

15.385 Sustainability-Oriented Innovation and Entrepreneurship

Spring 2017, 9 Units, Tuesday and Thursday 2:30-4PM

Location: E51-376, 70 Memorial Drive, Cambridge, MA

Open to Graduate Students at MIT (undergraduates by permission of instructor).

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Course website: <http://stellar.mit.edu/S/course/15/sp17/15.385>

Overview:

Sustainability challenges - in physical domains like waste, water, food, energy, and mobility, as well as human capital domains like health and education - represent some of the most significant business opportunities of the century. Capturing these opportunities, however, will require significant innovation: not just in technologies and products, but also in processes, business models, and market infrastructures. What does it take to bring sustainability-oriented innovations (SOI) to market and to scale?

This class explores sustainability questions from the perspectives of entrepreneurs, corporations, and investors looking for both financial and social return on their investments. It uses a combination of case discussions, industry speakers, lectures, applications of frameworks, and a cumulative project.

Learning Goals:

Our intent for 15.385 is to provide you with a structured approach to innovation that creates business value while solving social and environmental problems. The frameworks and tools you learn in the course will be useful throughout your professional careers, as you:

- Identify and scope down social and environmental **problems** that are amenable to commercial innovation.
- Develop and analyze **value propositions** and **business models** that serve real customer/beneficiary needs.
- Evaluate and improve the **environmental and social impact** of innovations.
- Identify and engage **partners and investors** who can help propel an SOI forward.

Target audience:

15.385 is for masters-level students who have an interest in BOTH sustainability AND commercializable innovation. Your vantage point could be impact investing, entrepreneurship, or corporate R&D and business development. Recommended for students who have already completed 15.915 S-Lab if pursuing the Sustainability Certificate, but acceptable to take the courses concurrently.

Students do *not* need to come with a specific project you are pursuing, but ideally a vested interest in tackling a sustainability issue with a focus on innovation.

Course Requirements & Grade Weights:

- **Classroom Engagement (40%):**
 - **Participation:** Your active participation in the discussion in class is integral to your success in the course. Course projects will depend on peer input and feedback. Discussions of cases and conceptual material will depend on everyone's bringing their insight and experience to the table. We expect you to be fully prepared, to have read the cases and assigned readings and to participate fully in the discussion.
 - **Readings:** Participants will read a combination of analytic articles and company case studies drawn from a variety of different industries. All articles, class notes, slides, and other resources related to the course will be posted on the Stellar course website. Please check the site regularly. *There is no textbook for this course.*
 - **Attendance:** We have designed the class as an integrated whole and expect regular attendance. If you are forced to miss class, please alert the TA in advance. Absences will be counted against your participation grade.
- **Course project (60%):** Course projects will give you an opportunity to advance a sustainability-oriented innovation. Key milestones:
 - February 23rd: Team formation, problem formulation, and topic mapping (10%)
 - March 16th: In-class project pitch session (15%)
 - April 25th: Business model canvas/ frameworks submitted (15%)
 - May 11th: Final projects due (20%)

Course Projects

The final project is open-ended in terms of both topic and format. We recognize that some students will be coming to the class with product ideas, startup ideas, or impact investment theses, which you want help advancing and evaluating. Others will be interested in pursuing roles in corporate management or consulting where you can help advance SOI strategies, and may have target companies or industries you would like to engage to help them address their issues.

Projects will be carried out in teams of 3-5. If you have an existing team working on a startup or investment thesis idea, you should consider taking the class as a group, and/or you can enroll other members from among the 15.385 students.

To ensure balanced contribution, you will have the opportunity to assess your project teammates through a confidential online peer evaluation.

MIT Sloan values

Dr. Jay sits on the MIT Sloan Values Committee, and takes the values of our community seriously. This class adheres to the following norms:

- **Speak your mind**, bring your passion and beliefs and distinctive perspective to class, while also being **respectful** of others'.
- Be **on time** to class - tardiness disrupts everyone's learning experience and reflects poorly on our community to our guests. It will also affect your participation grade.
- **Laptops and mobile devices** draw everyone's attention away from the topic at hand. They should be used in class only when explicitly permitted for in-class exercises, otherwise they should be shut off and put away.
- We are passionate about **academic integrity**. By enrolling in this class, you agree to be bound by MIT policy which is well articulated. <https://integrity.mit.edu/>. We very strictly enforce these standards, particularly with respect to proper citation of web and other sources in your writing.

Detailed Syllabus: Session Topics and sequence

1. Introduction (February 7):

What does SOI look like in the real world? Who gets involved in SOI and what are their interests and objectives? We begin the class with a live case of MIT startup Spoiler Alert to help us understand the complex set of stakeholders involved in SOI.

Guest speakers: Ricky Ashenfelter & Emily Malina, Spoiler Alert

Readings:

Armen, Spoiler Alert case

Supplemental Reading:

Jay & Gerard, Accelerating the Theory and Practice of SOI, Executive Summary, pp 5-10

2. SOI theory 1 (February 9):

SOI is a big field. What useful distinctions can we make between different types and scales of sustainability-oriented innovation? We will discuss the different innovation processes involved in creating new products, processes, system infrastructures, business models, and institutions.

Readings:

Jay & Gonzalez, SMR Blog post 1

Jay & Gerard, Accelerating the Theory and Practice of SOI, Chapter 1. Conceptualizing SOI, pp 13-26.

Supplemental Readings:

Raworth, A Safe and Just Space for Humanity: Can we live within the doughnut?

Sterman, Sustaining Sustainability

Assignment:

Use the Google form to submit problems to address to help in team formation in the next class.

3. Social Problem Formulation (February 14th):

Intro to problem formulation. Identify issue domains of common interest, form teams, start framing problems.

Readings:

Astor et al, What Problem Are You Trying to Solve?

Shook, Toyota's Secret: The A3 Report

4. Project scoping and team formation (February 16th):

We will dedicate this class session to small-group exercises to help you develop ideas for your final projects, to connect with team members, and to draw out your current state of knowledge about the problem (“what I think I know”).

Readings:

Jay & Gerard, Accelerating the Theory and Practice of SOI, Chapter 5. Areas for Further Research, pp. 65-66.

Assignment for next class:

“What I Think I Know” mapping exercise due from each project team

NOTE: No class Feb 21 due to MIT holiday

Assignment 1: Team Formation & Mapping Exercise Due February 23rd (10% final grade)

5. Champion 1 (February 23rd): Voice of the System

A unique facet of SOI is the role of “public problem holders” - organizations and institutions dedicated to addressing a systemic challenge where the champion’s offering may be an important solution. What stakeholders would you need to engage for your issue? Who might be your allies, beneficiaries, detractors, and bystanders?

Readings:

Jay & Gonzalez, SMR Blog post 3

Supplemental Readings:

Meadows, Leverage Points

Jay & Gerard, Accelerating the Theory and Practice of SOI, Chapter 2

6. Champion 2 (Feb 28th): Voice of the Customer

The primary stakeholder that SOI champions must hold in mind is the customer. Who are the beneficiaries? Use market segmentation and persona thinking to identify the “customers” who have something to gain. We build on Bill Aulet’s Disciplined Entrepreneurship approach from the Trust Center for MIT Entrepreneurship.

Readings:

Jay, Jackson, and Chatterjee, DE Overlay

Assignment:

Voice of the Customer Canvas Section (informed by 24 steps questions)

7. Public/private problem solving (March 2nd)

We use a live case with a social entrepreneurial team to see what it looks like to understand customer needs, craft a value proposition, and go to market.

Guest & Readings: Live Case - TBD

Assignment:

Customer interviews

8. Crafting a sustainable value proposition (March 7th)

Solution ideation, design thinking, and prototyping to leverage innovation to address social issues.

Guest: TBD

Readings: IDEO Shopping Cart

Assignment:

Value Proposition Canvas (informed by 24 steps questions)

9. Business model creation and refinement (March 9th)

What are the resources and activities needed to deliver the value proposition?

Assignment:

Business Model Canvas - Activities and Resources section

10. Organizational vehicles for SOI (March 14th)

SOI can take place in established companies and startups; and in for-profit, non-profit, or for-benefit contexts. What are the pros and cons of these different venues? For SOI champions inside established corporations, how do we make the business case for our projects to internal stakeholders?

Readings:

Patagonia Yulex case

UN Global Compact: The value driver model

Assignment:

Business Model Canvas - Partners section

Assignment 2: In-class project pitch session of business plan canvas due March 16th (15% of Final Grade)

11. Business model canvas pitch in class (March 16)

Student teams will do short presentations to the class, summarizing their work to date, pitching their innovation and business model, and seeking peer support.

NOTE: No classes March 20th -31st due to Sloan Innovation Period & MIT Spring Break

12. Environmental Assessment (April 4th)

How can investors evaluate SOI impact on the environment, *a priori*, in the early stages of innovation? We examine the environmental tools landscape, from LCA to “Design for Environment” heuristics to systems thinking.

Readings:

Jay & Gonzalez, SMR Blog post 4

Jay & Gerard, Accelerating the Theory and Practice of SOI, Chapter 4

Houston, Rossie, Hilsaca, Review of environmental SOI tools

Assignment:

Business Model Canvas - Social Cost/Benefit

13. Social Assessment (April 6th)

How can investors evaluate SOI impact on social progress and human welfare? We look at the social tools landscape, including the Social Progress Index, systems thinking, and S-LCA.

Guest: TBD

Readings:

Benoit, Vikery-Niederman, Social sustainability assessment literature review

Supplemental readings:

Guidelines for Social Life Cycle Analysis of Products

Social Progress Initiative, Social Progress Index 2015, Chapter 1

14. Sources of Support 1: Impact/Angel/VC (April 11th)

How do SOI ideas launch from concept to successful business? How can SOI investors deal with the fundamental tension of focus vs. diversification? How can they get synergy across “impact investments” when there are diverse metrics of impact, limited deal flow in any one domain, and syndication risks for unusual investment strategies?

Guests: TBD (in 2016 this session included Sarah Kearney & David Miller)

Readings:

Assignment:

Elevator pitch as appropriate for actual business phase; investors, recruiting, friends/family

15. Sources of Support 2: CVC (April 13th)

How can corporations invest in SOI outside their walls through open innovation mechanisms with startups, including long-term purchase agreements, corporate venture capital (CVC), strategic investment, mergers and acquisitions? How do strategic investments fit in the space of SOI? How can David and Goliath dance?

Readings:

TBD

Guests: TBD (in 2016 this session included Steven Taub, GE Ventures, Edward Greer, Dow Ventures, Manvi Goel, Greentown Labs)

Note: No class on Tuesday, April 18th due to Patriot's Day holiday

16. Policy Engagement & Systemic Change (April 20th):

SOI projects and enterprises can create a market for their offering, and an advantage for their business, when they get involved in changing standards, policy, and other rules of the game to favor their solutions.

Guests: TBD (in 2016 this session included Jeremy Kirsch & Jim Kapsis, OPower)

Readings:

Chatterjee, OPower case

Assignment:

Policy barriers

Assignment 3: Business plan canvas due April 25th (15% of Final Grade)

17. Centers of Excellence (April 25th):

How do we systematically foster and accelerate SOI? What is MIT currently doing to be a potential SOI COE?

Readings:

Jay & Gerard, Accelerating the Theory and Practice of SOI, Chapter 3

Guests: MIT guests plus global CoE representatives

18. Sources of Support 3: Government (April 27th)

How to use the tools of government to advance SOI? In what ways can technology shape policy, and policy shape technology?

Readings:

ARPA-E case

Guests: TBD (In 2016 this included Michael Kearney)

NOTE: April 28th is the MIT Sustainability Summit, focused on Sustainability-Oriented Innovation. We would love to see 15.385 students there and can arrange volunteer opportunities.

19. Breaking Through Gridlock (May 2nd)

Sometimes engaging people requires overcoming entrenched mental models and conflicting interests. In this class we reflect on and rehearse conversations to break through these dynamics and build wider coalitions around an SOI.

20. Making the Business Case for SOI (May 4th)

Readings: TBD Live Case

Howard-Grenville and Hoffman, The importance of cultural framing to the success of social initiatives in business.

Assignment: Value driver model as it relates to topic

Office Hours for Final Project feedback from May 4th - May 10th

21. Strategic visions and simple rules (May 9th)

How can investors make decisions on SOI without time- and resource-prohibitive analysis? Use of the simple rules framework to organize strategic priorities and simple rules for tackling issues

Readings:

Sull, *Simple Rules* excerpt

Guest TBD

Assignment 4: Final Business plan canvas & project presentation due May 11th (20% of Final Grade)

22. Project presentations 1 (May 11th): Students present project outcomes and findings.

23. Project presentations 2 (May 16th): Students present project outcomes and findings.

24. Closing reflection (May 18th)