Motivations: The Academic Perspective

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Disclosure: My Relationship with Medical Device Companies

- Geometrics@*
- Gammex-RMI*
- Adac
- GE Medical
- TomoTherapy@*
- Accuray$
- CPAC@*$
- Novelos*$
- Biolonix*$
- Shine Medical Technologies*$
- HealthMyne@*$
- Accelerated Devices@*$

* Indicates Former or Current Board Membership
@ Indicates Founder
$ Indicates Current Relationship

The Mine and the Mill

Ideas tend to come from academia and get implemented and refined in a company.

The University is the Mine

The Company is the Mill

A mill won't last long if there is no mine.

Licensing of Intellectual Property (IP)

- Every year scientists are legally robbed of their IP.
- Company X will give you a good deal in equipment in return for rights to your IP.
- Company X will send you to meetings to talk about the project you and the company developed “together”.
- Often like trading land for blankets and beads.
- A tech transfer office can defend and protect inventors and programmers.
- If your IP is good, a company will pay a fair price for it – but have realistic expectations.

How Do You Know Your Idea is Wanted By Industry?

- Are they giving you a research contract to sell you equipment or are they really interested in the work?
- Industry has a long product roadmap and disruptive ideas to the roadmap are generally unwelcomed.
- Treat your industrial partner as a customer – how can your idea alleviate a problem?
- Your clinical insight is valuable to industry.

Potential Resistance of University Culture to Business Relationships

- Dilutes productivity.
- Lowers “standards”.
- Hurts reputation.
- Creates conflicts of interest and lack of academic commitment.
- University wants an untenable “cut”.
- Shouldn’t pick winners.
- Is “impure”.
- Lets face it, jealousy is a big factor.

Resistance to University-Industrial Partnerships

- In 1996, Lee found that only 44% of faculty agreed with policy of offering technology assistance to companies.
- And only 26% of faculty thought it was OK for the university to take equity in university startup companies.
- Faculty with the least linkage to industry had the least favorable view of university-industrial partnerships.

Lee, Y (1996) Technology transfer and the research university. A search for the boundaries of university-industry collaboration. *Research Policy* 25:843-63

Disparities Between Academics and Business Executives

- How they are recognized professionally.
- Products of their work.
- Relationships with competing organizations.
- Homogeneity of goals across the organization.
- Organizational hierarchy.
- Time-frames.
- Measures of success.

Communication Styles

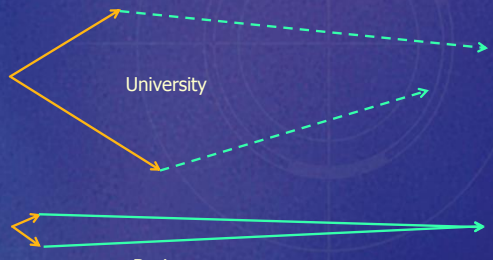
Academic	Business
Professors, Students, Journal Readers	Co-workers, Subordinates, Supervisors
"Thought Pieces", Grants	Reports, Procedures, Proposals, Minutes
Imparting Truth is the End Result	Imparting Message is the End Result
Don't Assume Shared Values, Avoid Jargon	Shared Values Assumed, Jargon Common
Longer, Nuanced, and Provoking Thought	Shorter, Seek Conclusions, and Reach Consensus

Divergent and Convergent Thinking: Focus is a Variable, Not a Point

Divergent Thinking
- Thinking Outside the Box
- Exploring Possibilities
- Brainstorming
- 1% Inspiration
- "Undisciplined", "Unfocussed"

Convergent Thinking
- Step by Step Execution
- Getting the Job Done
- Project Management
- 99% Perspiration
- "Incremental", "Boring"

Project Management Differences



Why in the World Would You Want To Start a Company?

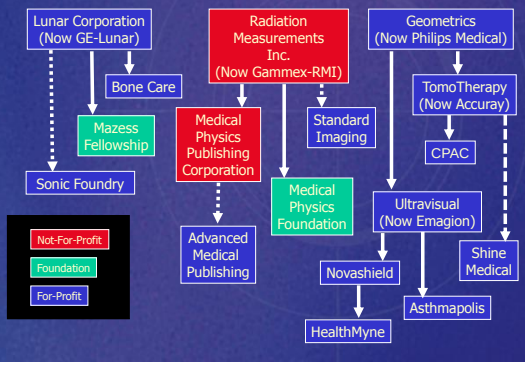
- What is your motivation?
- How will you get the financing needed?
- Who owns the intellectual property?
- Do you have the time?
- Will you enjoy doing it?
- Do you have business experience?
- Isn't there an easier way to accomplish your ends?

Economic Value

- >70% of high tech companies in Boston's Route 128 were academic spin-offs
- 40% of high tech companies in France between 1987-1999 were academic in origin
- ~20% of new technology companies in Cambridge UK were spin-offs
- Between 1980 and 1999, 280,000 direct US jobs were created by academic spin-offs – 83 jobs per spin-off

The economic value can only happen if there is a market.

Medical Physics Dept. Spin-Offs



Main Motivation for Academic Entrepreneurs

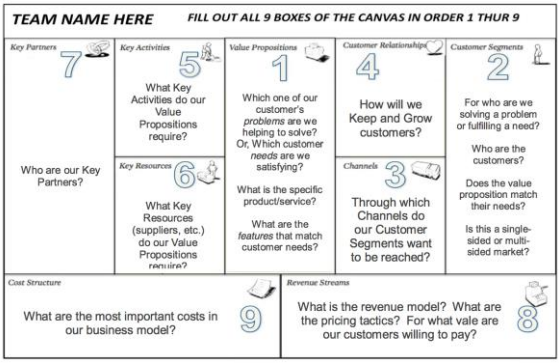
"The main factor that pushes inventors towards being entrepreneurial is the desire to see their inventions being commercially exploited and only then followed by their desire for wealth creation and independence."

Ismail et al. University Spin-Off Formations: How Business Decisions are Made. Int Journal Business and Social Science, 1 (2), 2010

Motivation for Translating Technology May be A Problem

- Too many companies are technology driven.
- If nobody needs or wants the technology then the company is doomed to fail.
- Companies must be market driven.
- There is hope if the founders are willing to swallow their pride by pivoting or abandoning the original technology and to develop products that the market wants.

NSF i-Core Business Canvas



Issues of Conflict of Interest

- My relationship between with the University was carefully managed by the UW Conflict of Interest committee.
- What is good for my company was not necessarily good for the UW and visa versa.
- Disclosure of the financial situation was the first requirement.
  - Disclosure to the UW
  - Disclosure in oral and written communications

Absolute Don'ts

- Be responsible for a clinical trial involving your company's products.
- Be responsible for either end of a contract (written or verbal).
- Force your institution's co-workers or students to be involved with the company.
- Limit the rights of your institution's co-workers or students, e.g., restrict publications.
- Aside from honoring non-disclosure agreements, you cannot limit the communication of your group with another group who may be working with another company.

Conflict of Commitment

- You sometimes need to make it clear when and what hats you wear?
- You need a formal agreement with your employer on your time commitment to the company – Don't assume "a day a week".
- You must not do business at your employer's place of business without compensation for non de minimis use of resources or space.
- When in doubt, your first obligation is to your employer.

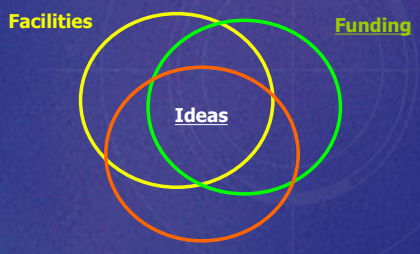
Is There a Coincidence of Interest?

- What is good for the company may also be good for your employer.
- Is the intellectual property owned by your employer and licensed to your company?
- Does a royalty or other benefit return to your employer?
- Is there a grant or a contract linking the employer and company?
- You are not the arbitrator of what is good for your employer, only your employer is.

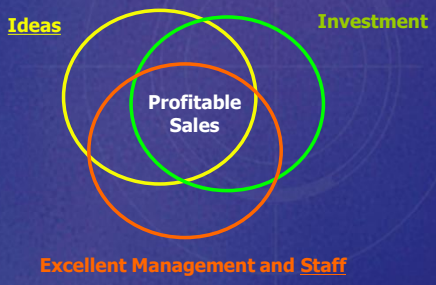
Conflict/Coincidence of Interest Matrix

	Good for Your Company	Not Good for Your Company
Good for Your Employer		
Not Good for Your Employer		

Ingredients for a Successful University



Ingredients for a Successful Business



Conclusions

- Universities and industries must work together but protect your intellectual property.
- Treat the industrial partner as a customer.
- You should be aware of the cultural differences between universities and companies.
- Starting a business is an efficient way to have ideas actualized.
- You should understand your motivation before starting a company.
- Potential conflict of interests can be managed.