

Management of High Technology Companies
UCI Graduate School of Management
Full-time and Fully Employed MBA Programs
Management 216 — Spring 2002

Course meetings: Thursdays (4/4-6/5), 1-4 (MBA), 7-10 (FEMBA)

Instructor:

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Catalog Summary

High-technology firms face special rewards and risks beyond those faced by other firms. Technological change creates opportunities for new industries and products, but at the same time renders existing firm competencies irrelevant. This course examines how managers can identify competency-destroying technological change, exploit such change for competitive advantage, and maintain capabilities for innovation. The specific focus is on firms that sustain competitive advantage through IT, either as producers of IT-related products or through the use of IT to drive change in other industries.

Course Policies

Prerequisites

This technology strategy class will build on tools and techniques that you have acquired earlier in your M.B.A. studies. It thus requires satisfactory completion of Business Strategy (Management 210) and its prerequisites. This requirement will not be waived.

Attendance

As a courtesy, I would appreciate advance notice of any absence, but no explanation or justification is required. Attendance in class is for your benefit, not the instructor's.

However, if you miss class it is impossible to "make up" that week's portion of your overall class participation, thus reducing your final grade. Also, you are responsible for obtaining any missing handouts from a fellow student.

Office Hours

Office Hours will be
Thursdays 4pm-6pm
3200 Berkeley Place, (949) 824-2079

Note that Berkeley Place is across the street from the GSM building — **not** in the 4th floor office listed in the GSM directory. The phone number should reach me at other times on Thursdays, but rarely on other days.

Original work

You are expected to do your own individual, original work for all assignments, except for the group work of the final project. This includes collaboration with other students, and using without attribution earlier work from printed sources and the Internet.

If you're not sure about whether something would violate these policies, just ask.

Evaluation

The course will be organized around weekly readings and cases. Students will be evaluated on their class participation, shorter written assignments, a take-home midterm and a final project which integrates the principles presented in the class into an original design for profiting from innovation.

Class participation	30%
Case write-ups	20%
Take-home midterm	20%
Final project	30%

Class Participation

Oral communication skills and thinking on your feet are an essential part of your MBA learning and your success in business. By now, you should all be comfortable with class discussion and oral case analysis.

The goal of the class discussion is to get every student to make a meaningful contribution each week. Meaningful in this context means that it is relevant both to the assigned materials and also to what is being discussed at that time. The class will include both volunteer and “cold call” responses.

The discussion will focus on the week’s assigned readings, both the case and the other readings. This will include summarizing the concepts or case setting, analyzing the specifically assigned issues, and consider applications to other contexts.

Written Assignments

Cases and Case Write-ups

Each week (except the final) will have an assigned case for analysis, with questions as posted to Catalyst. These cases are intended to refine your personal skills at analyzing and articulating technology-related business decisions.

On even-numbered weeks, the analysis includes a written submission. These case write-ups should answer the assigned questions; you can choose to answer the questions separately (e.g. 1, 2, 3) or together, as long as all of the questions are addressed. The recommended length is 1,000-1,500 words (about 3-5 pages if double spaced). You should bring an extra copy of your write-up to class, to refer to during the discussion.

Assignments are due at the beginning of class on the day assigned, whether or not you are present. If you will be absent from class, you should send them via e-mail to the instructor’s published e-mail address. Additional tips on analyzing cases are posted to Catalyst.

Not all weeks have a written assignment. Even if you do not do a written case write-up, you are expected to be ready to answer the assigned case questions each week; you should at least bring notes regarding the assigned questions.¹

Take Home Midterm Exam

A take home midterm exam will allow you to practice applying the concepts developed in the first half of the class. It will require an analysis of a particular technology firm or industry issue, and will be due at the next class meeting.

¹ Some students may be tempted to neither read the assigned materials nor prepare the cases and weeks where there is no written assignments. Besides limiting your comprehension of half of the course’s material, this will also result in a significantly lower participation grade.

E-mailing Assignments

In some cases you will be asked to e-mail an assignment;. In other cases, you may wish to e-mail your assignment (e.g. if you are going to miss class).

I get approximately 125 e-mail a day. To enable me to sort 40 assignments that come in simultaneously, please observe the following rules:

1. Mail assignments to joelwest@gsm.uci.edu; this ensures they are both time-stamped, and that they are not lost in the event of a connection failure.
2. Start the subject with “F216 Week 2” or “M216 Week 2”, depending on whether you are in the evening (FEMBA) section or daytime (full-time MBA) section. Change “Week 2” to be whatever week the assignment is due.
3. If you have an attachment, name it using this convention:
F216W2-lastname.xls or M216W2-lastname.xls for Excel documents
F216W2-lastname.doc or M216W2-lastname.doc for Word documents
etc., again changing the “W2” to be the week the assignment is due. If you e-mail more than one document of a given type, you can insert letters or numbers between your name and the file extension (.xls)

Submissions not conforming to this format will be returned in Week 2 for resubmission, and rejected in weeks after that.

Group Project

The final project will be developed in groups of 3 or 4 students. The teams composition and project topic will be approved by the instructor.

Due to schedule conflict with the FEMBA residential in weeks 10 and 11, the date(s) for the final presentation in the FEMBA section will be scheduled in the first class meeting.

Picking a Topic

Teams that know their industry or particular technology well will have a big advantage in the final presentation. You should look for a good “fit” between your team’s expertise and the topic.

At the same time, some people are too close to the topic and have a hard time making it understandable to an outsider (like the rest of the class). This problem will be magnified by the short time available both to explain your topic and your analysis .

Finally, you should pick a topic that you both have an interest in, and also that you can make interesting to the audience.

Project Proposal

To increase the odds of timely project completion, each team is required to meet an intermediate milestone. Specifically, you must submit a brief proposal (no more than 3 pages) for your project. The proposal will be evaluated but not graded; if the proposal is incomplete, you will have to redo and resubmit it.

The proposal should contain:

- Level of analysis: industry, firm, business unit
- Managerial problem to be addressed
- Sources of data
- If you have previously studied this firm or industry, how this project will be different
- Measure of success (usually a financial return)
- Responsibilities of each team member

Each team will be required to meet with the instructor, either before or after submitting the written proposal. The goal of both the written and oral evaluation of the proposal is to provide feedback to

improve the chances of successful outcome for the oral presentation. I will probably ask some teams to revise their proposal based on my comments to improve your chances of success.

The project will focus on a particular high-technology firm, business unit or group of firms (like an alliance), which may be existing or proposed (i.e. fictional). It should describe how this organization would profit from developing, enhancing, diffusing or otherwise managing some form of technology-based product or service.

Also, most projects will have some financial measure of success, such as NPV, DCF. If you do not plan on measuring success this way, then you must explain why in your proposal. Note that lack of data usually will not be a good enough answer; often we must make some assumptions when hard data is not available.

Finally, your project (if not proposal) should note what barriers to entry your project will erect to ensure profitability and recoup technology investments. For many companies, this will include proprietary technologies protected by IP law; certainly any investor will want to know what will prevent “me too” competitors from following later and preventing a return on their investment.

Oral Presentation

The deliverable for the group project will be an oral presentation during the final class meeting. The order of presentation will be determined by random draw. The amount of time will be determined by the number of teams.

At the beginning of your presentation, I would recommend that you give me a written copy of your presentation slides that I can use to take notes. This will allow me to give you better feedback on your presentation.

The evaluation criteria used for last year’s projects were:

- Did the team choose an important issue to analyze and explain it well? Was the presentation interesting? (25%)
- Technological content of project (15%)
- Quality of the analysis of the industry, strategy, and recommendation (35%)
- Handling of Q&A (20%)

The criteria for this year will be similar but the weights may be slightly different.

Readings

Required Texts

Charles H. Ferguson, *High stakes, no prisoners: a winner’s tale of greed and glory in the Internet wars*. pbk. ed. New York: Times Business, c1999.

Geoffrey A. Moore, *Crossing the chasm: marketing and selling high-tech products to mainstream customers*. Rev. pbk. ed. New York: HarperBusiness, c1999.

Cynthia Robbins-Roth, *From Alchemy to IPO: The Business of Biotechnology*, Perseus Books, 2001.

Carl Shapiro, Hal R. Varian, *Information rules: a strategic guide to the network economy*. Boston, Mass.: Harvard Business School Press, c1999.

Optional Text

Stephen R. Elias, *Patent, Copyright & Trademark*, 4th ed., Berkeley: Nolo Press, December 2000, ISBN: 0-87337-601-3

Web-based Readings

A few web-based readings and cases will be provided, and will be linked from Catalyst.

Course Reader

The course reader contains most cases and articles. It is being produced by University Readers. The contents of the reader are as follows:

Week 2

Lilien, Gary L., Philip Kotler and K. Sridhar Moorthy, "New Product Planning," excerpted from Chapter 10 of *Marketing Models*, Englewood Cliffs, NJ: Prentice-Hall, 1992, pp. 457-474.
Lynn, Gary S., Joseph G. Morone and Albert S. Paulson, "Marketing and discontinuous innovation: The probe and learn process," *California Management Review* 38, 3 (Spring 1996), pp. 8-37.

Week 3

Utterback, James M., "Dominant Designs and the Survival of Firms," Chapter 2 from *Mastering the dynamics of innovation: how companies can seize opportunities in the face of technological change*, Boston: Harvard Business School Press, c1994, pp. 23-55.
Suarez, Fernando F., Utterback, James M., "Dominant designs and the survival of firms," *Strategic Management Journal* 16, 6 (Sep 1995), pp. 415-418.
Christensen, Clayton M., "Value Networks and the Impetus to Innovation," Chapter 2 from *The innovator's dilemma: when new technologies cause great firms to fail*. Boston: Harvard Business School Press, 1997, pp. 29-59.
Case: Atheros Communications, Harvard Business School, December 2001, 9-802-073.

Week 5

Meyer, Marc H., "Revitalize your product lines through continuous platform renewal," *Research-Technology Management* 40, 2 (March/April 1997): 17-28.
Case: "Handspring, Inc.: Innovation on Your Palm," European Case Clearing House, 501-016-1.

Week 6

Teece, David J., "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy," *Research Policy* 15, 6 (Dec. 1986): 285-305.

Week 7

Case: "Red Hat and the Linux Revolution," Harvard Business School, February 2000, #9-600-009.

Week 8

Porter, Michael E., "Industry Scenarios and Competitive Strategy under Uncertainty," Chapter 13 from *Competitive Advantage*, New York: Free Press, 1985, pp. 445-481.
Case: Teledesic, Harvard Business School, 9-800-057

Week 9

McMillan, G. Steven, Francis Narin, and David L. Deeds, "An analysis of the critical role of public science in innovation: The case of biotechnology," *Research Policy* 29, 1 (Jan 2000): 1-8.
Case: "Millennium Pharmaceuticals, Inc. (A)," Harvard Business School, January 2000.

Handouts

The following materials will be distributed the week before in class:

Week 4

Case: "Qualcomm's CDMA 2000: Technology Strategy," U.C. Irvine, Graduate School of Management, April 2002.

Week 7

Case: "Digital Music," U.C. Irvine, Graduate School of Management, April 2002.

Weekly Schedule

1. Opportunity Identification and Mobilization (4/4)

Review of course syllabus and policies

Key Concepts

- Where do opportunities come from?
- Why do some firms recognize the opportunity but not others?
- Why is recognition not enough?

Case (Oral)

Front Page (Ferguson, Ch. 1-8)

2. Diffusion and Adoption (4/11)

Key Concepts

- Moving from innovation to viable product
- Learning from early users
- Refining the concept until it's right

Readings

Lilien et al 1992 (reader)

Moore, Ch. 1-2

Lynn et al 1996 (reader)

OECD report (web-based)

Case (Written)

Broadband diffusion (handout)

3. Radical Innovation and Dominant Designs (4/18)

Key Concepts

- Resources for exploiting discontinuous change
- Building competitive advantage in a new industry
- Incumbent inertia vs. liability of newness

Readings

Utterback 1994 (reader)

Suarez & Utterback 1995 (reader)

Christensen 1997 (reader)

Case (Oral)

Atheros Communications (reader)

Assignment Due

Project proposal

4. Standards and Controlling Industry Growth (4/25)

Key Concepts

- How standards constrain product choices
- Promoting vs. adopting standards
- Standards as a barrier to competition

Readings

Ferguson, Ch. 9-11

Shapiro & Varian, Ch. 5-7,10

Case (Written)

Qualcomm's CDMA (hand out)

5. Product Architecture (5/2)

Key Concepts

- Reuse and leverage of technology across a family of products
- Versioning and price discrimination
- Planning the product family

Readings

Shapiro & Varian, Ch. 1-3

Meyer 1997 (reader)

Case (Oral)

Handspring (reader)

Assignment Due

Mid-term exam (handed out week 4)

Special Lecture (5/2)

On May 2 UCI will have a special guest lecture on IP policy. This is assigned to prepare you for the week 6 requirements.

Pamela Samuelson will speak on "Intellectual Property and the Public Interest," 5:30 p.m. Thursday, May 2, Monarch Bay B, Student Center. She is a professor at UC Berkeley and director of the Berkeley Center for Law and Technology. An expert on intellectual property law, she serves on the National Research Council's Study Committee on Intellectual Property Rights in the Knowledge-Based Economy.

6. Intellectual Property Protection (5/9)

Key Concepts

- Different types of formal IP protection
- Differences between formal and actual IP protection
- Allocation of rights between various parties.

Readings

IP protection (web-based)
Shapiro & Varian, Ch. 4
Teece 1986 (reader)

Optional Readings

West 1995 (web-based)
Elias, pp. 16-20, 74-82, 212-220

Case (Written)

Digital Music (handout)

7. Alliances and Value Webs (5/16)

Key Concepts

- Role of complementary assets in adoption
- Attracting and incenting a supply of complementary assets
- Risks in supplying assets too early or too late

Readings

Reading: Moore, Ch. 4-7, conclusion
Reading: Shapiro & Varian, Ch. 8-9
Reading: Teece (reader) pp. 285-290

Case (Oral)

Red Hat Linux (reader)

8. Scenario Planning (5/23)

Key Concepts

- Foreseeing the unforeseeable
- Forecasting without point estimates
- Subjectively assigning objective probabilities

Readings

Porter (reader)

Case (Written)

Teledesic (reader)

Warning: This is an unusually time-consuming assignment

9. Science-based Innovation (5/30)

Key Concepts

- Commercialization of science-based inventions
- Research partnerships with universities and government
- Flow of knowledge between organizations

Readings

McMillan et al 2000 (reader)
Roth, Ch. 13, 15-20

Case (Oral)

Millennium Pharmaceuticals (reader)

10. Conclusion (6/5)

Assignment Due

Group project presentation