Entrepreneurship Using Physics

Welcome – we’ll get started soon

- Dial in or use your computer’s microphone and speakers.
- Submit questions via the Questions panel on the right.
- This session is being recorded.
- The recording will be sent to you via a follow up email.

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www.aps.org/careers/guidance/webinars
Scientist & Entrepreneur: Lab to Business Basics

Jeff Bargiel
Founder/CEO of EntoBio
Scientist/Entrepreneur

Both use the scientific method to gain knowledge and resolve uncertainty.

*Just do this, but for commercialization.*

Piece of cake, right?
Ideation

Problem + Solution
Ideation

Thought Experiments
Opportunity Redefinition

Mind & Mine Complaints
Extreme It
Biomimicry

Break Fixedness, Be Mindful
& Make Connections

Wishing
Think INSIDE the Box

What If...
Mindmapping

Brainstorming
Challenge Assumptions
Evaluation
“The first principle is that you must not fool yourself and you are the easiest person to fool.”

- Richard Feynman
Evaluation

Can we do it?

Should we do it?
Evaluation

Hypothesize → Test → Adjust → Repeat

Talk...to...customers.
Do it now. Do it often.
Or the market will kill you later.
Evaluation

Value Proposition Canvas
Business Model Canvas
BASE Board
Lean Canvas
Evaluation

Value Proposition

– A promise of value to be delivered.
– The reason a customer buys. Benefits, not features!
– A clear statement that:
  • Is relevant (explains how your product solves customers’ problems or improves their situation),
  • Is quantified (delivers specific benefits),
  • Conveys your unique differentiator (tells the ideal customer why they should buy from you and not from the competition).
Value Proposition

Canvas

Value Map

Customer Profile

Technology Push

Market Pull
| KEY PARTNERS | Who are our key partners?  
|             | Who are our key suppliers? 
|             | Which key resources are we acquiring from our partners? 
|             | Which key activities do partners perform? |
| KEY ACTIVITIES | What key activities do our value propositions require? 
|                | Our distribution channels? 
|                | Customer relationships? 
|                | Revenue streams? |
| VALUE PROPOSITIONS | What value do we deliver to the customer? 
|                  | Which one of our customers’ problems are we helping to solve? 
|                  | What bundles of products and services are we offering to each segment? 
|                  | Which customer needs are we satisfying? 
|                  | What is the minimum viable product? |
| KEY RESOURCES | What key resources do our value propositions require? 
|               | Our distribution channels? 
|               | Customer relationships? 
|               | Revenue streams? |
| CUSTOMER RELATIONSHIPS | How do we get, keep, and grow customers? 
|                        | Which customer relationships have we established? 
|                        | How are they integrated with the rest of our business model? 
|                        | How costly are they? |
| CUSTOMER SEGMENTS | For whom are we creating value? 
|                    | Who are our most important customers? 
|                    | What are the customer archetypes? |
| CHANNELS | Through which channels do our customer segments want to be reached? 
|           | How do other companies reach them now? 
|           | Which ones work best? 
|           | Which ones are most cost-efficient? 
|           | How are we integrating them with customer routines? |
| COST STRUCTURE | What are the most important costs inherent to our business model? 
|                | Which key resources are most expensive? 
|                | Which key activities are most expensive? |
| REVENUE STREAMS | For what value are our customers really willing to pay? 
|                | For what do they currently pay? 
|                | What is the revenue model? 
|                | What are the pricing tactics? |
Evaluation

Seriously, talk to customers.

And, stakeholders, decision makers, purchasers, executives, users, etc.
Evaluation

(A bit more advice.)
Evaluation (A bit more advice.)

Big Problem, Big Market

But can you start (selling) small and fast?

Wave Theory of Startups by Guy Turner at Hyde Park Ventures.
Zero-to-One by Peter Thiel
Evaluation

Minimum Viable Product
Minimum product that *delivers customer value*.
Prove the market, then improve the product.
Funding

• Yourself
• SBIR/STTR
• FFF: Friends, Family (and Fools)
• Pitch Competitions
• Local, County, State
• Angels & VCs (Venture Capitalists)
• Your Customers
Pitching is Selling

20 Seconds

Be compelling.
The tech probably doesn’t matter.
Common language.
PRACTICE, PRACTICE, PRACTICE.
Making Progress

Uncertainty

Valuation

Prioritize Inflection Points
And, “sales cures all.”

Major Milestones
Pitfalls/Advice

• Startups are NOT small versions of big companies.
• Products are not businesses.
• Solution is not at least 10X better.
• Be smart about protection. Most people are too busy to care about stealing your idea. But don’t disclose publically. Get a patent attorney to write.
Pitfalls/Advice

• Starting too late. Waiting until it is perfect.
• Do not let the perfect be the enemy of the good.
Pitfalls/Advice

• Be humble but decisive.
• Be coachable.
• Find mentors.
• Don’t ask for crazy valuations.
Where I Struggle(d)

• Analysis Paralysis
• Clear, concrete, down-to-earth communication
• Oooh, shiny!
• Cold calling anxiety
• Ignoring the unimportant
Resources

APS PIPELINE Undergrad Physics Entrepreneurship
www.aps.org/programs/education/innovation

Science and Technology Entrepreneurship Program (STEP) at Case Western Reserve University, MS Physics Entrepreneurship

Inside the Box by Drew Boyd and Jacob Goldenberg
Financial Intelligence for Entrepreneurs by Karen Berman and Joe Knight

Scrappy Project Management by Kimberly Wiefling

Business Model Canvas (Udacity Course) by Steve Blank

Writing a Compelling Executive Summary (Blog Post) by Garage Technology Ventures

Perfecting Your Pitch (Blog Post) by Garage Technology Ventures

Zero-to-One by Peter Thiel
Everybody Writes by Ann Handley
The Lean Startup by Eric Ries
Art of the Start by Guy Kawasaki

Pitch Anything by Oren Klaff
Grit by Angela Duckworth

Start with Why (TED Talk) by Simon Sinek
The Four Hour Work Week by Tim Ferris

The Wave Theory of Startups (Blog Post) by Guy Turner

How to Measure Anything by Douglas Hubbard

Don’t Fool Yourself