NEW TOOLS BEGET REVOLUTIONS
BIG DATA IS A MEASUREMENT REVOLUTION

- Clickstream/Page views/Web transactions
- Web links/Blog references/Facebook
- Google/Bing/Yahoo Searches
- Email messages
- Mobile phone/GPS/Location data
- ERP/CRM/SCM transactions
- RFID (Radio Frequency Identification), Bar Code Scanner Data
- Real-time machinery diagnostics/engines/equipment
- Stock market transactions
- Twitter feeds
- Wikipedia updates
- Etc....

→ “Nanodata” and “Nowcasting”

BIG DATA IS A MANAGEMENT REVOLUTION

“I think we, as an industry, do a lot of talking... We expect to have open dialogue. It’s a culture of lunches.

Amazon doesn’t play in that culture. [It has] an incredible discipline of answering questions by looking at the math, looking at the numbers, looking at the data. . . .

That’s a pretty big culture clash with the word-and-persuasion-driven lunch culture, the author-oriented culture.”

- Madeline McIntosh, Random House’s President of Sales & Operations
OVERVIEW

15.572: Analytics Lab: Action Learning Seminar on Analytics, Machine Learning, and the Digital Economy

• Instructors: Professors Sinan Aral and Erik Brynjolfsson (plus project mentoring team)

• Schedule: Meets once a week in September and October
  - plus matching workshop in September and final presentations in December (dates TBA)

• Students from a variety of programs, including MBA, eMBA, SDM, LGO, Sloan Fellow, ORC, MSMS, EECS, Urban Studies
  - Admission via application, selected based on experience and/or coursework in data science
  - New in 2016, all MBAn students (required coursework)

• Organization: Student teams of 3-4 design and deliver a project based on the use of analytics, machine learning, large data sets, or other digital innovations to create or transform a business or other organization.
  - Many proposals are organizations affiliated with the MIT Initiative on the Digital Economy

• History
  - A-Lab 2014: 36 students, 10 projects
  - A-Lab 2015: 41 students, 13 projects
  - A-Lab 2016: 60 students, 15-20 projects (estimate)

EXAMPLES OF PROJECTS

1. **Big Data as a Service (Amazon)**: Develop demand forecasting of value to Amazon’s retail vendors (2014)

2. **The “Myth of the Crystal Ball”: Understanding Forecasting Errors at Amazon (Amazon)**: Quantify the impact of supply chain forecasting errors to better prioritize forecast improvements in the future (2015)

3. **Understanding Supply and Demand in the Boston Public Schools (Boston Public Schools)**: Use the BPS student dataset to generate hypotheses about what drives demand for schools in the Boston area, helping BPS to “right-size” school districts (2015)


5. **Understanding Successful eBay Sale Prices (eBay)**: Find the factors that best predict successful prices for new and used eBay items in different categories and under a variety of sales conditions (2015)

6. **Predicting Hospital Readmission (Dell)**: Find the factors that best predict 30-day hospital readmission (2015)
EXAMPLES OF PROJECTS (CONTINUED)


8. Identifying Fraud for an Online Gift Card Platform (Raise Marketplace): Develop an algorithm to help Raise classify transactions as fraudulent or legitimate (2015)


10. Using Geospatial Data to Develop a New Kind of Football Analytics (Telemetry Sports): Use a new source of geospatial NFL data to classify plays, evaluate players, and design football strategy (2015)


12. Predicting New Product Adoption for American Apparel (Zensar): Sponsor challenge: “We may have people with experience, wisdom, and opinions, predicting sales of a new line of jeans. Can we do better with analytics?” (2014)

A DEEPER DIVE – AMAZON (2015)

The “Myth of the Crystal Ball”: Understanding Forecasting Errors at Amazon

Challenge: Help Amazon quantify the impact of supply chain forecasting errors to better prioritize forecast improvements in the future.

Data: 75 million rows containing daily demand and forecast data for 206 thousand products over two weeks.

Analysis: Defined different kinds of costs associated with forecasting errors and their magnitudes. Used statistical methods in R running on a cloud computing system to quantify lost profit due to forecast error.

Recommendation: Incorporate indirect costs into the evaluation of forecasting errors. Look for variation across product categories.
SLOAN COURSES WITH ANALYTICS CONTENT

15.034 Metrics for Managers: Big Data and Better Answers (Doyle)
15.060 Data, Models, and Decisions (Bertsimas et al)
15.062J Data Mining: Finding the Data and Models that Create Value (Welsh)
15.071 The Analytics Edge (Bertsimas)
15.074J Predictive Analytics and Statistical Modeling (Welsh)
15.075 Statistical Thinking and Data Analysis (Rudin)
15.096 Prediction: Machine Learning and Statistics (Rudin)
15.320 Strategic Organizational Design (Malone)
15.339 Distributed Leadership Workshop (Ancona, Malone, Orlikowski)
15.376J Media Ventures (Pentland, Bonsen)
15.377J Linked Data Ventures (Berners-Lee, Kagal, Rae, Sturdevant)
15.561 Information Technology Essentials (Malone)
15.564J IT Essentials II: Advanced Technologies for Digital Business in the Knowledge Economy (Madnick)
15.567 J Digital Evolution: Managing Web 3.0 (Madnick)
15.567 The Economics of Information: Strategy, Structure, and Pricing (Brynjolfsson)
15.569 Leadership Lab: Leading Sustainable Systems (Senge, Orlikowski)
15.570 Digital Marketing and Social Media Analytics (Aral)
15.571 Enterprise Transformations in the Digital Economy (Rossa)
15.575 Economics of Information and Technology in Markets and Organizations (Brynjolfsson)
15.576 Research Seminar in IT and Organizations: Social Perspectives (Orlikowski)
15.578 Global Information Systems: Strategic, Technical, and Organizational Perspectives (Madnick)
15.579-15.580 Seminar in Information Technology (Madnick, Malone, Orlikowski)

HOW TO APPLY: SELECTIVE ADMISSION

• Open to Sloan MBAs, eMBAs, and other MIT graduate students

• Application available 12:00pm, May 2 through 12:00pm May 9 on digital.mit.edu/a-lab

• Notifications of admission decision will be sent in mid-May

• No bidding for 15.572 is necessary
CLOSING THOUGHT

“Technological progress is going to leave behind some people, perhaps even a lot of people, as it races ahead.

But there’s never been a better time to be a worker with special skills or the right education, because these people can use technology to create and capture value”

_The Second Machine Age, p 11._
QUESTIONS?

For questions about the course, please contact Susan Young susany@mit.edu

More information is also available at:

digital.mit.edu/a-lab (course site) and

http://stellar.mit.edu/S/course/15/fa15/15.572/ (MIT Stellar site)