Entrepreneurship in Academia

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Topics for Today
- My experiences
  - 4 companies, 3 still going
- Intellectual property
  - Especially in an academic environment
- Business vs. Academia
  - How are they different

Companies

BECS Technology, Inc.

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Lessons Learned – BECS Technology

- Maintain Separation from University
  - Honor conflict of commitment rules
  - Don’t expect its success to help tenure case
- Growing a Company is a Lot of Work!
  - Someone has to be very dedicated – I had partners
  - Think hard about doing this while full-time faculty

BECS Technology, Inc.

Hearing Emulations, LLC

exegy
Hearing Emulations, LLC

- More of a Classic University Startup
  - Initial funding via SBIR grants through NIH

- Excellent Technology
  - Make hearing aids act like human cochlea
  - Demonstrated improved speech understanding in noisy environments – Important hearing problem

- Very Difficult Marketplace
  - Going it alone is very problematic
  - Not-Invented-Here syndrome is common at companies

Lessons Learned – Hearing Emulations

- Pick Your Market Carefully
  - The deck was stacked against us from the beginning
  - Incremental improvement (even if real) isn’t enough

- Leadership Must Not Think/Act Like Academics
  - Recognize that academia and business are different!
  - Someone has to be the business leader
  - This task is NOT anything like an academic job
  - Either transform or partner with someone

Exegy, Inc.

- University Technology
  - Patents applied for in 2000, Exegy formed in 2003
  - Early Bear Cub Fund recipient
  - Local St. Louis investment to start up

- I served as initial Director of Engineering
  - On leave from the university
  - My job included the task of hiring my replacement

- Computational Acceleration
  - Initially focused on approximate search applications
  - Repositioned to financial market data in 2005
  - Now market leader with ~100 employees

Why did Exegy work?

- The planets really did align
  - Some things went wrong
  - More things went right

- Working with the right people from day 1
  - Friend of the university helped raise initial funds
  - Lead investor truly believed

- Recognition that business depends on customers
  - What are you doing for those customers?
  - Do you really have something to offer them?
  - Does your offering work with the way they operate?
  - Are you willing to change when the initial approach isn’t working out?
Lessons Learned – Exegy

- Be Flexible with Company Direction
  - Again, great technology but hard-to-crack market
  - Successful only once we focused on customer needs

- Focus, Focus, Focus

- Professional Leadership is Key
  - Engineering
  - Marketing
  - Sales

VelociData, Inc.

- Spinout from Exegy
  - Return to initial product focus
  - Process large volumes of data from the Internet of Things

Lessons Learned – VelociData

- Understand Market Needs
  - Good technology is essential
  - Must be paired with good market understanding

  - Focus, Focus, Focus

What are the take home messages?

- Balance the demands of an academic career
  - Recognize that it will take time and effort

- Dot the i’s and cross the t’s
  - Manage potential conflicts of interest

- Push on university if it isn’t being reasonable
  - Issues we had have pretty much been resolved

- Work with folks who are business savvy
  - Or become business savvy yourself, recognizing that isn’t the same thing as academic savvy

- In real estate, it’s “location, location, location”
  - Think “customers who are willing to pay”

Intellectual Property

- Disclaimer: I’m an inventor, not an attorney

- 3 basic forms:
  - Patents
  - Copyright
  - Trade Secrets

- Use in academia is different than in business
  - Patents – I’ll talk about this next
  - Copyright – You own this on things you do
  - Trade secrets – Very limited applicability to academia
Patents

A patent grants a license to exclude others from making, using, or selling an invention

Subject matter must be patentable, and

- Novel – i.e., not have been disclosed
- Non-obvious – very tough for academics to judge, listen to your patent attorney
- Useful – European law calls this susceptible of industrial application

Many things are explicitly excluded
- Mathematical relationships, algorithms
- Software? This is in a fuzzy grey area of the law

Form of a Patent

- Includes intro, drawings, description, and claims
- Description
  - How to build and use the invention
  - Government license for exclusive use in exchange for full disclosure of the invention
  - Must be understandable to a “person having ordinary skill in the art”
- Claims
  - Explicit statement of what is to be excluded to others
  - This is what defines the boundaries of a patent

Patent Ownership

In the US, patent owned by inventor(s) until assigned to another entity – e.g., employer

At WU, university claims ownership if:
- Subject is close enough to university assigned duties
- Activity is supported by federal grant, foundation grant, or company grant to the university
- Substantial university resources were used during development of the invention

Otherwise
- Inventor is free to pursue independently of the university
- Undergraduate student class assignments are different

Business vs. Academia

- Mission is fundamentally different
  - Business – earn profit that is returned to owners
  - Academia – research, teaching, service

- Different organization and approaches to things
  - B – Organized top-down, boss calls the shots
  - A – Organized in distributed fashion, faculty have explicit roles in governance

Who do we answer to, outside the organization?
- B – customers, owners (stockholders), debt holders
- A – students, research funders, community at large

Where does the money come from?
- B – investors (esp. early), sales
- A – at WU: patient care, research grants, tuition

Be aware of the implications of these differences

Summary

- Entrepreneurship is lots of fun!
  - The personal sense of accomplishment is huge
  - True "impact", which is often difficult to gauge in academia

- Pay attention to how business and academia are different
  - Lots of work!
    - Much (most) of the work is NOT engineering
    - Either partner with people that have business skills or develop themselves, but don’t just assume they exist