Industry-University Research Collaborations
Best Practices

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Motivation

T Project funded by the Cambridge Massachusetts Institute (CMI)

M "The biggest challenge does not lie in the supply of ideas from universities, but the ability of industry to take advantage from university research"

– Lambert Report on Business-University Collaboration

P "Building collaborative relationships with universities…is by far the best way to ensure they are responding to industry needs"

– Lord Mandelson

Drivers for Industry-University Collaborations

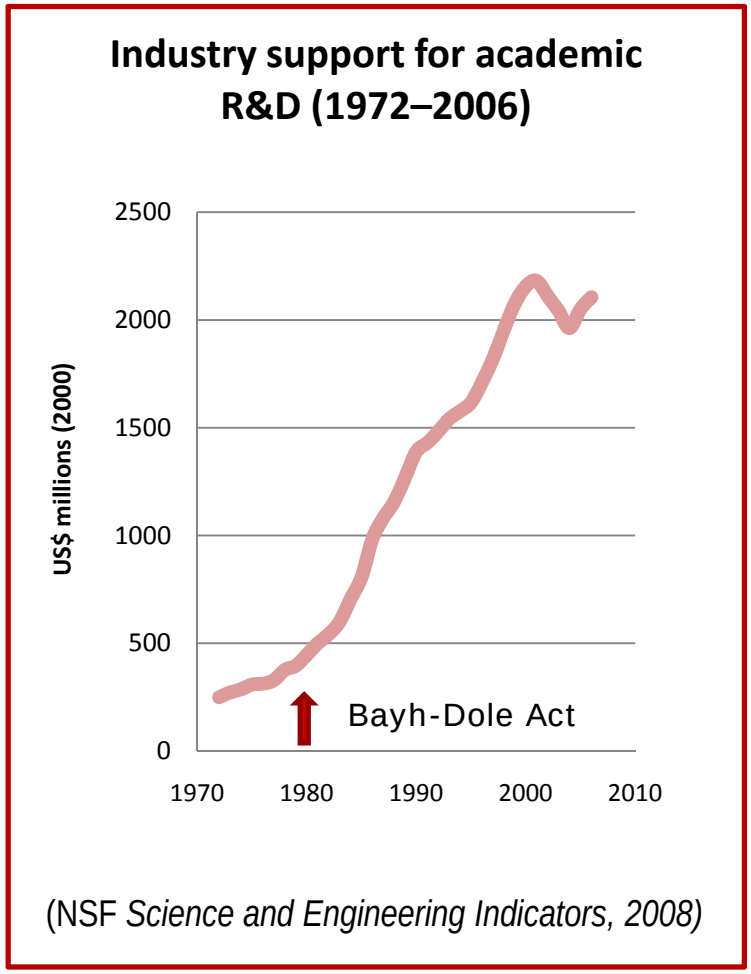
T Increasing difficulty for companies to do "all" necessary research

- Industrial R&D budgets remaining constant, but shifting to development (Office of Science and Technology Policy, 2008)

M Move towards ***open innovation*** paradigm (Chesbrough, 2003)

- Global view of R&D
- Ideas sought from outside the company
- "Reapplied with pride" just as important as "invented here"*

P More than 8 pieces of legislation in the U.S. (Bozeman, 2000)



* *FORTUNE*: Interview with CEOs Immelt and Lafley, 11/06

The Problem

- Industry often dissatisfied with its ability to extract value from university collaboration

> **Yield Rate:** "I would say realistically it's about 10-20%. We'd like it to be higher. There have been… [projects] where you'd think… *it would've gone somewhere but it didn't for whatever reason."*
>
> ***Project Manager***

- "The problem is on the demand side"

– Lambert Report (HM Treasury, 2003)

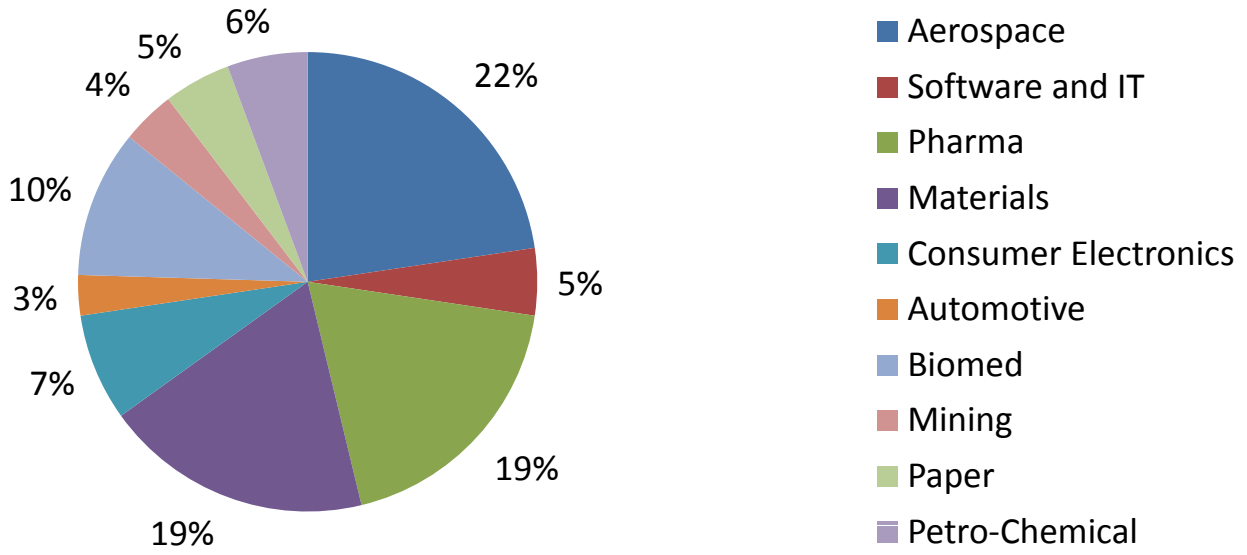
- Literature provides little on ***actionable practices***
  - Abundant information on the benefits, but not **on how to do it** (Perkman & Walsh, 2007)
  - Lack of systematic information on project selection criteria, management processes to achieve positive impact for company

Research Objectives

- Indentify, in a manner that can be acted upon, the ***best practices*** for industry-university collaborations
  - Project selection criteria
  - Collaboration management
  - Uptake of research results
- Expected research results
  - Better understanding of the collaboration dynamics
  - Go beyond the recognition of problem: provide actionable solutions

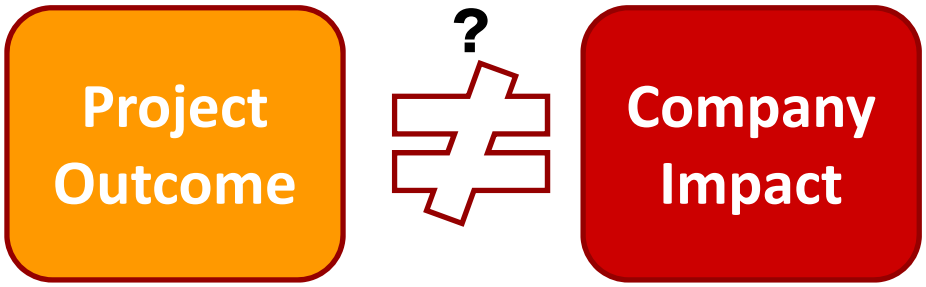
Methodology

- Case Study research with multiple embedded levels of analysis (Yin, 2009)
  - ***Why*** are companies dissatisfied?
  - ***How*** can we increase the *impact* of university research?
- On-site interviews in 25 companies with experience in collaborations



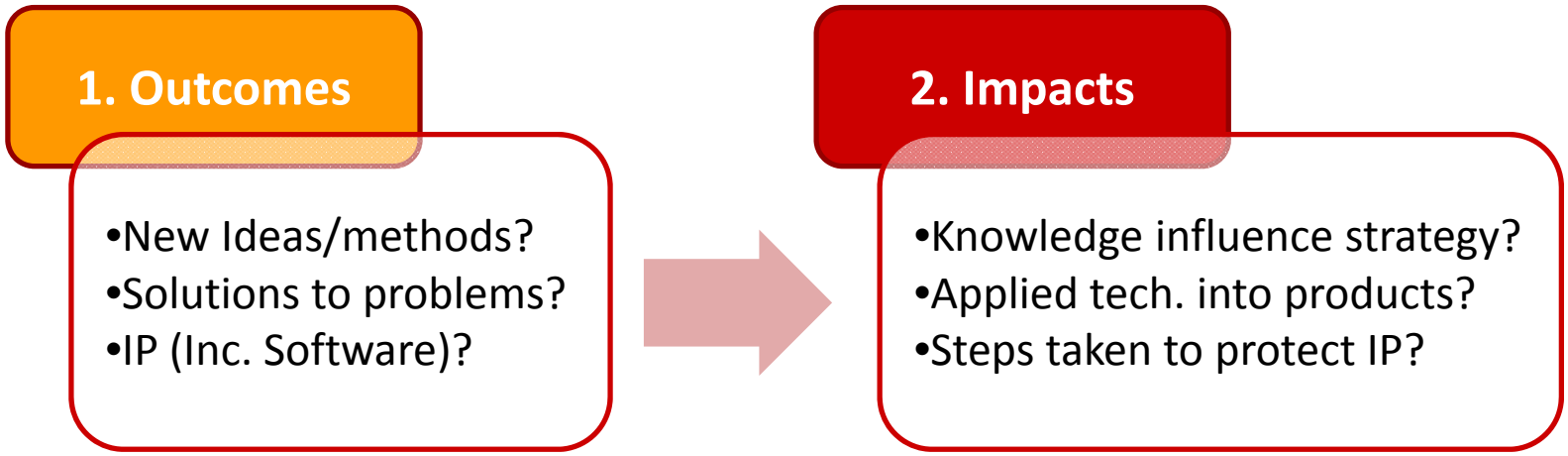
Research Framing

- Previous research is focused on collaboration **outcomes**
  - E.g. Patents, Publications, Licenses, Hires, etc. (Cohen et al., 2002)
- However, the success of a collaboration should be judged based **impacts** on company competitiveness
  - E.g. Tangible difference in products, processes, services, strategy



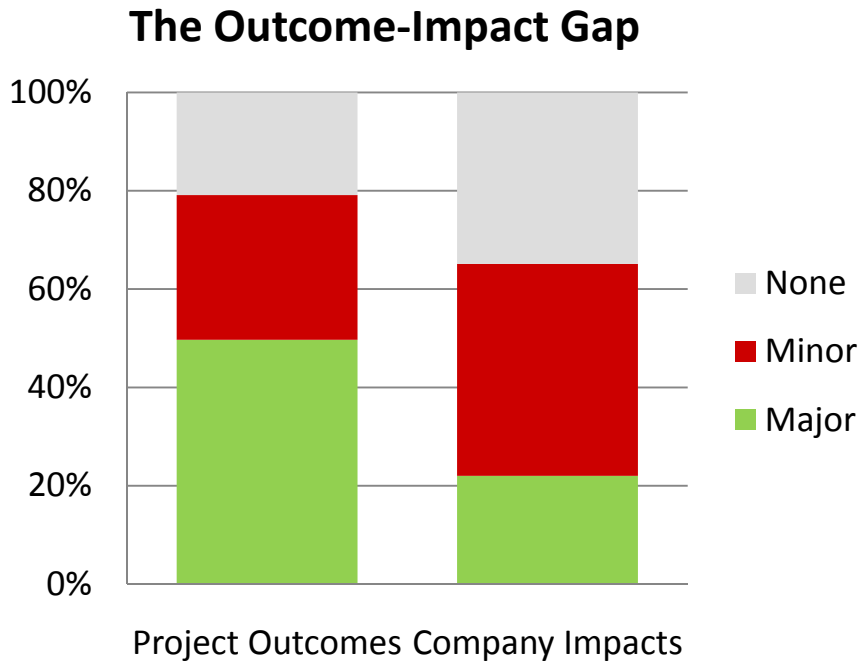
Collaboration Success Metrics

- Interviews with over 100 project managers , asked to evaluate:



- Interviews with senior technology personnel who coordinate university research activities
  - Independently judge the project manager's assessment

The Outcome-Impact Gap



Major Outcome

- Clear and significant potential benefit to the company
- Includes negative but useful results

Major Impact

- Observable and generally agreed upon positive impact on company's competitiveness or productivity.

Leading Research Question:

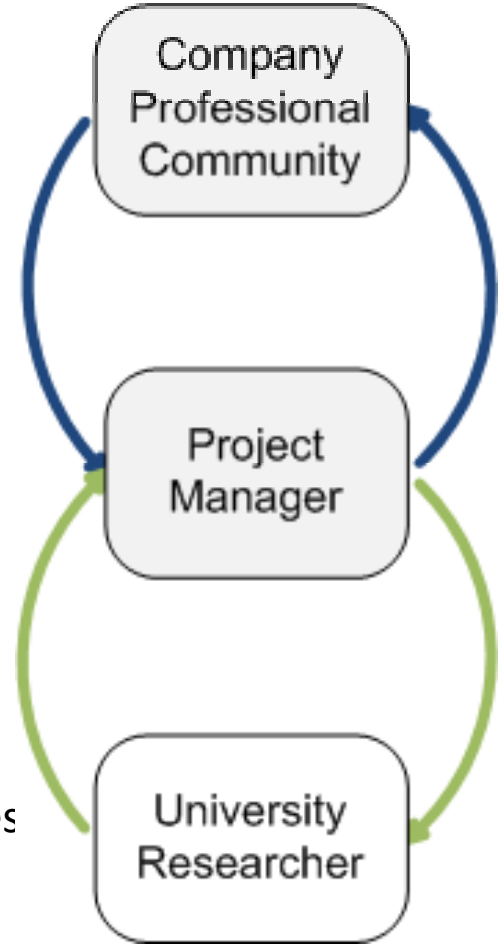
Why don't some research collaborations with interesting **outcomes** produce an **impact** on the company's productivity or competitiveness?

Defining Information for Closing the Gap

- Survey instrument composed of **closed** and **open-ended** questions
- Closed questions enabled **quantitative** analysis of practices
  - Activities/practices determined through interviews with managers of industry-university collaboration and literature
  - Practices organized into scales that capture collaboration attributes
  - Scales assessed statistically
- Open-ended questions to elaborate Case studies

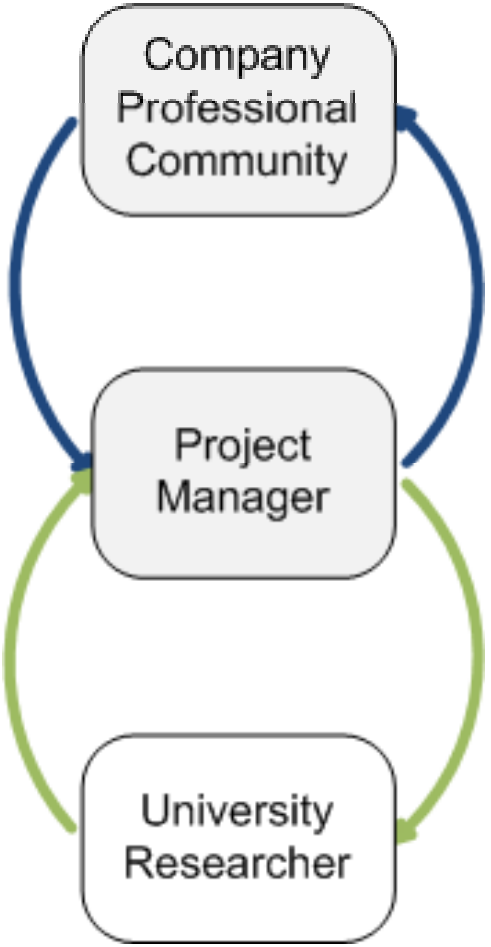
Example: Boundary Spanning Activity

- Boundary Spanning Activity (Allen, 1977)
  - Primary process through which knowledge is transferred across organizations
  - It is performed by key individuals ("boundary agents") who identify and communicate new information and ideas.
- Our hypothesis
  - The boundary spanning activity of the project manager will have a positive effect on the collaboration's outcomes and impact



Measurement of Boundary Spanning Activity

- Created a scale by asking project managers the frequency at which:
  - Brought the project up in conversation with other individuals involved in R&D
  - Solicited suggestions from technical professionals about how the project could better fit their needs.
  - Telephoned university researchers for unscheduled discussions.
  - Used project ideas or results in discussions about future company technologies
- In total, 7 activities that define a single practice
  - Cronbach's alpha = .831 -> scale is reliable
- Scale positively correlated with
  - Outcomes (r=.267, p<.05)
  - Impacts (r=.300, p<.001)



Other Practices (Attributes) Analyzed…

- Quality of Relationships
  - Trust, previous relationships, informal contacts
- Professional Networks
  - Communities of practice
- Communications
  - Frequency, type (email, face-to-face, etc), vocabulary
- Geography (proximity)
- Project Characteristics
  - Duration, Budget, founding sources
  - Number of people involved in project
  - Strategic alignment
- Company Policies
  - Champions, PM support, resources
- Approximately 100 questions related to practices

Data Analysis Results

- Analysis of data led to ***seven best practices*** for university-industry collaboration project managers
- Data show ***these specific practices*** contribute to closing the outcome-impact gap
- Taken together the practices provide ***a suite of actionable items to enhance project impact***

Seven Best Practices

1. Define the project's strategic context as part of the selection process
2. Select *boundary spanning* project managers
3. Share, with the university team, the vision for how the collaboration can help the company
4. Invest in long-term relationships
5. Establish a strong communication linkage with the university team
6. Build broad awareness of project within the company
7. Support the work internally both *during* the actual contract and *afterwards*, until the research can be exploited

Summary of contributions

- The ***outcome*** of industry-university research collaboration does not always lead to an ***impact*** for the company
- We described research to determine project management behaviors linked to ***the gap between outcome and impact***
- We presented **seven data driven *best practices*** to close this gap
- More information and case studies:

Pertuze, J., Calder, E., Greitzer, E., Lucas, W. "Best Practices for Industry-University Research Collaborations," *MIT Sloan Management Review*, Forthcoming July 2010.

Questions?

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