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Knowledge and Technology Transfer in Industry University Collaborations

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Innovation

- We can all agree, it is a good thing ...
- OECD's definition
 - “as the **implementation** of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practice, work place organization or external relations”
 - Broader than R&D, it's about any **novelty**
 - “Innovation is essential a powerful engine for development ...”

Focus on innovation

- Canada Foundation for **Innovation**
- **Innovation** Canada: A Call to Action (Jenkins Report)
- Government of Canada March 29th Budget “Jobs, Growth and Long Term Prosperity”
 - Creating Value-Added Jobs Through **Innovation**
- MDEIE’s Quebec Research and **Innovation** Strategy
 - Mobilize, **Innovate** and Prosper
- Quartier de l’**Innovation**

Open Innovation

- “Open innovation is the use of **purposive inflows and outflows** of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use **external ideas** as well as **internal ideas**, and internal and external paths to market, as they look to advance their technology” Professor Henry Chesbrough
UC Berkeley

So what is needed for innovation

- Four complimentary inputs
 - Capital and financing
 - Ideas and knowledge
 - Talented, educated and entrepreneurial people
 - Networks, collaborations and linkages to enable the pooling of resources
- Key role for universities



So how is this accomplished

- Knowledge transfer
 - Dissemination, training, hiring and networking
 - Formal and informal channels
 - Relatively few restrictions
- Technology transfer
 - Moving scientific/research results from one organization to another
 - Advancing the technology towards commercialization
 - Involves some type of intellectual property protection

Knowledge transfer

- University's role
 - Well trained students
 - Expertise in a broad range of subjects and disciplines
 - World class labs
 - Leading edge research and ideas
- Working with industry
 - Great experience for students
 - More relevant research topics and insight
 - Direct collaborations and through a network



Challenges for universities

- Finding a partner or partners
 - Potential conflicts between partners in a network
- Public institutions
 - No secret research
- Different expectations
 - Budgets
 - Schedules
 - Deliverables
 - Impact of results



Key points for industrial partners

- Academic freedom
 - The right to teach, learn, study and publish free of orthodoxy or threat of reprisal and discrimination.
 - The right to criticize the university and the right to participate in its governance.
- Confidential information
 - Review of publications
 - Public defense of dissertations
 - Sharing information and data among network members

Technology transfer

- Importance of intellectual property
 - 28% of US workforce (40 Million) work in IP dependent industries
 - 75 IP intensive industries alone generate 35% of GDP (\$5T), also representing 61% of exports (\$775B)
 - Google CLO David Drummond blogged in Aug 2011
 - “A smartphone might involve as many as 250,000 (largely questionable) patent claims, and our competitors want to impose a “tax” for these dubious patents that makes Android devices more expensive for consumers.”

Technology transfer

- Importance of intellectual property
 - Nortel's \$4.5B patent sales (~6k patents) by the Rockstar Consortium (RIM/Apple/Microsoft/EMC/Sony/Ericsson)
 - Google's \$12.5B acquisition of Motorola (~17k patents)
 - Microsoft's \$1B acquisition of AOL's 800 patents
 - More than 2600 lawsuits in the US from non-practicing entities in 2010

Technology transfer

- What gets asked by industrial partners
 - Ownership of newly developed IP
 - Access to existing university IP
 - Indemnification
 - Due diligence
 - Warranty
- Open source
 - Using and producing



Technology transfer

- IP ownership models
 - University of Waterloo, Queens, Carleton
 - IP is owned by the creator
 - Revenue is shared under certain circumstances
 - McGill
 - IP is jointly owned but decision to commercialize is with the inventor
 - UBC, Concordia and Université de Montréal
 - University is the owner but revenue is shared

Technology transfer

- United States
 - Bayh-Dole Act of 1980
 - Universities retained ownership of inventions from federal funding
 - US government has non-exclusive rights and march in rights
 - Share revenues with inventors
 - Follow similar ownership guidelines with industrial sponsors

Technology transfer

- United States
 - Recently major policy shift at Penn State and University of Minnesota
 - No longer required ownership of the IP from industrially sponsored research
 - Built in license payment of 10% of the contract or \$15K
 - Homerun clause



Technology transfer

- Is there a right model?
 - Pressure to take the funding
 - Best efforts or just an effort
 - “divergent valuation of early-stage IP”
- Project intent
 - Understanding a problem vs. finding a solution
 - Company background IP vs. university background IP



Key points

- Using newly developed IP to block or hold hostage
 - Not the best approach for a long term relationship
 - Freedom to operate
- University IP is generally at a very early stage
 - Requires significant investment to commercialize
 - Fundamental or incremental
- Restrictions on software licenses
- Reasonable and fair

Summary

- Good collaborations require good governance
 - Establishing expectations
- Not a subcontractor
- Not a ivory tower but a beacon
- Establish the right type of projects
 - Simulations
 - Experimental studies
 - Validation studies
 - Analyses
 - Exploring and comparing options

