Entrepreneurial Lessons Learned

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MIT “Nuts & Bolts”
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Why I tell the Virtual Ink story

Goal: Help people new to entrepreneurship to:

‣ Be more confident about starting a business
‣ See the business plan as just the first step
‣ Enter the MIT $100k Business Plan Competition

How?: Relate Nuts & Bolts “theory” & lectures to business “reality”:

‣ “What we thought back then was…”
‣ “But what happened was …”
‣ “So, today, what I’d do now would be …”
‣ Try to appeal to both the technical and business audience

DISCLAIMER:

Writing a business plan is not a sufficient condition for business success. A lot of blood, sweat, tears, dumb luck, favorable weather conditions, commitment & attitude of the founding team, the conditions of the market and competition, whether or not the founders all have their objectives aligned, the availability and willingness for early-adopters to adopt your potentially untested business offering, the availability and quality of your source of caffeinated beverage products, whether or
A bit about me…

• **Background:**
  - MIT BS/EE, MS/EECS, PhD-- (close, but no cigar)
  - HP Medical, HP Labs, Motorola

• **Founder & senior executive in 5 start-ups:**
  - Virtual Ink (1997 MIT $50k Finalist & $10k winner)
  - Newbury Networks (idealab! incubated)
  - Mok3/EveryScape (started w/ “N&B’s” student in 2002)
  - Calenova / HingePoint

• **Experiences:**
  - Founding teams with a variety of start-up contexts
  - Technology/IP and product/business strategy & due diligence
  - Part of fundraising angel & VC funds in excess of >$50M

• **Other affiliations:**
  - EO (formerly YEO)
  - MIT VMS
A bit about you…

- Grad students vs. undergrads?
- School of Science/Engineering/Mgmt/Architecture…?
- Have a new business idea?
- Based on their MIT research/thesis?
- Any previous business plan writing experience?
- Already started a business?
- Have a business plan/mgmt team?
- Investing in businesses?
How it all started...

As a 6.111 TA, I noticed 2 issues during design reviews:

**Problem 1:**
Students would spend much of the time writing down notes, block diagrams, schematics, timing diagrams, *etc*...

**Result:** NOT PAYING FULL ATTENTION AT THE MEETING

**Problem 2:**
Because of notetaking mistakes, they’d waste time on their own (building mistakes) and need to meet with me again…

**Result:** WASTED TIME & REPEATED MEETINGS
First attempt

Spring ’94: Entered 3-page “business plan” summary entitled “Transcription System”

( I also wrote up and entered two other ideas into the contest…)

Feedback:

Nice idea. Where’s the business plan?
Second attempt

- Sept 1996: Met up with undergrad classmate returning for MBA at Sloan, Michael Dixon.
- We shared some beers and some ideas.
- Mike liked “that pen thing” and said “let’s build a team, write a plan, and enter the contest”.
- I said, “Uh… okay. How do we do that?”.

Went on to win $10k in 1997 MIT $50k Entrepreneurship Competition
First Prototype

- More LEDs
- Controller
- Timing logic
- Analog stuff
- HEX LEDs
Building the company

• I once was a TA for 6.111… [early 90’s]
• Recruited fellow grad student to enter the MIT Entrepreneurship Competition, 1997
  Won 1st runner & $10,000 [’96-’97]
• Started as “five guys in a dorm room” [mid-’97]
• Discovered a major competitor [9/30/1997]
• Raised Series A of $1M from angel investors [4/1998]
• Development of alpha prototype [9/1998]
• Raised $5M from CMGI @ Ventures III [11/1998]
• Raised ~$4M for IDG Ventures [mid-1999]
• Launched mimio in 9/1999 [Ahead of competitor!]
1997: Existing solutions

Copyboard
- PanaBoard (Panasonic)
  - $2k - $3k

Digitizing whiteboards
- SoftBoard (Microfield Graphics)
  - $4k - $5k*
- SMARTBoard (SMART Technologies)
  - $4k - $5k*
- LiveBoard (Xerox)
  - >$30,000

* Ibid (Microtouch) 2’x3’ @ $599
Virtual Ink competition since the beginning...

9/30/1997: Met direct competitor: EFI

EFI had a history & reputation of aggressively litigating anyone who even remotely infringed on their patents

Intellectual property strategies would be core to the company’s survival
Legal essentials for start-ups

- Incorporate (<$750)
  - Need President, Treasurer, & Secretary of record
  - Usually Delaware S-corp well before significant financially impacting event
- Founder’s / Employment Agreements ($2000 to $5000; keep it simple)
  - Assignment of IP to company
  - Confidentiality
  - Non-compete (not in CA; still seen in MA)
  - Compensation (if any)
- Restricted Stock Agreements (often included in above)
  - Time-based vesting schedule & amount
    (eg. 4 yrs, 1 yr cliff, vesting monthly thereafter, accelerating vesting on IPO/M&A)
  - Right of first refusal / piggyback rights
- Other standard documents (often included in above)
  - NDA, Employment Agreement, & Contractor Agreement
Other common legal expenses

- Convertible Promissory Note ($500 to $2000; keep it simple)
  - Loan that converts to stock
  - Need to decide: amount, interest, discount rate, note term, *de facto* valuation
- “Term sheet” ($2000 to $3000 for legal review)
  - Lays outs terms for a stock offering; takes a few weeks to negotiate
  - Preferred Stock Rights: anti-dilution formula, liquidation preference, dividend, board seat(s), interests ... (more later)
- Preferred Stock [Series A] ($8,000 and up; keep it simple)
  - Collect all corporate documents, bank statements, contracts, etc for due diligence
- Employee Incentive Plan
  - Wait to set up an option plan until you need but “reserve” stock for it (usually Series A)
  - and patents ...
Patents

What is a patent?

In exchange for disclosing an invention, it is a time-limited exclusive right that prevents others from making, using, selling, or importing the invention, where invention must be:

- Novel (new)
- Inventive (non-obvious), and
- Useful (reducible to practice)

Helps to raise hurdle for competitors in product development or access to markets
Patents

Examples of what is NOT patentable:

- Something that already exists (prior art)
- Something that can’t be “reduced to practice” (e.g. perpetual motion machine)
- Technology for atomic weapons
- “Ideas”
Patents

- Example of patentable inventions:
  - Utility patent (20 yrs):
    - Machine, algorithm, chemical compound, manufacturing process, man-made organisms, gene sequencing processes, etc
  - Plant patent (20 yrs):
    - Invented or discovered & asexually reproduced
  - Design patent (14 yrs):
    - Ornamental design or appearance
Provisional patents

- **Advantages**
  - Inexpensive filing fee ($80; small entities)
  - Less complex (claims, prior art search optional)
  - English translation not required
  - Subsequent full filing can be a continuation-in-part

- **Disadvantages**
  - Hastily prepared application might lose to better ones filed in full applications by other parties
  - Claims denied by foreign authorities may make filing its own public disclosure abroad
Virtual Ink US Patent Portfolio

From August 2000 through October 2001:

6,100,877  Method for calibrating a transcription system
6,104,387  Transcription system
6,111,565  Stylus for use with transcription system
6,124,847  Collapsible detector assembly
6,147,681  Detector for use in a transcription system
6,177,927  Transcription system kit
6,191,778  Transcription system kit for forming composite images
6,211,863  Method and software for enabling use of transcription system as a mouse
6,217,686  Ultrasound welding apparatus
6,232,962  Detector assembly for use in a transcription system
6,292,180  Mount for ultrasound transducer
6,310,615  Dual mode eraser
Elements of Virtual Ink IP Strategy

• File patents; offensive and defensive filings
• Patent all technology bottlenecks
  (e.g. Virtual Ink pen transducer manufacturing)
• Patent all product innovations
  (e.g. Virtual Ink “calculators”)
• Patent in key markets (US, Europe, & Japan)
• Patent using metrics / quantitative thresholds
• Offensively block competitor filings
• Assume its published, what’s next to defend?
• Use patent portfolio in market positioning
Patents during market positioning?

Without having seen it, this figure looked like EFI’s first product !!!
Common misconceptions regarding patents

- “I have a patent so I can build my product and business”
  - Not if your novelty depends on something patented by someone else

- “I don’t need them”
  - Investors want some assurance of “freedom to operate”

- “I don’t know what to patent…”
  - Doing patent research helps make you a domain “expert”

- “Patents are expensive…”
  - Don’t need to file full applications up-front…
  - Start the prior art search yourself…

- “No one cares about patents …”
  - Try starting a biz in bio/pharma, medical diag/devices w/o them …

- “Big companies will crush us anyway…”
  - Ha…ha… funny story…
Patent counsel selection factors

When shopping for patent counsel, I look for:

- **Keen business acumen**
  - “Tell me about your business, markets, competitors …”

- **Strategic IP thinker**
  - “An IP strategy might seek to protect …”

- **Quality associates**
  - If considering IP firm, interview the associates

- **Relevant domain expertise**
  - Make sure counsel has experience in your space

- **Reasonable billing rates**
  - Get rates for partner, associates, expenses, …
  - Don’t get charged for “small stuff”
  - Cut costs by traveling to visit with them if needed (early on)
IP Strategy Summary

What we thought then:
- Need it for the investors

What we learned:
- IP strategy process helped product & market development

What I’d do differently:
- Not much

Recommendation:
- Think about what is your core sustainable unfair competitive advantage and if it is intellectual property, consider how to best protect it
- Distribute lab notebooks to technology team
- (www.snco.com good practice & helps document new potential IP)
Interesting IP tricks

• Buying provisional patents?

• Partner with older inventors & possibly qualify for: Accelerated Patent Examination (limited claims, 1 year issuance!!!!)
Now, the financial story...
Typical Founder Value for VC backed company

3 Founders

3 Founders: $100
Working to build value…

Raise $5M at $5M pre-$ (50%)

25% options pool (at founder’s expense)

More blood, sweat, & tears …

Raise another $6M at $12M pre-$ (33%)

Assume $200M company sale

Success! Exit event! (IPO or M&A)

But wait!!! Participating preferred gets another bite!! (on pro-rata as-converted basis)

Cumulating dividend Interest

Multiple Founders

Taxes
What you might think of VC's ...

“TRUST NO ONE”

- The X-Files tag line
The Life of a VC isn’t fun either

- Assumptions:
  - $500M fund
  - 2% operating fee
  - 5 general partners
  - 7 investments per year
  - $5M per investment per year
The Life of a VC isn’t fun either

Every VC partner:

• Spends ~4 weeks raising a new fund every 18 months
• Attends 2 to 3 conferences per year
• Takes much of August off (don’t raise $ then)
  Has 9 months of the year for “real work”

(7 company Boards) * (5 Board mtgs/yr/co) => 35 Board meetings per year
Either coming or going to a Board meeting every week

Spend ½ to 1 day for weekly Partner Meeting/Conference call
Only have ~2 days per week to hear & work on new deals

Reject 99% of business plans (assume 1000 plans / partner)
50%/50% hearing pitches and closing deals
Reserve ~8 to 10 real hours for hearing qualified deals in that top 2% to 5%

Bottom line: “You’ve got 30 seconds …”
Things to know about raising VC $

• Market validation/sales is a must
• Argue option pool size vs. pre-$ value
• Angels vs. VCs:
  • Depends on $ needed, stage of business, & mgmt team
• Politely move on if you:
  • Don’t get a “Yes, we’re interested but..” after 2 mtgs
  • Have spent more than 7 hours with any investor
• Seek investor referrals through:
  • Service Professionals (legal, acct’g, bankers)
  • Alumni associates at VC fund
  • Industry Forums (MITX, MIT EF, etc)
Things to know about raising VC $

- Invests locally
  - Boston great for bio-tech; on the rise again for tech
  - Si Valley great for I.T., web 2.0, medical devices
- In the U.S., they take August off (don’t raise $ then)
2003 Series A for Mok3 (EveryScape)

We like this a lot...

Interesting, but...

Come back

TERM SHEET SIGNED

DRAFT TERM SHEET

BEWARE !!

HELPFUL INVESTORS

SERIOUS INVESTORS

31 -> 20 -> 7 -> 4 -> 2 -> 1
Finding & raising $

- Get creative about financing
  - “Friends, Family, & Fools”
  - Federal Grants (SBIR/STTR: www.zyn.com/sbir)
  - Incubators (TechStars Boston, YCombinator, etc)
  - Work-for-hire (Consulting revenue)
  - Do not be afraid to say “No thank you.” to bad $.

- Prove market viability
  - Find early-adopters to offer feedback (NDA)
  - Find paying customers in your target market(s)
  - Ask them to characterize your product/service benefits
Financials & Fundraising Summary

• What we thought then:
  • <$3MM to profitability ...

• What we learned:
  • Prototypes, demos, & early users matter
  • Original educational market was real; >90% today

• What I’d do differently: (lots!)
  • Not raise $70MM+ in VC money...
  • Do NOT blindly get talked into “get big fast”
  • Fired CEO earlier
  • Hire CFO earlier
  • Developed telepresence tools & partners post-9/11
Now... are you ready?
About being an entrepreneur

- **Self-assessment**
  - Are you really ready to do this?
  - Believe it or not; *now* is the best time.)
  - What is your tolerance for risk & uncertainty?
    (not just pain, everyone @ MIT can handle pain)

- **What is your objective?**
  Is it to:
  - Learn how to run a company
  - Learning to be a CxO or VP in high-tech company
  - Bring an idea to market
  - Own a small company with respectable earnings
  - Fame, fortune, Caribbean mansion mailing address?

  Your approach to building and financing your company should be in line with your objectives.
Building the Team

• In the beginning… (MIT $50k)
  • How many founders? (2 to 3 is reasonable)
  • Is your founding/mgmt team the right team? Why? (Fix it)
  • Do you all have and share the same vision? (You better)
  • How well do you manage disagreement? (Learn how)
  • What happens when the going get rough? (It’s not easy)
• But “The Team” includes: (company)
  • Founding team (2 to 3 is reasonable)
  • Management team (hiring is important, when is a CEO/CFO key?)
  • Investors (the right people means more than the $)
  • Directors (operational experience)
  • Advisors (sanity checkers, wise gurus (MIT VMS))
  • Outside professionals: lawyers, accountants, etc.
Other Lessons

• For future start-up technical leaders:
  • Prove you know how to build it (not that you have to invent more)
  • Assume you’re not the smartest kid on the block
  • Developing and protecting IP is your responsibility: READ the prior art
  • If industry incumbents value or litigate over patents, consider a defensive perimeter but set-up an offensive IP strategy

• For future start-up business leaders:
  • Cultivate a culture of communication & respect across company
  • Ask customers what they’re trying to do, not want they want.
  • Task your CTO/technology team to visit & talk with customers
  • Eat at your own restaurant: be a customer of your product or service
  • To maximize your success, prove value and market viability ASAP
  • Don’t confuse various CxO with VP of X roles
  • In time, hire best product development / management lead (quality, schedule)
Recommended entrepreneur’s reading list

- *Only The Paranoid Survive*, Andrew Grove
- *Crossing The Chasm*, Geoffrey Moore
- *Innovator’s Dilemma*, Clayton Christensen
- *High-Tech Startup*, John Nesheim
- *The Art of the Start*, Guy Kawasaki
- *How To Win Friend & Influence People*, Dale Carnegie
- *Rules for Revolutionaries*, Guy Kawasaki
- *Term Sheets & Valuations*, Alex Wilmerding
- *Accounting & Finance For Lawyers*, Charles Meyer
- *Execution*, Larry Bossidy
- *First, Break All The Rules*, Marcus Buckingham
Common fears

- **“Technical” founders**
  - Someone else will steal my idea ...
  - I’ve don’t have an MBA & never managed people ...
  - I’m not a “people person” ...
  - I’m afraid of losing control or being pushed aside

- **“Business” founders**
  - I don’t have an idea & I’m not technical ...
  - I’m afraid of losing control or being pushed aside ...
  - The “techies” won’t respect my contribution ...
  - I must succeed on my first try or I’m a failure ...

Solutions vs Questions
Parting thoughts

Love risk
Be great
Be humble
Be collegial
Have fun

ENTER THE MIT $100K ENTREPRENEURSHIP COMPETITION
Best of luck

When contacting me, mention “Nuts & Bolts” in the subject line to:

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