

Professor Jacquelyn Pless  
E62-479  
[jpless@mit.edu](mailto:jpless@mit.edu)  
Office hours: Thursdays 10am-12pm by appointment



**15.910 Innovation Strategy**  
Spring 2020, First Half (H3)  
E62-250  
Mondays & Wednesdays, 10:00am-11:30am

Teaching assistant:  
Evan Chapman ([chapmane@mit.edu](mailto:chapmane@mit.edu))

## Course Overview & Purpose

Innovation is vital for business success. It also has the potential to drive economic growth and improve quality of life. But innovation is hard. It's uncertain. And it's not always well-understood. What exactly does it mean to innovate? Can (and should) the pursuit of new ideas be managed? Are there strategies that work better than others under certain conditions when it comes to developing and commercializing a new technology or technology-based service?

This class is about demystifying “innovation”. The purpose is to develop rigorous yet accessible frameworks for the strategic management of innovation, with an emphasis on established businesses in high-technology industries. A central premise is that strategic innovation management can serve as a source of growth and competitive advantage, and that innovation has the potential to address—but is not guaranteed to solve—the world's most pressing economic and social challenges.

The aim of this course is to provide a solid foundation for students interested in managing innovation in high-technology industries. The course teaches you how to (1) ask the right questions about high-technology markets and organizations, (b) analyze the structure of, and develop strategies for, these markets, and (c) link analyses and strategy development to technology and innovation management. Key frameworks are developed through applications in a variety of industry and case settings, with a particular focus on those that are most relevant in today's changing economic and social landscape.

There is one formal prerequisite: Competitive Strategy (15.900). If 15.910 is your first strategy course, please contact the instructor prior to the second class. The course is designed to be particularly appropriate for those who anticipate taking positions as:

- A manager in a technology-intensive firm
- An engineer or scientist interested in a R&D/new product development career
- An analyst or investor in technology markets
- A management consultant whose practice focuses on technology-driven industries

## CLASS REQUIREMENTS, GRADING, AND DUE DATES

This class can only be taken for a grade. The grading is divided as follows:

- Class participation: 25%
- Two individual “two-pager” assignments: 30% (15% each)
- Final group project: 40%
- Group 360 evaluation: 5%

### Active Class & Group Participation (25%)

The nature of this course lends itself to active exchange and engagement among participants, both with each other and with the instructor. We encourage, value, and recognize in-class contributions. Effective class participation includes attendance, preparation, and making an active and constructive contribution to the class discussion.

- You cannot contribute without being in class. Thus, both lateness and absences will count against your in-class contribution grade. If you must miss a class, please let the TA (and instructor) know beforehand.
- You should be prepared for every class. This means reading the assigned readings in advance and thinking carefully through the discussion questions. If for some reason you are not prepared, please let the TA and instructor know before the start of class. It is still best to attend and participate if possible.
- The value and quality of this class depends critically on the quality and diversity of the discussion. Part of your contribution grade is based on your in-class comments. Both quantity and quality are relevant, and thoughtful, consistent contribution is ideal. Sharing your perceptions and ideas with others is crucial for learning and for understanding how the diverse opinions that you are likely to encounter in an organization are debated. In your jobs and thus also in this class, you will find yourself presenting and testing new ideas that are not wholly formulated and assisting others in shaping their ideas as well.
- You should be prepared to take some risks and be supportive of the efforts of others.
- We understand that participation in a large classroom setting is more comfortable for some than others. To ensure that those that flourish in small group settings also have the opportunity to earn sufficient credit towards their participation grades, we will also sometimes have small group breakout sessions in class, whereby students will be asked to team up with one or two classmates to work through a question or discuss an idea. Active participation in these discussions will count towards this portion of the grade, and reporting out to the larger group once your smaller group has a conclusive thought is also a useful way to contribute to the broader discussion.

### Two Individual “Two-Pager” Assignments (30% -- each worth 15%)

Students are required to submit two individual “two-pager” assignments. Each submission should be 1.5-2 pages typed and double-spaced using 12-point font with one-inch margins. The page limit is for text only. You may attach as many numerical calculations, tables, or diagrams as you wish, but the important insights from these should be reflected in the text. The objective is to demonstrate holistic knowledge of how the core lessons fit together to inform innovation strategy development. More detail will be provided on the assignment material closer to the due dates. Grading will be on a “high pass”, “pass”, and “low pass” basis.

### Final Group Project (40%)

Students should form groups of 3-5 participants for the final group project. The exact details of the assignment will be provided within the first two weeks of class. The goal will be to develop an integrated analysis drawing upon a comprehensive set of materials, frameworks, and lessons from the course. The paper should be 8-10 pages types and double-spaced using 12-point font with one-inch margins. The page limit is for text only. You may attach as many numerical calculations, tables, or diagrams as you wish, but the important insights from these should be reflected in the text. Each group will give a short presentation on the last day of class.

### Group 360 Evaluation (5%)

A Group 360 Evaluation (an evaluation by each group member of all other group members) for the final group project will be distributed during the final week of class. I strongly encourage you to form your groups early in the semester and to begin meeting regularly to discuss the material each week, even when you are not working on the group project. Working in groups will give you a chance to learn from your colleagues. It also provides an opportunity to discuss your ideas in a setting that mimics the approximate size of many management teams charged with decision-making tasks. These discussions also can help inform your thoughts for the individual “2-pager” assignments, although these must be written and submitted independently.

### **Deadlines**

**Individual “2-pager” #1: 11:59pm on February 18<sup>th</sup>, 2020**

**Individual “2-pager” #2: 11:59pm on March 1<sup>st</sup>, 2020**

**Final group project: 11:59pm on March 10<sup>th</sup>, 2020**

### **OFFICE HOURS AND TEACHING ASSISTANCE**

The instructor will hold office hours from 10am to 12pm on Thursdays throughout H3. Students are encouraged to take advantage of this time to meet with the instructor one-on-one or in small groups. It’s a good opportunity to ask questions that are not addressed in class or to talk through final group project ideas. Students must sign-up for meeting times in advance via Canvas—signing up in groups of 2 or 3 at a time is encouraged. You should also feel free to approach or contact the teaching assistant if you have any questions regarding the course or material.

### **MISCELLANEOUS**

Sloan values an inclusive environment. If you need a disability accommodation to access this course, please communicate with us early in the semester. If you have your accommodation letter, please meet with the faculty so that we can understand your needs and implement your approved accommodations. If you have not yet been approved for accommodations, please contact Student Disability Services to learn about their procedures. We encourage you to do so early in the term to allow sufficient time for implementation of the services/accommodations that you may need.

## Course Outline

### 0. Introduction to Innovation Strategy

What is Innovation Strategy? The Disruption Dilemma February 3

### I. Foundations: Creating, Delivering, and Capturing Value

Creating Value: S-curves and Industry Evolution February 5

Delivering Value: Demand Dynamics and Crossing the Chasm February 10

Capturing Value: Profiting from Technological Innovation February 12

Capturing Value from IP: Patents and Beyond February 18\*

*\* Note this class is on a Tuesday rather than Monday due to the President's Day holiday*

IP and Industry Standards February 19

First "2-pager" due by 11:59pm on February 18<sup>th</sup>

### II. Innovation in the 21<sup>st</sup> Century

Innovation Strategy in an Era of Open Innovation February 24

Platforms and Regulatory Strategies February 26

How is AI Changing Innovation? March 2

Second "2-pager" due by 11:59pm on March 1<sup>st</sup>

### III. Innovation and Social Progress

Social Impact and the Direction of Innovation March 4

Guest Speak on Systems Innovation – Energy and the Smart Meter March 9

### IV. Wrap-up

Short Group Project Presentations and Wrap-Up March 11

Final group project due by 11:59pm on March 10<sup>th</sup>

**Innovation Strategy  
Detailed Course Syllabus  
Spring 2020 (H3)**

**0. Introduction to Innovation Strategy**

**What is Innovation Strategy? The Disruption Dilemma**

**February 3**

Reading

Gans, J., 2016. "Keep Calm and Manage Disruption," *MIT Sloan Management Review*, 57(3), pp. 83-90.

(Optional) Supplementary Readings

Amabile, T., 1998. "How to Kill Creativity," *Harvard Business Review*.

Lepore, J., 2014. "The Disruption Machine," *New Yorker*.

Christensen, C.M., Raynor, M.E., and McDonald, R., 2015. "What is Disruptive Innovation?" *Harvard Business Review*, December, pp. 44-53.

Questions for Discussion

What is innovation? How can innovation drive advantage? What are the challenges in developing and commercializing innovation? What strategies can be employed for responding to disruption? What role does innovation play in your career, your companies, and society?

**I. Foundations: Creating, Delivering, and Capturing Value**

**Creating Value: S-curves and Industry Evolution**

**February 5**

Reading

McGahan, Anita. (2004). "The evolution of industries," *Harvard Business Review*.

"The S-Curve and its Strategic Lessons: What Curve are You On?" *Innovation and Entrepreneurship*, HBS Press, 2003.

Questions for Discussion

Companies must choose between different technologies to create value for consumers, but the evolution of technologies is uncertain. How should managers and firms choose among alternative technologies? How can they (and should they) forecast the evolution of technology, and how do their choices impact the evolution of technology? How does the technology choice impact customer choice and the firm's overall strategy? What are the key challenges in taking advantage of the process of changing technological performance over time?

## **Delivering Value: Demand Dynamics and Crossing the Chasm**

**February 10**

### Reading

Fernando-Cornejo, J., Caswell, M., 2006. "The First Decade of Genetically Engineered Crops in the United States," *USDA ERS Electronic Information Bulletin*, Issue 11. Read Summary and pages 8-14 only.

Hindo, B. "Monsanto: Winning the Ground War," *Business Week*, December 6, 2007.

### Questions for Discussion

The rate of adoption of different agricultural biotechnology products varies widely, and there are significant differences in adoption rates by crop type, genetic traits, and region. What are the key elements of an effective diffusion strategy for a new agricultural biotechnology product? Is there a "chasm"? How did Monsanto adjust their diffusion strategy as they learned more about this emerging market and technology?

## **Capturing Value: Profiting from Technological Innovation**

**February 12**

### Reading

CASE: Tivo 2007: DVRs and Beyond [HBS 9-708-401]

### (Optional) Supplementary Readings

Teece, David J., "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy," *Research Policy*, 15(6), pp. 285-306, 1986.

Gans, Joshua S. & Scott Stern. "The Product Market and the Market for "Ideas": Commercialization Strategies for Technology Entrepreneurs". *Research Policy*. Vol. 23 (2003) 333-350

### Questions for Discussion

How does the relative importance of appropriability and complementary assets change over the life cycle of an industry? What is the relationship between the concept of "complementary assets" and "barriers to entry"? What was TiVo's strategy during its initial years of operation? In what ways has that strategy succeeded and failed? What tools were most (and least) effective at allowing TiVo to appropriate the returns from its innovations?

## **Capturing Value from Intellectual Property: Patents and Beyond**

**February 18**

*\* Note: this class is on a Tuesday rather than Monday due to the President's Day holiday*

### Readings

Rivette, K., and Kline, D., 2000. "Discovering New Value in Intellectual Property," *Harvard Business Review*, January/February 2000.

“The Arms Race,” *The Economist*, October 20, 2005.

### Questions for Discussion

Intellectual property laws are intended to enable inventors to protect the knowledge embodied in their products. How well do they do the job? What avenues are available for protecting one’s ideas? How do you choose among intellectual property instruments to protect a new invention? How does the probabilistic nature of the patent system impact the effective strategic management of intellectual property?

## IP and Industry Standards

February 19

First “2-pager” due by 11:59pm on February 18<sup>th</sup>

### Readings

CASE: Qualcomm Incorporated 2009 [HBS 9-710-433]

### Questions for Discussion

What role do patents play in Qualcomm’s strategy? What about standards? Has Qualcomm been successful in using IP to capture value from its innovations? Why? How should Qualcomm balance its manufacturing business model with its technology licensing business model?

## II. Innovation in the 21<sup>st</sup> Century

### Innovation Strategy in an Era of Open Innovation

February 24

### Reading

Chesbrough, H., 2006. “Path to Open Innovation,” excerpted from *Open Business Models: How to Thrive in the New Innovation Landscape*.

### (Optional) Supplementary Readings

Thomke, S., and von Hippel, E., 2002. “Customers as Innovators: A New Way to Create Value,” *Harvard Business Review*.

### Questions for Discussion

While traditional innovation strategy approaches focus on internal factors and the nature of technology markets, the external innovation environment is just as important. Companies today are experimenting with a wider range of models for strategic management of innovation across firm boundaries to take advantage of open innovation. What are the advantages of more open versus closed innovation strategy models? How can one combine internal and external innovation efforts effectively? What roles do users play in the process of open innovation, and how can firms leverage users in their innovation strategy?

Reading

CASE: Uber: 21<sup>st</sup> Century Technology Confronts 20<sup>th</sup> Century Regulation [Stanford P-81]

(Optional) Supplementary Readings

Gawer, Annabelle and Cusumano, Michael A., “How Companies Become Platform Leaders,” *Sloan Management Review*, 49(2), pp. 28-35, 2008.

Questions for Discussion

The rise of multi-sided online platforms, such as Uber, Airbnb, and Facebook, create value by enabling interactions between multiple participants in a market. Why have multi-sided platforms become some of the fastest-growing businesses of the past decade? Where do profits come from? What role do network effects play? What are the pricing models made possible and what might be their impact on the traditional pricing model? What is Uber’s regulatory strategy, and how does it fit into Uber’s overall competitive strategy? Is Uber’s regulatory strategy the right approach in the U.S., and if so, why?

**How is AI Changing Innovation?**

**March 2**

**Second “2-pager” due by 11:59pm on March 1<sup>st</sup>**

Reading

Agrawal, A., Gans, J., and Goldfarb, A., 2017. “How AI Will Change the Way We Make Decisions”, *Harvard Business Review*.

(Optional) Supplementary Readings

Agrawal, A., Gans, J., and Goldfarb, A., 2017. “What to Expect from Artificial Intelligence”, *MIT Sloan Management Review*.

Agrawal, A., Gans, J., and Goldfarb, A., 2018. “A Simple Tool to Start Making Decisions with the Help of AI”, *Harvard Business Review*.

Questions for Discussion

Artificial intelligence (AI) has the potential to improve existing goods and services and enhance production efficiency. It also may change the nature of the innovation process, decision-making, and the organization of R&D. At the same time, AI and the “big data” that it relies upon bring a new host of challenges, such as data protection and privacy concerns. How is AI changing the role of technology in society? How is it impacting the way that people work and make decisions? In what ways is it, or can it, impact the way companies innovate? What opportunities and challenges might AI bring to the strategic management of innovation? In what industries might AI have the most and least impact in the short run and long run?



### III. Innovation and Social Progress

#### Social Impact and the Direction of Innovation

March 4

##### Reading

Collison, P., and Cowen, T., 2019. "We Need a New Science of Progress: Humanity Needs to Get Better at Knowing How to Get Better," *The Atlantic*.

##### (Optional) Supplementary Reading

"Climate and Energy Experts Debate How to Respond to a Warming World," *New York Times*, October 7, 2019.

##### Discussion Overview and Questions

Different kinds of innovations affect society in different ways, as not all innovations are created equal. Some contribute to social progress and improve quality of life while others may detract from it. How can innovation help us address the world's most pressing social challenges? What obligations do technologists, founders, and managers have to ensure that innovation serves the broader social good? What is the role of policy? Are there policies and regulations that address the gap between the social and private returns to innovation?

#### Guest: Tod Perry on Systems Innovation – Energy and the Smart Meter March 9

We will have a guest speaker, Tod Perry, to lead this class on systems innovation. He will discuss the energy innovation and commercial ecosystem—who are the players and what are their priorities? We will use the smart meter as an innovation and track its development and deployment as an example of why commercializing innovations can be challenging, especially in complex systems like the energy grid.

Tod is an international executive with a diverse background having held a variety of executive roles across different types of companies in the energy sector. His executive career has focused on leading small and large organizations to improve efficiency, performance, and profitability through a variety of people-focused, technology, and management interventions. Most recently, he was Director and Chief Operating Officer of OnlineDIRECT Limited, a small SaaS company serving the energy broker market in the U.K., where he led complete company transformation to focus performance on customer service and profitable growth. Prior to joining OnlineDIRECT, Tod held numerous positions at E.ON in the U.K., including Head of Sales and Head of Meter Operations. Prior to that, he worked at E.ON's headquarters in Düsseldorf Germany to help develop their investment strategy for technology scouting and initiated their corporate venture capital activity. He was also previously a Program Manager at the National Renewable Energy Laboratory, a Senior Researcher at Harvard Business School, and a failed entrepreneur! Tod has a Ph.D. in Engineering Sciences from Harvard, a B.A. in Biology and Chemistry from Earlham College, and he has completed executive education courses at the Harvard Business School and the European School of Management and Technology.

#### IV. Wrap-up

##### Short Group Presentations and Wrap-Up

March 11

**Final group project due by 11:59pm on March 10<sup>th</sup>**

##### Readings

No readings – final group project due!

In the final class, each group will give short “elevator pitch” style presentations of their final projects. The exact number of minutes allotted to each presentation will depend on the number of groups. More details to be provided closer to the date.

##### Questions for Discussion

Wrap-up questions: Reflect on the course and how the frameworks, core principles, and cases tie together. What are the most important innovation management and strategy lessons that you take away from the course? Relative to the first day of class, how has your viewpoint changed on the strategic management of innovation? How can these lessons be applied either to companies where you’ve worked in the past or where you’d like to work in the future?