Lean Startup

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More startups fail from a lack of customers than from a failure of product development
But First a bit of history

It Started 100 Years Ago
U.S.  1870’s – 1920’s Rapid Industrialization
Railroads
Steel
Electricity
Automobiles
Consumer Goods
Ownership is separated from management
Ownership is separated from management

Business needs *professional business administrators*
The Master of Business Administration
The Master of Business Administration 1908
The Master of Business Administration (MBA)

Business School Curriculum

- Finance
- Leadership
- Org Behavior
- Operations
- Marketing
- Strategy

- Gov’t & Law
- Supply Chain
- Ethics
- Global Business
- Accounting
- Global Mgmt
The Master of Business Administration (MBA)

Business School Curriculum

- Finance
- Gov’t & Law

Execution of existing businesses

- Org Behavior
- Operations
- Marketing
- Strategy
- Ethics
- Global Business
- Accounting
- Global Mgmt
BUSINESS PLAN
**All I Need is the 5-Year Forecast**

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
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<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>$4.27</td>
<td>$6.38</td>
<td>$7.62</td>
<td>$8.13</td>
<td>$7.00</td>
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<tr>
<td>Accounts receivable</td>
<td>$20.58</td>
<td>$24.19</td>
<td>$28.77</td>
<td>$34.11</td>
<td>$32.00</td>
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<tr>
<td>Inventories</td>
<td>$30.73</td>
<td>$30.45</td>
<td>$36.75</td>
<td>$43.27</td>
<td>$33.00</td>
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<tr>
<td>Deferred income taxes</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$51.58</td>
<td>$61.22</td>
<td>$73.14</td>
<td>$88.21</td>
<td>$77.00</td>
</tr>
<tr>
<td><strong>Fixed assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>$331.64</td>
<td>$423.92</td>
<td>$503.87</td>
<td>$613.28</td>
<td>$650.00</td>
</tr>
<tr>
<td>Accumulated Depreciation</td>
<td>$98.72</td>
<td>$105.09</td>
<td>$112.40</td>
<td>$122.26</td>
<td>$115.00</td>
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<tr>
<td>Net fixed assets</td>
<td>$232.92</td>
<td>$318.83</td>
<td>$391.47</td>
<td>$491.02</td>
<td>$535.00</td>
</tr>
<tr>
<td>Goodwill</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Intangible assets</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Other assets</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total assets</td>
<td>$284.50</td>
<td>$380.05</td>
<td>$464.61</td>
<td>$577.23</td>
<td>$612.00</td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$31.83</td>
<td>$63.43</td>
<td>$83.84</td>
<td>$94.42</td>
<td>$80.00</td>
</tr>
<tr>
<td>Current debt</td>
<td>$30.86</td>
<td>$43.03</td>
<td>$64.85</td>
<td>$79.49</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$62.69</td>
<td>$106.46</td>
<td>$148.69</td>
<td>$173.90</td>
<td>$80.00</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>$40.00</td>
<td>$48.32</td>
<td>$53.41</td>
<td>$73.57</td>
<td>$214.54</td>
</tr>
<tr>
<td>Other long-term liabilities</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$102.69</td>
<td>$153.18</td>
<td>$202.10</td>
<td>$247.47</td>
<td>$294.54</td>
</tr>
<tr>
<td><strong>Shareholders' equity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Stock and Additional Paid-in Capital</td>
<td>$90.00</td>
<td>$130.00</td>
<td>$160.00</td>
<td>$220.00</td>
<td>$260.00</td>
</tr>
<tr>
<td>Retained Earnings</td>
<td>$91.81</td>
<td>$96.67</td>
<td>$102.51</td>
<td>$109.76</td>
<td>$117.46</td>
</tr>
<tr>
<td>Total Shareholders' Equity</td>
<td>$181.81</td>
<td>$226.67</td>
<td>$262.51</td>
<td>$329.76</td>
<td>$317.46</td>
</tr>
<tr>
<td>Total liabilities and shareholders' Equity</td>
<td>$284.50</td>
<td>$380.05</td>
<td>$464.61</td>
<td>$577.23</td>
<td>$612.00</td>
</tr>
</tbody>
</table>
Everyone has a plan until they get punched in the face

Mike Tyson
No plan survives first contact with the enemy

Field Marshall Helmuth von Moltke
Is this all there is?
It Resulted in Five Observations
Startups Are **Not** Smaller Versions of Large Companies
Startups Are Not Smaller Versions of Large Companies

Large Companies **Execute** Known Business Models
Startups Are Not Smaller Versions of Large Companies

Startups **Search** for Unknown Business Models
Startups Fail Because They Confuse *Search* with *Execute*
Startups need their own tools, different from those used in existing companies
Customer Development
Customer Development

SEARCH

CUSTOMER DISCOVERY → CUSTOMER VALIDATION

↑ PIVOT ↓

CUSTOMER CREATION → COMPANY BUILDING

EXECUTION
Steve Blank wrote a “Book”

The Four Steps to the Epiphany
Successful Strategies for Products that Win

Steven Gary Blank
Eric Ries Extends the Model

• Took my class at U.C. Berkeley
• Co-founded IMVU, I sat on his board
  – 1\textsuperscript{st} implementation of Customer Development
  – Paired it with an Agile Development Model
• Called it the \textbf{Lean Startup}
Which Turned Into A Better Model

**CUSTOMER DISCOVERY** → **CUSTOMER VALIDATION** → **CUSTOMER CREATION** → **COMPANY BUILDING**

↑ **PIVOT**

+ **Agile Development**
Alex Osterwalder - Business Model

• Business Model Generation
• Defines what the “search” is about
Which Turned Into an **Even Better Model**
Lean Gets Theory

Customer Development 2003
Blank

Business Model Canvas 2010
Osterwalder

Agile Engineering 2011
Ries

HBR Cover 2013
Blank
Entrepreneurship is Experiential
Let’s Do it That Way
Let’s Teach it That Way
What’s A Startup?
A temporary organization designed to search for a repeatable and scalable business model
A temporary organization designed to search for a repeatable and scalable business model
A temporary organization designed to search for a repeatable and scalable business model
A temporary organization designed to search for a repeatable and scalable business model.
Startups Fail Because They Confuse *Search* with *Execution*
Product risk is not the biggest risk startups face; it’s **market risk**. The risk that not enough people will buy and/or adopt.
Taking you from an Idea to a Business
Three Parts of Lean Startup

Part 1

Part 2

Part 3

Agile Engineering
1. Frame Hypotheses

- Frame Hypotheses
1. Frame Hypotheses

- Frame Hypotheses

Business Model Canvas
Company/Project View: Business Model Canvas

- **Feasibility**
  - Key Partners
  - Key Activities
  - Value Propositions
  - Key Resources

- **Desirability**
  - Customer Relationships
  - Channels

- **Viability**
  - Cost Structure
  - Revenue Streams

- **Guess**

**Adaptability**: External threats
# Business Model Canvas

<table>
<thead>
<tr>
<th>Partners</th>
<th>Activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customer Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who are our key partners? Suppliers? What are we getting from them? Giving them?</td>
<td>What key activities do we need to be expert in?</td>
<td>How are we solving each customers pains/gains? How? What product/service features match their needs?</td>
<td>How does the team get “Buy-In” from all the beneficiaries?</td>
<td>Who are our most important customers? Stakeholders? What are their pains/gains? What job do they want us to get done for them?</td>
</tr>
<tr>
<td>Resources</td>
<td></td>
<td></td>
<td>Channel</td>
<td></td>
</tr>
<tr>
<td>What key resources do we need to own or acquire? Financial? Human?</td>
<td></td>
<td>How will we deploy the product to widespread use? What constitutes a successful deployment?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs</td>
<td></td>
<td></td>
<td>Revenue Streams</td>
<td></td>
</tr>
<tr>
<td>What is the Budget/Cost?</td>
<td></td>
<td></td>
<td>What is the revenue model? What are the pricing tactics?</td>
<td></td>
</tr>
</tbody>
</table>

Source: Alexander Osterwalder- Business Model Generation
9 Guesses

Source: Alexander Osterwalder- Business Model Generation
"I wonder how much of this is reality..."
2. Test Hypotheses

- Frame Hypotheses
- Test Hypotheses ➔ Business Model Canvas
2. Test Hypotheses

- Frame Hypotheses $\rightarrow$ Business Model
  Customer Development
There Are No Facts Inside The Building, So Get the Heck Outside
“It’s a big mistake to theorize before one has data because one begins to twist facts to suit theories instead of theories to suit facts.”

--Sherlock Holmes
3. Build Incrementally & Iteratively

- Frame Hypotheses
- Test Hypotheses
- Build the product incrementally & iteratively

→ Business Model
→ Customer Development
  Rapid Prototype/MVP
  (Agile Engineering)
build-measure-learn
Lean Framework

• Business Model Canvas
  – Articulate initial Hypotheses
  – Weekly Progress Scorecard

• Customer Development
  – Test hypotheses in front of customers
  – Hypothesis > Experiment > Data > Insight

• Rapid Prototyping – Agile Engineering
  – Building a Series of Minimum Viable Products
Experiential

• Getting out of the building
• Formal methodology for customer interaction
• Focus on Minimal Viable Products and Pivots
  — Getting out of the building is a big idea
  — It accelerates speed of translation
Courses
Lean LaunchPad, H4D, I-Corps,

Turning Researchers, Hackers, Hustlers and Designers into Entrepreneurs
Common Elements

Team-based
Experiential
Immersive
Lean Methodology
Evidence-based
Flipped Classroom
Team Teaching
Differences

Teams work on *their own* projects
  Lean LaunchPad
Teams work on their own research
  I-Corps
Teams work on *sponsors* projects
  Hacking for Defense (H4D)
Number of Variants

- Lean Launchpad
- I-Corps
- Hacking 4 Defense (H4D)
- Hacking 4 Diplomacy
- Hacking 4 Social Impact
1500+ teams
2011

1,000+ teams
2012

~250,000 on-line students
Udacity.com

2015

National Security Agency

2015

United States of America

2016

I WANT YOU FOR Hacking For Defense (HAD)
National Geospatial-Intelligence Agency

2011

Stanford University

2012

CORPS
NSF Innovation Corps

2015

Department of Energy

2015

NSF
Hacking for Defense is a for-credit class that gives students the opportunity to build solutions for real-world problems from the Department of Defense and Intelligence Community that address the nation’s emerging threats and security challenges.

Overview

- **Government sponsor** sources a problem for university use
- **Students** form a team, downselect a problem, and compete to get into the course
- **University teaching team, the problem sponsor, and corporate mentors** form a support group for the student team
- **Students** use the Mission Model Canvas and Lean Startup methodology to better understand the problem and beneficiaries
- **Students** create hypotheses, build Minimum Viable Products, and conduct 10 stakeholder interviews a week to test them
- **Students** present results each week, learn, pivot, and finally build a strategy to reach a deployable solution
- **Student teams** gain follow-on sponsorship from their government sponsor, transition to programs like i-Corps or build new companies

Partners & Sponsors

- MDS
- JIDO
- SOCOM
- NDU
- DIUx
- AWG
- NAVAIR
- 75 Ranger Rgt
- AFNWC
- NSA
- CYBER
- TRANSCOM
- VA
- SOUTHCOM
- MEDCOM
- CIA

Learn More

The H4Di community is growing daily. Please contact us at contact@h4di.org or visit h4di.org if you would like to learn more.
Adopted by the NSF
(National Science Foundation)

550+ teams, 1,700+ team members
Taught by 50 NSF Sponsored Universities
Thanks!