Increased Agility through Open Innovation

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INNOXEC

Education
- PhD (EE): Software, CS, Physics
- University Governance & Management

Engineer & Architect
- BNR Computing Research Lab (CRL)
- Nortel Disruptive Technologies
- SEI Visiting Scientist (CMU)

Portfolio Manager
- Nortel Disruptive Technology Program
- Qualcomm Learning Center

Research & Innovation Leadership
- Cisco Research Center
- HP Global University Programs
- Innoxec – Innovation & Collaboration

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Increased Agility through Open Innovation

Dennis Mancl
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MSWX

Education
- PhD (CS): Software
- lifelong learning in large and small software organizations

Technology Transfer experience
- Bell Labs – Software Technology Center
- C++ language, tools, and applications
- OO Design and Patterns, Requirements Models
- Legacy Software techniques
- Coaching agile development

Technical/Agile Portfolio
- OO Design Heuristics
- Agile practices for large companies
- Architecture in an Agile World

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Part I: Innovation

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Seminar Learning Objectives

- Increased awareness for value of:
  - open innovation
  - collaboration
- Share strategies and models for open innovation
  - context of company-university relations
- Increased understanding of mechanisms to foster and support company-university collaborations
- Increased agility for open innovation collaborations

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Anticipated Audience

- Individuals looking to learn more about open innovation and strategies to leverage university technology and talent relationships
- University researchers and staff looking for strategies to increase engagement with companies to calibrate and collaborate
- Leaders seeking strategies to grow their innovation ecosystem

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Innovation?

- *The process of translating an idea or invention into a product or service that creates value or for which customers will pay.*
- *To be labelled an innovation, an idea must be replicable at an economical cost and must satisfy a specific need.*

**Based on definition from BusinessDictionary.com*

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Approaches to Innovation: Collaborative or Competitive?

Collaboration
- Working together
- Shared resources
- "Open" network

Competition
- Working apart
- Limited resources
- "Closed" network

Are you a Collaborative Leader? Herminia Ibarra and Morten Hansen, HBR, Jul - Aug 2011.

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Innovation Examples

Products & Services	Fabrication & Delivery Processes	Marketing & Delivery	Business Models & Organizations
• Improve • Integrate • New Technologies • …	• Faster • Cheaper • Better Quality • …	• Create Need • Influence Need • Satisfy Need • …	• Partnerships • Revenue Models • Off-shoring • …

- Frederick Taylor (1856-1915)
  - Optimize cost-of-acquisition
  - "Scientific Management"
  - Train – supervise – measure
- William Deming (1900-93)
  - Optimize cost-of-ownership
  - Continuous improvement
  - Cooperation/collaboration

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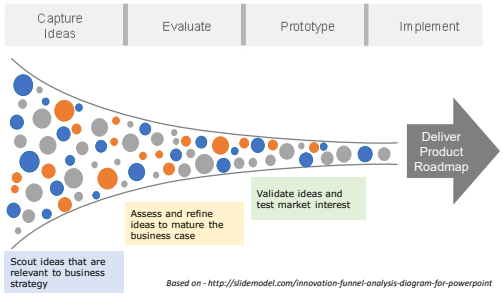
Innovation in the 19th and 20th Century: Cone of Commercialization



Based on - http://slidemodel.com/innovation-funnel-analysis-diagram-for-powerpoint

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21st Century Innovation

Global Innovation Chain:

- Intellectual Property – global governance
- Global talent – global mobility
- Searchable & Shareable – ideas, people, resources
- Libraries & Frameworks – simplify reuse & integration
- VC Funding – availability of "funding"

COVID-19

- Work-from-Home – Enforced by necessity
- Collaboration video* – WebEx, Skype, Zoom, …
- Collaboration support – Slack, GitHub, Standards, …
- Social change – Management, customers, etc.

**Being mindful to have "effective" meetings when necessary*

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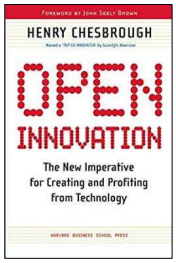
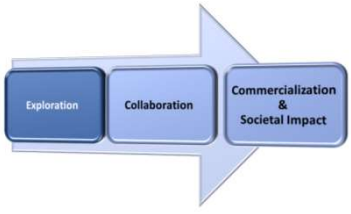
Open Innovation





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Traditional Innovation "Horizons"

Horizon	Innovation Focus
H1: 0-18 Months	Product Development
H2: 18-36 Months	Advanced Development
H3: >36 Months	R&D Innovation

The Alchemy of Growth, M. Baghai, S. Coley, D. White, 1999, NYC.

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Traditional Company Investments

Future: H3 Innovation ~10% Investment
- Create new capabilities and business models to disrupt markets and competition

Soon: H2 Innovation ~20% Investment
- Extend company's existing business models and capabilities to new customers and markets

Now: H1 Innovation ~70% Investment
- Incrementally create new capabilities and leverage existing business models

McKinsey's Three Horizons Model Defined Innovation for Years. Here's Why It No Longer Applies. Steve Blank, HBR, Feb 1, 2019

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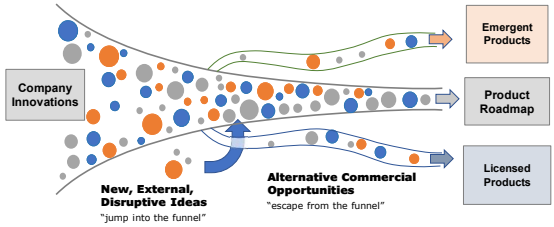
Open Innovation: An Agile "Leaky Funnel"*



* Henry Chesbrough

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Strategies for Commercializing Innovation

Invention
- Libraries
- Labs
- Research
- Expertise
- Processes
- Platforms
- Integration
- Scaling
- Standards

Knowledge Transfer
- Sharing Information
- People Transfer
- Publication
- Conferences
- Education
- Ecosystems

Commercialization
- Patents (IPR)
- Integration
- Productization
- Licensing
- Spin-offs
- Spin-ins
- Start-ups
- Stealth Mode

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Modern Challenge: Responsible Innovation?

Address Questions of:
- Ethical acceptability
- Sustainability
- Societal desirability

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Examples: Non-Responsible Innovation

Cambridge Analytica
Data Misuse

Software that "Cheats"

Tainted Funding Sources

Societally Harmful

Catastrophic Software Certification and Sensor Issues

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Part II: Company - University Partnerships

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Why Do Companies Engage Universities?

• Foster collaborations to accelerate innovation	IPR
• Expand company brand in research community	Attract talent
• Incubate a talent pipeline to grow capabilities	Attract talent
• Leverage regional & government incentives	Funding
• "Do Good" with universities, NPOs, NGOs, …	Public relations
• Influence government policy	Business benefits

** IPR – Intellectual Property Rights*

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Why Do Universities Engage Companies?

• A chance to increase the impact of innovations	Tenure/IPR
• Build up a portfolio of publications	Tenure
• Opportunity for students to demonstrate skills	Talent Placement
• Access to resources	Funding
• Opportunity to deliver training/coaching services	Funding
• "Do Good" with companies	Public relations

** IPR – Intellectual Property Rights*

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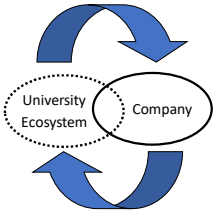
Contrasting Motivations: Sponsor vs PI*



Sponsor/Company

- Exploration + IP + Acquisition + ROI
- Talent Acquisition (full-time/internships)
- Product Benchmarking
- Sales
- Brand Collateral
- Philanthropic Donor

Researcher/University

- Research Agenda
- Talent (Student) Development + Placement
- Industry Calibration + IP Revenue
- Publication
- Professional Development (Tenure)
- Philanthropic (Funding) Recipient

- *PI = Principal Investigator (Researcher)*
- *IP = Intellectual Property*
- *ROI = Return on Investment*

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Sample Government Innovation Catalysts

NSF (US)	- Industry-University Cooperative Research Centers Program
NIH (US)	- Academic-Industrial Partnerships for Translation of Technologies for Diagnosis and Treatment
NSERC (Canada)	- Collaborative Research and Development Grants
Horizon 2020 (EU)	- EU Framework Program for Research and Innovation Horizon Europe – latest € 100 B innovation program
ARC (Australia)	- Discovery Program

Incentives

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A Sample of University Innovations

http://goo.gl/3tnFv

- CAT Scan (Georgetown)
- CEA Markers (McGill)
- Cisco (Stanford)
- e-Ink (MIT)
- Facebook (Harvard)
- Flu Vaccine (Rochester)
- Gatorade (Florida)
- Google (Stanford)
- GPS (MIT)
- HP (Stanford)
- Insulin (Toronto)
- LASER eye surgery (UCLA)
- Microsoft (Harvard)
- Pacemaker (Minnesota)
- Polaroid (Columbia/Harvard)
- Polio Vaccine (Pittsburgh)
- RIM (Waterloo)
- Rocket Fuel (Clark)
- Seat Belts (Cornell)
- Solar Power (MIT)
- SUN (Stanford)
- Ultrasound (Vienna)
- Warfarin (Wisconsin)
- Web Browsers (Illinois)

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Companies* with University Collaborations

- ABB
- Agilent
- Apple
- Cisco
- Cuebiq
- Ericsson
- Dell EMC
- Facebook
- Google
- Graphcore
- IBM
- HP
- Huawei
- imec
- Intel
- Lam Research
- LG
- Microsoft
- Nokia Bell Labs
- Nortel
- Procter & Gamble
- Qualcomm
- Ripple
- Samsung
- Siemens
- Sony
- VMware
- Western Digital

**Sample Companies*

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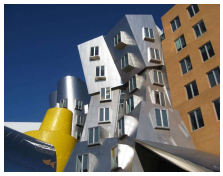
Sample University AI Consortia



- CMU AI
- EPFL Habitat Research Center (HRC)
- McGill Center for Intelligent Machines (CIM)
- MIT CSAIL
- MIT Media Lab
- Stanford AI Laboratory
- Stanford Institute for Human-Centered AI (HAI)
- UBC CAIDA
- UC Berkeley AMP Lab
- UCL Centre for AI
- UCSD Center for Networked Systems (CNS)
- University of California: CITRIS
- University of Montreal – MILA (AI Institute)
- University of Toronto – Vector Institute
- University of Waterloo AI

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Challenges to Collaboration

IPR* Contamination + Unplanned Disclosures

Differing Time Scales: Months, Quarters, Years

Lengthy Negotiations: Diverse University Needs

Talent Acquisition: Tech Transfer + Retention

CHURN

Research Gift/Donation Restrictions

Intellectual Property Rights

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Three Requirements to Manage "Effective Collaborations"

1. Database* of relationships

- List of PIs
- List of "Partners"
- List of Sponsors
- Contact information
- Funding/projects/outcomes
- List of Students/Admin Staff
- Publications created from collaborations

2. Assessments of outcomes

- Itemize the Value to the company or university (monetary and "in-kind")

3. Transparency

Must have transparency in "the process of creating relationships and funding"

- Look out for duplication
- Look out for potential compliance issues

** Relationship Manager*

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"Jump Start" Collaborations

1. Scout for Partners and Resources

- Identify partners
- Identify funding sources

- "Invest"
  - company needs/provides?
  - university needs/provides?

2. Broker & Fund Relationships

3. Collaborate & Assess Outcomes

4. Share Learnings & Make Results Visible

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Internal Conferences Build Community

**Internal to a company or university*

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Collaboration Dashboard

Proposals + Publications + Interactions + Impact

Recruits* + Sabbaticals + Internships

IPR

University Spin-offs + Intellectual Property Rights

(Licenses, Patents, …)

Press + Marketing + Sales Collateral Brand Value + Philanthropic Corporate Citizen

Satisfaction

No Negative News

**Students, Researchers, Professors*

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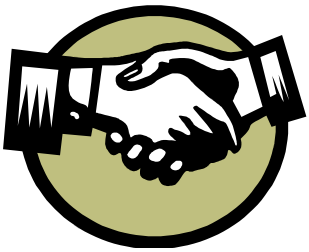

Part III: Strategies for Collaboration

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Strategy for Collaboration

- Diagnosis of Situation
- Guiding Policy
  - Architecture of goals
  - Operational purpose
- Coherent Plan
  - Risks
  - Resource constraints
  - Actions to implement policy

* ***Good Strategy, Bad Strategy*** – book by Richard Rumelt
* ***Competitive Strategy*** – book by Michael E. Porter

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Strategies to Demonstrate Value: For "Busy Folks"

Strategies needed by both companies and universities

- Facilitated communications
  - Targeted messaging
  - Strategic publications
  - Conferences (Internal & External)
- Enterprise Vision of Open Innovation
  - Building & leveraging partnerships
  - Leveraging IP* (Intellectual Capital)
- Innovative Talent
  - Showcasing and developing talent
  - Refreshing & on-boarding talent (inbound inspiration)
  - Dedicated staff catalyzing knowledge transfer
  - (Internships / sabbaticals / visiting scientist / adjunct prof)
- Metrics to demonstrate value

* Intellectual Property

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Influence Strategies

- Authority (power relationship)
- Commitment (agreement)
- Consistency (go with the flow)
- Inspiration (go with a good idea)
- Liking (follow a friend)
- Reciprocity (give a gift back)
- Reward (promise a "payoff")
- Scarcity (get before it disappears)
- Social Proof (follow the crowd)
- Fear (do it or you'll be sorry!)
- Proximity (you're always together)

Cialdini, *Influence: Science and Practice (2001).*
Manns & Rising, *Fearless Change (2004).*

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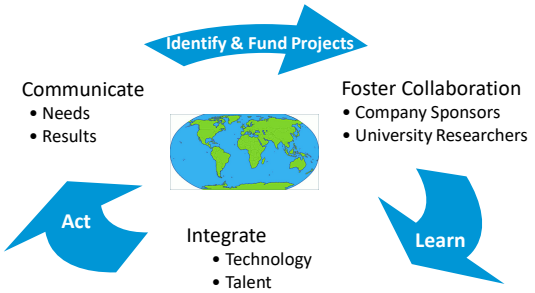
Company Collaboration Cycle



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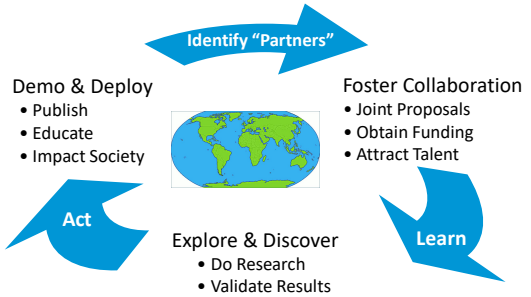
University Collaboration Cycle



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Collaboration Governance

(Company and University)

Scout Proposals & Partners
Create Proposals

Review Proposals for
Research and Sponsorship

Compliance Vetting
(Government regulations – FCPA, ITAR, DHS, IRS, DoJ; Academic integrity – proper credit, no plagiarism)

Contract Negotiations
(SoW, Schedule, IPR Licensing, Publicity, Confidentiality, Indemnification, Termination, Budget, Payments …)

Collaboration
+ Oversight

Results
(Inspiration, Intellectual Rights, Brand Visibility, Relationships, Talent Acquisition & Retention, Partnerships, …)

FCPA=US Foreign Corrupt Practices Act; ITAR=Intl Traffic in Arms Regulations; DHS=US Dept. Homeland Security; IRS=US Internal Revenue Service; DoJ=US Department of Justice; SoW=Statement of Work; IPR=Intellectual Property Rights

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Strategic Collaboration Catalysts

(Company and University)

University Research Consortia
Company Research Centers

Lectures + Conferences
Visits + Student Projects +
Hackathons

Donor Advised Foundation

Research Gifts/Donations
Conference Sponsorships

Research Contracts
Research Collaboration

Equipment Donations
Endowed Chairs

Consulting + Sabbaticals
Incubators + Accelerators +
Grand Challenges

Fellowships + Internships
Full-time Hires + Alumni

Open Source
+ Publications

Standards +
Policy Development

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Collaboration Strategies: Funding Models

Many-to-Many Research Relationship

Consortia provide "umbrella" for companies-universities relations

Long-term relationship, with influence, but not much control by individual companies

One-to-One Research Relationship

Options: Research Contract or Contract for expert consulting

Negotiate a Statement of Work (includes agreement on ownership of any new IP)

University/Department Gift

Direct "donation" support for a university department

Examples: donate equipment / funding academic chairs / funding fellowships

Gift/Donation Agreement

Direct "gift" support for a university research program

Gifts to "leading programs" or "local programs" creates long-term goodwill (and tax benefits)

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Collaboration Strategies: Funding Models

	Research Consortia	Research Contracts	Expert Consulting	Gift/Donation Contracts	"Equipment" Donations	Chairs + Fellowships
Governance	Mix – Company; PIs; University Guidelines	Subject to Contract Terms; University Guidelines	PI Employment + University Guidelines	Arm's length; University Guidelines	Arm's length; University Guidelines	Arm's length; University Guidelines
Project Selection	Center Selects from PI Proposals	Company Negotiates with PI/University	Company has close relationship with PI	Company Selects from PI Proposals	Company Initiatives + University Proposals	PI/Student; Department; Dean; Company Proposal
Payments	Annual Fees	Specified by Payment Schedule	Specified by contract (hourly; or project based)	Determined by Company	Determined by Company	Fee generally set by Department or University
Term	Flexible – Often Self-Renewing	Specified in Contract Terms	Specified in contract terms	Fixed term best [~1 Year]	Perpetuity or "loan"	Fellow ~ 1 yr; Chair – depends on University
Strengths	Critical Mass; Tech Sensing; IPR Access; Publicity; Goodwill; Tax Benefit	Tangible IPR Deliverables; Tax Benefit	PI/Consultant signs "employee agreement" for access and NDA	Exploration; Goodwill; Publicity; Overheads; Tax Benefit	Goodwill; Publicity; Benchmarking; Tax Benefit	Talent Development; Goodwill; Tax Benefit
Weaknesses	Expense; Lack of Influence on Project	Overhead costs; Negotiation time	Depends on University context; NDA issues	Arm's Length Nature of Relationship	Arm's Length Nature of Relationship	Lack of Tangible Results; Expense
Risks	Company IPR Contamination	Indemnification Issues; 3rd Party Rights	Indemnification Issues; 3rd Party Rights	Ethics; Tax Issues; Compliance + Overhead Issues	Ethics; Tax Issues; Compliance	Contractual Issues

PI = Principal Investigator
IPR = Intellectual Property Rights
NDA = Non-Disclosure Agreement

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Trade-offs: Gifts/Donations *vs* Contracts

	Gifts/Donations	Consortia/Contracts
Intellectual Property Rights (IPR)	• No IPR (or reciprocity)	• Exclusive (ERF) • Non-Exclusive (NERF) • Negotiation required
Non-Disclosure Agreement (NDA)	• No NDAs (or reciprocity)	• Contract terms and/or NDA • Publication
Research Direction	• Solicit research proposals • No "directed" research	• Negotiate research contract • Milestones; deliverables; etc.
Cost Factors	• Gift $ + Overhead % (<<)	• Contract $ + Overhead % (>>)

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Part IV: Collaboration Use Cases

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Use Cases (UC) for Company-University Collaboration

- Why Use Cases?
  - Describe the "actors" (participants)
  - Identify actor "goals"
  - Document a step-by-step scenario
  - Focus on interactions
  - Include some "alternative steps"
  - Consider "Rainy Day Scenarios"

Wine Case

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Roles and Goals of UC* Collaboration Actors

Company Actors

- Engineers who want to leverage university research and talent to drive product innovation
- Company champions to evangelize and increase visibility/value of collaborations
- Knowledge transfer staff to facilitate "commercializing new knowledge"
- Company Business Leaders to assess and fund collaborations

University Actors

- Researchers looking to expand their world – to calibrate their research and identify corporate sponsors
- Students seeking internships and full-time opportunities
- Knowledge Transfer (IPR) Staff or "Collaboration Managers" to build and commercialize collaborations
- University Leaders looking to build (fund) for the future

UC = Use Case

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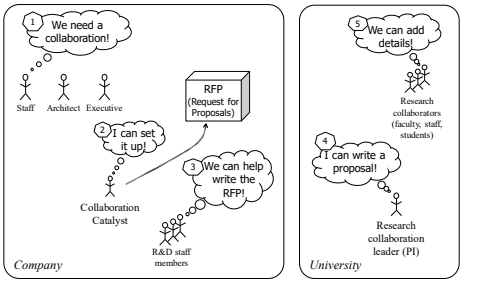
UC1: Company Initiated Project

One specific collaboration project

Trigger: A company makes a tactical decision to fund one specific research effort – with one partner (maybe already identified in advance)



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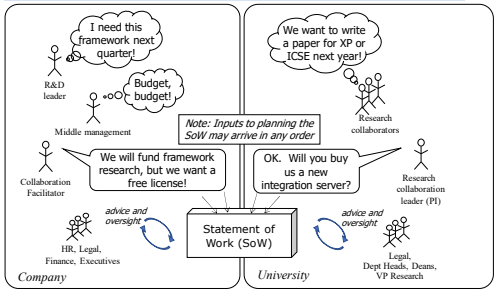
UC2: Tactical Research Collaboration

Trigger: Need to create a research contract = refine a "proposal" to a well-defined Statement of Work (next step after proposal is accepted)



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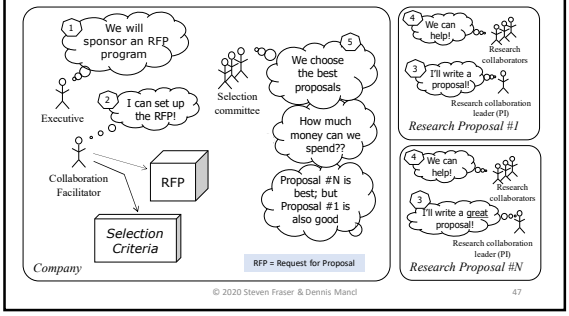
UC3: Strategic Proposal (RFP) Program

Wide-ranging collaboration program

Trigger: A decision to fund a wide-ranging collaboration program



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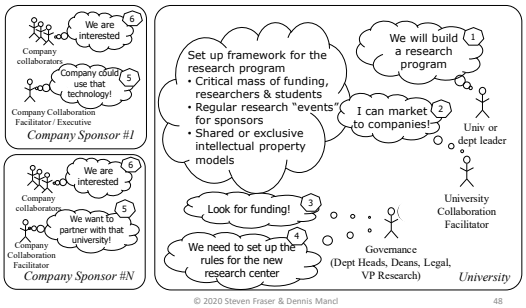
UC4: University "Consortia"

Trigger: University creates a "Center of Excellence" and seeks sponsors



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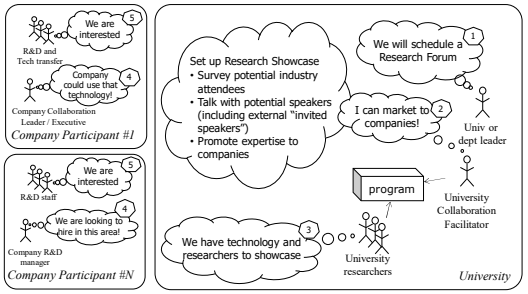
UC5: University Department "Research Forum"

Trigger: Department invites Sponsors to "Research Forum"



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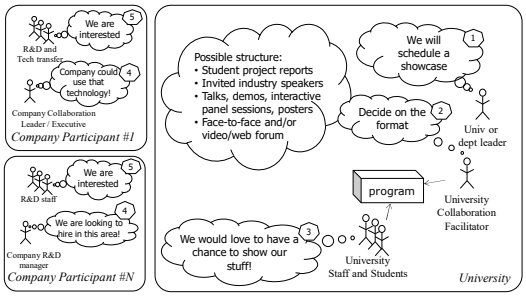
UC6: Talent Programs & Career Fairs

Trigger: University Desires to Showcase Student Talent



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UC Collaboration Failure scenarios

- The basic use case scenarios are written "in the positive" – assuming that everything is successful
- However, in the real world, some of the steps might fail
  - A fully-defined use case defines the most important failures, and how to recover or fail gracefully

RFPs that spark no proposals or superficial proposals :
- Keep the proposal process lightweight
- Don't just publish the RFP, socialize it through personal interactions, conferences, seminars…

Company-University contract impasse:
- Be flexible – a university contract should be simpler than for a corporate supply chain partner
- Use an incremental approach to project planning – initial set of objectives, adjust based on intermediate research results
- Consider the simplicity of philanthropy rather than complexity of contracts

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Company and University Perspectives on Company "Champions"

Companies and universities should beware of "absent" or "disappearing" Champions

Champions are a key catalyst for collaboration

Companies should not fund ongoing programs without Champions

Champions must be aware of compliance issues

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Preparations for "Campus Visits"

Set pre-visit objectives

Review existing agreements and constraints

Don't clash with University "cycles": [reading weeks, exams, breaks, faculty retreats, etc.]

Company-specific visit or group of companies?

Attend Review meetings: opportunity to meet staff and students

Check: Consortia agreements and research contracts may have **IP/NDA constraints**

Check: **Pre-existing agreements** between company and university which may enable discounts, etc.

Watch out: Be aware of **IPR contamination** and campus resource usage implications.

Check the calendar, don't create "meeting overload":

Specialized events may represent a significant coordination overhead for university participants.

Research Reviews: consortia want to **showcase innovation and talent** – AND to **solicit corporate input and funding**

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Preparations for "Virtual Campus Visits"

(Post COVID-19)

Set pre-visit objectives

Review existing agreements and constraints

Don't clash with University "cycles": [reading weeks, exams, breaks, faculty retreats, etc.]

What kind of meeting technology? Presentation or discussion?

Discussions can be an opportunity to meet staff and students

There are barriers to free-flowing communication over video…

Consider what type of interactions are needed to meet the objectives:
- Live demos versus recorded usage sessions
- Frequent breaks for questions and discussion
- A designated "discussion facilitator" to avoid chaos or silence

Watch for "meeting overload":

Prepare an initial agenda in advance; be prepared to adjust the schedule

It's really hard to "meet" students in a big video meeting.

Consider scheduling one-on-one followups (for further exploration)

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Part V: The Cost of Innovation

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The Cost of Company Innovation

- Internal costs
  - Product Engineering
  - Research & Development
  - Staffing + Overheads + Infrastructure
- External costs
  - Innovation by acquisition (can be $$$ billions)
  - Acquisition+ licensing of IPR owned by others
  - Outsourcing + off-shoring
  - University partnerships + Joint Ventures + etc.
  - Legal (patent + patent defense + infringement costs)

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The Cost of University Innovation

University "overhead rates" reflects cost of:

- Academic and administrative staff
- Buildings (heat, light, power, water, etc.)
- Labs and equipment
- IT Infrastructure
- Patent, patent defense, patent infringement

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"Hidden Costs?"

University research is *not*:

- "free"
- "low-cost"

Fine Print!

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University Overheads: Keeping the Lights On!

University	Overhead Rate %
Boston U	64
Columbia	60
Duke	57
Harvard	69
MIT	56
Penn State	49
Princeton	61
Stanford	57
UC Berkeley	56
U Mass Amherst	59
U Michigan	56
Wisconsin	50
Yale	66

University Overheads

- Administrative
- Heat
- Lights
- Power

Average = 60%

Based on Boston Globe 2013

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Avoid Negative "Headlines"

Litton hits Nortel, JDS, others with fiber-optic patent suit

- Stanford University and Litton Systems Inc. filed the lawsuit in U.S. District Court in Los Angeles, alleging the 15 defendants have been infringing the patent by...
  (Bloomberg News – Oct 6, 2000)

HP Hit with $184 M Verdict In Cornell Patent Trial

- A federal jury in New York found Hewlett Packard Co. liable on Friday for years of infringement of a computer processor patent held by Cornell University and ordered the company to pay $184 million in damages.
  (Law 360 – Jun 2, 2008)

Apple + Intel Cases: Wisconsin University wins huge damages

- The Wisconsin Alumni Research Foundation, the patent licensing arm of the University of Wisconsin-Madison, said the verdict was important to guard its inventions from unauthorized use...
- The University of Wisconsin sued Intel over the same patent in 2008. That case was settled out of court for an undisclosed sum.
  (BBC News – Oct 17, 2015)

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Part VI: Examples and Personal Experience

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Fraser: Innovation through Collaboration

Software Engineering Institute | Carnegie Mellon University
SEI Visiting Scientist

BNR Design Forum
QTech Forum
CTech Forum
Info Exchanges

MARVEL
Columbia University

CONEXT
Conference Sponsorships
(Recruiting)

MIT MEDIA LAB
wireless @mit
ONRC
Center for Networked Systems
Consortia Relationships

Biz Dev (Tech Radar)
(input through tech scouting)

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Fraser: Innovation through Collaboration

Czech Technical University
Acquisitions
(Cognitive Security)

Video Aware Wireless Networks
(VAWN – Cisco, Intel, Verizon
UCSD + USC + MSU + UT Austin + Cornell)

UCSD Triton Sort
(Benchmarking & Brand Enhancement)

Russian Technology
$1B Innovation Program

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Collaboration = Opportunities to Learn

Mancl experiences

- There is an enormous value in two-way training and coaching relationships between companies and universities
- Using tools and software libraries developed by universities
  - Bring in professors as "guest lecturers" to help teams get started
  - Everyone works on real-world problems
- Need to be tolerant of buggy tools
  - University researchers want to get their tools used on something "really big"
  - For the students, it's an introduction to "working with real-world customers"

Mancl "collaboration stories"
- University people both "teach" and "learn"
- "Knowledge transfer" – making an impact in a company – is really hard

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Internal Tech Transfer

Mancl experiences

- Research ideas are often really great!
- But… no one in the product units understands how to use them
- Need a set of "knowledge transfer experts"
  - Researchers are too busy (and often too impatient) to work with product development teams
  - Developers don't always ask the right questions to researchers
  - Sometimes creates a bad relationship: "arrogant" vs. "clueless"
  - Tech transfer team makes it work
- Tech transfer team activities:
  - Training, coaching, jumpstarts, measuring the impact of new technologies, monitoring appropriate use of Open Source products

My stories:
- DB modeling
- C++
- UML modeling
- Use cases
- Refactoring tools
- Agile
- Unit testing tools
- Remote collaboration
- Defensive coding
- Code review environment

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Summary

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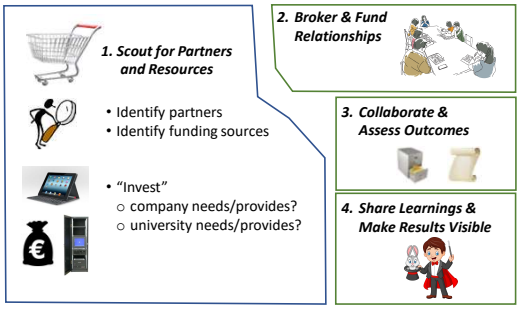
"Jump Start" Collaborations



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University Success Measures

Tangible Results	Evidence of Success
Conference Publications	Tenure
Journal Publications	Graduated Students
Hands-on Experience for Students	Academic Rank
Funding (from Government and Industry)	Start-up Spin-off
Breadth and Depth of Consulting Contracts	
Consortia Leadership	
New Intellectual Property	
New Material for University Courses	

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Company Success Measures

	Corporate Gifts/Donations	Contracts/Consortia
Performance Objectives	Oversight + Liaison	Close collaboration
Joint Publications	Discouraged	Encouraged
Intellectual Property Rights	None	ERF/NERF rights?
Access to Data/Technology	Depends on nature of gift	Discussions/Presentations
Product Design	Indirect impact	Direct impact
Time-to-Market	Assess indirect impact	Assess direct impact
Benchmarking/Testing	Discouraged	Encouraged
Brand/Market Impact	Depends on agreement	PR + Brand Visibility
Talent Acquisition	Possible (leverage brand)	Encouraged
Tax Benefit (Gift/Research)	Gift/Donation benefit	Research credit
Tech Talks @ Company	Pre-Gift + once results public	Encouraged
Overall Company Impact	Renew or terminate?	Expand? Extend? Cut?

ERF – Exclusive Rights Royalty Free
NERF – Non-Exclusive Rights Royalty Free

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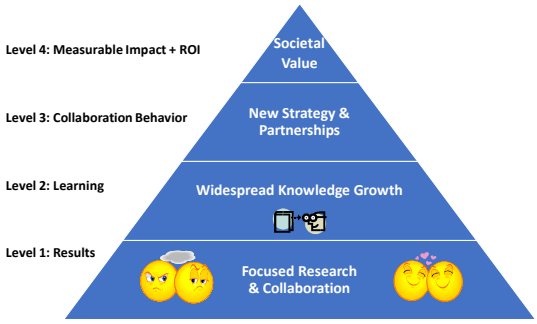
Assess Collaboration Impact*



* Inspired by Kirkpatrick's evaluation of training programs

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Innovation through Effective Collaboration

- "Jump Start"
  - 1. Scout for partners and resources
  - 2. Broker relationships; make results visible
  - 3. Document relationships, funding, and partners
- Manage
  - 1. Database of Relationships (relationship manager)
  - 2. Assess Outcomes (what was the impact?)
  - 3. Transparency (identify compliance issues early)
- Leverage
  - ✓ Proposals + Publications + Interactions + Impact
  - ✓ Recruits + Internships
  - ✓ Press + Marketing + Sales
  - ✓ Satisfaction / Measurements of Success

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Thank You!

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Extra slides

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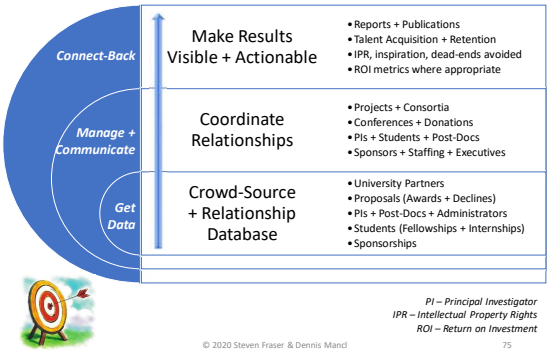
Achieving Strategic New Business Impact



PI – Principal Investigator
IPR – Intellectual Property Rights
ROI – Return on Investment

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Cisco's PhD/Post-Doc Hiring Approaches

Role-Centric Recruiting

- Business has planned *"must fill"* role
  - Challenging to identify "right" candidate
  - Multiple candidates for one role
- Business identifies multiple candidates
  - Through referrals
  - PhD/Post-Doc candidate pool
  - Recruiter sourcing
- Business interviews candidates
  - Internal tech lecture
- Business selects candidate for offer

Talent-Centric Recruiting

- Candidates opportunistically identified by:
  - Company funded research
  - Referrals by professors, etc.
  - Conferences, campus visits, etc.
- "Research Center" screens interviewees, matches to 3 roles (selected from Business role pool)
- Business Managers vet candidate matches
- Candidates visit Company
  - Tech lecture Interview with 3 teams
  - ~5 interviews/team
- Candidates/Managers "match"
  - results in an offer to candidate

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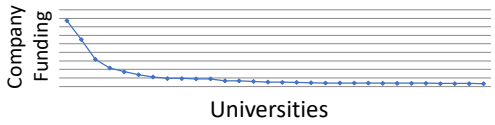
"Long Tail" Company Funding by University



- Some universities may receive significant company funding as a result of:
  - Reputation and connections
  - Company proximity
  - Variety of programs (consortia, institutes, projects, etc.)
- Other universities receive less funding (fewer projects funded)

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Support Innovation – Disseminate Ideas

- Develop performance objectives to incent, assess, reward collaboration & innovation outcomes, etc.

Create an incentive for individual employees to be part of a collaboration program

Help others learn from the collaboration program

- Spread new ideas internally: tech forums, learning programs, training, hackathons...
- Foster communities of practice & interaction – connect, leverage, develop, retain senior talent, etc.
- Support agile iterative product planning (roadmaps), development, and deployment

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Grow Talent in your Organization

- Identify, leverage, recruit, and retain expertise through the collateral of research investments
- Encourage company experts to give university talks – and invite researchers to give company talks/demos

- Organize directed internships and sabbaticals that translate into full-time hires and long-term relationships

Use to help academics to "get to know you" – they might learn that there are interesting problems in industry!

Increase your company's reputation in the academic world…

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Increase Company's "Innovation" Branding

- Associate with top tier universities: research philanthropy, equipment donations, fellowships, chairs, etc.

Improve your company's reputation!

Not just university – standards committees, government, conferences, …

- Influence policy and standards, benchmark prototypes, encourage open application development where relevant
- Leverage government programs (funding, regional development, etc.)
- Create visibility through conference sponsorship and participation, (joint) publications, standards, etc.

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