Harvard-MIT Division of Health Sciences and Technology
HST.921: Information Technology in the Health Care System of the Future, Spring 2007
Course Director: Steven E. Locke, MD

HST.921/HST.922/HST.923/HST.924

Information Technology in the Healthcare System of the Future

Spring 2007

Steven E. Locke, MD

Course Director

Bryan Bergeron, MD

Co-Director

James Carter, MD

Co-Director

Jeffrey Blander

Co-Director

Daniel Sands, MD

Co-Director

Welcome!

Spring 2007 Course

HST.921: Information Technology in the Healthcare System of the Future

http://web.mit.edu/hst.921/www

Lectures: Thursdays, 3:30-5:00pm

Tutorials: Thursday, 5:15-6:30pm

Harvard Medical School, Medical Education Center (MEC) - 260 Longwood Avenue, Boston, MA

Agenda

- Welcome and Introductions
- Course Mission Statement
- Course Overview
  - Faculty, Students, and Sponsors
  - Lectures
  - Tutorials
  - Practicum – Projects and Final presentations
- FAQs
  - Registration & Credit
- Q&A

Mission Statement

The mission of this course is to empower students to critically analyze a current -- *or future* -- problem in health care, and working in teams, to develop a novel solution using information technologies.

Course Overview

Course Faculty

Steven Locke, MD

Associate Professor of Psychiatry, HMS;
Associate Professor of Health Sciences and Technology, MIT

James Carter, MD

Research Psychologist, Center for Clinical Computing at Beth Israel Deaconess Medical Center;
Instructor, HMS

Jeff Blander

Co-founder & Executive Director
Bienmoyo Foundation

Bryan Bergeron
President
Archetype Technologies, Inc.

Daniel Sands, MD, MPH

Director,
IBSG Healthcare;
Director of Medical Informatics, Cisco

Project Consultants

- Mirena Bagur
  - Principal, CONTeXO Consulting
- Liz Boehm
  - Principal Analyst, Forrester Research
- Sherri Dorfman
  - Founder, Stepping Stone Partners
- Gary Hirsch. M.S.
  - Consultant

Students

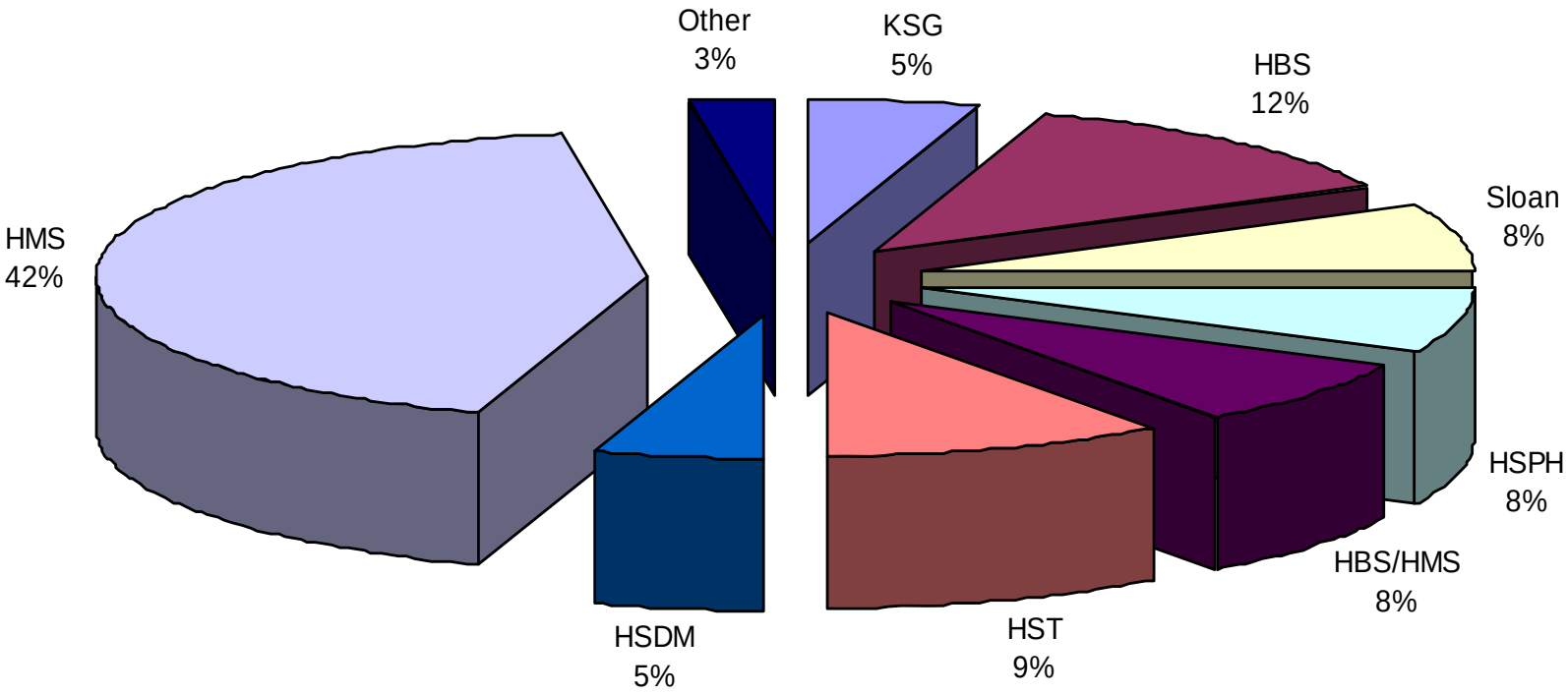
Harvard

- HMS
- HSPH
- HBS
- KSG
- HGSE
- FAS
- HLS
- Affiliated hospitals

MIT

- HST
- Computer Science
- Electrical Engineering
- Biomedical Engineering
- Media Lab
- Sloan School

Student Affiliations



Sponsors

Course Sponsors	HEALTHWAYS The Health/Care Trust Channel ™ Harvard Vanguard Medical Associates
Other Participating Organizations	• Archetype Technologies, Inc. • Center for Clinical Computing, Beth Israel Deaconess Medical Center • Veritas Health Solutions LLC

Technology-driven Healthcare

Speech recognition
OCR
LCDs
Security
DNA Mapping
ASP
Printers
Wireless
PDAs
Laptops
Cell Phones
Email
Internet

Technology

→

Custom drugs
Home monitoring
EMR
PHR
ePrescribing
Self-diagnosis
Disaster preparedness
Behavioral health services
Telemedicine
Disease surveillance

Healthcare Systems

Computer-assisted care

- Interactive informed consent
- Computer-based self assessment tools
- Evidence-based decision support tools
- Guideline-driven treatment algorithms
- Multimedia patient education at time of diagnosis
- Home-based monitoring of treatment response
- Home-based monitoring of side effects
- Patient-clinician e-mail

Computer-assisted care 2

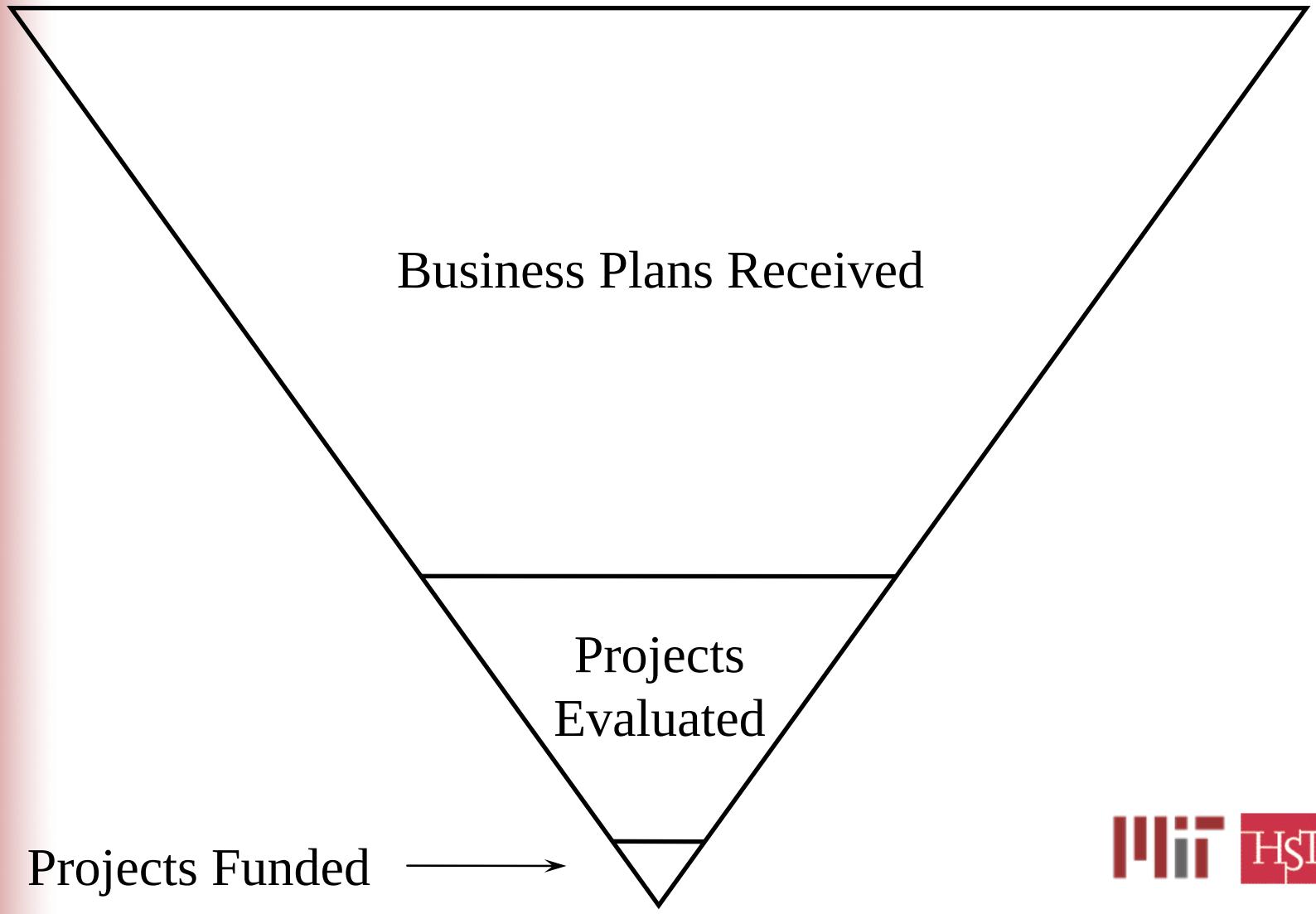
- Computer-assisted self-help Rx via IVR, Web
- Graphic reports to case managers and PCPs
- Automated alerts for adverse events
- Automated alerts for suicide risk
- Automated pharmacy reports
- Interactive patient education
- Tailored, patient education materials
- Interactive advanced directives

Many of our economy's greatest companies began as disruptive innovators

Intel	Merrill Lynch	Toyota
Sun Microsystems	Charles Schwab	Honda
Compaq	Bloomberg	Sony
Dell	AT&T	Barnes & Noble
EMC	Cisco	Amazon
Microsoft	Sprint PCS	Sears
Nucor	Nokia	Wal-Mart

Source: Christensen CM.

Venture Capital Deal Flow



Lectures

Date	Title	Faculty
Feb 8	Welcome & Course Introduction; History of Cybermedicine	Course Faculty; Warner Slack, MD
Feb 15	Telehealth: The Future of Healthcare	Joseph Kvedar, MD
Feb 22	Building the Health Informatics Chunnel: The PHR Meets the EHR	Daniel Sands, MD, MPH
Mar 1	The Future of Electronic Health Records	John Halamka, MD, MS
Mar 8	Creating High Impact Social Ventures for Global Health	Jeffrey Blander, MS
Mar 15	Convergence Informatics: The Future of Clinical Innovation	Keith Strier, JD, PAHM
Mar. 22	The Future of Enterprise Computing in Healthcare	John Glaser, PhD
Apr 5	Biomimetics, Robotics, and Embedded Systems in Healthcare	Bryan Bergeron, MD
Apr 12	Developing a Winning Business Plan	Eugene Hill, MBA
Apr 19	The Future of Disease Management	Steven Locke, MD
Apr 26	Interactive Multimedia in Healthcare	James Carter, PhD
May 3	Entrepreneurs Panel	Steven Locke, MD

Tutorials and Assignments

Date	Tutorial/Practicum 5:15-6:30		
	Title	**Faculty**	**Milestones**
Feb 8	Project Description and Overview	Locke, Yoo	Registration
Feb 15	Project Presentations and Discussion/Q&A	Locke and Faculty	Project Proposals Due
Feb 22	Project Team Meeting 1	Locke; and Faculty	Project Selections Due
Mar 1	Event Diagramming	Bergeron, Yoo	Reflection Paper 1 Due
Mar 8	Marketing Principles	Yoo, Blander	
Mar 15	Project Team Meeting 2	Faculty	Stakeholder Analysis Due
Mar. 22	Tour of Center for Medical Simulation	Faculty	
Apr 5	Project Team Meeting 3	Faculty	Project Track Review Due
Apr 12	Part I: The Elevator Pitch	Eugene Hill and David Ahern	Event Diagram & Porter Analysis Due
	Part II: Project Team Meeting 4	Faculty	
Apr 19	Classroom Simulation	Locke	Reflection Paper 2 Due
Apr 26	Project Team Meeting 5	Faculty	
May 3	Project Team Meeting 6	Faculty	Reflection Paper 3 Due

Entrepreneurs Panel

Bryan Bergeron, MD
Eugene Chan
Stephen Hau, MD
Daniel Sands, MD
Allan Guo, PhD
Mirena Bagur

Steven Locke, MD (Moderator)

Projects & Final Presentation

Group Design Projects

- Student, faculty or corporate sponsor driven
- Common elements for each project
- Track selection
- Group final presentations and paper

Common Elements

1. Objective of the group project
2. Proposed product or service solution
3. Industry summary
4. Analysis
    1. Problems with current solutions
    2. Competitive analysis
    3. Porter model
    4. Evaluation of macro-industry forces
    5. Micro-stakeholder analysis
5. Interaction diagrams
6. Reflection on cost, quality, and access

Project Track Selection

- Track 1: Marketing Plan
- Track 2: Business Plan
- Track 3: Product Design Plan
- Track 4: Clinical Trial/Product Evaluation

Each team chooses two out of four

Market Plan

1. Market Background
2. Future Directions of Market
3. Market Size/Forecast
4. Customers/Customer Segmentation
5. Target Market Segments
6. Product Description
7. Pricing
8. Promotion
9. Sales and Distribution Strategy

Business Plan

1. Partnering
2. Staffing Plans
3. Advisory Board
4. Risk Management (analysis of specific risks and address various scenarios)
5. Financial Projections and Resources Required
6. Near Term Milestones and Expenses
7. Long Term Projections

Product Design

- **The Product**

1. Product Definition and Goals
2. Product Requirements/Specifications
3. Expected Product Lifecycle
4. Product Add-ons, Third Party Tool Sets
5. Follow-on Products

- **User Profile (Differentiate from buyer)**

1. Job Description
2. User Skills, Knowledge and Education
3. Work Style
4. Concerns
5. Wants
6. Requirements
7. Work Environment

Clinical Trial

1. Rationale
2. Objectives
3. Study design and hypotheses
4. Participants
5. Intervention
6. Primary and secondary endpoints
7. Sample size (optional)
8. Anticipate time frame for study completion
9. Data collection; sub-protocols, intervals, encounters, events
10. Analysis

Example Projects

- Kurzweil Technologies, Inc.: Creating a Web Presence for Specialty Practices
- Institute of Cybermedicine/ABCD/HSPH: Development of Virtual Social Support Communities
- Institute of Cybermedicine: On line delivery of programs for parenting and/or child abuse
- MGH Anesthesia: Web-Based Specialty-Specific Residency Clearing House
- Pfizer Health Solutions: Web-enabling a mind/body program to manage high utilizing somatizing patients

Example Projects

- Johnson and Johnson: Breast Center manager Market Research/Roll-out in Europe
- Radiology.com Patientexpress(TM): - An internet service for personal management (storage & access) of medical images
- Harvard Vanguard Medical Associates: Techniques for Decreasing Medication Morbidity in the Patient with Sensory or Cognitive Impairments
- Emerald Solutions/IOC: Development of Strategy for a Secure Clinical Web Environment

FAQ's

- Course auditing
- Project selection
- Required readings
- Required paper
- School-specific credit
- Work load
- Attendance

Registration and Credits

MIT Students

Go to WebSIS (student.mit.edu) and follow links to pre-registration. Add HST.921 and HST.923 to your pre-registration.

Harvard Students

https://crossreg.harvard.edu/OASIS/CrossReg/index.html

Registration and Credits

	Grade	HMS	HSPH	KSG	HBS	MIT
Lecture						
HST.921	P/F	2	2.5			9
HST.922	Ordinal	2	2.5			9
Tutorial						
HST.923	P/F	2	2.5			3
HST.924	Ordinal	2	2.5			3
	Full Credit	4	5			12
	Half Credit	2	2.5			9

Handouts and Website

- Syllabus
  - Lecture topics and readings
  - Tutorial topics, readings and assignments
  - Mostly online
- Group design project tracks
- Website: http://web.mit.edu/hst.921/www

Questions and Discussion