK Holiday, no class</td>
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<tr>
<td>01/23/2012</td>
<td>Operations Strategy</td>
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<td>01/30/2012</td>
<td>Process Capacity Analysis</td>
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<td>02/06/2012</td>
<td>Process Flow Time Analysis</td>
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<tr>
<td>02/13/2012</td>
<td>Process Strategy &amp; Case Discussion</td>
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<tr>
<td>02/20/2012</td>
<td>Project Management</td>
<td>*HW#1 due *Manzana case due</td>
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<tr>
<td>02/27/2012</td>
<td>Decision Analysis</td>
<td>*Midterm Review</td>
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<tr>
<td>03/05/2012</td>
<td>Spring Break</td>
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<tr>
<td>03/12/2012</td>
<td>Midterm Exam</td>
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<tr>
<td>03/19/2012</td>
<td>Quality Analysis</td>
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<td>03/26/2012</td>
<td>Statistical Quality Control</td>
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<tr>
<td>04/02/2012</td>
<td>Six Sigma Strategy &amp; Case Discussion</td>
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<tr>
<td>04/09/2012</td>
<td>Inventory Analysis</td>
<td>*Six sigma case due</td>
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<tr>
<td>04/16/2012</td>
<td>Supply Strategies</td>
<td></td>
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<tr>
<td>04/23/2012</td>
<td>Supply Chain Management</td>
<td>*HW#2 due</td>
<td></td>
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<tr>
<td>04/30/2012</td>
<td>Final Exam</td>
<td>*Peer review due</td>
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TENTATIVE TEACHING TOPICS

**Topic 1: Introduction to Operations**
In this class, we will discuss our course syllabus and introduce operations management as a business field. We will define process view and value chain concepts, business model and operations key decisions, and performance measurements in both goods- and service-producing firms. The road map of the course will also be discussed.

Pre-class reading assignment is listed as follows (please remember to prepare any questions):
1. Course syllabus
2. PPT slides: Introduction
3. HBR article: Reinventing your business model, 12/2008
**Topic 4: Operations Strategy**
The goal of this class is to provide students with concepts and a strategic framework to analyze business models of various organizations. We will describe the role of operations strategy and demonstrate how operational decisions can be made based on marketing research and competitive analysis. This is followed by case discussions on business models of grocery retailing operations.

The pre-class reading assignments are listed as follows:
1. Related text chapters (Read at least one whole chapter of operations strategy text)
2. PowerPoint slides: Operations strategy
3. Xavier teaching case: “Grocery store operations strategies” prepared by L. Wu
4. HBR article: Michael Porter, What is strategy? 11-12/1996
5. HBS article: Linking strategy to operations, 08/2009

**Topic 3: Process Capacity Analysis**
The primary goal of this class is to introduce the basic concepts and analytical tools for process analysis. We will start with process mapping tools and then focus on bottleneck analysis and efficiency analysis (such as utilization). After the class, students are expected to understand the basic elements for analyzing and improving capacity and utilization of various multi-stage business processes.

Pre-class reading assignments:
1. PowerPoint slides: Process Analysis
3. Teaching note about Business Process Management
4. HBR article: Competing on analytics, 01/2006
5. (Further reading) HBR article: When a process is art, not science? 03/2009

After-class assignment (Due date indicated on course calendar):
1. Process analysis homework (HW#1 problems 1, 2, 3)

**Topic 4: Process Flow Time Analysis**
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 units processes will be covered.

Pre-class reading assignments:
1. Read PowerPoint slides for flow time analysis
2. Flow time teaching examples
3. (Further reading) Little’s law teaching note, 2008, Springer Science

After-class assignment (Due date indicated on course calendar):
1. Process analysis HW#1 problems 4 and 5
2. Case report for Manzana Insurance Case (HBS# 9-692-015)
   Please focus on the following items: (a) Specify key performance indicators and assess the overall performance of the business; (b) Compute the theoretical turnaround time (TAT) as the foundation of your performance evaluation, note that TAT computation in Exhibit 3 is wrong; You need to use Little’s Law for computing TAT (flow time); You are encouraged to compute the flow rate (or capacity) based on the weighted average processing times (given in Exhibit 4) and the process flow chart given in Exhibit 2; (c) Find their actual TAT and explain why the branch was underperforming (Consider operations process and marketing
policy, these are the main things you need to present in the report); (d) Propose your recommendations to fix the problem(s). A more detailed version of case hint information will be posted online.

**Topic 5: Process Strategy & Case Discussion**

We consider strategic decisions in managing processes for creating long-term competitiveness, including process structure, customer involvement, resource flexibility and capital intensity. This is followed by case discussions on a Make-To-Order cookie manufacturing and retailing process.

Pre-class reading assignments:
1. PowerPoint slides: Process strategy
2. Harvard Business School case: Kristen’s Cookie (A) (9-686-093) (Note: This case will be discussed in class, appropriate preparation is expected)
3. Teaching note: Process strategy real world examples

**Topic 6: Project Management**

In this class 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.

Pre-class reading assignments:
1. PowerPoint slides: Project Management

After-class assignment:
1. Project homework problem 1 (not part of HW#1, please do not turn in)

**Topic 7: Decision Analysis (Not Covered on Midterm)**

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.

Pre-class reading assignment:
1. PowerPoint slides
2. Teaching note: Spreadsheet modeling basics, 01/2010

After-class homework (due date indicated on course calendar):
1. LP homework problem 1 (HW#2 problem 1)

**Topic 8: Quality Analysis**

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 and six sigma metric. After the class you will understand how to assess and interpret the process quality for a given process.

Pre-class reading assignment:
1. PowerPoint slides
2. HBR article: Competing on the eight dimensions of quality, 11-12/1987
3. SMR article: How do customers judge quality in an e-tailer? Fall 2006
After-class assignment (due date indicated on course calendar):
1. Do quality analysis homework problems (HW#2 problems 2, 3, 4)

**Topic 9: Statistical Process Control**
In this class, we will explore the root causes for quality variations and introduce the statistical process control tools—the same techniques used at IBM, GE and Motorola to achieve high quality standards. Please remember to bring in one quarter coin (for each group) to play an in-class game.

Pre-class reading assignments:
1. PowerPoint slides
2. Bring in one quarter coin for playing exercise A

After-class assignment (due date indicated on course calendar)
1. Case report for case Six sigma quality at Flyrock tires (Case questions are attached at the end of the case) (case report due in two weeks)
2. Do quality homework problems (HW#2 problems 5, 6)

**Topic 10: Six Sigma and Case Discussion Session**
We will discuss the famous six sigma strategy in the class, specifically, we explain the relevant 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 strategy is totally data-driven for solving real operational problems. The lecture is followed by a case discussion on sigma quality management.

Pre-class assignments:
1. Read PowerPoint slides
2. Teaching note: Real world examples on six sigma (from Bloomberg Business Week), 2009
3. SMR article: Process management and the future of six sigma, winter 2002

**Topic 11: Inventory Analysis**
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.

Pre-class assignment:
1. PowerPoint slides
2. HBR article: Control inventory in lean retailing, 11-12/2000
3. (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 inventory homework problems (HW#2 problems 7, 8)

**Topic 12: Supply Strategies**
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. Then we explain the impacts (both positive and negative) of quick response strategy as an effort to shrink the mismatch cost.
Pre-class assignment:
1. Read PowerPoint slides
2. Teaching note: The newsvendor problem by Dr. Evan Porteus of Stanford University, 2008
3. (Further reading) IJLRA article: The optimal quantity of quick response manufacturing for an onshore and offshore sourcing model, 2005.

After-class assignment (due date indicated on course calendar)
1. Do quick response problem (HW #2 problem 11 parts 1-4)

**Topic 13: Supply Chain Analysis**
In this class we introduce 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. A brief final review will also be provided in this class.

Pre-class assignment:
1. Read PowerPoint slides
2. (Further reading) IJPE article: Supply chain coordination: Perspectives, empirical studies and research directions. May 2008.

**SUPPLEMENTAL BOOKS AND JOURNALS**
(3) *Bloomberg BusinessWeek* and the other journals you have free access through Xavier University library: *Harvard Business Review, Supply Chain Management Review*, and *Interface*.

**POLICY**
Our general policy for this class is that when preparing cases and assignments students should not benefit from anyone who has already participated in a faculty-lead discussion of the same material, at Xavier or at another school.

**MISSION OF THE WILLIAMS COLLEGE OF BUSINESS**
We educate students of business, enabling them to improve organizations and society, consistent with the Jesuit tradition.

(The End)