HARVARD UNIVERSITY
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

OPERATIONS MANAGEMENT

MLD-601 SYLLABUS
Fall 2017

T/Th 1:15—2:30
Room: L-230

Recitation:
Fri 10:15-11:30 1BR 401
Fri 11:45-1:00 1BR 401

Instructor:
Mark Fagan, L-102, 617-947-2586, mark_fagan@hks.harvard.edu

Office Hours:
Tuesdays and Thursdays 2:30 to 5:30
or by appointment

Faculty Assistant: Veronica Chapman
Email: veronica_chapman@hks.harvard.edu

Version: 8/21/2017

Course Objectives and Overview

Have you noticed…the provision of inefficient and/or poor quality public services?

Have you thought…there must be a better way.

Then this is the course for you!
This course is an introduction to Operations Management with a focus on the public sector. It teaches how managers create public value by delivering services effectively and efficiently. We will examine value considering public welfare and safety, social equity, and resource utilization across a range of services from healthcare to education to transportation. Our examination of effectiveness is based on the ‘rights’ – right service, right quality, right time and place. Efficiency centers on lowest total cost – direct provider costs, direct recipient costs, indirect societal costs and optimal use of resources.

The course begins with a look at value creation in the public sector. Next, quality service delivery will be explored followed by techniques for efficient delivery of services. With this foundation, performance measurement and management will be examined. The course continues with a look at the role of technology and operations management in the developing world. At the end of the course students will be able to:

1. See opportunities to improve operations.
2. Diagnose the problems and barriers to creating value.
3. Design effective and efficient solutions.
4. Apply concepts to solve client issues.

The course features experiential learning through a consulting project with a local government agency or non-profit organization. Students work in teams of 4-6 classmates to tackle a real operations management issue facing a client. Past clients have included the City of Boston, Boston Public Schools, Children’s Hospital, Massachusetts Department of Youth Services, Massachusetts Department of Revenue, and Rose Kennedy Greenway Conservancy. The projects begin the second week of classes and culminate in a presentation to the class and client as well as a formal report at the end of term.

The course will focus on the provision of services. As such it will be unlike traditional courses in Operations Management that focus on manufacturing products. Rather students will learn how organizations provide services and information to produce public value.

**Course Outline**

The course will be taught using a blend of cases, theoretical and practical readings, and interactive simulations exercises. The major topics covered in this course are:

- **Value Creation**
  We will begin the course by looking at how operations management creates public value.

- **Quality Service Delivery**
  This section covers key concepts for delivering quality services including TQM, moments of truth, process mapping, quality via reengineering, and quality via employee engagement.

- **Efficient Service Delivery**
  This section of the course shows you tools and techniques for greater efficiency in the delivery of services: organizing workflows, managing capacity/throughput/utilization/bottlenecks, optimizing queues, addressing demand peaks, applying lean concepts and delivering services through a supply chain.
• **Performance Measurement**
  How do you know you are improving operations? This section provides tools and management techniques for assessing effectiveness and efficiency.

• **Role of Technology**
  This section addresses the fundamental question all managers should ask when introducing a new technology into their organization: What value does the technology add? We examine this question through a number of cases, looking at the operational and strategic benefits of IT.

• **Operations Management in the Developing World**
  Operations managers in developing counties often face issues that push the basic concepts to the edge. As we wrap up the class we will explore how managers can navigate these challenges.

**Audience**
The course will serve both general managers and consultants who want an understanding of how to maintain, improve or change their organization’s operations, as well as managers with specific responsibility for day-to-day operations. There is no formal course prerequisite but previous exposure to management courses is recommended.

**Friday Recitation**
Recitation class is held on most Fridays at 10:15-11:30. The sessions are an opportunity for students to apply the classroom concepts and tools to real world problems. A few sessions are for special topics such as an overview of consulting prior to beginning the client projects. Recitation attendance is not mandatory but highly recommended.

**Student Assessment**

1-on-1 Reengineered Process -- 25%
Identify, analyze, and solve an operations management issue/problem you find interesting. Your work will be communicated during a 15 minute 1-on-1 meeting with the instructor. You are welcome to use visuals to help convey your story. Feedback and your grade will follow immediately after the discussion.

Analytical Exam -- 20%
You will analyze a short case study to determine the capacity, throughput and resulting quality of a service delivery process. You will then provide recommendations on how to improve the efficiency and effectiveness of the delivery process. This is an open book, take home exam. The exam may NOT be discussed with anyone. It will be handed out on a Friday October 20 at 2:00 PM and due no later than Monday October 23 at 6:00 PM. (It should take 4-7 hours to complete.)

Client Project – 40%
You will work in a team of 4 to 6 people on one of the client projects. The projects will involve real problems that government agencies and non-profit organizations need solved. Your task is to significantly progress the client’s issue. The final output consists of two deliverables. First is a work-in-progress presentation to the class and client which highlights the issue, your analysis and your preliminarily ideas for resolving the challenge. The presentations are during class, two
weeks before the end of term. Second is a final paper that details your work. (The client might also request a briefing memo or internal presentation that you will work out with them directly.) You will have bi-weekly status meetings with our CA or me to review progress.

Your grade may be adjusted up or down a ½ grade based on a 360-degree assessment of you by your team and the client’s assessment of your team’s performance.

Class Participation -- 15%
Class participation is essential to the course since much of what you learn will come through conversations with your colleagues. Your participation grade is based on in class comments/discussion. You will be “discussion catalyst” for one class during the semester. In this role you will receive a pre-class assignment and may be called upon to start, foster, and/or synthesize class discussion that day. You will sign up for the class you would like to be catalyst for on a first come basis.

Expectations of Professionalism

Note on Ethics: You are expected to abide by the University policies on academic honesty and integrity. Violations of these policies will not be tolerated and are subject to severe sanctions up to and including expulsion from the University.

Note on Attendance: Punctual attendance is also part of your overall grade. If you miss more than 3 classes, your final grade will be reduced by half a letter grade; a full grade if you are absent 5 or more times. You must provide a written response to the Discussion Questions for any missed classes. If you are late more than 3 times, your final grade will be reduced by half a letter grade.

Grading
I will assign grades according to the following HKS-recommended distribution:

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>A</td>
<td>10-15 percent</td>
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<td>A-</td>
<td>20-25 percent</td>
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<td>B+</td>
<td>30-40 percent</td>
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<tr>
<td>B</td>
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<td>B- or below</td>
<td>5-10 percent</td>
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Materials
- Course materials are available through the course page on Canvas.
- Pre-class videos: I will record some lectures for viewing prior to class. This will enable us to maximize time devoted to problem solving. These are posted on the course page.
- Slides used during class are provided in hard copy at the beginning of each class.
- The frameworks/concepts used are provided (hard copy and electronically in Canvas) in a toolkit format after each class.

Class Ground Rules
• **Start on time; end on time**
• If you can not be there…email me
• Prepare and participate
• I cold call
• Expect polite pushback; you may do the same
• No multitasking ergo **No Electronics**
• Do not understand? Ask. Frustrated? Tell me.
• I can not spel – no laughing
CLASS SCHEDULE (PRELIMINARY, SUBJECT TO CHANGE)

1. Thursday August 31, 2017

Value Creation Through Operations

**Required Preparation:**
- Pre-class Video 1a: Creating Public Value
- Pre-class Video 1b: Who/What Framework
- Pre-class Video 1c: TSA Case Context

**Supplementary Readings:**
- “Value of Improved Public Services: An Application of the Choice Experiment Method to Estimate the Value of Improved Wastewater Treatment Infrastructure in India, Birol and Das”, 2010, [http://www.mse.ac.in/pub/working%20paper%2051.pdf](http://www.mse.ac.in/pub/working%20paper%2051.pdf)

**Discussion Questions:**
1. What value does TSA’s airport screening operations create? What are the associated costs? Is this an attractive value proposition for the air traveler? The public?
2. How does the organization define and deliver quality service?
3. How efficiently does TSA screen passengers?
4. How does the agency utilize technology and human insight?
5. How does TSA measure its success?

Friday September 1, 2017 – Recitation #1: Calculating Public Value

*** Note: Special Time 4:15-5:30 ***

***Note: Bring laptops***

2. Tuesday September 5, 2017

Quality Operations

**Required Preparation:**
- Pre-class Video 2a: Total Quality Management -TQM
- Pre-class Video 2b: *The Ultimate Question*
- Pre-class Video 2c: Martin Redux (optional)
- **Bring to class three examples of “quality” organizations. What are the attributes that make them high quality?**
Supplementary Readings:

- “Summary: The Ultimate Question: Driving Good Profits and True Growth by Fred Reichheld,” Fagan, Mark.

Discussion Questions:

1. What is quality?
2. What characteristics describe quality service delivery?
3. Is quality free?
4. What are the requirements to create a quality culture?
5. How is quality measured when delivering public services? How does quality create value?

3. Thursday September 7, 2017

Process Mapping: Starting Point for Operations

Required Preparation:

- “Process Fundamentals”, HBS, 9-696-023, 2009

Supplementary Readings:

- Process mapping software examples: https://www.smartdraw.com/business-process-mapping/process-mapping-software.htm?id=49244&gclid=CjwKEAjwiMe8BRD0ts3Vtv-ohWgSJAAZurk1Iosr9mUuV-8ZeDAqJHd15koTUQOcyyxJ_ZW0ApYcOhoCmrLw_wCB
  https://ardq.com/business-process-mapping-software/?gclid=CjwKEAjwiMe8BRD0ts3Vtv-ohWgSJAAZurk1uDYAeMR97Txa33J_ACtV0pdqPvijPd2yaInt95rBM2hoC11Lw_wCB

Discussion Questions:

1. What is the value of mapping processes?
2. What is the difficulty of mapping processes?
3. Beyond the process steps what additional information can be incorporated into the map?
4. What does the TSA passenger screening process map look like? From the passengers perspective? From TSA’s perspective?

Friday September 8, 2017 – Recitation #2: “Consulting 101”, “Teams 102”

Monday September 11, 2017 Movie Night: The Big Short

4. Tuesday September 12, 2017

Mapping with Interrelationships and Feedback – System Dynamics

Required Preparation:

- Pre-class Video 4a: System Dynamics Basics
• Pre-class Video 4b: System Dynamics Application to Slippery Rail (optional)
• Pre-class Video 4c: US Housing Crisis

Supplementary Readings:

Discussion Questions:
1. What is the power of causal loop mapping?
2. What is an example of a virtuous cycle? Vicious cycle?
3. How could system dynamics modeling be used to understand the 2007/8 Great Recession?

5. Thursday September 14, 2017

Moments of Truth and Root Cause of Failure

Required Preparation:
• NASA’s Moments of Truth, Fagan, 2011
• Pre-class Video 5: Root Cause Analysis Techniques (optional)

Supplementary Readings:

Discussion Questions:
1. What were the United and NASA’s moments of truth?
2. How well did the organization perform? (Consider the Zone of Tolerance)
3. What were the proximate and root causes of the broken guitar and the Columbia disaster? (Use the 4Ps framework)
4. What are the 5 whys and answers that explain the why the Challenger disaster did not prevent the Columbia accident?
5. Why is culture so hard to change? How can it be done?

Friday September 15, 2017 – Recitation #3: Root Cause Analysis and Pot Holes
6. Tuesday September 19, 2017

Quality via Process Reengineering

Required Preparation:
- Preventing Another Madoff: Reengineering the SEC’s Investigation Process, Fagan, 2010
- “Leading Change: Why Transformations Efforts Fail”, Kotter, John, Best of HBR, reprint Ro701J.
- Pre-class Video 6: Reengineering in the Public Sector

Supplementary Readings:

Discussion Questions:
1. What was the SEC’s process for investigating allegations of misconduct?
2. What gaps in the process enabled Madoff to escape discovery?
3. What was the role of “culture” and human psychology in the process failure?
4. How would you re-engineer the SEC process to prevent another Madoff?
5. Do you agree with Thong et al that public sector reengineering is more challenging than in the private sector? Why?
6. Why was the Singapore Housing reengineering effort so successful?
7. How do you make change stick?

7. Thursday September 21, 2017

Quality via Employee Engagement

Required Preparation:

Supplementary Readings:

Discussion Questions:
1. What are the core tenets of Toyota’s quality management? How are they operationalized?
2. Why was NUMMI successful in implementing the Toyota system at a former GM plant? What barriers were overcome? Which were not?
3. What was the role of employee engagement? How was it built?
4. Why did Toyota’s quality culture stumble in 2010?
5. What actions would you take to correct and then prevent quality failures?
6. What is the role of continuous improvement (kaizen) in process improvement?

Friday September 22, 2017 – Recitation #4: Change Management Tutorial

8. Tuesday September 26, 2017

Organizing Work Flows
Required Preparation:
• “Reading Rehabilitation Hospital: Implementing Patient-Focused Care”, HBS, 9-898-172, Rev. 2000.
• Pre-class Video 8: Work Flow Taxonomy

Supplementary Readings:

Discussion Questions:
1. What are the alternative ways to organize workflows?
2. When are each appropriate, especially in the public service context?
3. What do the performance measures at Reading indicate about efficiency and quality of current patient services?
4. What are the disadvantages of the service line approach?
5. How would you change the Reading model to meet the CEO’s objective of “finding the balance between mission and real world business practice…”?
6. How effectively did the CEO adopt the Deming Cycle?

9. Thursday September 28, 2017

Queuing
Required Preparation:
• Out Foxing the Flu, Fagan and Perez, HKS Case # 2046
• Pre-class Video 9: An Introduction to Queuing Theory

Supplementary Readings:
• “What You Hate Most About Waiting in Line”, Seth Stevenson, Slate.com, 06/2012

Discussion Questions:
1. What are the challenges of managing lines?
2. Why is conventional optimization not optimal?
3. What are the core drivers of queuing application?
4. How can Logan officials reduce lines? (Bring a spreadsheet answering the case questions.)

Friday September 29, 2017 – Recitation #5: Queuing Theory Practice

Reengineered Process Assignment 1-on-1 Meetings October 2-7, 2017

10. Tuesday October 3, 2017

Waiting Times and Work Processing Strategies
Required Preparation:

Discussion Questions:
1. What determines the speed of a process?
2. How does workflow impact inventory and output?
3. What aspects of Herbie’s “production” were problematic and how were they solved?
4. What are the implications of waiting in lines on work processing design?
5. What defines the capacity of a process? How is it calculated? How much is just right?

11. Thursday October 5, 2017

Inventory Management
Required Preparation:
• Fagan, “Determination of Safety Stock: A Practical Approach For Service Industries”
• Pre-class Video 11: Inventory Basics

Supplementary Readings:
• Production and Operations Management, Martin Starr, 2004, P. 506-538

Discussion Questions:
1. What value does inventory create?
2. What costs are incurred?
3. What is the optimal inventory level of turnover items?

Friday October 6, 2017 – Recitation #6: Inventory Practice
Inventory Management – Overview, Formulas and Problem Set
12. Tuesday October 10, 2017

Capacity Utilization

Required Preparation:
- Pre-class Video 12: Victoria Station Context

Supplementary Readings:

Discussion Questions:
1. What is the process for inbound passengers at Victoria?
2. What are the capacities and utilizations of each process stage?
3. Where is the bottleneck?
4. Is there sufficient space on the platform to accommodate demand?
5. What strategies can improve the flow of passengers through Victoria station?

13. Thursday October 12, 2017

Managing Demand Peaks

Required Preparation:
- Pre-class Video 13a: CSX and The Fall Peak
- Pre-class Video 13b: Structuring Your Analysis

Discussion Questions:
1. What are the opportunities and challenges of peak demand?
2. What are effective response strategies?
3. What type of peak does CSX face based on the Ronen et al framework?
4. Are locomotives a binding constraint at CSX?
5. Why is the CSX CEO so focused on Amgrain?

Friday October 13, 2017 – Recitation #7: Victoria and CSX Review

14. Tuesday October 17, 2017

A Test Run/Putting It All Together

Required Preparation:
Bring a warm coat for fieldwork

15. Thursday October 19, 2017

Service Delivery in a Supply Chain – Beer Game

Required Preparation:
http://proquest.umi.com.ezp-prod1.hul.harvard.edu/pqdweb?did=1031726191&Fmt=7&clientId=18857&RQT=309&VName=PQD&cfc=1
• Pre-class Video 15: Beer Game Basics

**Discussion Questions:**
1. What are supply chains?
2. What are the complexities of managing supply chains?
3. Why is coordination of supply chains so critical?
4. In what ways are public sector supply chains more difficult to manage than those in the private sector?
5. What is your favorite beer? What is your response when your local store is out of stock?

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**Friday October 20, 2017 – Recitation #8: Capacity Analysis Review**

**Capacity Analysis Exam, October 20-23, 2017**

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**16. Tuesday October 24, 2017**

**Role of Information in Operations**

**Required Preparation:**
http://www.metapress.com.ezp-prod1.hul.harvard.edu/content/xg2g8588147k8437/

**Discussion Questions:**
1. How did you feel during the beer game?
2. Did you seek to maximize your own outcome or that of the supply chain?
3. What information was lacking?
4. What would the outcome have been if there had been complete information visibility?
5. How does Systems Thinking facilitate supply chain management?
6. What insights do you draw from the responses to Hurricane Katrina?

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**17. Thursday October 26, 2017**

**Resource Allocation**

**Required Preparation:**
- [url]
http://www.bostonpublicschools.org/domain/29
- Simulating Alterative School Choice Options in Boston – Main Report, Pathak and Shi, MIT, 2013, [url]
http://economics.mit.edu/files/9245

**Discussion Questions**
1. What are the core tradeoffs that must be made?
2. How do you weight the factors?
3. What assignment policy would you design?

Friday October 27, 2017 – Recitation #9: Client Presentation and Reports

18. Tuesday October 31, 2017

Performance Measurement Basics

Required Preparation:
- Pre-class Video #18: Performance Measurement and Management

Supplementary Readings:

Discussion Questions:
1. What measures effectively assess: delighting the customer, managing by fact, managing people, and continuously improving?
2. What are the hallmarks of innovative performance measurement systems?
3. How much measurement is enough measurement?

19. Thursday November 2, 2017

Prospective Performance Measurement

Required Preparation:
- Tracking the Flu with Technology and Twitter, Heather Kelly, CNN [link]
- Pre-class Video 19: Forward Looking Performance Measurement
**Discussion Questions:**

1. What is the value of forward-looking measurement?
2. In what ways is the Charlson Index forward looking?
3. What are the limitations for the index?
4. Is data mining social media a viable tool?
5. What are the risks of using social media?

**Friday November 3, 2017 – Recitation #10: Statistical Process Control**

**20. Tuesday November 7, 2017**

**Technology for Quality and Efficiency**

**Required Preparation:**
- Introducing Technology at Transport for London: Oyster’s Multiple Pearls (A) and (B), Fagan and Stuart, 2009.

**Supplementary Readings:**

**Discussion Questions:**
1. How does information technology facilitate process reengineering?
2. How does IT act as an enabler and as an implementer of new process design?
3. What were the motivators for the Oyster card development?
4. What were the critical success factors for the Oyster card deployment?
5. What benefits did Oyster yield?
6. What might be the next generation of fare collection technology at TFL?

**21. Thursday November 9, 2017**

**Technology to Expand Reach**

**Required Preparation:**

**Supplementary Readings:**

**Discussion Questions:**
1. What accounts for M-PESA’s rapid growth?
2. In what ways is technology an enabler?
3. What are logical extensions of cellphone-based technology?
4. What other ways can technology extend the reach of service providers in developing geographies?

Friday November 10, 2017 – Recitation #11: Scaling Up Water Delivery

22. Tuesday November 14, 2017

Applying the Toolkit – The Lean Farm

Required Preparation:
- Note on the Lean Farm by Ben Hartman

Supplementary Readings:
- None

Discussion Questions:
1. What enabled the farm to be “leaned?”
2. What tools were most powerful?
3. How could you apply the farm’s use to lean to a public school system?

23. Thursday November 16, 2017

Behavioral Science Insights for Operations

Required Preparation:
- Pre-class video 23: Behavioral Science and Operations Management

Supplementary Readings:
- None

Discussion Questions:
1. How could TSA use behavioral science to improve service delivery?
2. What behavioral science insights could enhance your client project?

Friday November 17, 2017 – Recitation #12: Client Work-in-Progress Presentations and Feedback
(Note: Extended session; mandatory attendance - your team and 2 others)

24. Tuesday November 21, 2017

Scaling Up: Building Organizational Capacity

Required Preparation:
- Investing in Early Childhood: Peru’s Cuna Mas Program Faces Barriers to Expansion, Datla and Boatwright Wilson, HKS case, 2016.

Supplementary Readings:
Discussion Questions:
1. What are MSF’s goals for addressing HIV/AIDS in Ethiopia?
2. What are the requirements to meet these goals?
3. How well positioned is MSF to carry out their plans?
4. What organizational challenges does MSF face in implementing their plans; how are they overcome?

Thursday November 23, 2017

Thanksgiving Day – No Class

25. Tuesday November 28, 2017

Operations Management in the “Real World”

Required Preparation:
- Sustainable and Responsible Coal Mining: Ideas from Developed Countries, Fagan, 2005.
- Pre-Class Video 25: Coal Mine Safety

Discussion Questions:
1. If you were responsible for reducing coal-mining deaths in China, what would you do?

26. Thursday November 30, 2017

Wrap-Up

Required Preparation:
- Come to class with your Top 10 Takeaways from the course

Final Project Papers Due, December 7th at 5pm