Management of Technology I (MOT-I):
The External Environment

Tuesday, Thursday 12:00 - 1:30
Fall, 1999

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Syllabus -- PUBP 6608

Course Description
MOT-I examines factors in the environment of the public agency or private firm that are essential to managing technology. Through an examination of technology policies in the federal government in which public agencies, universities, and private industry play a major role, it will teach both analytical concepts and practical skills.

Most examples will be case studies of large technical systems. These are technology development programs that involve multiple actors in both the public and private sectors in the creation and implementation of multi-component, socio-technical entities. Examples of large technical systems include: commercial aircraft, the space shuttle, railways, naval weapons, the superconducting supercollider, nuclear power, and automated ground transportation. We will also examine the design of bicycles.

The course is divided into two parts according to two conceptual themes: agency and structure. The first part on agency will employ a political science perspective, examining how development is shaped by participants’ interests (e.g. firms’ interest in profitability, federal agencies’ interest in mission continuity, etc.) We will examine how individuals agents (or entrepreneurs) work with others in their environment to initiate and launch large technical systems. Analytical concepts include: veto points, coalitions, equity, distribution, effectiveness, and political rationality. Practical techniques include: stakeholder analysis, coalition-building, negotiation, lobbying, and budgetary strategies.

The second part on structure will employ a sociological perspective, examining how institutions in the environment both impede and force innovation. Here we examine organizational rigidities, regulatory frameworks, and constitutional institutions. Analytical concepts include: dynamic conservatism, quality-based competition in regulated markets, cancellation of programs, forcing mechanisms, and system structure. Practical techniques will include: project design, institutional design, and technology design.

Requirements and Assessment
Class participants will be required to read about 100 pages per week and to attend class regularly. The class will largely follow a seminar format in which everyone is expected to actively participate. There will be two in-class games, one on negotiation and the other on technology design. Two in-class tests will examine students’ mastery of the readings. A final group project will give students the opportunity to apply analytical concepts to a development project of their choice.

Course assessment will be as follows:
- Class participation: 10%
- Test 1: 30%
- Test 2: 30%
- Final project: 30%

Office Hours
Tuesday and Thursday, 4-5:30 PM. It is strongly recommended to contact the instructor after class or by E-mail to make a confirmed appointment.

Readings
A reading pack will be available through the College of Management.
PART ONE: AGENCY

WEEK 1  Federal Technoscience / Large Technical Systems

1. Introduction
(no reading)

2. System Development Programs in the Federal Government

WEEK 2  Initiation of System Development

3. Launching Technology: The Bureaucrat’s Perspective
Lambright, Governing Science and Technology, Chapter 2: “Launching Technology.”

4. Program Advocacy in the Political System: The Supplier’s Perspective

WEEK 3  Working with Congress

5. Equity and Distribution: The Elected Official’s Perspective
Sapolsky, Harvey, "Equipping the Armed Forces," Armed Forces & Society, Fall 1987.

6. Budgets and Strategy
WEEK 4

Deployment

7. Federalism


8. Stakeholders and Negotiation


WEEK 5 Mid-Term Week

9. Negotiation

In class: Harborco Game (no reading)

10. Test Number 1

(no reading)

PART II: STRUCTURE

WEEK 6 Implementation and Its Discontents

11. Resistance


12. Termination


WEEK 7 Structural Forces for Innovation

13. Regulatory Frameworks

14. Becoming by Doing


**WEEK 8  Design of Structures**

15. Project Design


16. Intransigent Technology


**WEEK 9  The Role of Technology**

17. The Phenomenology of Design


In Class: Delta Design Game

18. Test No. 2

(no reading)

**WEEK 10  Strategies for System Development**

19. Group Presentation

(no reading)

20. Group Presentation

(no reading)