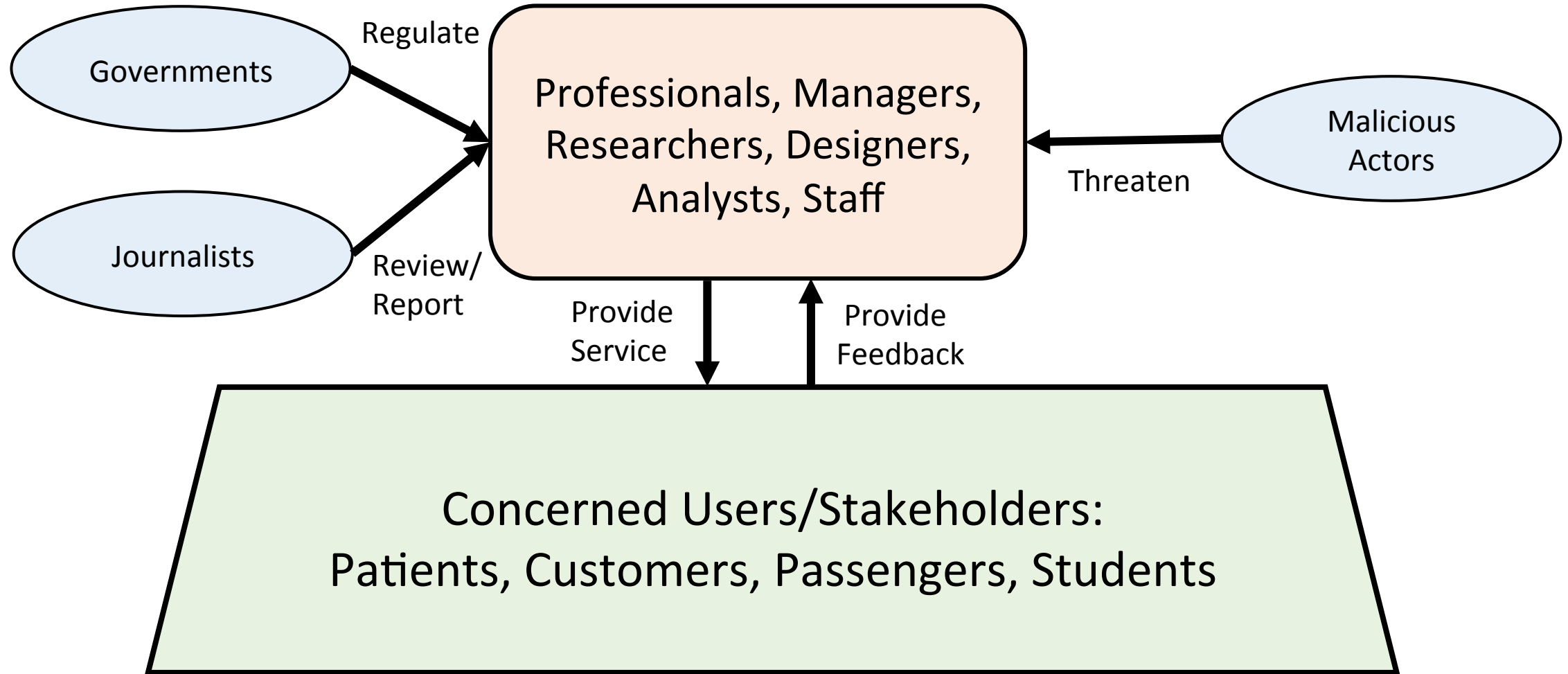# Design Tools for Governance in Cyber Social Systems:

Community Formation/Management, Deliberation, Conflict Resolution

Ben Shneiderman, August 28, 2016
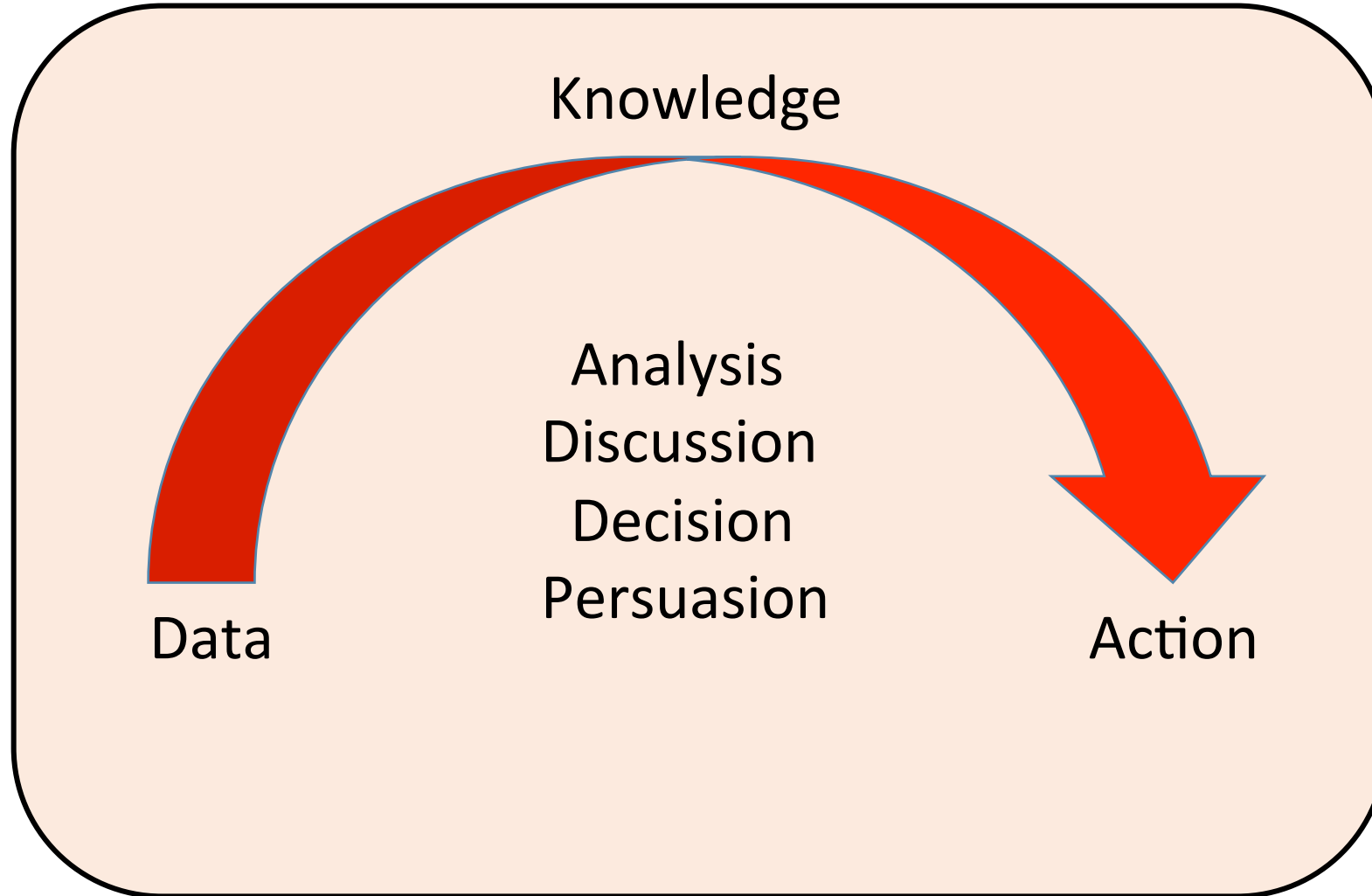
University of Maryland

CSS Framing Document

- Transform all major sectors of our society:
  - Healthcare delivery, education, community services, transportation,
  - Justice, civil rights, environment,
  - Homeland & international security, bio-security,
  - Business & commerce

- Novel syntheses of computer & information science & engineering with human & social sciences:
  - Human cognition and communication; collaboration & teamwork; mechanism design, including social reward & recognition;
  - Ethics; behavioral, social, and organizational design; behavior change; social psychology; practice culture; implementation science; complexity & network science;
  - Online community design; motivation & persuasion; behavioral economics; sociology; political science; humanistic thinking; ethnographic methods

Cyber-Social System Activities

Knowledge

Analysis
Discussion
Decision
Persuasion

Data

Action

Example CSS

Great successes

- Air Traffic Control System

- American College of Cardiologists

- World Wide Web: W3C, ICANN, etc.

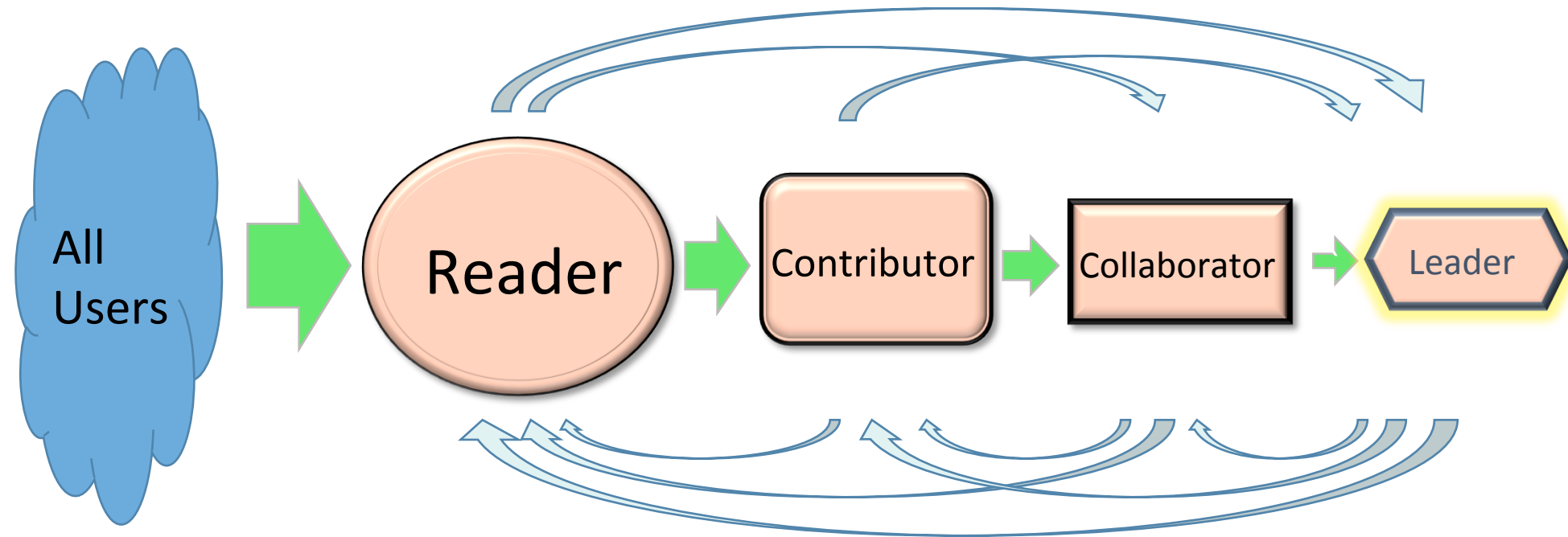- Linux/Apache, Mozilla, R, etc.

- Wikipedia

Example CSS

Great successes

- Air Traffic Control System
- American College of Cardiologists
- World Wide Web: W3C, ICANN, etc.
- Linux/Apache, Mozilla, R, etc.
- Wikipedia

BUT 98% failure rate

- NASA's EOSDIS
- NCI's CaBIG
- Open source projects
- Wikis

From Reader to Leader:
Motivating Technology-Mediated Social Participation

All Users → Reader → Contributor → Collaborator → Leader

Preece & Shneiderman, *AIS Trans. Human-Computer Interaction1* (1), 2009
aisel.aisnet.org/thci/vol1/iss1/5/

Governance Tools in Cyber Social Systems

1) Deliberative systems design

2) Large-scale teamwork monitoring systems
   - enable 1000+ people to work together towards a common goal.

3) Collaboration toolkits & remote teamwork

4) Online dispute or conflict resolution tools

1) Deliberative systems design

- How to engage with large numbers of people in:
  - Sharing ideas
  - Refining ideas into plans
  - Developing consensus
  - Obtaining & allocating resources
  - Getting commitment to shared goals

2) Large-scale teamwork monitoring systems

- Enabling 1000+ people to work together towards a common goal

- Assigning tasks (Linux-like strategies for posting tasks that members take on)

- Sharing of critical path diagrams to monitor progress

- Evaluating peers & mentoring for improvement

- Bug reporting schemes (e.g. Bugzilla)

- Repairing problems as they emerge
  (github-like posting of issues and closing them)

- Collecting guidelines for future use

MindTools
Essential skills for an excellent career

Toolkit

> **Leadership Skills** (59)
> **Team Management** (270)
> **Strategy Tools** (129)
> **Problem Solving** (40)
> **Decision Making** (49)
> **Project Management** (64)
> **Time Management** (61)
> **Stress Management** (61)
> **Communication Skills** (135)
> **Creativity Tools** (28)
> **Learning Skills** (48)
> **Career Skills** (174)

3) Collaboration toolkits

- Checklists
- Communications tools
- Shared documents, calendars
- Task lists & schedules
- Remote work support

The **Good** Project

Home   Projects   Toolkits & Curricula   Courses

teamworkprojects

#slack   Team communication for the 21st century.

21 tools that will help your remote team work better together
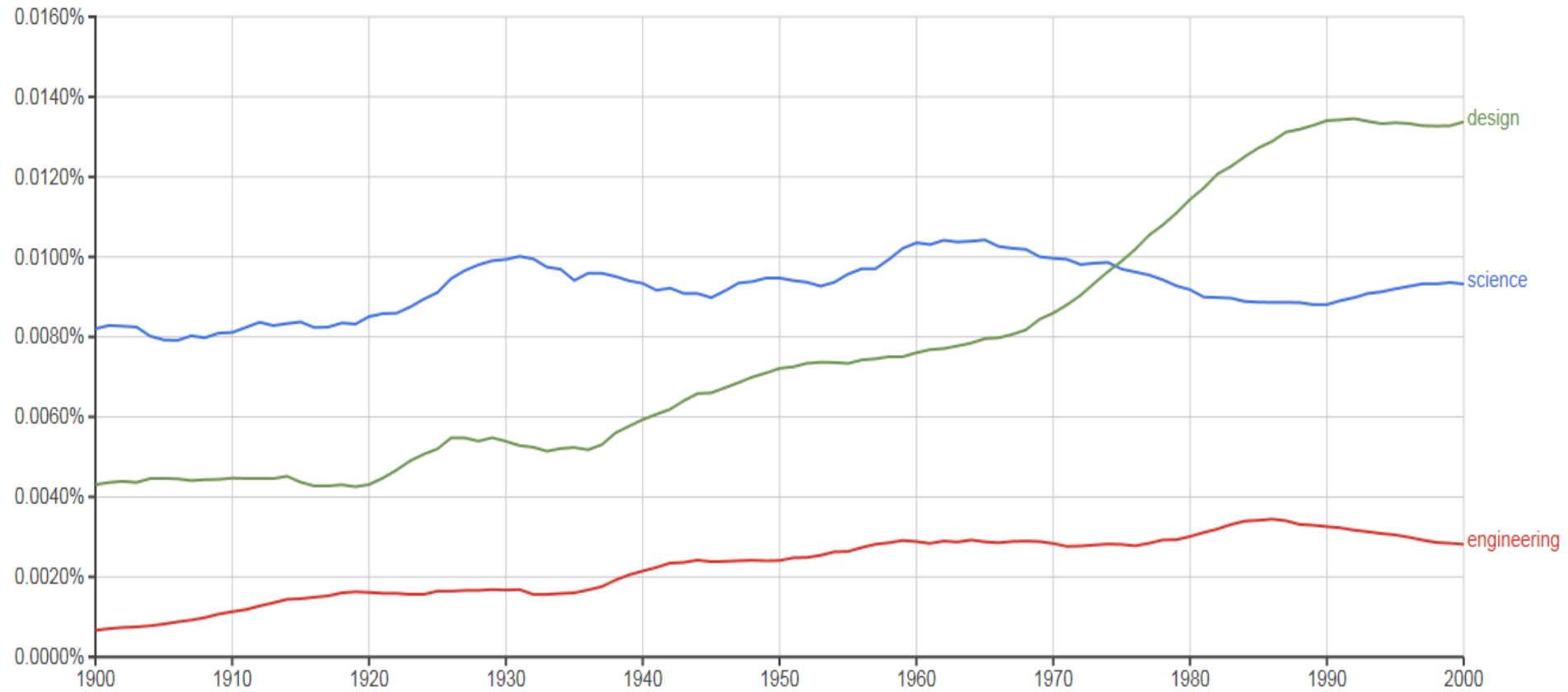
4) Online dispute or conflict resolution tools

- Ebay, PayPal, Amazon, etc.
- Online mediation services
- Modern Delphi methods

Science, Engineering & Design

- Scientific Method
  - Controlled Laboratory Tests
  - Reductionist Thinking

- Engineering Process
  - Iteratively refine prototypes
  - Guided by measurable criteria
  - Modular design, interdependent components

- Design Thinking
  - Challenge the goals/requirements
  - Empathize with users
  - Divergent/Convergent thinking
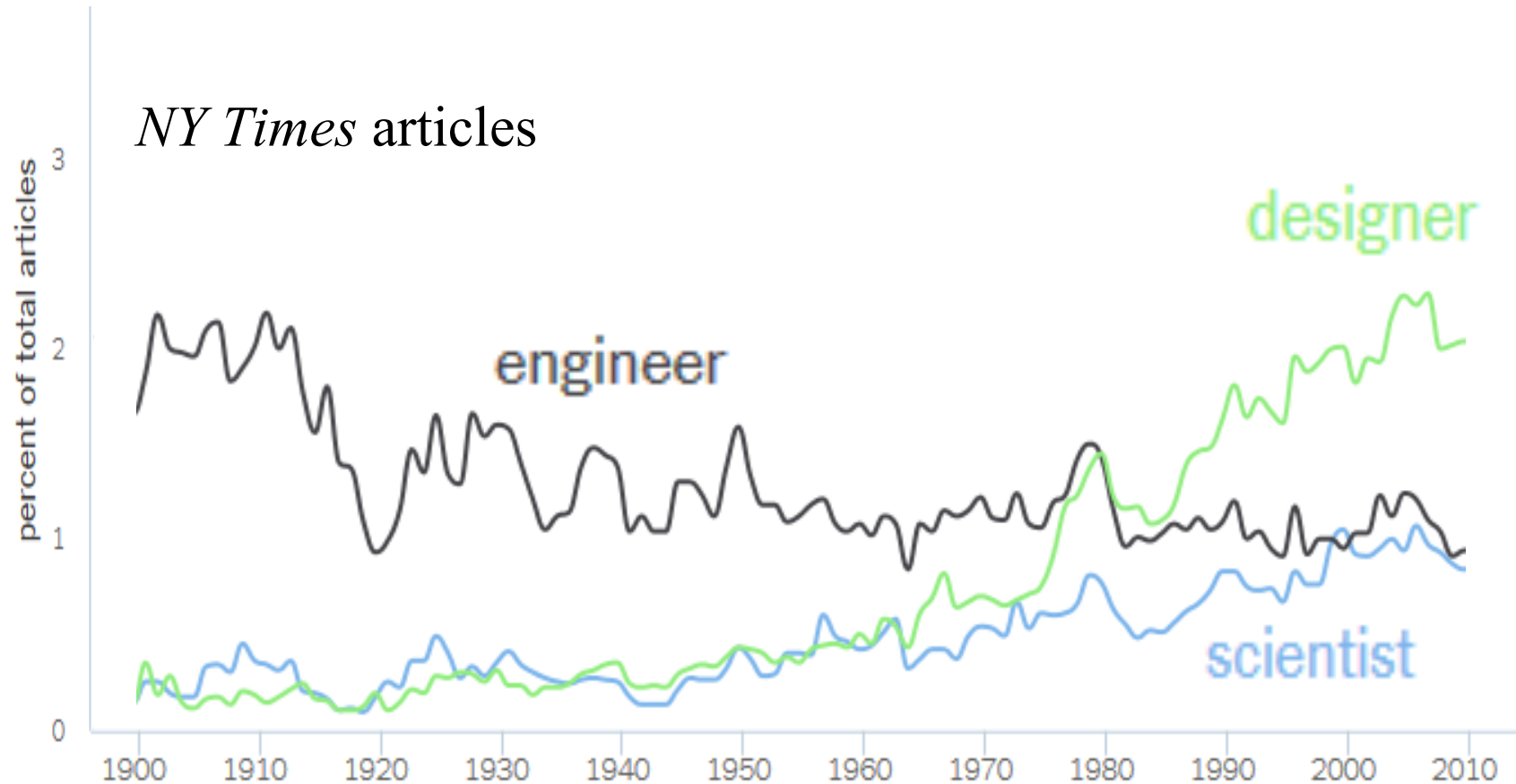 - Celebrate teamwork & diverse viewpoints

Science, Engineering, Design

Scientist, Engineer & Designer

NY Times articles

http://chronicle.nytlabs.com/

Applied & Basic Combined

- Teams that follow SED & ABC Principles
  are more likely to produce breakthroughs

- New collaboration technologies
  empower research groups

- Greater ambition
  to take on societal challenges
  - Healthcare delivery
  - Environmental sustainability
  - Energy conservation
  - Education, Housing, Transportation, …

Applied & Basic Combined

- Teams that follow SED & ABC Principles
  are more likely to produce breakthroughs

- New collaboration technologies
  empower research groups

- Greater ambition
  to take on societal challenges
  - Healthcare delivery
  - Environmental sustainability
  - Energy conservation
  - Community safety
  - Education, Housing, Transportation, …

OXFORD

THE
NEW
ABCs
OF
RESEARCH

Achieving Breakthrough
Collaborations

BEN SHNEIDERMAN

www.cs.umd.edu/hcil/newabcs