An Introduction to Technology Commercialization and Venture Capital

04.25.08

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Talking Points

I. Roadmap from the lab to the marketplace

II. Who VCs are and how VC works

III. How VCs evaluate and fund investment opportunities

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At the laboratory

- One asks a question or poses a problem
  - A device that performs a novel/improved function
  - A method/material for the lowering power dissipation/cost/size and/or increasing the performance/reliability of a system
- Several approaches/solutions for addressing the problem/challenges are proposed
  - New system architecture
  - New process
  - New material
  - New device
- A researcher creates a “proof of concept” to prove the validity of his/her approach/solution
  - Results are peer-reviewed, published, and presented to the academic community
  - Disclosures are made to the Office of Technology Licensing

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Startup vs. Licensing

- Can a business be built around the technology, if further engineered?
  - Is it a standalone system?
    - Battery, memory, solar panel, engine
  - Is it a material that can be sold to a systems integrator?
    - Anode material, dielectric material
  - Does it enable an exclusive service?
    - Method for transporting hydrogen
  - Does it fit into existing distribution/sales channels?
  - *WOULD A COMPANY THAT OWNED THIS TECHNOLOGY HAVE A DISTINCT COMPETITIVE EDGE, OR "**VALUE PROPOSITION?**"*
- Would an existing company pay to use the process/material as-is?
  - Compound for a drug

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Sources of funding

- Small-business innovative research grants
  - Government grants that support technology commercialization
  - NSF, NIH, DOE, DoD, etc…
  - Phase 1: Feasibility study – 6 months, $100,000
  - Phase 2: Commercialization plan – 1 year, $750,000
  - NIST – Advanced Technology Program – $1 Million per year
- Joint research/development agreements
  - A large corporation finances technology development/engineering with specific milestones, in exchange for an option to take a first look at the end product

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Other sources of funding

- Debt financing
  - Small Business Association loans
  - Typically require some sort of leverage
- Equity financing
  - Friends, family and fools
  - Angel investors
  - Venture Capitalists

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Venture Capital

- Consists of:
  - Limited partners
  - General partners
  - Associates and analysts
- Limited partners
  - Invest capital into the fund (they bring the money to the table)
  - Do not make decisions as to what investments are made
- General partners
  - Decide what investments are made
  - Manage the fund
- Associates and/or analysts
  - Assist the general partnership in making investment decisions

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Evaluating an Investment Opportunity

- *Purpose:* Understand the **risk** and **reward** associated with the investment
  - Technology
  - Market
  - Financing
  - Competitive
  - Management
  - *How much $$$ is needed to get where, and how much as that worth?*

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Technology Risk

- Demonstrating a concept in practice
- Scaling from a “proof of principle” to a “commercial sample”
  - Performance
  - Yield
  - Cost
- Compatibility with existing peripheral systems
- Mass manufacturability

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Market Risk

- Market value
  - What kind of value does the market place on the technology?
  - What is the risk associated with achieving that value?
- Market “window”
  - Early entry results in requiring additional capital to keep the business afloat until revenue is generated
  - Late entry puts the company at a competitive disadvantage against incumbents
- Market size
  - Is there a market?
  - Small market: Will it sustain the company’s expenses
  - Large market: What will be the competitive dynamic?

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Competitive Risk

- Large corporations with cash-rich R&D organizations
  - Engage in a strategic partnership?
- Other well-funded startup companies
- Competing technologies
  - Superior ***and*** inferior technologies

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What is the potential upside?

- ***Does the anticipated upside justify the potential risk?***

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Financing the startup

- Investors offer a “term sheet” that provides a template for:
  - “Pre-money valuation”
  - Amount invested and the option pool
  - Vesting schedules
  - Liquidation preferences
  - Board composition
  - Protective provisions
  - Voting rights
- Only legally-binding term is the exclusivity clause
  - Cannot negotiate with other investors until an agreed date

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Basic terms

- Valuation
  - The share of the company that the founders are giving up for the venture financing
  - Function of the risk-reward profile
- Amount invested
  - Financing needs for achieving agreed-upon milestones
- Liquidation preferences
  - Protects preferred shareholders in an event that the company is liquidated

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Example Series A Financing

	# of common shares	# of Series A preferred shares	Fully-diluted %
Investors	0	10000000	50%
Newco (founders)	6000000	0	30%
Option Pool	4000000	0	20%

- Total # of shares: 20 million
- Preferred shareholders get:
  - Special treatment in an event where the company is liquidated.
  - Voting rights
  - Others outlined by the term sheet

Future financing rounds

	Investment	Premoney	Post	F/O % Stake	F/O Equity
Series A	10	10	20	50.00%	10.000
Series B	15	30	45	33.33%	15.000
Series C	15	45	60	25.00%	15.000

- As “value-creating” milestones are met, capital can be raised at a lower expense to the existing shareholders
- Although it may be attractive for a founder to get a high “pre-money,” the resulting “post-money” could turn away potential future investors
  - Investors like to look back and see significant increases in company valuation between financing rounds
  - Furthermore, there needs to be enough “breathing room” in the valuation so that the investors can expect a return that would justify the risk

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How much should you raise?

- Identify the significant milestones that will significantly reduce risk, hence add value to the company
  - Putting together a team, starting a company, and licensing the technology
  - Showing a proof of concept
  - Attracting a world-class CEO
  - Developing engineering design libraries
  - Delivering product samples to customers
  - Generating revenue
  - Becoming profitable
- Figure out how much time and money will be required to hit each milestone
  - At least half of the venture money is usually spent on payroll for R&D/engineering at technology-focused startups
- Request an amount that would take the company to the next step

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Is more $$$ better early on?

- The first money is also the most difficult to raise
  - *Should the entrepreneur try to raise as much as he/she can in the first round?*
- Rationale for “yes” answer:
  - Better resources can be provided early on to ensure success **faster**
  - Longer runway means more time will be spent adding value to the company rather than going out to raise money
  - The company will not be “marketed” as much to VCs
- Rationale for a “no” answer:
  - The company’s higher “post” valuation (premoney + amount invested) would make the company less attractive for follow-on investors

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Financing examples

- $10M raise at a $10M premoney valuation

	Total VC Inv.	Pre	VC 1 Inv	Post	F/O % Stake	F/O Equity ($M)	VC 1 % Stake	VC 1 Equity
Series A	10	10	3	20	50.00%	10.000	15.00%	3.000
Series B	15	30	3	45	33.33%	15.000	16.67%	7.500
Series C	15	45	2	60	25.00%	15.000	15.83%	9.500

- $2.5M raise at a $2.5M premoney valuation

	Total VC Inv.	Pre	VC 1 Inv	Post	F/O % Stake	F/O Equity ($M)	VC 1 % Stake	VC 1 Equity
Series A	2.5	2.5	1.25	5	50.00%	2.5	25.00%	1.25
Series B	10	25	2.5	35	35.71%	12.500	25.00%	8.750
Series C	15	45	2.5	60	26.79%	16.071	22.92%	13.750
Series D	15	60	2.5	75	21.43%	16.071	21.67%	16.250

Venture investment process

- The general partnership makes a decision
- An investment is made in return for a stake in the company
- The VCs take an active role as advisors and board members
  - Facilitate access to key customers/potential acquirers
  - Assist in securing additional non-dilutive government financing
  - Build visibility and awareness
  - Recruit talent & professional management
  - Assist in raising additional financing
  - Define competitive strategy and positioning
- The VCs assist in identifying/facilitating an “exit”
  - Acquisition
  - IPO

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New challenges in early-stage tech VC

- Specialized innovations
  - Requires in-depth knowledge to appreciate the value proposition and anticipate major challenges that lie ahead
  - Require a deep understanding of an ever more complex value chain for commercialization
- Semiconductor newcos normally need to deliver working systems prior to exit
  - Requires relationships in place with potential customers to define specifications
  - Complex value chains require investigating/evaluating multiple paths to commercialization
- VCs will need to shift from “passive opportunity seekers” to “active opportunity builders.”
  - Hands-on assistance in shaping and building opportunities for the business

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