1 — Products

Software Development
From Code to Product
Is this a restaurant?

Tasty, nutritious food
This is a restaurant
Is this a product?
Some leading products

- Microsoft Office:mac 2011
- Google
- Angry Birds
Lecture 1

• About this course
• Products and people
• Layers of a product
• Startups and growth
• Software platforms
• Founders and goals
• External resources
Course objective

“Learn how to turn a core technology or idea into a software product which delights users, succeeds in the marketplace and becomes a profitable business.”
Our assumptions

• You can program
• You are web savvy
• You know English, ish
• No other experience
• Technical founder(s)
• No investors (yet)
Syllabus and Assessment

The big picture
- Introduction to products
- The entrepreneurship process

User interface
- User interface principles
- Practical interface design

Business model
- Selling products and services
- Digital advertising

Marketing
- Marketing and retention
- Search engine visibility

Technical stuff
- Customer facing APIs
- Analytics and optimization

Ex: Spec for MVP
Ex: Design an API
Final project
Final Project

• Choose 2 competing products
  – Desktop/web/mobile (or a combination)
  – Lecturer approval required

• Explain problem

• Compare products
  – Functionality, UI, business model, marketing

• Conclusion

• Independent analysis
We won’t cover...

- Raising money
- Forming a company
- Recruiting
- Legal issues
- Enterprise sales
- Management
- Exit strategy
Lecture 1

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Products are for people
People are physical

Brain → Eyes → Hands
People are emotional
People are impatient

“The vast majority of people who visit your site... will arrive with their finger poised on the Back button... So your site has to say: Wait! Don't click on Back. This site isn't lame. Look at this, for example.”

— Paul Graham, Y Combinator
People are irrational

<table>
<thead>
<tr>
<th></th>
<th>16 GB</th>
<th>32 GB</th>
<th>64 GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>WiFi</td>
<td>$499</td>
<td>$599</td>
<td>$699</td>
</tr>
<tr>
<td>WiFi + 3G</td>
<td>$629</td>
<td>$729</td>
<td>$829</td>
</tr>
</tbody>
</table>
People are self-interested
People are skeptical

“The average American is exposed to several hundred ad messages a day and is trying to tune out.”
— Prof. Philip Kotler, 2005

“On average, Americans are subject to some 3,000 essentially random pitches per day.”
— Inc.com, 2005

“Not too long ago, the average American was exposed to over three thousand advertising messages in the average day. Today, you get that many before breakfast!”
— Newspaper Association of America, 2002
People are followers

![Graph showing NASDAQ index over time](image-url)
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What is a software product?

Code that solves problem

+ Inputs and outputs

+ User packaging

+ Can generate cash
Layers of a product

- Core
- Data storage
- Input + Output
- User management
- Licensing + Billing
- User interface

Less unique
Less technology
But more visible to end users (in general…)

From Code to Product
Lecture 1 — Products — Slide 23
gidgreen.com/course
Layers of Microsoft Excel

- Calculation engine
- Data in memory
- File formats
- Visual Basic for Applications
- Graphics engine
- Buttons + menus

Microsoft Office
Layers of Google

- Google.com
- Query parsing
- GoogleBot
- GoogleFS
- Ad matching
- PageRank
- PR, Gmail, Maps, ...
Code Breakdown Example

- Algorithm Core: 48%
- Data storage: 13%
- Parsing: 14%
- User management: 9%
- Billing: 5%
- Web interface: 11%

From Code to Product Lecture 1 — Products — Slide 26 gidgreen.com/course
What’s the core of PayPal?

• High volume transaction processing?

• Integration with external systems?

• “...PayPal is: a security company pretending to be a financial services company” — Max Levchin, Founder
An ideal core

- New
- Clever
- Invisible
- Hard to reproduce
- Research-based
- Optimized for speed
- Improve with usage

Objective: Barrier to entry
An ideal core interface

• New Familiar
• Clever Simple
• Invisible Obvious
• Hard-to-reproduce
• Research-based
• Optimized for speed
• Improve with usage

Objective: No barriers to usage
## Combining the ideals

<table>
<thead>
<tr>
<th>Product</th>
<th>Technology</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop</td>
<td>P2P + VoIP</td>
<td>Config-free</td>
</tr>
<tr>
<td><strong>skype™</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web</td>
<td>Messaging</td>
<td>140 characters</td>
</tr>
<tr>
<td><strong>twitter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td>Super effects</td>
<td>Instant posting</td>
</tr>
<tr>
<td><strong>Instagram</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lecture 1

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# Startups vs (Real) Companies

<table>
<thead>
<tr>
<th>Startups</th>
<th>Real Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>No product</td>
<td>Existing product</td>
</tr>
<tr>
<td>Unknown market</td>
<td>Known market</td>
</tr>
<tr>
<td>No brand</td>
<td>Recognized brand</td>
</tr>
<tr>
<td>No customers</td>
<td>Existing customers</td>
</tr>
<tr>
<td>No revenue</td>
<td>Significant revenue</td>
</tr>
<tr>
<td>On life support</td>
<td>Financially independent</td>
</tr>
</tbody>
</table>
But just maybe...
The Math of Rapid Growth

\[ \text{Size} = ae^{b \cdot \text{Time}} \]

\[ \text{Growth} = \frac{d\text{Size}}{d\text{Time}} = a be^{b \cdot \text{Time}} \]

\[ \Rightarrow \text{Growth} \propto \text{Size} \]
In other words...

Sustainable growth is characterized by one simple rule: *New customers come from the actions of past customers.*

— Eric Ries, The Lean Startup

\[ \text{Growth} \propto \text{Size} \]
What does a startup do?

- (Raise money)
- Development
- Monetization
- Marketing
- Publicity
- Biz dev
- (Exit)

Where to focus?
(especially at the start)
Baseline scenario

Steady growth by word of mouth
5% per month = ~80% per year
Monetization without buying ads

More revenue per user
Marketing

Revenue

Time

Constant flow of extra users
Publicity

- Euphoria
- Depression
- Diminishing returns

Revenue

Time
Example: Not so Cuil

Launched as Google Killer

Raised $8m

Raised $25m

Didn’t Kill Google

Relaunched as Cpedia

Dead

Mar 07  Sep 07  Mar 08  Sep 08  Mar 09  Sep 09  Mar 10  Sep 10
Everything but the Product

Revenue vs. Time

Revenue vs. Time
Increasing growth rate
# Compound Growth

<table>
<thead>
<tr>
<th>Monthly</th>
<th>1 year</th>
<th>2 years</th>
<th>5 years</th>
<th>10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>1.4x</td>
<td>2.0x</td>
<td>5.9x</td>
<td>35x</td>
</tr>
</tbody>
</table>
# Word of Mouth

**To what extent do you trust the following forms of advertising?**

<table>
<thead>
<tr>
<th>Source</th>
<th>Trust Completely/ Somewhat</th>
<th>Don't Trust Much/ At All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommendations from people I know</td>
<td>92%</td>
<td>8%</td>
</tr>
<tr>
<td>Consumer opinions posted online</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Editorial content such as newspaper articles</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>Branded Websites</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>Emails I signed up for</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Ads on TV</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Brand sponsorships</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Ads in magazines</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Billboards and other outdoor advertising</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Ads in newspapers</td>
<td>46%</td>
<td>54%</td>
</tr>
</tbody>
</table>

Source: Nielsen Global Trust in Advertising Survey Q3 2011
On marketing schemes...

“The one thing we learned over 5 years is that nothing works better than just improving your product. Every minute, every developer hour we spent on any one of these crazy things... was nothing compared to just making a better version of the product and releasing it.”

— Joel Spolsky, Fog Creek Software
Lecture 1

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• **Software platforms**
• Founders and goals
• External resources
# Software platforms

<table>
<thead>
<tr>
<th>PCs</th>
<th>Web</th>
<th>Smartphone</th>
<th>Tablet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial adoption</td>
<td>1977</td>
<td>1993</td>
<td>2007</td>
</tr>
<tr>
<td>2013 shipments</td>
<td>316 million</td>
<td>—</td>
<td>1 billion</td>
</tr>
<tr>
<td>Annual growth</td>
<td>~10%</td>
<td>8%</td>
<td>39%</td>
</tr>
<tr>
<td>Jan 2014 users</td>
<td>1.7 billion</td>
<td>2.8 billion</td>
<td>1.5 billion</td>
</tr>
</tbody>
</table>

| Core platforms | ![Windows](logo.png) | ![X](logo.png) | ![Chrome](logo.png) | ![Android](logo.png) | ![iOS](logo.png) | ![Windows](logo.png) |
Global Mobile Traffic as % of Total Internet Traffic, 12/08 – 5/14
(with Trendline Projection to 5/15E)

Mobile Traffic as % of Global Internet Traffic = Growing >1.5x per Year & Likely to Maintain Trajectory or Accelerate

Source: StatCounter Global Stats, 5/14. Note that PC-based Internet data bolstered by streaming.
Historical user growth

![Graph showing historical user growth](https://www.gidgreen.com/course/assets/images/historical_user_growth.png)

- **PCs**
- **Web**
- **Touchphone**
- **Tablet**

Timeline:
- 1980
- 1985
- 1990
- 1995
- 2000
- 2005
- 2010
- 2015

Y-axis:
- 0
- 1 billion
- 2 billion
Operating system shipments
Other platforms

• Mainframes
• Supercomputers
• PC servers
  – Linux, FreeBSD, Windows Server
• Game consoles
  – Wii, Xbox, PlayStation, handhelds
• Other mobiles
  – Blackberry, Symbian
Lecture 1

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Startup founders

- 2 or 3 people
  - If just one, get lots of advice
- Complementary skills
  - Vision + Product
  - Technology
- Friendship + trust
- Shared goals
- Everyone vests
Founder goals

• Make money
• Have fun
• Be free
• Create something
• Do good
• Get famous
• Make money
How much annual income?

- $1,000: Feel good
- $10,000: Extra money
- $100,000: Lifestyle
- $1,000,000: Working rich
How big an exit?

$2$ million

$20$ million

$200$ million

$2$ billion

Something neat

Team + technology

Scaled business

Scare someone big
Lecture 1

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Books

INTERVIEWS WITH THE FOUNDERs OF
37Signals
Adobe
Aliant Computer
Apple
Hotmail
HotorNot
Hummer Winblad
Lycos

FOUNDERS AT WORK
STORIES OF STARTUPS’ EARLY DAYS

JESSICA LIVINGSTON

JARED TAME
STARTUPS OPEN SOURCED
STORIES TO INSPIRE & EDUCATE

From Code to Product    Lecture 1 — Products — Slide 61    gidgreen.com/course
## Some websites

<table>
<thead>
<tr>
<th>Website</th>
<th>Description</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hacker News</td>
<td>Links to news</td>
<td>news.ycombinator.com</td>
</tr>
<tr>
<td>Mashable</td>
<td>Social media news</td>
<td>mashable.com</td>
</tr>
<tr>
<td>Mixergy Interviews</td>
<td>Interviews with founders</td>
<td>mixergy.com/interviews</td>
</tr>
<tr>
<td>OnStartups Answers</td>
<td>Q&amp;A for startups</td>
<td>answers.onstartups.com</td>
</tr>
<tr>
<td>Quora</td>
<td>Q&amp;A popular with startups</td>
<td>quora.com</td>
</tr>
<tr>
<td>ReadWriteWeb</td>
<td>In-depth startup blog</td>
<td>readwriteweb.com</td>
</tr>
<tr>
<td>TechCrunch</td>
<td>Leading startup blog</td>
<td>techcrunch.com</td>
</tr>
</tbody>
</table>
## Thought leaders — Entrepreneurs

<table>
<thead>
<tr>
<th>Name</th>
<th>Company/Method</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 Signals</td>
<td>Ruby on Rails</td>
<td>37signals.com/svn</td>
</tr>
<tr>
<td>Steve Blank</td>
<td>“Customer Development”</td>
<td>steveblank.com</td>
</tr>
<tr>
<td>Jason Cohen</td>
<td>SmartBear Software</td>
<td>blog.asmartbear.com</td>
</tr>
<tr>
<td>Seth Godin</td>
<td>“Permission Marketing”</td>
<td>sethgodin.typepad.com</td>
</tr>
<tr>
<td>Dharmesh Shah</td>
<td>HubSpot</td>
<td>onstartups.com</td>
</tr>
<tr>
<td>Joel Spolsky</td>
<td>Stack Overflow</td>
<td>joelonsoftware.com</td>
</tr>
<tr>
<td>Eric Ries</td>
<td>“Lean Startup”</td>
<td>startuplessonslearned.com</td>
</tr>
</tbody>
</table>
# Thought leaders — Investors

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris Dixon</td>
<td>Founder Collective</td>
<td>cdixon.org</td>
</tr>
<tr>
<td>Brad Feld</td>
<td>TechStars</td>
<td>feld.com</td>
</tr>
<tr>
<td>Paul Graham</td>
<td>Y Combinator</td>
<td>paulgraham.com</td>
</tr>
<tr>
<td>Guy Kawasaki</td>
<td>Garage Technology Ventures</td>
<td>blog.guykawasaki.com</td>
</tr>
<tr>
<td>Dave McClure</td>
<td>500 Startups</td>
<td>500hats.typepad.com</td>
</tr>
<tr>
<td>Mark Suster</td>
<td>GRP Partners</td>
<td>bothsidesofthetable.com</td>
</tr>
<tr>
<td>Fred Wilson</td>
<td>Union Square Ventures</td>
<td>avc.com</td>
</tr>
</tbody>
</table>
And check these out

[Logos of Airbnb, Evernote, Conduit, GitHub, Dropbox, MailChimp]