Engineering 245

The Lean LaunchPad

Session 1: Overview/Business Models/Customer Development

Professors Steve Blank, Ann Miura-Ko, Jon Feiber

http://e245.stanford.edu/
Agenda

“Is This the Right Course for Me?”

- Introductions
- Course Objectives/teams/project
- Class Logistics
- Building a “Lean Startup”
  - Idea
  - Sizing the Opportunity
  - Business Models
  - Customer Development
Introductions
Steve Blank, Ann-Miura-Ko, Jon Feiber

8 startups in Silicon Valley
- Semiconductors
- Supercomputers
- Consumer electronics
- Video games
- Enterprise software
- Military intelligence

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Steve Blank, Ann-Miura-Ko, Jon Feiber

8 startups - 32 years in Silicon Valley
• Semiconductors
• Supercomputers
• Consumer electronics
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• Enterprise software
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Teach: Stanford, Berkeley, Columbia

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Course Assistant

Thomas Haymore

- B.A. in Political Science
- Stanford Law (‘06)
- J.D. Stanford Law (‘12)
- Wordnik – Product Mgmt

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- **CA’s role**: Class/lecture questions, Grading and attendance
Mentors/Advisors

- Venture Capitalists or Entrepreneurs
- Their role is to:
  - Help you “Get you out of the building”
  - Share contacts
  - Offer “Real-world” entrepreneurial advice
  - Critical feedback
- You arrange your schedule for them, not the other way around
Mentors – Tactical Guidance

• Every week:
  – Review teams presentation *before they present*
  – Commenting on teams Customer Discovery blog
  – Responding to teaching teams critique of your team
  – Rolodex help - “why don’t you call x?”
  – Pushing the teams to make 5 - 10 customer contacts/week

• Meeting one-on-one with their teams at least twice during the class

• Check in with teaching team at class 3 and 7 to discuss team progress
Advisors – Class-wide Resource

• Advisors are a class resource for specific domain expertise.
  – Respond to student emails/phone calls within 24-hours
  – Skype calls with one/two teams a week, as needed
Course Objective
Course Objective: Idea to a Business

• What does it take to go from idea to a business?
  – Business Model + Customer Development
  – Hypotheses testing of the business model(s)
  – Get “out of the building”

• Operating and decision making in chaos with insufficient data

• Teamwork
Course Objective: Simulate A Startup

• Create the pressures, uncertainty, and challenges of a real startup
  – Our expectations are unreasonable, they require extraordinary effort
  – We expect failures, iterations and Pivots
  – Class is a “lab” - books/lectures are tools, not answers
  – Fail fast, learn quick, push you outside your comfort zone
Teaching team philosophy

• This class is taught using the “Startup Culture”
  – We’re tough, direct, fair - you need to be the same
  – Startup culture has no hierarchy - in this class you are an entrepreneur - not a PI, lab mgr or center director
  – We’re your biggest supporters – we want you to succeed

• Question us, challenge us, push us as hard as we push you
Getting Out of The Building

• This class is not about our lectures
• The class is not about your attendance
• The class is about the work you do outside the building
• It’s the difference between a vision and a hallucination
Our Expectations of You

• This is a full-contact, immersive class
  – All of you will be full participants – here and remotely
  – You will spend lots of time outside of your university
  – You all will do all the work assigned (and it is a lot more than you probably realize)
  – No “dine and dash”

• If you think you are not learning, or you all cannot commit the time, drop the class
What Will you Learn?

• Opportunity evaluation
• Search for a Business Model
• Customer Discovery and Validation
• Operating and decision making in chaos with insufficient data
• Ruthless pursuit of an objective by a team
This Class is Hard

• You can’t pass by attending the lectures
• Your grade is determined by the work you do outside the class
• There’s a lot of it
• You are dependent on group success – communication is critical
• You don’t need to be friends you need to be partners
Team Projects

• Any scalable startup
• If you are a domain expert, that’s your best bet (but not required)
• If you pick a web project, you have to build it (and there needs to be some novelty)
Class Logistics
The Course ‘By the Numbers’

- 3/4 Units of Credit
- 3 Instructors, 1 CA, 15+ Mentors & Advisors
- 8 Lectures
- 8 Weekly 10-minute presentations
- 1 Final 20 minute presentation
- 2 Textbooks

10-15 hours of work a week outside the classroom
Course Reading

- Business Model Generation
- Four Steps to the Epiphany

copies available at the bookstore
Class Schedule

Eight (3 hour) Class Sessions:
• 1: Jan 10th - Introduction, Business Models, Customer Development
• 2: Jan 17th – Value Proposition/Customer Segment
• 3: Jan 24th – Channels
• 4: Jan 31st - Demand Creation (Customer Relationships)
• 5: Feb 7th – Revenue Model
• 6: Feb 14th – Key Resources and Activities
• 7: Feb 21st - Cost Structure
• 8: Feb 28th – Fund Raising
9 & 10: March 6th / 13th – Lessons Learned Presentations
Team Deliverables - Presentation

• Each Week
  – Lessons Learned presentation 10 minutes
  – Updated business model canvas
  – Update blog/wiki
  – 10’s of hours of “outside the building” progress

• Final Presentation
  – 20 minute Lessons Learned Summary
Team Deliverables - Blog

• Each Week
  – Business model canvas updates
  – Hypotheses
    • Experiments
    • Pass/Fail Criteria
  – Documentation of the process
    • Interviews
    • Photos/Videos
    • A/B tests
    • Strategy
Interview with Fred Ford

I spoke with two people who worked for the farm at the Saratoga Farmer’s Market on Saturday 1/15/11. The owner was not available, but I did get some interesting feedback from them. They own approximately 80 acres of apple trees and 20 acres of squash. They don’t weed the orchards, just mow. They manually weed the squash once or twice during the growing season, but it is difficult due to the sprawling nature of the plant. Also the squash is quite prodigious and seems to grow fine with minimal weeding. When asked about the value of an automatic weeding machine, they thought it would help some, but not enough to justify the cost. Their main labor concern is thinning the fruit trees – in fact they throw out approximately 75% of the fruit early in the growing season so the remaining fruit grow large and sweet.

One person had an interesting take: she said “people have been farming for 1000s of years and we’ve never needed machines before...” She went on, but in effect, her point was that there is a spiritual side to manually working the fields that would be lost with a machine – it is good for both the people and the food.

Another worker was also skeptical about how well the machine would perform, having been burned in the past with “new technology” that actually ended up harming more than helping and reducing productivity.

Hypothesis test: Are farmers interested in an autonomous weeding system?

Result: Not likely for small farmers/orchards.

It may be obvious, but tree farms do not weed their fields. Squash also seems to thrive with minimal weeding. As found with Paloutzian Farms, it could be a harder sell to the small farmer due...
Surveys
Damon Cockerham – Supervisor of Parks Maintenance – Los Altos Parks and Recreation
650-947-2870

In-Person Interview with Joe Bingold

Los Altos has 20 acres of turf spread across several parks (biggest park ~3.5 acres), which are mowed once a week by 2 operators with 2 ride-on mowers. It takes 1 day (Wednesday) 9 hour shift to mow the entirety of the Los Altos parks. Thus, it takes about 18 hours to mow the parks. Of this time, about 6 hours is actually spent on the mowers – a lot of time is spent in travel between parks, clearing the areas, etc.

They currently have a John Deere and a Toro mower. The mowers last about 10 years and cost about $60K. Residual value of the mowers at the end of the 10 yrs is $3K.

Given the smaller amount of turf that Damon is responsible to mow, there is probably not a business case for an automated mower. It is unlikely that they will reduce their manpower with this technology. That said, Damon did believe that an individual could start a mower going in a park and then go do other maintenance in the meantime (edging, park inspection, etc.).

Damon’s biggest concern was liability. He knows that teenage kids will likely mess around with the mower and create problems – potentially damaging themselves.
Competitive Analysis

Surveying Competitors Pricing Model

Posted on February 05, 2011 by gillesbrue

- NimSoft
  * Description: Company featured in Rackspace as one of its partners. It provides solutions to monitor virtualized datacenter, on hosted or managed infrastructure, IaaS, PaaS, or SaaS services, public and/or private clouds.
  * Pricing Model:
    * Cold called their sales department, but they refused to give specific quotes
    * They mentioned that their pricing model is very flexible:
      * license by server/network device count
      * or can also license by hour; usage, meter usage, bulk pricing, volume

- Neptuny / BMC
  * Description: Recently acquired by BMC. Products capacity management for all data center resources, including physical and virtual servers, databases, storage, applications, middleware, networks, facilities, etc. The product also provides automated capacity analysis and reporting to help its clients optimize performance and capacity.
  * Pricing Model:
    * Cold call and refused to provide specific quotes
    * Did mentioned that they licensed per sockets, and the price applies across all client types.
Key finding this week: Reviews & popularity highly disproportionate

I would not buy the following products without consulting online reviews:

<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>40</td>
</tr>
<tr>
<td>Software</td>
<td>28</td>
</tr>
<tr>
<td>Communication services</td>
<td>22</td>
</tr>
<tr>
<td>Cosmetics</td>
<td>21</td>
</tr>
<tr>
<td>Medication</td>
<td>20</td>
</tr>
<tr>
<td>Gaming devices</td>
<td>19</td>
</tr>
<tr>
<td>Personal care products</td>
<td>18</td>
</tr>
<tr>
<td>Insurance</td>
<td>16</td>
</tr>
<tr>
<td>Airline tickets</td>
<td>16</td>
</tr>
<tr>
<td>Food</td>
<td>17</td>
</tr>
<tr>
<td>Credit cards</td>
<td>15</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
</tr>
</tbody>
</table>

What product/services do you intend to purchase online in the next 6 months?

<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks</td>
<td>44</td>
</tr>
<tr>
<td>Clothing/Accessories/Decks</td>
<td>38</td>
</tr>
<tr>
<td>Airline ticket/reservations</td>
<td>32</td>
</tr>
<tr>
<td>Electronic equipment</td>
<td>27</td>
</tr>
<tr>
<td>Travel/Hotel reservations</td>
<td>26</td>
</tr>
<tr>
<td>Cosmetic/nutritional supplies</td>
<td>22</td>
</tr>
<tr>
<td>Event tickets</td>
<td>20</td>
</tr>
<tr>
<td>Computer hardware</td>
<td>19</td>
</tr>
<tr>
<td>Videos/On-Demand</td>
<td>18</td>
</tr>
<tr>
<td>Groceries</td>
<td>18</td>
</tr>
<tr>
<td>House</td>
<td>16</td>
</tr>
<tr>
<td>Sporting goods</td>
<td>13</td>
</tr>
<tr>
<td>Toys/Skis</td>
<td>11</td>
</tr>
<tr>
<td>Computer software</td>
<td>11</td>
</tr>
<tr>
<td>Flowers</td>
<td>8</td>
</tr>
<tr>
<td>Automobiles &amp; Parts</td>
<td>8</td>
</tr>
<tr>
<td>Baby supplies</td>
<td>7</td>
</tr>
<tr>
<td>Alcohol drinks</td>
<td>6</td>
</tr>
<tr>
<td>Sports Memorabilia</td>
<td>5</td>
</tr>
<tr>
<td>Gifts</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
</tr>
</tbody>
</table>

I do not plan to make an online purchase in the next 6 months

Posting credit: Ian
A/B Test Results

Winning landing page design should increase conversions by 80%

Results of A/B tests are in. Based on 260 page views and 119 conversions, we have a 97.8% probability of finding a conversion rate of 53.6% to 58.1% (an 80% increase!) by using the below design:

- Adding a call-to-action button
- Promoting the software
- Mentioning the benefits of the paid version
- Putting navigation items to the left in small text so it’s not distracting

Combination 2 has a 97.8% chance of outperforming the original. Run a follow-up experiment to validate the results.

Page variations:

<table>
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<tr>
<th>Variation</th>
<th>Status</th>
<th>Est. conv. rate</th>
<th>Chars. to Best Exp.</th>
<th>Observed Improvement</th>
<th>Conv. Value</th>
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<tbody>
<tr>
<td>Original</td>
<td>Disabled</td>
<td>32.4% / 1%</td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Combination 2</td>
<td>Enabled</td>
<td>50.7% / 1%</td>
<td>15%</td>
<td>10%</td>
<td>0.14</td>
</tr>
<tr>
<td>Variation 1</td>
<td>Enabled</td>
<td>50.7% / 1%</td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Variation 2</td>
<td>Enabled</td>
<td>50.7% / 1%</td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Variation 3</td>
<td>Enabled</td>
<td>50.7% / 1%</td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Variation 4</td>
<td>Enabled</td>
<td>50.7% / 1%</td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
</tbody>
</table>

Posting credit: Abhishek
Should we pivot?

Here's our latest thinking on doing Product Libraries—personalized catalogs of products you can organize, annotate, and share—just like Personal Libraries—with the added features of price comparisons and instant appraisals.

If you're a part of the E245 class, please consider leaving a comment (click on the post title to enable commenting).

Revised Customer Segment & Value Prop Hypothesis

Based on ~20 interviews, ~800 subject MVP tests, market & competitive research

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**Pat the Professional**

- Salary: $40,000 - 150,000/year
- Finance, Consulting, Public Relations, Marketing
- Keeps up with trends in fashion and technology

**Traits:**

- Gets ideas from blogs and shopping websites
- Values celebrity trends and friends' opinions
- Wants to buy high-ticket items at lowest price
- Interested in shopping opportunities—either being the first to have something, or getting an alert when a price drops

**Purchase Power:**

- Spends $3,000 - $15,000 in online shopping per year on discretionary items

**Value Proposition:**

- Promise: Save & hassle time shopping online
- Differentiation:
  - Discover online goods recommended by friends at the lowest possible price from unspammy vendors
  - Evidence: Price recommendations, social features
- Cost: Free to user
- Effort: Download an install, initially requires Chrome
- Risk: Concerns about privacy, browser crashing, biased search results, valuable use of time

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Posting credit: Ian
Clinical Trials Design

Here is the hypothetical design of all the clinical tests and trials needed to bring our innovative technology to market. This includes a pilot testing program to prove feasibility and pivotal FDA trials to reduce the risk and increase the chance of getting FDA approval, which at the same time includes economic end-points such as procedure time, cost, required follow-up time, etc. to include CMS cost-effectiveness studies for faster acquisition of our specific Cat III CPT codes.

Each stage involves a certain number of patients, and the cost is relatively estimated. The different stages of clinical trials, such as patient enrollment, trial design, facility, technician and physicians involved, permit to perform the tests, results analysis, and publications.

Clinical Trials Design

MammOptics

Clinical Trials

- 500 patients
- Total cost: $7.2M

Stage 2
Interim Trials

- Focus on Safety
- Efficacy & statistical superior sensitivity clinical results

6 Months
15 Months

Quarters 5-6
Quarters 8-12
Week 7 Business Model Canvas & Financial Projections

Pretty dramatic on our business model canvas, moving from "Reference Libraries" to "Product Libraries"—key change is we’re focusing on people with lots of money who love to shop, and have many good options on shops to help them shop, rather than researchers with no money and lots of needs, and fewer good options.

We’re pretty much pivoting away from our existing software for the course. It’s a difficult choice, but our previous project just didn’t fit the course objectives....

Business Model Canvas as the Scorecard
Grading

Individual - 15%
• Participation in class 15%

Team - 85%
• 40% out-of-the-building progress as measured by blog write-ups each week.
• 20% weekly team “lesson learned” summaries
• 25% team final report

Grade is on how much you learn
Office Hours

- With your team
- Before class
- Look at availability
- Get on the calendar
Intellectual Property - Suggestions

• You own what IP you brought to class with you
  – No team member has claim to anything you brought
• Your team jointly owns any IP developed for the class
  – If any of you decide to start a company based on the class, you own only what was developed and completed in the class
  – You have no claim for work done before or after the class quarter
  – If a subset of the team decides to start a company they do NOT “owe” anything to other team members for work done in and during the class
  – All team members are free to start the same company, without permission of the others
• You are agreeing to this unless the team decides in writing to do something different
Class Disclosure/NDA’s

• Successful startups are not about the original idea
  – It’s about learning, discovery and execution
  – You will not be presenting your IP/technical details

• You get to see how previous teams solved problems by looking at their slides, notes and blogs

Therefore:

• Your slides, notes and blogs will be public
• This is an open class. No non-disclosures
What’s A Company?
What's A Company?

A business organization which sells a product or service in exchange for revenue and profit
How Are Companies Organized?
How Are Companies Organized?

Companies are organized around Business Models
What’s a Business Model?
What’s a Business Model?

A business model describes all the parts of the company necessary to make money.
What About My Technology?
What About My Technology?

Your technology is one of the many critical pieces necessary to build a company. It is part of the “Value Proposition”
What About My Technology?

Customers don’t care about your technology
They are trying to *solve a problem*
What’s A Startup?
What’s A Startup?

A startup is a temporary organization designed to search for a repeatable and scalable business model.
How to Build A Startup

Idea
Size Opportunity
Business Model
Customer Development
How to Build A Startup
How to Build A Startup

Idea → Size of the Opportunity → Business Model(s) → Customer Discovery → Customer Validation

Theory → Practice
How to Build A Startup

- Web startups get the product in front of customers earlier
Customer Development Process

1. Hypotheses
2. Design Experiment
3. Test
4. Learn

The process is cyclical, with each step informing the next.
How to Build A Startup

- Idea
- Size of the Opportunity
- Business Model(s)
- Customer Discovery
- Customer Validation

Books:
- "Business Model Generation"
- "The Four Steps to the Epiphany"
Idea
We’re Engineers Darn It!

Stanford

• Aren’t companies all about product?
• I have a great technology idea
• Teach me how to make a company around it
• Just like Facebook and Google (or Intel or Apple)
Sources of Startup Ideas?

- Technology shifts
  - Moore’s Law
  - Disruptive tech
  - Research
- Market changes
  - Value chain disruption
  - Deregulation
- Societal changes
  - Changes in ways we live, learn, work, etc.
  - The world is flat (outsourcing)
- Dinosaur factor
  - Arrogance
  - Deadened reflexes
- Irrational exuberance
  - Undervalued assets
An Idea is _Not_ a Company
Size of Opportunity
This Class is about **Scalable Startups**

- Not all startups are designed to scale
- Small business startups have different goals
  - They are done by normal people
- Scalable startups are designed to grow big
  - Typically require venture capital
- This means the size of the opportunity needs to be $100’s of millions to billions
Small Business Startups

- Business Model found
- Profitable business
- Existing team
< $1M in revenue
Small Business Startups

- Business Model found
- Profitable business
- Existing team
< $10M in revenue

• 5.7 million small businesses in the U.S. <500 employees
• 99.7% of all companies
• ~ 50% of total U.S. workers

Scalable Startup

- Total Available Market > $500m
- Company can grow to $100m/year
- Business model found
- Focused on execution and process
Scalable Startup

- Total Available Market > $500m
- Company can grow to $100m/year
- Business model found
- Focused on execution and process
- Typically requires “risk capital”

- In contrast a **scalable startup** is designed to grow big
- Typically needs risk capital
- What Silicon Valley means when they say “Startup”
Very Different Startup Goals

- Business Model found
- Profitable business
- Existing team
- Total Available Market > $500m
- Company can grow to $100m/year
- Business model found
- Focused on execution and process
- Typically requires “risk capital”
Venture Firms Invest in Scalable Startups
Market/Opportunity Analysis

How Big is It?: Market/Opportunity Analysis

- Identify a Customer and Market Need
- Size the Market
- Competitors
- Growth Potential
How Big is the Pie?  
Total Available Market

- How many **people** would want/need the product?
- How large is the market be (in $’s) if they all bought?
- How many units would that be?

How Do I Find Out?
- Industry Analysts – Gartner, Forrester
- Wall Street Analysts – Goldman, Morgan
How Big is My Slice?

Served Available Market

- How many people need/can use product?
- How many people have the money to buy the product
- How large would the market be (in $’s) if they all bought?
- How many units would that be?

How Do I Find Out?
- Talk to potential customers
How Much Can I Eat?

Target Market

- Who am I going to sell to in year 1, 2 & 3?
- How many customers is that?
- How large is the market be (in $’s) if they all bought?
- How many units would that be?

How Do I Find Out?

- Talk to potential customers
- Identify and talk to channel partners
- Identify and talk to competitors
Segmentation
Identification of groups most likely to buy

- Geographic
- Demographic
- Psychographic variables
- Behavioral variables
- Channel
- etc…
Market Size: Summary

- Market Size Questions:
  - How big can this market be?
  - How much of it can we get?
  - Market growth rate
  - Market structure (Mature or in flux?)
- Most important: Talk to Customers and Sales Channel
- Next important: Market size by competitive approximation
  - Wall Street analyst reports are great
- And: Market research firms Like Forester, Gartner
Business Model
What Is a Business Model?

- Diagram of flows between company and customers
- Scorecard of hypotheses testing
- Rapid change with each iteration and pivot
- Founder-driven

*Alex Osterwalder*
9 building blocks of a business model:
CUSTOMER SEGMENTS

which customers and users are you serving?
which jobs do they really want to get done?
VALUE PROPOSITIONS

what are you offering them? what is that getting done for them? do they care?
how does each customer segment want to be reached? through which interaction points?
CUSTOMER RELATIONSHIPS

what relationships are you establishing with each segment? personal? automated? acquisitive? retentive?
REVENUE STREAMS

what are customers really willing to pay for? how? are you generating transactional or recurring revenues?
KEY RESOURCES

which resources underpin your business model?
which assets are essential?
KEY ACTIVITIES

which activities do you need to perform well in your business model? what is crucial?
KEY PARTNERS

which partners and suppliers leverage your model?
who do you need to rely on?
COST STRUCTURE

what is the resulting cost structure?
which key elements drive your costs?
sketch out your business model
But,

Realize They’re Hypotheses
9 Guesses
How Do Startups **Search** For A Business Model?

- The Search is called **Customer Development**
- The Implementation is called **Agile Development**
Customer Development

Solving For Customer Risk
Customer Development

The founders
^ Get Out of the Building
More startups fail from a lack of customers than from a failure of product development (focus on “who” more than “what”)
Customer Development

Product Introduction Model

- Concept/Bus. Plan
- Product Dev.
- Alpha/Beta Test
- Launch/1st Ship

Customer Development

- Customer Discovery
- Customer Validation
- Customer Creation
- Company Building

Pivot
Customer Discovery

- Stop selling, start listening
- Test your hypotheses
- Continuous Discovery
- Done by founders
Turning Hypotheses to Facts

Test Hypotheses:
• Product
• Market Type
• Competition
Test Hypotheses:

- Problem
- Customer
- User
- Payer
Test Hypotheses:

• **Channel**
<table>
<thead>
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<th>Key Partners</th>
<th>Key Activities</th>
<th>Value Propositions</th>
<th>Customer Relationship</th>
<th>Customer Segments</th>
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<td>Test Hypotheses:</td>
<td>Test Hypotheses:</td>
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<th>Revenue Streams</th>
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Test Hypotheses:
- Channel
- (Customer)
- (Problem)

Customer Development Team

Agile Development

Test Hypotheses:
- Demand Creation

Test Hypotheses:
- Channel
- Problem
- Customer
- User
- Payer

Test Hypotheses:
- Product
- Market Type
- Competitive

Test Hypotheses:
- Size of Opportunity/Market
- Validate Business Model

Test Hypotheses:
- Pricing Model / Pricing
The Pivot

- The heart of Customer Development
- Iteration without crisis
- Fast, agile and opportunistic
Our “Culture” for E245

- Show up on time and stay ‘til we’re done
- Pay attention to the other team presentations
- Step outside if you must call, email, skype, twitter, chat, surf the web, or do anything unrelated to E245
- Keep your commitments (in class and out)
- Entrepreneurship is a team sport
  - 80% of your grade depends on working with others
For Next Week

• Team deliverable by next week:
  - Hypotheses for each part of business model.
  - Test for whether your business is worth pursuing (market size)
  - Test for each of the hypotheses
  - What constitutes a pass/fail signal for the test (e.g. at what point would you say your hypotheses wasn’t even close to correct)?
Examples of Team Presentations

Title Slide
Our technology converts forestry waste (slash) into biochar, a soil amendment.

~40 landowner-related conversations
Arka Solutions

Arka will make modular, low cost, enhanced heat pipe-based cooling solutions, first for LED lighting, and subsequently for electronics cooling and HVAC applications
FINAL PRESENTATION

Team Autonomow
ENGR-245
Confidential

For further information contact Heraud_Jorge@gsb.stanford.edu
Autonomow

Autonomous Large-Scale Mowing and Agricultural Weeding
Hydrogen sensors in Chlor-alkali

Dr. Jason Gu
Co-founder / CEO
jasongu.sensevere@gmail.com
implantable drug infusion pumps with remote physician control
Examples of Team Presentations

Market Size &
Initial Business Model Canvas
Market Size

Global lighting industry - $100B

LED lighting - $6B, CAGR>40%

- Enhanced cooling allows
  - Higher lumen output
  - Higher light quality
  - Better reliability

LED Replacement Lamps
~500 million sockets * $15/lamp = ~$750M
Market size

- 300 million patients worldwide
- Required HbA1C testing every 60-90 days
- Available in-home HbA1C tests today are $100/10 tests
- Assuming $1 per test, TAM = $1.2 billion
- Assuming 50% people have the access to a HbA1c test, SAM = $600 million
- Assuming we can capture 20% of SAM (high-end diabetics and early adopters), Target market = $120 million
Americans Love to Eat Meat and Snack

- Giant Markets
  - Meat: $160B / Snacks: $70B
  - Meat Snacks: $4B

- Varying Growth Rates
  - Meat: + 5%
  - Snacks: + 15%
  - Jerky: + 5%

- Mega Consumer Trends Converging
  - Healthy, More Flavorful, Higher Quality

- Snacks Driven by Innovation / News

- Meat Snacks / Jerky Generally Sleepy
  - Limited Innovation
  - “Gut Stuffer” Image

- Change Underway Driven by New Entrants
  - All-Natural
  - 10% Growth Latest 52 Weeks Nielsen F/D/M

2009 US Snack Food Retail Sales

- Sweet
  - $35B

- Salty
  - $30B

- Meat
  - $4B

Source: US Package Facts
Neuroblastoma

Prevalence: about 6000 US cases about 1000 new cases per year

Subjects receive 3-6 images/year to follow response to therapeutic protocols

World market at U.S. x 2 gives potential of 40,000-70,000 scans/year

Drug costs $500/per gives ~$20 - $35 M

Parkinson’s Disease

DatSCAN sales in Europe ~$100 M

The world's highest recorded prevalence of Parkinson's Disease of any region is in Nebraska, with 329.3 people per 100,000 population

US – 600,000 patients 1 scan per year @ $500 = $300 M
Market size

High End Antique Furniture WW : $4.5B
Marketing Spending by Galleries ~10%
TAM: $450M

\[ \downarrow \]

US Market 60% (\sim 4,500 dealers): $270M
Target Segment 5%-20% : $13.5M-$54M
Scalable by:
add painting, sculpture
add new geographies...
Target Market

- Who am I going to sell to?
  - Airports
- How large is the market be (in $’s)?
  - $100 M
- How many units would that be?
  - 200 M units
Market Size

- Growing market
  - Aging population
  - Living Style & Diets
  - Chronic disease

- Driving factors
  - Healthcare costs
  - Reimbursement
  - Healthcare labor shortage

Total Available market
170M (US & EU5)
$25B

Target market
3.5M (Resistant Hypertension)
$500M
Market Size Estimation

Number of Users

- Entire market
  - > 100m unique Google Maps mobile visitors/month
- Served available market
  - 55% users concerned about sharing location information [Nielsen 2011]
- Target market
  - Open Question, but rapidly growing market

Pricing

- Originally considered 1x payment
- But customers naturally assumed subscription service
- Possible to charge more?
  - Reduced price --/--> willingness to use
**Business Model Canvas**

**Sweet Sensors**

**Key Partners**
- Glucose monitor manufacturers
- Kit manufacturers
- Reagent suppliers

**Key Activities**
- Conferences
- Product R&D
- QC
- Marketing
- IP
- Personnel

**Key Resources**
- Reagents
- Manufacture
- Licensing
- FDA certification?

**Value Propositions**
- At home
- Convenient
- Less exposure to infectious diseases in the hospital
- Cheaper
- More frequent
- Better indicator of health (diabetic management)

**Customer Relationships**
- Product supports
- Patient network/community
- Retailers (Walgreen)
- Online vendors (Amazon)
- Direct sales

**Customer Segments**
- Diabetics
- Clinicians (in rural area)
- Triage nurses
- Pre-diabetics

Disposable test kit (used repeatedly on a regular basis)
MammOptics

Business Model Canvas 1

**Key Partners**
- Hospitals
- Leading doctors
- 3rd party manufacturers
- Distributors

**Key Activities**
- Product Development
- IP
- Clinical trials
- FDA

**Value Proposition**
- Radiation-free
- Earlier detection
- Non invasive

**Customer Relationships**
- Strong clinical data
- Training
- Maintenance

**Customer Segments**
- Pioneering Doctors
- Hospitals

**Key Resources**
- IP
- Leading doctors
- Technical Expertise

**Channels**
- Direct Sales to hospitals

**Cost Structure**
- Product Development
- Clinical trials
- Operating Costs

**Revenue Streams**
- Capital Equipment Sales and disposable item
Business Canvas 1

Key Partners:
- LED manufacturers
- Environmental conscious Groups
- Government Agencies (DOE)
- ASIE, Groups
- Suppliers
- Luminaire Manufacturers

Key Activities:
- Thermal management technology and LED systems integrations
- Awareness Building Certifications

Value Propositions:
- 50% higher heat dissipation rate with same form factor
- Better performance in lumens at lower watts
- For given lumens, fewer LEDS leading to lower cost
- Lower operating temperature increases reliability

Cost Relationships:
- Direct Sales
- Trade Publications, Shows, Sales
- Web based demos, educations

Customer Segments:
- Indoor Applications
- Commercial Customers
  - Replacement Lamps

Key Resources:
- IP
- System Design

Channels:
- Luminaire Manufacturers
- OEMS

Cost Structure:
- Development Cost
- Cost of Sales

Revenue Stream:
- Requires no infrastructure changes
- Sale of Product
Action Plan

**Sweet Sensors**

**Key Partners**
- Clinicians (in rural area)
- Triage nurses
- Pre-diabetics
- Diabetics
- Retailers (Walgreen)
- Online vendors (Amazon)
- Direct sales
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**Revenue Streams**
- Disposable test kit (used repeatedly on a regular basis)
## The Business Model Canvas

### Key Partners
- cGMP manufacturer
- Radiopharmacies
- Nuclear Medicine and Radiology departments
- Pharmaceutical development companies

### Key Activities
- SOPs for precursors and drugs
- Recruit clinical sites
- In vivo animal studies
- Develop regulatory plan for pre IND meeting
- ID cGMP CRO
- Fund-raising

### Value Propositions
- Accessibility (RCY)
- Purity
- Speed
- PET/SPECT
- Multiplatform
- Sensitivity (nca)
- Specific compounds

### Customer Relationships
- Technical Assistance (Image Atlas)
- FDA regulatory support

### Key Resources
- IP
- PoP data
- IP
- PoP data
- Regulatory plan
- Understanding of the regulatory process

### Customer Segments
- Radiopharmacies
- Equipment producers
- Prescribing physicians
- Radiologist who perform studies

### Channels
- Direct sales of precursor
- R&D and clinical studies presented in journals and meetings

### Cost Structure
- Contract cGMP precursor manufacture
- Salary, Rents
- Clinical trials

### Revenue Streams
- Sales of intermediates
- Technology license
- Product license (royalty)
The Business Model Canvas

Key Partners
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- FDA regulatory support
- Technical assistance

Customer Segments
- Radiopharmacies
- Equipment producers
- Prescribing physicians
- Radiologist who perform studies

Channels
- Direct sales of precursor
- R&D and clinical studies presented in journals and meetings
- Sales of precursor through global finished pharmaceutical distributor

Cost Structure
- Contract cGMP precursor manufacture
- Salary, Rents
- Clinical trials

Revenue Streams
- Sales of intermediates
- Technology license
- Product license (royalty)
The Business Model Canvas: ver 0.0

Key Partners
- Privacy advocacy groups
- LBS App Providers

Key Activities
- Creating awareness
- Building trust

Value Propositions
- Increased privacy
- educational trust
- Privacy-concerned customers who use LBS

Customer Relationships
- Bundling with LBS apps
- Own website

Customer Segments
- Developing costs
- Marketing costs

Revenue Streams
- App revenue (direct or shared)
Canvas (1)

The Business Model Canvas

Key Partners
- KOLs
- Foundations
- Advocacy Group
- OEMs
- Wireless Developers

Key Activities
- Trade shows
- Formulary Acceptance
- FDA
- Physician remote control

Value Propositions
- Training
- Clinical data
- Hospitals
- Pain clinics

Customer Relationships
- Chronic pain patients
- Neurosurgeon
- Oncologist
- Anesthesiologist

Customer Segments
- Support Services
- Unit sales

Key Resources
- IP

Key Partners
- Product Dev Costs
- Manufacturing Costs
- Marketing Costs

FS Team

Canvas (1)