

Professor Jacquelyn Pless  
E62-479  
[jpless@mit.edu](mailto:jpless@mit.edu)  
Office hours: TBD



## **15.910 Innovation Strategy**

Spring 2023 (H3 only)

E62-250

Mondays & Wednesdays, 10am-11:30am

### **Administrative Assistant:**

Ryan Harrington ([ryanharr@mit.edu](mailto:ryanharr@mit.edu))

### **Teaching Assistant:**

Stewart Peña ([stwartpf@mit.edu](mailto:stwartpf@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 are no formal prerequisites for this class, however it is helpful if you have taken (or are simultaneously taking) Competitive Strategy (15.900). 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

The grading is divided as follows:

- Class engagement: 25%
- Two individual assignments: 30% (15% each)
- Final group project: 40%
- Group 360 evaluation: 5%

### Active Class & Group Engagement (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. It also includes an online engagement component: **20% will come from in-class participation and 5% comes from the online engagement.** See the separate document on Canvas with online engagement details. Some things to keep in mind:

- 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, we will also have small group breakout, 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 Assignments (30% -- each worth 15%)

Students are required to submit two individual 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 3-4 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

First individual assignment:	12:00am on February 22 <sup>nd</sup> , 2023
Second individual assignment:	12:00am on March 6 <sup>th</sup> , 2023
Final Group Projects:	12:00am on March 15 <sup>th</sup> , 2023
Final Group Presentations:	In class on March 15 <sup>th</sup> , 2023

## **OFFICE HOURS AND TEACHING ASSISTANCE**

Students are encouraged to take advantage of this time to meet with me 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 so that you can get to know not just me but also your classmates, as there is plenty that you can learn from each other as well, and this is a good opportunity to talk about your group projects. You should also feel free to approach or contact the teaching assistant if you have any questions regarding the course.

The day and time of my office hours are TBD. We will post a Google sheet to sign up.

## **MISCELLANEOUS**

Sloan values an inclusive environment. If you need a disability accommodation to access this course, please communicate with us within the first week of class. If you have your accommodation letter, please meet with the faculty within the first week of class 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 Feb. 6<sup>th</sup>

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

Creating Value: S-curves and Industry Evolution Feb. 8<sup>th</sup>

Delivering Value: Demand Dynamics and Crossing the Chasm Feb. 13<sup>th</sup>

Capturing Value: Profiting from Technological Innovation Feb. 15<sup>th</sup>

Capturing Value from IP: Patents and Beyond Feb. 21<sup>st</sup>

*\* Note that Feb 21<sup>st</sup> is a Tuesday!*

**Guest Speaker:** TBD Feb. 22<sup>nd</sup>

*\* First individual assignment due 12:00am Feb. 22<sup>nd</sup>*

### II. Innovation in the 21<sup>st</sup> Century & Innovation for Social Progress

How are Big Data and AI Changing Innovation? Feb. 27<sup>th</sup>

Open Innovation March 1<sup>st</sup>

Public Sector Innovation Management and Policy March 6<sup>th</sup>

*\* Second individual assignment due 12:00am March 6<sup>th</sup>*

**Guest Speaker:** Dinesh Moorjani, Co-Founder of Tinder March 8<sup>th</sup>

CleanTech Innovation and Innovation Addressing Climate Change March 13<sup>th</sup>

### III. Wrap-up

Short Group Project Presentations and Wrap-Up March 15<sup>th</sup>

*\* Final group projects due 12:00am March 15<sup>th</sup>*

**Innovation Strategy**  
**Detailed Course Syllabus – SUBJECT TO CHANGE**  
**Spring 2023 (H3)**

**0. Introduction to Innovation Strategy**

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

**February 6<sup>th</sup>**  
**Class 1**

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 8<sup>th</sup>**  
**Class 2**

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

Feb. 13<sup>th</sup>  
Class 3

### 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

Feb. 15<sup>th</sup>  
Class 4

### 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

Feb. 21<sup>st</sup>

Class 5

*\* Note that this is a Tuesday*

### 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.

**Optional:** recorded lecture on innovation strategy analytics.

### 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?

**Guest Speaker:** TBD

Feb. 22<sup>nd</sup>

Class 6

*\* First individual assignment due 12:00am Feb. 22<sup>nd</sup>*

## II. Innovation in the 21<sup>st</sup> Century & Innovation for Social Progress

### How are Big Data AI Changing Innovation?

Feb. 27<sup>th</sup>

Class 7

### 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, but it also can 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?

## Open Innovation

March 1<sup>st</sup>  
Class 8

### Reading

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

**Case:** *Open Innovation at Siemens* by Karim R. Lakhani, Katja Hutter, Stephanie Healy Pokrywa, and Johann Fuller.

### (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?

## Public Sector Innovation Management and Policy

March 6<sup>th</sup>  
Class 9

*\* Second individual assignment due 12:00am March 6<sup>th</sup>*

### 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*.

### 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? How can they pursue this? What is the role of policy? Are there policies and regulations that address the gap between the social and private returns to innovation?



**Guest Speaker:** Dinesh Moorjani, Co-Founder of Tinder (and other companies)

**March 8<sup>th</sup>  
Class 10**

Dinesh is a seasoned CEO, entrepreneur and investor. He served as the Managing Partner at Comcast Ventures, and the founder & CEO of Hatch Labs Inc., where he built over ten mobile enterprise software and consumer companies from ground up. Dinesh cofounded Tinder (NASDAQ: MTCH) in 2012 and numerous other technology companies. Dinesh held leadership roles at IAC/InterActiveCorp and Samsung Electronics across the US & Asia. He cofounded Saffronart, a leading Sequoia Capital-backed global fine art marketplace and auction house, where he continues to serve on the Board. Dinesh spent his early career at AD Little, Mainspring (IPO in 2000, acquired by IBM 2001), and Goldman Sachs. Dinesh serves as a board director at numerous companies including Alight, SevenRooms, and Monet Networks. He also serves on various advisory boards including at American Express (NYSE: AXP), Assurant (NYSE: AIZ), and Warburg Pincus, the global private equity firm with \$58 billion of assets under management. He is an active faculty member at UCLA's Anderson School of Management and guest lectures at Harvard and Columbia. He serves on the advisory board of Harvard's California Research Center and Northwestern University's Farley Center for Entrepreneurship. Dinesh earned his B.S. in Chemical Engineering from Northwestern University and his MBA from Harvard.

### Reading and Video

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

**Optional:** recorded lecture on platform strategy.

### Questions for Discussion

Please come up with questions for our speaker in advance. He will gather questions at the beginning and answer them in order.

Some questions that might be of interest that relate to the recorded lecture and which might spark some ideas: 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?

**CleanTech Innovation and Innovation Addressing Climate Change**

**March 13<sup>th</sup>  
Class 11**

### Reading

IEA Clean Energy Innovation Flagship Report (July 2020) Executive Summary, which can be accessed [here](#).

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

["A crash course on climate change, 50 years after the first Earth Day,"](#) *New York Times*, April 22, 2020

## Discussion Overview and Questions

Why is clean energy innovation important today? What are some of the major challenges and barriers associated with it, and how do they differ from innovation challenges in other industries? Why does the government play such an important role for innovation in the energy sector? How can clean energy innovation be financed besides through the government, and does that differ depending on where the technology is on its technological or market S-curve?

### III. Wrap-up

#### Short Group Presentations and Wrap-Up

March 15<sup>th</sup>

Class 12

*\* Final group projects due 12:00am March 15<sup>th</sup>*

#### Readings

No readings for the last class – 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?