

The Peter F. Drucker and Masatoshi Ito Graduate School of Management
Claremont Graduate University

MGT 408
THE ART AND SCIENCE OF PROJECT MANAGEMENT
Fall 2007 Module I
Mondays 7 to 10 p.m.

Dr. Karen L. Higgins

Classroom: Burkle 26

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Course Background

Today's business environment moves rapidly and often unpredictably. Funding and political support may wax or wane. Technology changes in computers, new materials, or products are rapid and profound. The competitive landscape shifts daily. Goals evolve and are interpreted by different stakeholders; uncertainties create risk that must be managed. Relying on each other for technical expertise and facilities, organizations and people are increasingly interdependent. Businesses collaborate. Leaders can no longer rely on power alone to influence outcomes when they work interdependently with other organizations.

To succeed in this complex and dynamic environment, project managers must work beyond experience and tools, technical insight, communication and people skills. They must view leadership as a system of interrelated parts and understand the effects of their actions. They must act flexibly and quickly.

The **purpose of this course** is to develop a systems perspective of leadership that can be used to manage a project in today's complex world. Students will gain a grounded understanding of skills, characteristics and actions needed to succeed. The course treats project management as both art and science. As a science, project management considers formal systems such as metrics, rewards and traditional tools. As an art it emphasizes culture and the informal side of the organization. By integrating art and science – using a systems perspective – a project manager proactively influences success. **Aspiring and current leaders** regardless of level or responsibility will find the course useful.

Project Management Definition

Firms create projects of many shapes and sized to implement their strategies. Projects range from efforts with thousands of people and billion dollar budgets, to small tasks with a few people, simple products and small budgets. Project management is a fundamental part of running a complex business, whether that business involves

designing and developing new products, producing current products, or providing services.

Once requirements are set and resources are allocated, project implementation begins. During implementation, the project team applies resources toward desired goals, products or services—all aimed at providing value for stakeholders. The project team may include members from different organizations. A project is accomplished within a larger organizational context and exists for a given time period, until it is complete.

Systems Perspective Definition

Systems perspective considers an organization or project holistically as an assembly of elements that interact. It incorporates external influences as well as interactions among internal elements such as trust, communication, formal structures, culture and relationships. Interactions may be simple feedback, e.g. formal rewards that influence behavior, or they may be complex combinations that change products and performance over time.

Course Objectives

By the end of this course the student should be able to:

- **Understand traditional approaches** to project management that emphasize formal processes. The student will become familiar with project planning and implementation; setting requirements; cost, schedule and performance metrics; and tools such as work breakdown structures, cost estimation, PERT/Gantt charts, risk assessments and earned value management. The course presents these items as tools to be used in the course of managing a project, rather than as a primary focus. References allow the student to get more detail on these tools if desired. The course neither expects nor teaches project management computer applications, but students may independently use such programs for assignments if desired.
- **Analyze and diagnose real life project management problems.** The course is highly participative with examples from complex cases. Using case study methodology and a Management Coordination System (MCS) Model, the student will understand individual elements of a project. He or she will be able to identify influences that can change outcomes.
- **Develop a systems perspective** to understand interdependencies and the long and short term effects of leaders' actions. The student will be able to put formal processes and tools in the context of a greater whole in which the human side – the informal, less tangible part of an organization (e.g. culture, relationships) – is crucial. Using the MCS model, the student will learn cause and effect relationships of actions on formal and informal parts of an organization, on motivation and goal alignment, on internal characteristics such as trust and commitment and ultimately on performance. The student will recognize interactions with the external environment, including with customers and other stakeholders.

- **Use a systems perspective** to shape a project environment. The student should be able to translate this systems perspective into an actionable knowledge of skills and actions that can influence long term success.
- **Improve interpersonal communication skills.** All project managers require good communication skills. There will be opportunity for the student to improve interpersonal communication skills in a learning environment.

Approach

The course uses a variety of media, case studies, readings, real-life examples and a tested model to illustrate how the interplay of individual elements ultimately affects outcomes. We will combine academic knowledge with practical experience to build a foundation for practicing project managers and other leaders. The student will begin to internalize the lessons and be able to apply them on-the-job.

During the sessions, I will highlight important issues and relationships, but it is imperative that each student do the required reading prior to each session and come prepared to discuss each topic. Be prepared to explore reasons behind success or failure in the case studies. Class participation will benefit everyone.

Grading

Quality of your work on in-class exercises and the quality and quantity of contributions in class comprise 45% of the final grade. Quality will be evaluated from the insightfulness, relevance and clarity of: 1) **comments** during class discussion that are original contributions or that build further understanding from others' comments and 2) **completeness, thoroughness and level of participation** for in-class exercises.

The paper on the assigned case study comprises 15% of your grade. Grades will depend on 1) completeness and thoughtfulness of answers and 2) logical organization of analysis.

The final project makes up 40% of your grade. Grades will depend on: 1) an understanding of the systems perspective and actions a project manager can use to influence project success, 2) completeness in addressing the points in the final project description, and 3) demonstration of clear and organized thought process.

The specific grading plan follows:

Class Contribution [including in-class exercises]	45%
Paper on Case Study [Session 5]	15%
Final Project	40%

Students that miss more than one class (three hours) in this course are subject to instructor withdrawal at the instructor's discretion. Students are expected to complete a make-up assignment should they miss any one class.

Books and Material:

1. Frame, J. Davidson (2002), The New Project Management: Tools for an Age of Rapid Change, Complexity and Other Business Realities, 2nd edition, SF: Jossey Bass
2. Senge, Peter M. (2006), The Fifth Discipline, New York, NY: Currency, revised edition
3. Verzuh, Eric (2005), The Fast Forward MBA in Project Management, 2nd Ed, NY:Wiley & Sons
4. Course pack [Purchase at Huntley Bookstore]

Reference: For information and further study if desired: *Not Required Reading*

1. Project Management Institute (2004), A Guide to the Project Management Body of Knowledge 2004 Edition (PMBOK), Newtown Square, PA.

SESSIONS 1 & 2: IN-CLASS GROUP EXERCISES THE “TWEETER PROJECT”

The “Tweeter Project” Description: An established customer has sent out a Request for Proposal to design and build 500 birdhouses. He wants colorful birdhouses with a simple design and 2 entry holes. He wants them to last outdoors for at least 5 years. He needs all 500 delivered in 60 calendar days. You are to give him your best proposal to win against competitors. The contract will be fixed price, but for every day you come in ahead of schedule, you will earn an additional \$500.

SESSION 1: PLANNING

Homework for Session 1

Prior to Session 1, use the above project description and list the tasks you might use to break this project down into manageable parts. For each task, also list your estimated start/stop dates, task duration and the number of people it will take to complete the task on time. Use this estimate to guide discussion in the in-class group exercises.

Use the following assumptions and list other assumptions you have made.

- Your company has available the following personnel
 - 2 craftsmen, and 2 designers [though they may be shared with other projects]
 - 1 administrative and one other support person
 - 2 project managers who manage several projects
 - If you need to outsource for additional support, labor costs an additional 10%.
- Determine your own assumptions about productive hours per week and productivity rates, i.e. how long does each personnel type take to complete a task. [Remember the class must believe you!]

In-Class Exercise for Session 1

We will break into small groups to plan the Tweeter Project. Each group will develop a) a simple Work Breakdown Structure (WBS), b) schedule and c) personnel requirements for the project. Use your individual homework assignments to get you started. Groups will share their results in class for feedback. From this exercise, you will include a final WBS, Schedule and Personnel Requirements in your presentation for Session 2.

- a) **WBS:** For your WBS, use 3 levels and the graphic block diagram/ “tree diagram” format [see Verzuh (2005) Chapter 6]
 - Level 1 should be called “Produce Birdhouses”
 - Level 2 should have a maximum of 3 tasks
 - Level 3 will have a maximum of 2 tasks for each Level 2
- b) **Schedule:** Base the schedule on the 3rd level WBS tasks and use a bar chart [Gantt] format. Show the sequence of tasks, any overlap, their duration and

start/stop dates on a graph depicting “weeks after go-ahead”. [See Verzuh (2005) Chap 7]

- c) **Personnel Requirements:** For each 3rd level task, estimate how many and what types of people will be required to complete the task on time.

SESSION 2: COST ESTIMATION

Homework for Session 2

Work with your group from Session 1. Using your 3rd level WBS tasks, prepare a “bottom up” cost estimate for the Tweeter Project. [See Verzuh (2005) Ch 8]. Your final product should include 3rd, 2nd and top level costs estimates. Reflect all costs to the customer, including personnel, materials, profit and any other expenses that may not be in your WBS. This cost estimate will be part of your company’s “proposal” to the RFP. Separately note estimated gains if your project completes early.

Assumptions:

- Burdened labor rates [wages, benefits and overhead] in your company are:
Craftspersons: \$60 / hour, with time and a half for >40 hours/week
Designers: \$90 / hour, with time and a half for >40 hours/week
Admin & Support: \$40 / hour, with time and a half for >40 hours/week
Project Managers: \$120 / hour, salaried [no overtime paid]
- You have no inventory and will need to purchase all materials. Make your own assumptions about cost of material used [order of magnitude is sufficient].
- You do not need to consider cost of buildings, work-spaces or offices. You have enough equipment for this project and do not need to purchase any.

In-Class Exercise for Session 2

Oral Presentation: Each group will give a **5 minute** oral presentation of their proposal to the rest of the class. Your group will have a short time in class to refine/ negotiate these estimates and coordinate your presentation. Ensure that all members have a brief speaking part. Presentation of your proposal should include:

- *Brief* description of selected design
- Implementation approach [e.g. use of in-house vs. contractors, special requirements]
- Final WBS [all 3 levels]
- Final Schedule and Personnel Requirements
- Assumptions for the design, implementation and cost estimate
- Risks [schedule and cost]
- Final cost estimates [Proposal to the RFP]; show 3rd, 2nd and top levels. Separately annotate your expected profit.

Assessment: After all presentations, the rest of the class will determine the feasibility of the project and will vote on which proposal to accept.

Hand in a copy of your presentation at the end of class. Include the names of all group members on the presentation.

SESSION 5: WRITTEN PAPER

The Custom Woodworking Company Case Study

Homework for Session 5

Analyze the project management case study: “The Custom Woodworking Company – Woody 2000 Project”. Write a 3 page [max] typewritten and double spaced paper on the case to answer the following questions. You may use the Project Appraisal Questionnaire at the end of the case to aid your thinking. Your paper should be well organized and demonstrate a clear thought process. It should include project management concepts we have studied and can include other thoughts and references.

1. Name three areas where the project failed and describe why they contributed to failure.
2. When should Ian Leadbetter first have known that the project was in trouble?
3. Name three success indicators that should have been measured during execution.
4. How did expectations differ from reality?
5. Characterize communication in the company.
6. Describe what the culture of the company might be.
7. Assume you are Win Easley, the project management consultant:
 - a. How would you advise Ian Leadbetter to improve his project management skills?
 - b. What should President Emelia Carpenter do differently on the next project?

In-Class Exercise for Session 5

Be prepared to discuss your conclusions in class. You will hand in your paper at the end of Session 5.

SESSION 5: IN-CLASS GROUP EXERCISE AV-8B Case Study

Homework for Session 5

To prepare for Session 5, analyze Parts A and B of the AV-8B Harrier Case using a systems perspective. Use the Management Coordination System (MCS) Model to structure your thinking and answer the following:

1. Select **three (3)** of the following MCS elements. For each element selected, describe **one (1)** major action that leadership took to increase success.
 - a. Formal Systems
 - b. Informal Systems
 - c. Communication
 - d. External Environment [including customers and other external stakeholders]
 - e. Internal Environment [Pick one: Commitment, Trust, Empowerment or Learning]
 - f. Goal Alignment [internal]

2. For each of the three actions selected, answer the following
 - a. Did this action affect individual motivation? If so how?
 - b. With which other MCS element(s) did it interact?
 - c. Were results of the action immediate or did they lag?

3. List **one** other action a leader might take to increase long term success.

In-Class Exercise for Session 5

Break into small groups to discuss your analysis for the AV-8B Case. Each group will select the best answers for the above questions and share them with the class.

FINAL PROJECT

Select option, A or B or C, and write a paper to discuss the topic described in the option. The paper should be **12 pages (max)** typewritten and double spaced. It should be well organized, concise and should reflect your understanding and ability to apply project management techniques from a systems perspective. **For all three options**, guidance in the next two paragraphs is important to demonstrate your ability to apply a systems perspective to project management – it will make the difference in your grade! Your analysis should:

- (1) Incorporate a systems perspective in your paper. Select a framework to organize your thoughts: you may use the Management Coordination System [MCS] Model and/or systems thinking principles from Senge's *The Fifth Discipline* [e.g. chapters 5-8] and Lewis's *Mastering Project Management* [chapters 9, 10].

Using this systems perspective, describe how leaders' actions influenced elements inside the project. Include elements such as formal and informal systems; motivation; communication; goal alignment; commitment, trust, empowerment and learning; and any others you may identify. Describe effects of the external environment on the project, as well as influences of leaders' actions on the external environment. Include customers and other stakeholders in your discussion of external environment.

- (2) Describe interactions and cause-effect relationships among the elements listed above. Note unintended consequences and how actions/interactions relate to performance success or failure. Discuss short and long term effects and lags between action and effect. Clarify and illustrate your points with examples.

Use course material and/or other external sources to substantiate the discussion.

Option A: Discuss the philosophy and building blocks for project management in today's environment. Describe factors you believe are most important and delineate specific examples of what a project manager can do to create an environment for success. Describe potential pitfalls of a manager's actions.

Option B: Write and analyze your own case study based on your experience or knowledge. Provide background and actual outcomes for this case, and identify the pitfalls and areas of success. Write "lessons learned" as though you are the project manager. Describe what you would have done to increase success.

Option C: Contrast the Boeing and NASA cases. Compare how actions in these organizations might have affected their success and how these actions could influence future performance. Include a "recommendations to future project

managers” section based on failures, successes and differences in the two organizations. Push beyond class discussions.

Final projects are **due no later than 5 November 2007**. They may be sent via email to karen.higgins@cgu.edu. Earlier submittals are welcome.

CLASS ASSIGNMENTS

Session 1 INTRODUCTION TO PROJECT MANAGEMENT

Prepare for "Session 1 In-Class Exercise" [see earlier description]

Frame (2002), The New Project Management

Project

Chapter 1, "*The New Business Environment and the Need for a New Management*", pp. 1-18

Ensure

Chapter 10, "*Estimating Realistic Costs, Schedules, and Specifications to Project Success*", pp. 207-228

Higgins/Maciariello (2006), Chapter 13, "Managing Projects in Engineering Organizations Using Inter-Organizational Teams," Volume III Manufacturing and Management, Mechanical Engineers' Handbook 3rd Edition, Myer Kutz, ed., NJ: Wiley & Sons.

Update",

Sections 1, 2, 3, "*Introduction*", "*Current Business Environment and Implications of the Current Business Environment*", pp. 447-450.
Appendix and Annotated Bibliography, pp. 478-483.

Verzuh, Eric (2005)

Chapter 2, "*The Project Environment*", pp. 12-30

Chapter 6, "*Work Breakdown Structure*", pp. 113-125 only

Chapter 7, "*Realistic Scheduling*", pp. 131-163 except Fig 7.4, 7.6, 7.8, 7.11, 7.12

In-Class Exercise: Break into small groups. Using your individual preparation for Session 1, together develop a Work Breakdown Structure (WBS), personnel requirements and schedule for "The Tweeter" project. [see earlier description].
Share consolidated results with class.

Homework assignment for Session 2: Working with your group, use the 3rd level WBS your group developed in Session 1 to prepare a "bottom up" cost estimate for personnel, equipment and materials on this project. Prepare a 5 minute oral presentation that includes planning from Session 1 and your cost estimation for the project. [see earlier description]

In session 2, your group will give the presentation and the class will discuss the feasibility of your project and vote on which proposal to accept.

Session 2 TRADITIONAL PROJECT MANAGEMENT

Frame (2002), The New Project Management

Chapter 3, “*Engaging Change: Knowing When to Embrace, Accept, or Challenge*,” pp. 44-71.

Chapter 13, “*Integrating Cost and Schedule Control to Measure Work Performance*”, pp. 274-291

Chapter 15, “*Understanding and Using Performance Metrics: Measuring the Right Stuff*”, pp. 306-326

Kerzner, Harold (2006), Project Management: A Systems Approach to Planning, Scheduling, and Controlling, “Contracts and Procurement” Chapter 19, 9th Edition, NJ: Wiley & Sons.

Section 19.0, *Introduction* pp. 803-804

Section 19.6, *Types of Contracts*, pp. 811-815

Verzuh, Eric (2005)

Chapter 8, “*The Dynamics of Accurate Estimating*”, pp. 166-183 and 186-190 only [skip Fig 8.5 and 8.6]

Case, “*SAFECO Field; Fast-Tracking a Baseball Stadium*”, pp. 224-227

In-Class Exercises:

Tweeter Project: cost estimate presentations, feasibility vote and winning proposal [see syllabus]

Earned Value Management Questions [handed out in class]

Homework assignment for Session 3:

Complete *Motivational Questionnaire* in course pack [Kerzner, (2006), Project Management, Chapter 5, 9th Edition, NJ: Wiley & Sons, pp. 272-278.]

Prepare to discuss your observations during Session 3.

Session 3 SYSTEMS FRAMEWORK FOR PROJECT MANAGERS

Higgins/Maciariello (2006), Chapter 13
Section 4, “*Research Based Model...*” to “*External Environment*” pp. 450-458.

Hurley, Robert F., (2006), Harvard Business Review, “Winning Your Employees’ Trust” pp. 1-8, Reprint R0609B

Kerzner, Harold (2006), Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Chapter 5, “Management Functions”, 9th Edition, NJ: Wiley & Sons.
Chapter 5, Case Studies, “*Motivational Questionnaire*”, pp. 272-278

Lewis, James P., (1998), Mastering Project Management
Chapter 9, “*Understanding Systems Thinking*”, pp. 89-100
Chapter 10, “*How to Apply Systems Thinking in Managing Projects*”, pp. 101-108

Senge (2006), The Fifth Discipline
Chapter 1, “*Give Me a Lever Long Enough...*”, pp. 3-16
Chapter 15, “*The Leader’s New Work*”, pp. 317-340

In Class Exercises

Motivational Questionnaire:
 What Motivates You?
 How Do You Motivate?
Drivers of Trust

Homework assignment for Session 4:

Prepare to discuss your thoughts on the handout “What Would You Do?”

Session 4 CUSTOMERS, COMMUNICATION AND SYSTEMS MODEL

Want,
Frame (2002), The New Project Management
Chapter 5, “*Satisfying Customers: Knowing Who They Are, What They
and When They Are Right or Wrong*”, pp. 93-117
Chapter 6, “*Defining Requirements That Bridge the Customer-Developer
Gap*,” pp. 118-142.

Higgins/Maciariello (2006), Chapter 13
Section 4.4, begin at “*External Environment*”, pp. 458-466
Sections 6 & 7, “*Practical Applications*”, “*Summary*”, pp. 476-478

Sons
Kerzner (2006), Project Management Case Studies, 2nd Edition, NJ: Wiley &
“*Project Management Cultures*,” p 151
“*The Blue Spider Project*”, pp 301-316

Kerzner, Harold (2006), Project Management: A Systems Approach to
Planning, Scheduling, and Controlling, Chapter 5, “*Management Functions*”,
9th Edition, NJ: Wiley & Sons.
Section 5.15, “*Project Management Bottlenecks*,” pp 239-240
Section 5.16, “*Communication Trap*”, pp. 240-241
Section 5.17, “*Proverbs and Laws*” pp 241 to mid 242

Senge (2006), The Fifth Discipline
Chapter 4, “*The Laws of the Fifth Discipline*”, pp. 57-67

In Class Exercises

Discuss Handout: “What Would You Do?”
Interpersonal Communication Listening Skills
Senge’s Eleven Laws

Written Homework Assignment for Session 5:

Analyze *The Custom Woodworking Company – Woody 2000 Project* Case study. Write 3 page paper answering questions described earlier in this syllabus. Be prepared to discuss your analysis in Session 5.

Session 5 WHEN SYSTEMS PERSPECTIVE IS APPLIED

Higgins, Karen (rev Oct 7, 2006)

“AV-8B Harrier Aircraft: Part A: Early Challenges”, Case KH-PM-06-002A.

“AV-8B Harrier Aircraft; Part B: Later Challenges”, Case KH-PM-06-002B

Kerzner, Harold (2006), Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 9th Edition, NJ: Wiley & Sons.

Case Study, “*Telestar International*”, pp. 306-307

Woody
Wideman (accessed 19 April 2007), “*The Custom Woodworking Company – 2000 Project*”

In-Class Exercises:

Discussion of Woody 2000 Project Case Study [see earlier description]

Discussion on AV-8B Case Parts A and B [see earlier description]

Paper Due: *The Custom Woodworking Company – Woody 2000 Project Case study*

Project
In Class Video: “*Software Development for the AV-8B Harrier: Shaping a Environment for Success*”

Session 6 RISK, CULTURE AND SYSTEMS PERSPECTIVE

Bohmer, Richard et al (2004), "*Columbia's Final Mission*," HBS Case Study 9-304-090.

Edmondson, Amy et al (2002 & 2003) "*Group Process in the Challenger Launch Decision (A), (B) and (D)*", HBS Case Studies 9-603-068; 9-603-070; 9-603-073.

Frame (2002), The New Project Management Chapter 4, "Managing Risk: Identifying, Analyzing and Planning Responses,"
pp. 72-92.

Higgins, Karen (rev 7 Oct 2006), "*The National Aeronautics and Space Administration*"
Part A, Case KH-PM-06-001A
Part B: The Rest of the Story, Case KH-PM-06-001B
Part C: Implementing Change, Case KH-PM-06-001C

Kerzner, Harold (2006), Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 9th Edition, NJ: Wiley & Sons.
Case Study, "*The Reluctant Workers*", p 288

Senge (2006), The Fifth Discipline Chapter 5, "A Shift of Mind", pp. 68-91

In-Class Group Exercises:

NASA Functional Group discussion and Project Risk Assessment
NASA Culture and Leadership Actions

In Class Video: NASA Space Shuttle *Challenger* Video Parts 1 and 2

Written Homework for Session 7: Leadership Effectiveness Problems
[handout]

Session 7 PROACTIVE LEADERSHIP

Higgins, Karen (Oct 9, 2006), *"The Boeing Company"*
Part A: An Ethics Dilemma, Case KH-SL-06-001A
Part B: The Challenge of Deep Change, Case KH-SL-06-001B

Kerzner (2006), Project Management Case Studies
"The Trophy Project", pp. 331-333

Peters, Tom (1992), Liberation Management, NY: Alfred A Knopf
In **Chapter 14**, *"Understanding Project Management"*, pp. 212 [mid page] to

214

Senge (1994), The Fifth Discipline
Chapter 10, *"Shared Vision"*, pp. 191-215
Chapter 12, *"Foundations,"* pp. 258-271

In-Class Group Exercises:

Discussion of Leadership Effectiveness Problems

Boeing:

Ethical Contributors and Culture Shaping

Leadership Style and actions

Project Manager Keys to Success