Georgia Tech Ernest Scheller Jr. College of Business

MANAGEMENT 3663: TECHNOLOGY STRATEGY
Time and day: MW 12:05-1:25pm. Class: 202

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Course Website:	t-square.gatech.edu

Faculty profile: http://scheller.gatech.edu/news_room/news/2013/articles/marcoprofile.html

Course materials

All required cases (except for three cases, which are available on T-Square) can be purchased through a course packet available at https://cb.hbsp.harvard.edu/cbmp/access/32269780. Other material such as news articles, papers, or book chapters will be available in electronic form through the course website in T-Square.

Course Description

Just like financial and human resources, technology has critical importance in organizations, and the management of technology is a basic business function. Just as we need financial or human resource strategies, organizations need to develop a technology strategy, which serves as a basis for the overall company strategy.

In this course, technology strategy will be studied by analyzing the economic and strategic factors that guide – or should guide - firms' decisions regarding the generation, commercialization, protection, and adoption of technological innovations. The emphasis is on the development and application of economic and strategy tools which are critical for insightful long term planning when deciding the sources of innovation (internal vs. external), how much to invest in internal R&D, whether to seek intellectual property protection, whether to develop and commercialize an invention in house or sell it through arm's-length licensing contracts, or other cooperative strategies such as joint ventures or the sale of a technology-based firm's equity. Technology markets are analyzed from both a seller's and buyer's perspective. Internal technology commercialization may entail the exploitation of first mover advantages or specialized downstream capabilities. Other topics covered include the analysis of situations, increasingly observed in several high-tech industries, where firms create and accumulate technological innovations without exploiting them directly, using them rather for technological negotiations with other firms or for preempting potential rivals from entering an industry.
We will use a combination of lectures, cases, readings, and several guests will be invited to discuss specific managerial issues.

Main Learning Objectives

To develop your capacity to **think strategically** about a company technology decisions related to how much to invest in R&D, how to protect and commercialize innovations, how to improve and sustain a firm's performance through the generation and adoption of technological innovations.
To build your skills in conducting strategic analyses about technology commercialization in a **variety of industries and competitive situations**, with particular focus on high-tech industries.
To give you **hands-on experience (through seminars with practitioners and the case study method)** in crafting a technology strategy that is integrated with the overall strategy of the company, reasoning

carefully about strategic options, using analytical frameworks to evaluate action alternatives, and making sound strategic decisions.

Outcomes

By accomplishing the learning objectives outlined above, you will leave the class with a greater appreciation for strategic issues in managing technology and innovation. These outcomes are valuable for students interested in technology-driven businesses, entrepreneurship and innovation, as well as consultants and senior executives, because they must make, or help to make, technology strategy decisions affecting the organization as a whole.

Course Structure

We will approach the class material in a variety of formats, especially the case analysis and the discussion with practitioners. Every week, with few exceptions, we will examine a topic with a lecture or case analysis during the Monday class, and a discussion with a practitioner during the Wednesday class. While required readings and occasional lectures will cover concepts, research, and theories relevant to the strategic management of technology, the bulk of the course is concerned with the application of these intellectual tools to real-world situations. Because the development of successful technology strategies is by necessity a collaborative process, we will model that process through our in-class case discussions. It is therefore absolutely essential that each person involved in this class contribute to the process. Accordingly, a significant portion of your final course grade will be based upon your contribution to each class discussion. You will have many opportunities to contribute and you'll be expected to contribute.

Case Analysis: Part of the class discussions will be organized around assigned business cases. They are designed to simulate many of the characteristics of decision making in the real world: there is too much information about certain areas, not enough about others, and there is little real guidance as to what is important and what is unimportant. The first stage in analyzing a case involves sifting through this mass of information to pick out the important patterns and issues. In doing this you will be guided partially by the formal analytic frameworks developed in this class, and partly on your overall judgment about the industry and firm – a judgment that formed by your critical thinking about the case as a whole. Because some important factors will only become obvious when we discuss the case together, you will need to strike a balance between focusing on what you consider to be the crucial points/facts in the case and making sure that you know enough about the other elements of the case to be able to follow the class discussion if it begins to veer into an area different from the one you anticipated.

Class Participation: Because much of this course is organized around case analyses and seminars with guest speakers, much of the action happens in class discussion. For this reason, a healthy part of your grade will depend on your participation in these discussions. Each student is expected to be an active participant in case discussions and to offer meaningful analyses and convincing arguments for the positions you stake out. Your grade on class participation is something to be earned by contributing your assessments and judgments to the discussion. You should therefore make a conscientious effort to be sufficiently prepared to make intelligent, timely comments regarding the managerial issues raised in the cases – this entails reading the assigned cases and preparing several pages of notes to the study questions.

Attendance: Obviously, if you're not in class, you're not able to participate. You also are also unable to learn from the classroom discussion, and insights gained in one case analysis and are likely to come in useful in subsequent ones. Consequently, attendance at all class is strongly recommended.

Communication: I will use both T-Square and the class group email distribution list to post information on class changes, upcoming assignments, grades, and the like. If you do not use your Georgia Tech email, I suggest that you arrange to have your GT email forwarded to an account that you do check often.

Midterm Exam & Final Project: We will have one individual midterm exam (which will require a take-home case write-up) and one group-based final project with in class presentation. These assignments will require an analysis of the current technology strategy of a company, a diagnosis of issues facing the firm, and a set of proposals for moving the company into the future. I will assign the case study and questions for the midterm exam, whereas for the final project groups can pick a subject of their choice, to be approved by the instructor. For the final project, you should organize into groups of 3-4 members (depending on class size). A one to two page **proposal for the final paper topic, including a preliminary list of source material, is due at the beginning of class on Wed March 25** (week after Spring break). **This proposal will be graded and is worth 5% of the final group project grade**. More details on both assignments will be provided later in the semester.

Academic Honesty/ Honor Code: The instructor and students of this class, as members of the Georgia Tech community, are bound by the Georgia Tech Academic Honor Code. The full text of the honor code may be found at http://honor.gatech.edu. Note that the acts that qualify as academic misconduct include, "Submission of material that is wholly or substantially identical to that created or published by another person or persons, without adequate credit notations indicating authorship (plagiarism)." Suspected cases of academic misconduct are investigated by the Office of Dean of Students.

Grading Components

Your course grade will be based on the following components and percentage allocations:

Component:	Weighting
Class Participation	30%
Midterm Individual (Take home) Case Write-up	30%
Final Group Project proposal	5%
Final Group Project Paper	25%
Final Group Project Presentation	10%
Σ =	100%

Sessions' outline, readings, and questions
MODULE I
COURSE OVERVIEW:

MODULE I
CREATING AND SUSTAINING A TECHNOLOGY-BASED COMPETITIVE ADVANTAGE

Week 1 **Capturing value through innovation**

Mon Jan 5

Case: **TiVo: Pioneering the DVR**
[Available on T-Square]

Questions: 1. What is TiVo Strategy? Does the company have a sustainable competitive advantage?

2. Evaluate TiVo's commercialization strategy related to the DVR. Is Tivo's business model conducive to success? What factors determine the extent to which Tivo can capture the returns from its innovation?

3. What should TiVo strategy be going forward?

Reading: Ceccagnoli, M., Rothaermel, F.T, 2007, "Appropriating the returns from innovation," Chapter 1 in Advances in the Study of Entrepreneurship, Innovation, and Economic Growth, Vol. 18. ***[Available through T-Square]***

Wed, Jan 7
No guest, e.g. no class today

Take-home assignment:

Read the following article: Intellectual property in the global economy, by L. Hallenborg, M. Ceccagnoli, and M. Clendenin ***[Available through T-Square]***

Week 2 **The role of IPR in profiting from new technology**
Mon Jan 12

Case: **The Lego Group: Publish or protect?** ***[Available through HBS coursepack]***

Questions: 1. How much know how should Lego Group share with its tool suppliers? How practical is it in reality to prevent spillovers?

2. How much of LEGO Group's process innovations are actually detectable? Easy to imitate?

3. How should LEGO drive and protect its platform?

Reading: Strategic Management of Intellectual Property: An Integrated Approach, by W.W. Fisher II and F. Oberholzer-Gee ***[Available through T-Square]***

Wed Jan 14
Guest speaker: Philip Burrus (former Chair of the Intellectual Property Section of the Georgia Bar);

Week 3 **Profiting from innovation by enforcing patents**

Mon Jan 19: No class due to Martin Luther King Day

Wed Jan 21

Guest speaker: Scott M. Frank (President and CEO, AT&T Intellectual Property Inc.)

Week 4 **"Stick" vs "carrot" licensing in platform-based industries**
Mon Jan 26

Case: **Rambus Inc.: Commercializing the Billion Dollar Idea (A)**
[Available through HBS coursepack]

Questions: 1. How does Rambus attempt to create value? Evaluate Rambus commercialization strategy.
2. How Is it likely that the market will "tip" to a Rambus standard? Why or why not?
3.What would you recommend that Rambus do next?

Readings: Understanding the licensing option, by D.J. Teece ***[Available through T-Square]***

Wed Jan 28
Guest speaker: Jackie Hutter (CEO, Evgentech, Inc.)

Week 5 **Profiting from technology through market intermediaries**
Mon Feb 2

Case: **Ocean Tomo: Building a Market for Intellectual Property**
[Available through HBS coursepack]

Questions: 1. What has prevented the emergence of a larger market for IP?

2. How has Ocean Tomo addressed these constraining factors? Are there any that have not been addressed?

Reading: A capital idea: The emerging market of intellectual capital, by M. Blaxill and R. Eckardt
[Available through T-Square]

Wed Feb 4
Guest speaker: Robert A. Moore (Managing Director and CFO, IPX International)

Week 6 **Open vs. proprietary business models**
Mon Feb 9

Case: **Linux vs. Windows** ***[Available through HBS coursepack]***

Questions: 1. Why has Microsoft been so successful with Windows?
2. Why have "Open Source Software" (OSS) and Linux been so successful? What are the advantages and disadvantages of OSS? Why do people contribute to OSS?
3. How great a threat is Linux to Microsoft ?
4. How should Microsoft compete against Linux?

Reading: The Art of Standards Wars, by C. Shapiro and H.R. Varian ***[Available through T-Square]***

Wed Feb 11
Guest speaker: Sanjay Parekh (founder and organizer of Startup Riot)

Week 7 **Take-home Midterm Exam**
Feb 16 and 18

Week 8 **In class discussion of Midterm Exam**
Mon Feb 23

Wed Feb 25
Guest speaker: David Reynolds (Partner at Venetia Systems).
Reading: "How Smart, Connected Products Are Transforming Competition," by Porter and Heppelman

MODULE II
INNOVATION AND CORPORATE STRATEGY

Week 9 **Innovation and diversification**
Mon Mar 2

Case: **easyGroup**
[Available through T-Square]

Questions: 1. How successful were the internet café, easyCar, and easyCinema businesses? Why?
2. How does the company leverage technology and intangible assets to increase firm performance in the internet café, easyCar, and easyCinema businesses?
3. What is easyGroup corporate strategy? Is it successful?

Reading: Strategic entrepreneurship: Creating competitive advantage through streams of innovation, by R.D. Ireland and J.W. Webb ***[Available through T-Square]***

Wed Mar 4
Guest speaker: Page Guillot, Global Director of Strategic Planning at The Coca-Cola Company

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Week 10 **Innovation and vertical integration**
Mon Mar 9

Case: **Nucleon Inc.** ***[Available through HBS coursepack]***

Questions: 1. What are your recommendations regarding the manufacturing of CRP-1 for Phase I and Phase II clinical trials? What are your recommendations regarding manufacturing for Phase III clinical trials and commercialization?

2. How would you justify your recommendation to would-be investors in the company? Develop a strategic and financial analysis of the alternatives.

3. What is your recommendation regarding Nucleon's long-term vertical boundaries? What should this company look like in 10 years (e.g., an R&D boutique, an R&D boutique with pilot scale manufacturing capabilities, or a vertically integrated manufacturing enterprise)?

Reading: Collaboration strategies, by S. Shane ***[Available through T-Square]***

Wed Mar 11
Guest speaker: Brent R. Bellows, Ph.D. (Partner, Knowles Intellectual Property Strategies).

Week 11 **No class: Spring Break**

Week 12 **Innovation and strategic alliances**
Mon Mar 23

Case: **P&G Connect & Develop**
[Available on T-Square]

Questions: 1. Weigh the benefits and costs of closed vs open innovation. What conclusions do you draw?

2. Do you believe P&G's C+D model has the potential to create a sustainable competitive advantage?

Reading: Open Innovation: A New Paradigm for Understanding Industrial Innovation, by H. Chesbrough ***[Available through T-Square]***

Wed Mar 25
Guest speaker: Ayana Johnson (Director, Innovation at Georgia-Pacific LLC)

Week 13 **Innovation and M&A**
Mon Mar 30

Case: **Intel Capital, 2005 (A)** ***[Available through HBS coursepack]***

Questions: 1. What is the role of corporate venture capital (CVC)?

2. Evaluate Intel's CVC strategy. What is your assessment of Intel Capital?

Reading: R&D meets VC: The promise of corporate venturing, by J. Lerner

[Available through T-Square]

Wed Apr 1

Guest speaker: Michael J. Zeto III (Director of Corporate Development and M&A, AT&T Mobility)

Week 14
Apr 6 and 8 **Work on group project**

Week 15-16 **FINAL PROJECT AND PRESENTATIONS**
