## MANAGEMENT 731: TECHNOLOGY STRATEGY
Spring 2010 (Quarter 3)

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Office hours: by appointment

### COURSE DESCRIPTION
The course is designed for students interested in analyzing and developing firm strategies in industries where technological innovations play an important role in creating and sustaining competitive advantage. It provides concepts and frameworks to help understand the interaction among firm strategies, technologies and markets. Students act in the roles of key decision-makers or their advisors and solve problems related to the development or maintenance of the competitive advantage of the firm in a given market. The first part of the course focuses on technology and industry dynamics. Next, we examine the strategic challenges and opportunities that firms face in competing with their innovations. Finally, we expand our analysis from firms to ecosystems and understand the key drivers of value creation and value capture in such interdependent value chains.

The course uses a combination of cases and conceptual readings. The cases are drawn primarily from technology-based settings. Note, however, that the course discussions are mainly based on strategic (not technical) issues. Hence, a technical background is not required for fruitful participation.

### EVALUATION
Class participation (30%)
Application project
- Project presentation (14%)
- Final paper (40%)
Feedback on another team's application project (16%)

### INDIVIDUAL RESPONSES TO THE DAILY POLL
For the first ten class sessions, there will be a survey poll posted on webCafé in the "Assessments" section. Everyone will be individually responsible for responding to the poll by 6AM the day of class. Answering the poll will not take much time beyond your normal preparation for the class. If you do not respond to the poll, I will assume that you have not prepared for class and will not call on you. Your participation in the online questionnaire will count towards your class participation grade.

### APPLICATION-PROJECT
The major assignment for the course is a team project that applies the concepts and frameworks learnt in the course to a specific episode of technology strategy in an industry. In keeping with the spirit of the class, the project will examine how firms choose to create and capture value from their technological innovations. I am open to studying both successes and failures. The more specific the innovation, the more narrow the definition of the market, the better. For example, it is better to focus on digital imaging than printing technologies; web browsers than internet application software; pacemakers than medical devices.

The projects will be evaluated on four dimensions: First, the insight offered by the analysis – does it go beyond describing what happened to shed light on the fundamental causes. Second, the quality of the analysis and how well it integrates the concepts developed in the course. Third, how relevant, useful, and well supported are the lessons and recommendations presented. Fourth, the readability of the paper and readers' access to the ideas presented.

## COURSE OUTLINE*

**Class 1: Course logistics; Understanding Technology (Thu 01/14)**
> Readings: (1) Sahal, D. (1981), "The Conception of Technology," Chapter 2 in *Patterns of Technological Innovation*, pp 15-30. (2) Rosenberg, N. (1982), "The Historiography of Technical Progress and "Technological Interdependence in the American Economy," Chapters 1 and 3 in *Inside the Black Box: Technology and Economics.*

**Class 2: Technology and industry dynamics (Tue 01/19)**
> Readings: (1) McGahan, Anita (2004). "How Industries Change." *Harvard Business Review.* 82(10): 86-94; (2) Utterback, James. (1994). "Dominant Designs and the Survival of Firms" and "Innovation and Industrial Evolution," Chapters 2 and 4 in *Mastering the Dynamics of Innovation*.

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*Complete Team Sign-Up by 7pm on 01/19 Via WebCafé and E-Mail*
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**Class 3: Technology positioning in emerging markets (Thu 01/21)**
> Case: E Ink in 2005 (HBS 9-705-506)
> Reading: (1) Foster, R. (1986), "The S-curve: A New Forecasting Tool," Chapter 4 in *Innovation, The Attacker's Advantage.* (2) Moore, G. (1999), "High-tech Market Illusion" and "High-Tech Marketing Enlightenment," Chapters 1 and 2 in *Crossing the Chasm.*

**Class 4: Technology positioning in existing markets (Tue 01/26)**
> Case: Hewlett-Packard: The Flight of the Kittyhawk (HBS 9-606-088)
> Reading: Christensen, C. (1997), "Value Networks and the Impetus to Innovate," Chapter 2 in *Innovator's Dilemma.*

**Class 5: Technology substitution (Thu 01/28)**
> Case: Kodak and the Digital Revolution (HBS 9-705-448)

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*Application project proposal due by 7pm on 01/28 Via WebCafé*
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**Class 6: Network externalities and standards (Tue 02/02)**
> Case: (1) DVD War (HBS 9-706-504), (2) Kenji Hall, "DVD Format Wars: Toshiba Surrenders," *BusinessWeek*, February 19, 2008.
> Reading: Shapiro, C. and Varian, H. (1999), "Networks and Posistive Feedback," Chapter 7 in *Information Rules: A Strategic Guide to the Network Economy.*

**Class 7: Complementary assets (Thu 02/04)**
> Case: Abgenix and the XenoMouse (HBS 9-501-061)
> Reading: Teece, D. J. (1986), "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy," *Research Policy*, 15(6): 285-305.

**Class 8: Technology licensing and creating markets for IP (Tue 02/09)**
> Case: Rambus Inc., 2005 (HBS 9-706-416)

**Class 9: Business ecosystems (Thu 02/11)**
> Case: HTC Corp in 2009 (HBS 9-709-466)
> Reading: Moore, J.F. (1993), "Predators and Prey: A New Ecology of Competition," *Harvard Business Review*, 71(3): 75 - 86.

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* Please note that slides will be posted after each class in the webCafé room set up for this course.

**Class 10: Technology evolution and ecosystems (Tue 02/16)**
        <u>Case</u>: The Global Electric Car Industry (SM-175)
        <u>Reading</u>: Adner, R. 2006, "Match your innovation strategy to your innovation ecosystem," *Harvard Business Review*, 84(4) 98-107.

**Class 11: No Class – work on completing your application project (Thu 02/18)**

**Class 12: Project Presentations (Tue 02/23)**

**Class 13: Project Presentations (Thu 02/25)**

> *Feedback on another team's application project due by 7pm on 02/28 Via WebCafé*

**Class 14: Wrap-up (Tue 03/02)**

> *Final paper due by 7pm on 03/07 Via WebCafé*