

Managing Technological Innovation

MGT 693

Spring Term, Y2K+1
1800 hrs, Thursday
Asheville Campus

Instructor: George Mechling
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Course Syllabus

Required Reading Materials:

Afuah, Allan, Innovation Management: Strategies, Implementation, and Profits, Oxford University Press, New York, 1998.

Selected Harvard Business School (HBS) cases; packet purchased at the campus bookstore.

Selected University of Michigan Business School (UMBS) cases located on the web and other (public domain) readings and cases—readings packet two.

Course Goal:

The goal of this course is to introduce students to concepts, models, frameworks, and tools by which they can create an integrated conceptual approach to critically examine and effectively manage innovative phenomena. Managers possessing such analytical capabilities are in a position to make valuable contributions to the organizations in which they work because effective innovation is a recognized pre-condition for establishing and maintaining competitive advantages in the world of work. This course is designed to assist students in beginning to acquire these capabilities through reading of the textbook, selected readings, and cases this class provides. The readings explore these concepts, models, frameworks and tools while the cases provide an opportunity to apply theory to the socially complex context in which decisions about innovation must be made. The cases will introduce students to different industries, such as; computers, telecommunications, the Internet, semiconductors, pharmaceuticals, biotechnology, and automobiles and thus, while emphasizing theory during discussions of them, these cases will also emphasize those idiosyncrasies of each industry that can be critical to successfully exploiting an innovation in that industry.

Course Themes:

- 1) The text emphasizes the link between new ideas and continued profits.
- 2) Underscoring the importance of theory in applying innovation concepts to real-life problems, the text draws on the latest academic research in emphasizing the theoretical underpinnings of good practice.
- 3) The strategic role of innovation in gaining and sustaining a competitive advantage is emphasized.
- 4) Innovation is shown to occur in many varied contexts, dramatic and otherwise.
- 5) The study of innovation is shown to necessarily be a multi-disciplinary undertaking.
- 6) Implementing good strategy requires an appropriate organizational structure, systems, and right persons in the right environment.
- 7) Finally, it is recognized that innovation entails dealing with new knowledge. Consequently, firms that successfully innovate do so because they can acquire useful information and effectively collect, organize, and process it into knowledge that will permit them to create valued new products and/or services.

Course Rationale and Organization:

Management research suggests that innovative firms—those that are able to use technology in innovative ways to differentiate their products and services from competitors—are on average twice as profitable as other firms. Unfortunately, managing such innovation is inherently difficult and risky. Most often new technology (the knowledge of how to do things, do more things, and do all things better—C. Ayres) fails to be translated into commercially successful products and services (innovation). Innovation can enhance competitiveness and give a going concern an advantage over

others. However, the management knowledge and skills to achieve such successes differ from the knowledge and skill of everyday business administration and undertaken ill advisedly, attempts at innovation can in fact lead to deleterious results. Therefore, this course is intended to introduce students to the knowledge and skills needed to manage innovation so as to make it possible for them to constructively contribute to improving firm competitiveness and organizational effectiveness.

The organization of this course and its content are informed by the way similar MBA courses at the Harvard Business School (HBS), MIT, and the University of Michigan Business School (UMBS) are conducted. The heart of this course will be the set of cases (mostly HBS and UMBS cases) and readings assigned to students to study and discuss in class. Any cases (the UMBS cases in particular) and readings that can be placed on the Appserver for free downloading will be. The HBS cases must however, for the most part, be purchased. Arrangements are being made for their purchase as well as other reading materials from the WCU university bookstore system. Afuah's text, *Innovation Management: Strategies, Implementation, and Profits* (Oxford University Press, 1998) and ancillary readings will provide the hermeneutics of the course for dealing with the cases.

Course activities will consist of the following. Once the course is up and running, class meetings will begin with a wrap up of the previous class meeting by the instructor. At the "wrap-up," the instructor will return to the students graded case analyses submitted at the previous class meeting with comments on 1) their analysis and 2) their contribution to the previous discussion. Questions about the previous class meeting should be voiced during the "wrap up" portion of the class meeting.

Class discussion of the case or cases assigned from the previous class meeting will follow the "wrap up." Students will be expected to submit a analysis of the case to be discussed at that time (3-4 pages, double-spaced and 12 pt Times Roman font preferred—see "*Case Analysis Guidelines*" for assistance in writing up the analysis). This analysis is to be done in duplicate—one for the student to retain and one to be submitted to the course instructor. A student will be randomly selected to present his/her case analysis as a point of departure for beginning class discussion. Students will then be expected to enter into a critical discussion of what has been presented by sharing their insights and preparation so as to mutually enhance the class' overall understanding of the meeting's topic and the case(s) previously assigned. The instructor will moderate and direct this discussion as needed. It is not, however, the instructor's job to monopolize it. Once class discussion has run its course, the instructor may comment on the discussion as is necessary and then proceed to provide focus and direction on the assignment due at the next class meeting (lecturette).

Concluding each of the first three sub-topics of the course students will submit a "Reflective Pause." (See "*Reflective Pause Note*" for guidelines.)

The final examination will require each student to write a case, two copies of which will be submitted at the class meeting preceding the class meeting set aside for the final. The instructor will keep one copy of the case along with its instructor's note. The instructor will randomly distribute second copies of the cases (without the instructors' notes) to the students in the class. At the final, students will provide the class a synopsis and analysis of the case they received--a copy of each they will provide the instructor and other students in the class. (See "*Case Project Note*" for guidelines.)

Course grading: class meetings (includes case analysis submissions and other ancillary submissions)—50%; three "reflective pause" submissions—30%; case writing project (final)—30%.

Schedule of Course and Class Meetings Events

The course is subdivided into four sub-topics, Fundamentals of Innovation, Innovation Strategy, Implementation of Innovations and the Protection of Profits, and Globalization of Innovation.

11 Jan	I. Fundamentals of Innovation Course Introduction -- Lecturette Case: <i>Apple Computer: Paradise Lost</i> Case ^{II} (The Economist) ^{II} -- read in class/discuss <u>Value Chain</u> -- Lecture (Afuah, Chapter 3) Assignment: Reading -- Afuah, Chapters 1, 16, 3 Reading -- Porter chapter on Value Chains ^{II} Construct a Value Chain*
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- 18 Jan Present/Discuss Constructed Value Chains
Sources and Transfer of Innovation (Afuah, Chapter 4) -- Lecturette
 Assignment:
 Reading -- Afuah, Chapter 4
 Reading -- Case: *Merck Waters*^{II} (The Economist)*
 Refine Value Chains*
- 25 Jan, 1Feb Present/Discuss Refinements to Value Chains
 Present/Discuss *Merck Waters* Case
Static/Dynamic Models of Innovation (Afuah, Chapter 2) -- Lecturette
 Assignment:
 Reading -- Afuah, Chapter 2, pgs. 13-41
 Reading -- Case: *Imatron and CT Scanner Competition in the 80's*^{II} (UMBS)*
 Reading -- Case: *Biotechnology Strategies in 1992* (HBS) or *Human Genome Sciences*^{II} (UMBS)*
- 8 Feb Present/Discuss *Imatron and CT Scanner Competition in the 80's* and *Biotechnology Strategies in 1992* or *Human Genome Sciences* Cases
Dominant Designs and Standards (Afuah, Appendix One) -- Lecturette
 Assignment:
 Reading -- Afuah, Appendix One
 Reading -- Arthur, *Increasing Returns and the New World of Business*^{II} (HBR)
 Reading -- Sahal Selection
 Reading -- Case: *McCaw Cellular Communications Inc. in 1990* (HBS) or *Intel and Gigabit Ethernet* (UMBS)*
- 15 Feb Present/Discuss *McCaw Cellular Communications Inc. in 1990* or *Intel and Gigabit Ethernet* Case
 • Reflective Pause over I., Fundamentals of Innovation, Write-up due 22 Feb.
- 22 Feb Present/Disuss *Reflective Pause*
- III. Innovation Strategy**
Recognizing the Potential of an Innovation as a Function of Organizational Structure
 (Afuah, Chapter 5 and Appendix Two) -- Lecturette
 Assignment:
 Reading -- Afuah, Chapter 5, Appendix Two
 Reading -- Christensen, *Disruptive Technologies: Catching the Wave*^{II} (HBR)
 Reading -- Case: *3M: Making Waves with Microreplication* (UMBS)*
- 1 Mar Present/Discuss *3M: Making Waves with Microreplication* Case
Reducing Uncertainty (Afuah, Chapter 6) -- Lecturette
 Assignment:
 Reading -- Afuah, Chapter 6
 Reading -- McGrath & Taylor, *Discovery-Driven Planning*^{II} (HBR)
 Reading -- Case: *DuPont Kevlar: Aramid Industrial Fiber*^{II} (HBS, abridged)*
- 8 Mar Present/Discuss *DuPont Kevlar: Aramid Industrial Fiber* Case
Locating Profit Sites (Afuah, Chapters 7, 9) -- Lecturette
 Assignment:

Reading -- Afuah, Chapter 7, 9 pgs. 186-187
Reading -- Case: *Triada* (UMBS)* OR *Idealab* (UMBS)*

SPRING BREAK

22 Mar Present/Discuss *Triada* or *Idealab* Case
• Reflective Pause over II., Innovation Strategy, Write-up due 29 Mar.

III. Implementation of Innovations/Protection of Profits

Implementing the Innovation Decision (Afuah, Chapters 11 and 12) -- Lecturette
Assignment:

Reading -- Afuah, Chapters 11, 12 pgs. 253-255

Reading -- Case: *Sony Changes the Game*^{II} (Fast Company)* OR *PC&D* (HBS)*

29 Mar Present/Discuss Reflective Pause over II, Innovation Strategy
Present/Discuss *Sony Changes the Game* OR *PC&D* Cases
Identifying Potential Coopetitors (Afuah, Chapter 9) -- Lecturette
Assignment:

Reading -- Afuah, Chapter 9

Reading -- Case: *Pixar* (UMBS)*

5 Apr Present/Discuss *Pixar* Case
Protecting Profits (Afuah, Chapter 12) -- Lecturette
Assignment:

Reading -- Afuah, Chapter 12

Reading -- *Can Andy Grove Keep Profits Up in an Era of Cheap PC's?*^{II}
(Business Week)

Reading -- Case: *Merck A* (UMBS)* AND/OR *Merck B* (UMBS)*

EASTER HOLIDAY

19 Apr Present/Discuss *Merck (A)*, AND/OR *Merck (B)* Cases
Financing Entrepreneurial Activity (Afuah, Chapter 10) -- Lecturette
Assignment:

Reading -- Afuah, Chapter 10

Reading -- *Thermo Electron Corporation* (HBS)*

26 Apr Present/Discuss *Thermo Electron Corporation* Case
• Reflective Pause over III., Implementation of Innovations/Protection of Profits, due 3 May

IV. Globalization

Role of Government (Afuah, Chapter 15) -- Lecturette
Assignment:

Reading -- Afuah, Chapter 15

Reading -- Case: *Uncle Sam's Helping Hand*^{II} (The Economist)* --no case analysis due.

3 May Present/Discuss Reflective Pause over III., Implementation of Innovation/Protection of Profits.

Comments on *Uncle Sam's Helping Hand*
Submission and Distribution of Case Projects

10 May Case Project Presentations/Discussions/ and Critiques

Afuah -- Assigned Reading from the course text to facilitate preparation for the next session

xxxxx -- Session Topic (Lecturette to facilitate preparation for the next session)

UMBS -- *University of Michigan Business School Case*

HBS -- *Harvard Business School Case*

HBR -- "Harvard Business Review" Article

Sahal -- Selection from **Patterns in Technological Innovation** by Sahal

* -- Indicates a (Case) reading assignment for which a written submission (analysis) is
due at the beginning of the next class meeting followed by class recitation

ii -- Readings packet two

CAVEAT 1: The instructor reserves the right to modify the above schedule as might prove
necessary--particularly with respect to the replacement and substitution of
selected cases.

CAVEAT 2: If someone in the class believes that they are entitled to special consideration in how the evaluation of their
course performance is conducted, that person must advise me of this by the course's second class
meeting.