



OPM 6090 (A02) (3.0 CH)
PRODUCTION AND OPERATIONS MANAGEMENT
Winter 2009

Instructor

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Introduction

Operations management concerns the management of the direct resources and value-added activities that transform inputs (e.g., material, labour, capital, energy, and skills) into outputs (goods and services). Operations managers make decisions, both strategic and tactical, in a number of contexts (e.g., capacity, facilities, technology, sourcing, the workforce, quality, planning and control, and organization).

Course Objective

The objective of this course is to introduce you to the fundamental concepts of operations management from a general management perspective. Although you may not be involved in the direct management of operations in current or future employment, it will be useful to understand the problems and complexity faced by operations managers.

At the conclusion of this course, you should appreciate that operations management is not simply a set of well-understood "nuts-and-bolts" techniques. Rather, it is primarily a management discipline that is strategically important for survival in today's more competitive environment.

Course Material (all available at the U of M Bookstore)

- Meredith, Jack R. and Shafer, Scott M. 2007. *Operations Management for MBAs*, 3rd ed. New York: John Wiley & Sons, Inc.
- Package of cases and readings
- Access code for the Littlefield Technologies game

Methods of Instruction

The primary method of instruction will be the analysis and discussion of case studies. This requires active student participation. Each case presents an operations management situation in which a decision must be made in light of a number of tradeoffs and alternatives. Class time will be devoted to discussing the situation, the managerial and technical implications of various options, and action to be taken to implement preferred options. There is no right answer to a case but there are definitely approaches that address the issues and recognize the tradeoffs involved. Other activities will include discussions, exercises, a web-based game and associated debriefing session, an in-class game, and a site visit.

Performance Evaluation

| | |
|--------------------------------|-----|
| Class Participation | 30% |
| Mini-Tests | 15% |
| Game: Littlefield Technologies | 15% |
| Site Visit Assessment | 10% |
| Final Examination | 30% |

Class Participation. Participation is very important. I expect you to actively participate in advancing the learning of the class. Participation means making a useful contribution in a fair number of sessions. Generally, you may choose your moments. However, on a given day, I may call on you for your contribution or I may include your name in a list of people from whom I expect to hear.

In general, a useful contribution helps push the understanding of the class forward. Examples include, but are not limited to, being involved in a discussion of assigned material, arguing your point of view during a case discussion, asking a relevant question, suggesting an alternate viewpoint, redirecting our attention to something else in need of discussion, or being actively involved in in-class activities. You do not have to be a top participant in each session, nor do you have to have the "right answer."

Although I expect you to attend every session, attendance is not the same as participation. On those very rare occasions when you are unprepared for a session and do not wish to be included in the discussion, please let me know in advance (voicemail or e-mail), but please attend. As well, please let me know if you plan to be absent. You do not have to explain; I will simply expect more from you later.

I judge participation for each session on a scale of 0 to 4, where 4 indicates an extensive contribution and 0 indicates no contribution. A regular contribution, such as building on points made by others, is worth 1. At the end of the course, I will determine overall participation by assigning grades to the best and worst participators and scaling others accordingly. **Note:** This makes it possible for everyone to do well in participation.

Mini-Tests. These are short, multiple-choice tests. Each one will cover the most of the reading assignments for a number of sessions but not the content of any cases. See the memo, handed out

separately, for the coverage of each mini-test. Each test will be administered twice, first individually and then to your group. This serves two purposes. First, it encourages you to be prepared to do your fair share in upcoming group activities. Second, it should increase your group's understanding of the assigned material.

Game: Littlefield Technologies. This is a web-based game played in small teams. The game will be available in suspended mode for some time before it begins. Your group should use this time to become familiar with the game, determine a strategy, and prepare to play. The game takes place outside of class time – over a number of weeks. You will need to be in regular contact with your group members during the game, with the methods and timing decided by your group.

Site Visit Assessment. You will be visiting a local manufacturing plant. As part of this visit, your group will do an exercise in quickly sizing up the plant's operations. Instructions for this exercise and for the group document to be submitted will be provided in class.

Final Examination. The examination will be designed to test your knowledge of the assigned readings, cases, and text material. The exam will consist of reasonably open-questions (e.g., case scenario, long answer, short answer), designed to allow you to demonstrate what you know, rather than feeding back memorized facts. I will not be directly testing details of the cases we discuss in class, but I will assume you have a basic understanding of each case. As we approach exam time, I will provide a handout with more detail about the nature of the exam.

Schedule – Winter 2009 – Section A02

| | | |
|--------|-------------|--|
| Jan 08 | session 01a | Introduction to Course / What is Operations Management? |
| | session 01b | Discussion: How to Prepare a Case |
| Jan 15 | session 02a | Discussion: Synchronous Operations |
| | session 02b | Mini-Test One; Cases/Exercise: (1) Process Fundamentals and (2) Capacity Analysis: Sample Problems |
| Jan 22 | session 03a | Case: Quinte MRI |
| | session 03b | Discussion: Toyota Production System / Lean Manufacturing |
| Jan 29 | session 04a | Case: Deutsche Allgemeinversicherung |
| | session 04b | Mini-Test Two; Exercise – Quality |
| Feb 05 | session 05 | Site Visit (date is tentative) |
| Feb 12 | session 06a | Case: H.M.S. Pinafore |
| | session 06b | Mini-Test Three; Exercise – Project Management |
| Feb 26 | session 07 | Case: The Beer Game |
| Mar 05 | session 08a | Guest Speaker |
| | session 08b | Mini-Test Four; Case: Barilla SpA (A) |
| Mar 12 | session 09a | Case: The ITC eChoupal Initiative |
| | session 09b | Discussion: Operations Strategy |
| Mar 19 | session 10a | Case: IDEO Product Development |
| | session 10b | Littlefield Technologies Debriefing; Course Evaluation |

Mini-test coverage: Please see the separate memo for the content of each mini-test.

Preparing for our First Session

Please prepare for our initial session in accordance with the instructions, later in this syllabus, under the headings "What is Operations Management?" and "How to Prepare a Case." In particular, please study Chapters 1 and 3 of the text.

Session Assignments (Note: listed in alphabetical order)

For each of the case/discussion sessions, you have been assigned some "Questions for Consideration." These are for guidance only, to help you focus on certain aspects of the material. For each case, you should be prepared, at a minimum, to address each question in class. However, each case discussion will normally follow a sequence of:

- Issues
- Criteria
- Discussion / Analysis
- Plan of Action

Overall, putting yourself in the position of the decision maker, the real issue is what should be done and why. That is, as the decision maker, how do you plan to resolve the situation?

Note: I have attempted to match the content of readings and cases/discussions to some degree. However, there is no implied direct match; readings may contain concepts that are not in particular cases/discussions and vice versa.

Barilla SpA (A)

Additional Reading: Meredith and Shafer, Chapter 7.

Questions for Consideration:

1. Diagnose the underlying causes of the difficulties that the JITD program was created to solve. What are the benefits and drawbacks of this program?
2. What conflicts or barriers internal to Barilla does the JITD program create? What causes these conflicts? As Giorgio Maggiali, how would you deal with these?
3. As one of Barilla's customers, what would your response to JITD be? Why?
4. In the environment in which Barilla operated in 1990, do you believe JITD (or a similar kind of program) would be feasible? effective? If so, which customers would you target next? How would you convince them that the JITD program was worth trying? If not, what alternatives would you suggest to combat some of the difficulties that Barilla's operating system faces?

The Beer Game

Additional Reading: none

Instructions:

1. Study the case thoroughly, making certain you understand how the game is played and how to complete the six phases of activities for each simulated week.
2. Arrive on time and check your assigned table and position.
3. Be prepared to play your assigned role as one of four channel participants (i.e., retailer, wholesaler, distributor, or factory).

Capacity Analysis: Sample Problems

Additional Reading: none

Instructions:

1. Study the example problems in the case. Ensure that you understand how the various calculations are made and why they make sense.
2. Be prepared to explain the concepts to the class or apply the concepts to similar material in class.

Deutsche Allgemeinversicherung

Additional Reading: Meredith and Shafer, Chapter 4.

Questions for Consideration:

1. Why is DAV using Statistical Process Control (SPC)? What are the primary challenges in applying SPC to a service industry compared with manufacturing?
2. If you were to explain (in about thirty minutes) the concept of a p-chart to, say, a group of bank tellers who have little background in SPC, how would you do it?
3. How large should each sample be for the experiment described by Schoss and Kluck?
4. The first twelve weeks of the data in Exhibit 4 represent the diagnostic period for the Policy Extension Group. What are the 3-sigma control limits for the process? In which of the subsequent weeks is the process out of control (if any)?
5. As Annette Kluck, what are your specific implementation plans? How do you intend to begin improving the performance of the operation?

H.M.S. Pinafore

Additional Reading: Meredith and Shafer, Chapter 11.

Questions for Consideration:

1. As Francis Vanden Hoven, construct a network plan for the H.M.S. Pinafore project.
2. What does your network tell you?
3. How would you answer the questions raised in the case?
4. What, if anything, will you do to ensure that the project is completed on time at minimum cost (and opening night is a success)?

How to Prepare a Case

Reading: While not a course requirement, you may wish to read at least the first few chapters of Ronstandt, 1980, *The Art of Case Analysis: A Guide to the Diagnosis of Business Situations*, Dover, MA: Lord Publishing. Copies are available in the management library, some on reserve.

Questions for Consideration:

1. When confronted with a new case and limited time, how should you effectively prepare for a case discussion?
2. What would you do first, second, etc.?
3. What would you focus upon?
4. How would you determine that you were adequately prepared?

IDEO Product Development

Additional Reading: Thomke, *Enlightened Experimentation: The New Imperative for Innovation*.

Questions for Consideration:

1. How would you characterize IDEO's process, organization, culture, and management?
2. As Dennis Boyle, what advice would you give to David Kelley and why? That is, should IDEO accept the Visor project as is (on a dramatically reduced schedule)? Should they try to persuade Handspring's management to change its aggressive launch schedule? Or, should they simply decline the project? Please consider both the IDEO and Handspring perspectives.

The ITC eChoupal Initiative

Additional Reading: Hayes et al., *Information Technology and Operations*.

Questions for Consideration:

1. What was ITC's motivation for creating the eChoupal?
2. What were the old and new physical flows and information flows in the channel?
3. What principles did ITC employ as it built the newly-fashioned supply chain?
4. What barriers did ITC face in embarking on this project?
5. As Mr. Sivakumar, how do you plan to proceed to develop this platform for the future?

Littlefield Technologies Debriefing

Reading: Review a copy of your group's report.

Instructions

1. Prepare for the debriefing session in accordance with instructions in the Littlefield Technologies Assignment (handed out separately).

Operations Strategy

Reading: Meredith and Shafer, Chapter 2 and Hayes et al., *Operations Strategy: Origins and New Directions*.

Questions for Consideration:

1. What is operations strategy?
2. How can a firm create a competitive advantage through operations?
3. What is the Sand Cone Model? What message does it attempt to convey?
4. What are performance frontiers and improvement trajectories? How do these relate to the notion of operational tradeoffs?
5. What roles can the operations function play in relation to corporate strategy? What role should it play?
6. What do Hayes et al. say about the notion of fit? of focus? of the "one best way" to organize and manage operations?
7. How may firms attack (and defend) through operations? What lessons are there from some of the examples in the readings?

Process Fundamentals

Additional Reading: none

Instructions:

1. Study the case material thoroughly and make certain that you understand the concepts, examples, and terminology.
2. Be prepared to explain the concepts to the class or apply the concepts to similar material in class.

Quinte MRI

Additional Reading: Meredith and Shafer, Chapter 5, pp. 214-234.

Questions for Consideration:

1. What is your analysis of the cause of the current backlog?
2. Where is the bottleneck in the process?
3. As Dave Wright and/or Kevin Saskiw, what do you recommend to resolve the capacity issues?
4. What additional recommendations do you have to improve the performance of the clinic?
5. How should your recommendations be implemented?

Site Visit

Reading: Goodson, *Read a Plant – Fast*.

Instructions: In accordance with the class handout:

1. Prepare to observe and evaluate the operations at the plant in line with the various categories and related questionnaire items.
2. After the visit, hand in your group reports by the deadline - using the format requested.

Synchronous Operations

Reading: Chapters 13 to 15 of Goldratt and Cox, *The Goal: A Process of Ongoing Improvement*

Questions for Consideration:

1. What are the analogies between the hike and a typical plant? For example, the troop hiking along the trail represents raw material being processed. There are many others; what are they?
2. While on the hike, what does Alex realize about statistical fluctuations and dependent events? How does this help him understand his plant?
3. While on the hike, what does Alex realize about a balanced plant? How does this help him understand his plant?
4. What other lessons did Alex learn while on the hike? How might these help him to manage?
5. Which performance measures are appropriate at the operational level? Why?

Note: In the **Goldratt** material, throughput refers to throughput rate (i.e., capacity or output rate), not throughput time (i.e., manufacturing lead time).

Toyota Production System / Lean Manufacturing

Reading: Jacobs et al., Chapter 12 (Lean Manufacturing) and Meredith and Shafer, Chapter 10.

Questions for Consideration:

1. Prepare for a discussion about the Toyota Production System (sometimes called just-in-time production, lean manufacturing, etc).
2. Which aspects of this system are "Japanese" and which could be applied in other industrial settings? That is, what is so Japanese about Japanese approaches to manufacturing?
3. What explains the success the Japanese have had with their approaches to production?
4. How is the notion of waste used in the Toyota Production System?

What Is Operations Management?

Reading: Meredith and Shafer, Chapters 1 and 3.

Questions for Consideration:

1. What is operations management? How does it differ from other functional areas such as marketing or finance?
2. How does operations management apply in the service sector?
3. What types of activities typically comprise operations management? What are typical subject areas?
4. What are the various types of transformation systems? How do these relate to output variety and output volume? How do they relate to the product and process life cycle?
5. Why bother studying operations management?



ACADEMIC INTEGRITY

I.H. Asper School of Business—Faculty of Management, The University of Manitoba

It is critical to the reputation of the I. H. Asper School of Business and of our degrees that everyone associated with our faculty behaves with the highest academic integrity. As the faculty that helps create business and government leaders, we have a special obligation to ensure that our ethical standards are beyond reproach. Any dishonesty in our academic transactions violates this trust. The University of Manitoba Graduate Calendar addresses the issue of academic dishonesty under the heading “Plagiarism and Cheating.” Specifically, acts of academic dishonesty include, but are not limited to:

- using the exact words of a published or unpublished author without quotation marks and without referencing the source of these words
- duplicating a table, graph or diagram, in whole or in part, without referencing the source
- paraphrasing the conceptual framework, research design, interpretation, or any other ideas of another person, whether written or verbal (e.g., personal communications, ideas from a verbal presentation) without referencing the source
- copying the answers of another student in any test, examination, or take-home assignment
- providing answers to another student in any test, examination, or take-home assignment
- taking any unauthorized materials into an examination or term test (crib notes)
- impersonating another student or allowing another person to impersonate oneself for the purpose of submitting academic work or writing any test or examination
- stealing or mutilating library materials
- accessing tests prior to the time and date of the sitting
- changing name or answer(s) on a test after that test has been graded and returned
- submitting the same paper or portions thereof for more than one assignment, without discussions with the instructors involved.

Many courses in the I. H. Asper School of Business require group projects. Students should be aware that group projects are subject to the same rules regarding academic dishonesty. Because of the unique nature of group projects, all group members should exercise special care to insure that the group project does not violate the policy on Academic Integrity. Should a violation occur, group members are jointly accountable unless the violation can be attributed to a specific individual(s).

Some courses, while not requiring group projects, encourage students to work together in groups (or at least do not prohibit it) before submitting individual assignments. Students are encouraged to discuss this issue as it related to academic integrity with their instructor to avoid violating this policy.

In the I. H. Asper School of Business, all suspected cases of academic dishonesty are passed to the Dean’s office in order to ensure consistency of treatment.



MEDICAL ABSENTEEISM FORM

L.H. Asper School of Business—Faculty of Management, The University of Manitoba

STUDENT IDENTIFICATION: (PLEASE PRINT CLEARLY)

| | | | |
|---------------------|-----------------|----------------|--------------------------------------|
| _____ | _____ | _____ | _____ |
| Last Name | First Name | Middle Initial | U of M Student Identification Number |
| _____ | _____ | | |
| Course # | Instructor Name | | |
| _____ | _____ | | |
| Student's Signature | Date | | |

TO BE COMPLETED BY THE ATTENDING PHYSICIAN: (after the above section is completed) (PLEASE PRINT CLEARLY)

| | | |
|-----------------------|------------------------|----------------|
| _____ | _____ | _____ |
| Physician's Last Name | Physician's First Name | Middle Initial |
| _____ | _____ | _____ |
| Street Address | City, Province | Postal Code |
| _____ | _____ | |
| Telephone Number | Fax Number | |

To the attention of the physician: Your evaluation of the student's condition is being used for the purpose of determining whether or not the student has a valid reason to miss an important exam or assignment. Your professional evaluation is necessary to ensure that only valid cases are excused.

I certify that the nature of the student's condition is severe enough to prevent the student from taking an exam or completing an assignment. If requested, my associates or I will verify for the above named instructor/administrator that this information is accurate.

The student's condition will likely span the following dates:

| | | |
|-----------------------|-------|---------------------|
| _____ | until | _____ |
| (Indicate start date) | | (Indicate end date) |
| _____ | | _____ |
| Physician's Signature | | Date |

NOTES TO PHYSICIAN:

- Please make a note in the student/patient's file indicating that the student has given the above named instructor/administrator permission to verify with you, your staff, or your colleagues, that the information contained on this form is correct. Thank you for your professional evaluation of this student's condition.
- **PLEASE ATTACH THIS FORM TO YOUR REGULAR OFFICE STATIONERY THAT INDICATES THE STUDENT VISITED YOUR OFFICE.**

NOTES TO STUDENT:

- The use of this form is at the option of the student. However, in order to obtain an excused absence for an assignment or exam the student must obtain a doctor's certification that the student's condition is severe enough to prevent the student from taking the exam or completing the assignment.
- It is **NOT SUFFICIENT** to provide a note that only indicates the student visited the doctor's office.



Ron McLachlin, Ph.D. is an Associate Professor of Operations Management at the University of Manitoba, Asper School of Business. He earned his B.Sc.(Eng) and MBA degrees at the University of Alberta and his Ph.D. in Operations Management at the University of Western Ontario.

Dr. McLachlin's research interests are in operations strategy and supply chain strategy, with a recent focus on supply chain management for the not-for-profit sector in interrupted environments (e.g., humanitarian relief supply chains), with Paul Larson. He is also researching the transport of perishable food products between Canada and Mexico, with Barry Prentice. Other areas of research include process innovation (e.g., just-in-time / lean manufacturing, synchronous operations), supply chain integration, and supply chain postponement strategies.

He has published in journals such as the Journal of Operations Management and the International Journal of Manufacturing Technology and Management and has presented papers and participated in panel sessions at conferences such as those of the Production and Operations Management Society, the Administrative Sciences Association of Canada, the International Humanitarian Logistics Symposium, and the Decision Sciences Institute.

He has taught operations management, the management of quality, service operations, production seminars, operations strategy, topics in advanced production and operations management, and advanced supply chain management.