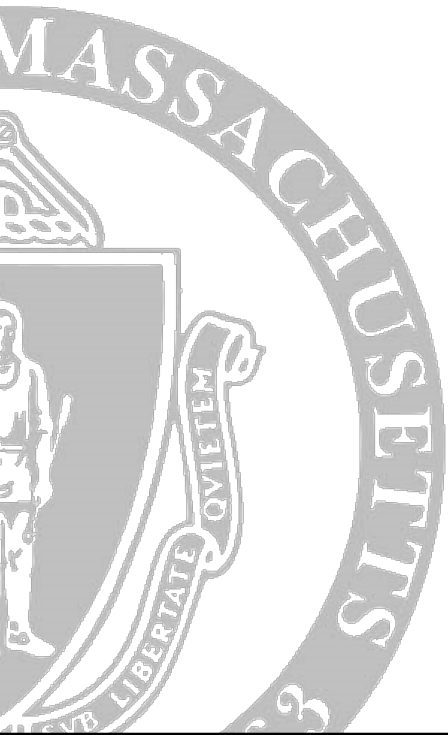




When Does a Start-up Make Sense? What do you need to know?

10/11/17

Robert MacWright, Ph.D., Esq.
Director, Technology Transfer Office
UMass Amherst



Ten Questions You Need to Answer

1. What are the products?
2. Who are the customers?
3. How big is the market?
4. What's the competition?
5. What are the "barriers to entry"?
6. What's the "exit strategy"?
7. How long to develop products?
8. What's the profit margin?
9. How much money to get there?
10. What's the 10-year outlook?





1. What Are The Products?

- Consumer products
- Biotech/pharma/Agbio
- Medical devices
- Commodities
- Engineered materials
- Military and police
- Microelectronics
- Information technology



No “One-Trick Ponies”

- 1-product companies are very risky
 - Regeneron
- Best investments:
 - Orphan to broad market drug
 - Near-term, mid-term, long term
 - Multiple parallel, related technologies
 - Multi-generational products
 - Razor/razor blade product pairs



2. Who Are the Customers?

- Consumers
 - Personal, home, travel, convenience
- Doctors, Patients, hospitals
- Businesses - Component-built product makers, OEM, wholesalers/distributors
- Government
 - Military, infrastructure, big vendors
- IT, communications giants



Two Approaches to Customers

1. Lean Launchpad/I-Corps

- Hypothesize who the customers are
- Talk to 100 of them!
- Revise your product concept and repeat

2. Edwin Land

- “It is not the customer’s job to know what they want.”
- Often quoted by Steve Jobs



3. How Big is the Market?

- Consumer goods – trend analysis
- Bio/pharma/devices – disease stats
- Ag biotech – crop, plant disease stats
- Commodities – markets are huge
- New materials – goods they can make
- Military/police – public purchases
- Microelectronics, IT – device sales, trends, Moore's Law



Information Sources

- Google, etc.
- SEC's Edgar database
- D&B and similar business sources
- Academic review articles
- Patent applications (USPTO.gov)
- Governmental reports
- Company press releases



4. What's the Competition?

- The “best available alternative”?
- How many other products?
- How much better is yours?
- How will price vs benefit compare?
- Market dominator, or many players?
- Size of competing companies?
- Others developing new products?
- Any in clinical trials? (clinicaltrials.gov)



5. What Are the “Barriers to Entry”

- Human trials cost \$400M, 7-10 yrs
- Dept. of Ag approvals, GMO fears
- Government product specifications
- Nobody will tear down their factory
- Commodities – price, reliable supply
- Market fluctuations, e.g., crude price
- Short product life cycle
- Fickle consumers



6. What's the "Exit Strategy"?

- None: a "Lifestyle company"
- Grow by expanding product line, acquiring related businesses
- Acquisition by big pharma, Google
- Initial public stock offering (IPO)
- Sublicense and become a holding co.
- "Go virtual"; contract manufacturing and sales to others



Investors Want a “Liquidity Event”

- Stock in a non-public company is difficult to value, sell
- Investors can't get an ROI if they can't get money out!
- Acquisition or IPO are preferred
- Strategies that grow revenues and provide investor dividends are great, but acquisition or IPO are top goals



7. How Long to Develop Products?

- Long cycle requires “patient money”
- Cost and time to market are related
- High cost needs big exit
- Staged product launches encourage longer-term investment
- Development partners, CROs, joint ventures, contract manufacturers can shorten cycles considerably



8. What's the Profit Margin?

Gross Margin =
Cost of goods (COGS)/Sale Price

Operating Margin =
COGS + business expenses + R&D
+ marketing + debt service /
Sale price



Cost of Goods

- Make a components list
- Scratch out a manufacturing process
- Ask vendors for bulk pricing
- Ask contract manufacturer for quote
- Get quote on equipment rental, purchase (amortize cost)
- Labor is only free at UMass!
- Overhead – rent, heat, light, elect.



Sales Price

- Price of competing products
- Price range of what customers buy
- Insurance coverage
- The most a customer would pay
 - Ask some customers!
- How valuable is the improvement?
- Commodity spot-prices
- A wild guess if you must!



What's a Good Margin?

- Assume COGS may be 100% higher
- Varies by industry:
 - Pharma, >95%
 - Agriculture, as low as 2%
 - Consumer products, 50% (distributor and retailer each add another 50%)
 - Commodities low, public knowledge
- Public companies often report to SEC



9. How Much Money to Get There?

- Map out a product development plan
- Big plays will justify big money
- Rough out investment stages, costs
 - “proof of concept”
 - Pilot testing/animal testing
 - Scale-up/GMP production
 - Regulatory testing & approval
 - Marketing and product launch



How Can I Possibly Know?

- You are not asking for the money!
- Purpose is to see if realistic
- Guess if you must! You can be off 200% and find the information useful
- The overall goal is to see if the investment needed is justified by the potential profits



10. What's the 10-Year Outlook?

- The big question here is what your annual market penetration will be
- Nobody believes in the hockey stick!
- Staged products will give overlapping market growth curves
- Need many if life cycles are short
- Investors look for the 10-year ROI; what will be the “multiple”?



You Will Revise a Thousand Times!

- Answering these questions should get you to a go/no go decision
- If you did all this work, you also know you have the will and the time!
- If a "GO," use what you learned to create formal company documents
- Refining and expanding them over time will build your business case



THANKS!

Bob MacWright

Director, Technology Transfer Office

UMass Amherst

macwright@umass.edu

www.umass.edu/TTO

