Healthcare Ventures Spring 2021
15.367/HST.978 Syllabus

Class Sessions Thursdays, 4-6PM; Monday Rec, 1-2PM, virtual

Class Description
Healthcare Ventures explores the process of early-stage healthcare venture creation and models the process of entrepreneurship, amid navigating healthcare's complexities. The course is an opportunity for those who seek careers at the intersection of healthcare innovation, medical technology startups, global health and healthcare venture capital. This course lends a taste of the process needed to discover, evaluate, and test new technologies and business models with broad potential to impact human health. Course content and process have taken principles from MIT Hacking Medicine, Product-Market Fit, Human-Centered Design Thinking, Agile Sprints, Business Model Canvas and tailored them to the complexities and tectonic shifts of healthcare, both in the US and globally. An emphasis will be placed on understanding the Business Models and Economic Buyers for your healthcare innovation while developing a plan to design and launch a product or service.

Outside Speakers
Over half of the classes will include outside speakers from startups, venture capital, healthcare systems, government, pharma and med tech. Past years speakers included Google Ventures, PillPack/Amazon, Sequoia Capital, MIT Engine Fund, Blue Cross, Bain Capital, IDEO, Aetna, Fidelity, True Ventures, Verily/GoogleX, GE Ventures, Langer Lab, HHS, Atrius Health ACO.

Action Learning Lab
This course is a graduate-level action-learning lab with a major objective of providing participants with a near real-world experience of testing early-stage healthcare venture design and pitching. Classmates and faculty mentors include a mix of Engineers/Scientists, MBAs, Physicians, and entrepreneurs from the Boston area ecosystem, and teams are formed in a way that leverages that diversity. Participants are expected to come ready to actively engage with their teams and to coordinate tasks in and out of class to build a case for their venture. During class sessions, participants will report on their progress and receive customized assignments and advice for work outside the classroom.

Most classes will have:
- Outside Speakers from Startups, VC, government and industry
- Faculty lectures on class topics
- Team breakout sessions.

Joining a Team formed in class around a Theme is Required
Startups are a team sport. Lone wolves don't make nearly as fast progress and cognitive diversity on a team will result in more informed decisions while teaching important leadership skills. Students will be assigned teams in the first class based on theme preference, background expertise, personality and the randomness of the Universe. In the pre-class survey you are asked to select up to three themes you would like to work on. Below there is a list of this year's themes. It will be instructive and fun even if the team disagrees, since most do. The true startup test is leading a diverse team under ambiguity, time pressure and not enough resources.

Pre-Requisites: None.

Website: https://www.mitling.org/HealthcareVentures/.

Required pre-class Survey for all participants
All participants must submit the pre-class survey by 9 AM on Wednesday, February 17, 2020 via https://bit.ly/HV-signup

Cross-registration website for Wellesley, Mass College of Art, & Harvard
For more info about cross-registration, please visit the MIT cross-registration website
https://registrar.mit.edu/registration-academics/registration-information/cross-registration.

Course Faculty

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TA

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Class 'Cloud' Drive: https://bit.ly/Drive-HealthcareVentures2021
Because of the community nature of the class, resources are NOT distributed through Stellar or Canvas (MIT's online course management system). All classroom resources are maintained out of a shared Google Drive folder, and obtaining access will be coordinated on an individual basis. Access can be requested via the link.

2020 Themes for Healthcare Venture Disruption

Teams will be formed at the start of the class by the faculty based on participants' backgrounds and experiences, personalities and theme preferences. After teams are formed in the early classes, you will begin by exploring large problems that can be addressed by digital transformation and the themes below and other macro trends driving healthcare redesign. In the second block, you will consider and test potential value propositions, and finally, in the third block, you will craft a business model and pitch. Teams will witness the development, challenges, and progress of the other teams attacking different areas of healthcare in the course at regular intervals. By the end of the course, students will have experienced best practices in identifying and validating health venture opportunities, amid the challenges of navigating the healthcare/disease mapping, team dynamics, and venture capital pitching process.

I. **Algorithmic + Virtual Care Models**

The first wave of telemedicine solutions did not solve efficient care models and the shortages of specialists, PCPs and nurses. Now we have multiple examples of virtual and algorithmic care businesses that prove convenient care can be provided at high efficiency and scale. TelaDoc, DirectDerm, NurX.com, Roman have each scaled to hundreds of thousands of satisfied patients. What are other specialties where we can take a large portion of the patient queue, virtualize that care, and only send the exceptions into the traditional waiting line?

- Complex, low-risk guideline care via app
- Address MD shortages, access issues, wait times, convenience
- NurX/Hims/Lemonade examples of care by app
- Specific disease states, e.g., migraine/headaches

I. **Hospital Unbundling**

Traditional procedures done in a hospital OR setting result in separate charges from the hospital and the physician. The shift to office-based procedures often results in more throughput and revenue for the doctor and lower overall costs due to the elimination of hospital charges. Which specialties and procedures could serve as a cluster to attack?

- Home Care Service
- Elder Care and Skilled Nursing Facilities
- Moving procedures out of the Operating Room and into Physicians Offices

I. **Attack a Giant Healthcare Franchise**

One of the best strategies for building a startup that can raise venture money is to threaten the existing incumbents of a giant segment. Often, healthcare regulations, Stark Laws, Trust, and ethics encourage or require a third party to provide a service that Pharma companies or physicians cannot. Pick one where customers or patients hate the experience enough to be engaged and even go out of their way to choose a credible startup:

- Kidney dialysis centers with next-gen home devices
- Psychiatry drugs with drug/app combinations
- Medicare Advantage business models

I. **Next-Gen Medical Devices**

New sensors, components, biometrics and the ubiquity of smartphones enable old medical devices and patient experiences to be reimagined. Take a big problem and attack the poorly designed and clunky medical devices out there.

I. **Emerging Market and Low Resource Healthcare Settings**

Most of the growth at large multinational pharma and med-tech companies has been driven by the growth in the middle class of emerging markets in China, India, and Latin America. Marked differences often exist in the cultures, trust in healthcare professionals, healthcare delivery infrastructure, and experiences demanded. Pick a country that one of the students knows well and go deep to re-design.

I. **Personalized Medicine**

Personalized medicine (PM) allows for adjusting medical treatments to the individual characteristics of patients. This requires a new understanding of people's unique molecular and genetic profiles that make them susceptible to certain diseases and responsive to specific treatments. Pick a patient population, disease or PM objective (risk assessment prevention, detection, treatment, diagnosis, management) or combination and change the way we think about it.

- Genomic biomarkers, new biometrics that changes Dx/Rx experiences
- Food as Medicine

I. **Cybersecurity, Fraud & Payments**

Providers and payers must comply with the privacy and security rules outlined in HIPAA, but healthcare cybersecurity threats continue to evolve. Complex and opaque medical billing processes are outdated and susceptible to fraud. How can new technologies be deployed to improve the healthcare cyberspace?

- AI-based security solutions to identify threats
- Intelligent network systems analytics
- Machine learning software for combining health data
- Blockchain powered health information exchange

Testimonials:

"Multiply Labs transformed from a research idea into a startup during Healthcare Ventures. The discussions with the mentors and the guidance of the class faculty were invaluable to shape our early business model. Most importantly, the class made us reflect deeply about the numerous and interconnected stakeholders in the US healthcare systems. The challenges that we identified during Healthcare Ventures have shaped the evolution of our startup until today - and many of the solutions that we converged to first emerged during the class!"
— Fred Parietti, PhD, Founder of MultiplyLabs

"The team behind Healthcare Ventures is dedicated to providing individualized guidance, both inside and outside the class. Despite being extraordinarily busy, every instructor was willing to take extra time to share feedback, brainstorm ideas, and open up their networks and experiences to us. Some of the most important strategic decisions we've made at Karuna were shaped by those conversations."
— Joe Kahn, Founder of Karuna Health, backed by VCs FirstRound, Slow Ventures, Founder Collective, Lerer Hippeau

"As a Harvard Master of Public Health student, Healthcare Ventures allowed me to bring my public health background and apply them to numerous healthcare startup ideas, adding evidence-based skills to the challenges of building viable healthcare businesses. The class was a phenomenal way for me to meet other students across MIT and Harvard who are passionate about healthcare."
— Jane Rho, Harvard Masters of Public Health 2020

"Healthcare Ventures brings together expert advisors and a cohort of passionate, intelligent colleagues to facilitate the venture creation process, a model that I've taken with me into my current venture. I come into the class from a graduate program with my own startup in mind, but the class made it into a reality."
— Andy Chen, Harvard Ph.D. 2019

Certificate of Accomplishment & Grading

All course participants will be given a signed certificate of accomplishment at the conclusion of the course. The certificate will be personalized with the student name, team name, and date. These will be presented on the final day of class.

Grades will be based on class participation, assignments, and team project.

- Attendance & Participation: 20%
- Team Projects: 80%
    - Assignments 20%
    - Two Advisory Panel Presentations: 2 x 15%
    - Final Team Presentation: 30%

Attendance

Because this class is an interactive, team-based course, regular attendance is mandatory. Sloan videoconferencing will be available for EMBA students and occasional use for other students that cannot attend a class in person. With the exception of Sloan students during SIP week, please contact the TA if you need to miss more than one class.

Expectations of Remote Students

Instructions can be found on the Drive (https://bit.ly/Drive-HealthcareVentures2021). Below are the standard Expectations of Remote Students at MIT Sloan which we will adhere to in Healthcare Ventures:

- Connect to the video conference meeting five minutes before class start time and to be entirely settled in a controlled environment by the beginning of the class meeting. Your calendar should be blocked off, your staff be made aware of this time, and considered equivalent to any meeting which cannot be interrupted.
- Set usernames to display your full name, program, and graduating year (e.g. John Doe, MBA21). Do this at the initial login prompt in the "Screen Name" field. If you have signed up for an account at https://mit.zoom.us, then it will get the information from your profile.
- Be present and attentive during class. Students who are engaged in other activities, unresponsive in the chat, disruptive to the class, or failing to meet any of these expectations will be put on a brief hold by the TA. A report will be sent to the staff whenever a remote participant is placed on hold multiple times in a single meeting.
- Maintain an uninterrupted video image of one's entire face throughout the duration of the class. Interruptions of a remote student's image are considered the equivalent of a local participant exiting the classroom or inviting distractions into the classroom. This includes poor framing, bandwidth, lighting, colleagues entering your office, driving while joining the meeting, and/or obstructions to a student's webcam. If you have a Lenovo and cannot enable your camera, please follow the steps in this support article on IT Support Guides.
- Interact with instructors and local participants through audio. The TA is not responsible for vocalizing your questions in class. S/he can draw the faculty member's attention towards your request.
- Direct all content-specific questions to the TA and technical support questions about your personal technology to Zoom (https://zoom.us/support).
- Do not operate a vehicle while attending class.
- Wear headphones, preferably with a built-in microphone.
- Report all feedback to the Improvement Survey.

Essential Reading References

- Biodesign: The Process of Innovating Medical Technologies 2nd Edition - Paul G. Yock et. al
- Disciplined Entrepreneurship - Aulet, Bill
- Four Steps to the Epiphany Blank - Steven Gary
- Venture Deals Feld - Brad
- The Lean Startup - Reis, Eric
- The 30 Best Pieces of Advice for Entrepreneurs in 2017: The most insightful and transformative pieces of advice we published on the Review in 2017, curated for your perusal and continued excellence. Relevant to everyone working in tech, not just founders http://firstround.com/review/the-30-best-pieces-of-advice-for-entrepreneurs-in-2017/#rt_u=1492537739_oaHDzo.

Additional materials will be shared in the Class Google Drive and customized for teams.

	Week #	Date	Topic	Homework o *Submitted by team, unless marked with a * indicating individual submission* o *Due Thursday 9a of the following week, unless otherwise noted*
	1	Thu Feb 18	Introduction and understanding needs to be solved	*Due Friday Feb 19 at midnight: ● Optional - Record a problem pitch and upload as per the TA *Due Sunday Feb 21 at midnight: ● Not Optional: Review the pitches from other class mates and indicated and indicate your top 5
	2	Mon Feb 22	Project selection	*Due: Tuesday Feb 23 at midnight: ● Rank your top 3 problems/projects
		Thu Feb 25	Stakeholders, Stakeholder Maps, and Value	● Read Reppening's "The Most Underrated Skill in Management" ● Work with your team to come up with 3 needs statements and do a draft stakeholder map for each need statement
	3	Mon Mar 1	Workshop needs statements and assessment of stakeholder value	
		Thu Mar 4	Interviewing and process mapping	● Conduct 8 interviews and refine stakeholder map based on what you learn ● Draft team charter
	4	Mon Mar 8	**No Class**	
		Thu Mar 11	Value proposition; benefits ladder; Decision Making Unit (DMU)	● Continue interviewing ● Create draft value proposition for each stakeholder
	5	Tue Mar 16	Workshop value props and DMU	● Create draft PPT for advisory board
		Thu Mar 18	Market Definition	● Finalize and practice Advisory Panel presentation PPT ● Finalize Team Charter
	6	Mon Mar 22	**No Class** *Will have office hours to review Advisory Panel presentations*	
		Thu Mar 25	Advisory Panel #1	
oduct	7	Mon Mar 29	Review the Advisory Panel feedback	● Upload a 1-pager with what was learned and changed,

				• update value prop and one or more solutions/products
		Thu Apr 1	Competitive Analysis	• Add two elements to main slide deck (advisory panel deck) 1. Competitive analysis 2. Three key questions to discuss with the faculty
	8	Mon Mar 5	Workshop Competitive Analysis	
		Thu Apr 8	Product market fit	• Prepare a draft presentation for the advisory board meeting, and include: - Refined stakeholder map; - 3 slides: hypothetical product, how your product fits value prop, validation from interviews
	9	Mon Apr 12	Workshop product market fit	
		Thu Apr 15	Structuring a Business Model to Support Revenue Generation	• Finalize and practice presentation for Advisory Panel #2
Understanding the Company	10	Mon Apr 19	**No Class**	
		Thu Apr 22	Advisory Panel #2	• Synthesize the feedback from Advisory Panel • Suggest one or more business models for your venture
	11	Mon Apr 26	Review Advisory Panel feedback; workshop priorities	
		Thu Apr 29	Business development and partnering	• Identify potential strategic partners and document why they are a good fit
	12	Mon May 3	Workshop each team	
		Thu May 6	Delivering on the promise: track results and reevaluate decisions	• What outputs and outcomes will your venture create? How will you know (measure)?
	13	Mon May 10	Workshop each team	

		Thu May 13	Path to funding; presenting and selling the business idea to investors	● Preparing and practicing presentation for final advisory panel
	14	Mon May 17	Advisory Panel presentation dry runs	
		Thu May 20	Final Advisory Panel	