Market Disruptions and Innovation

Erik Troan
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- Graduated NCSU in 1995 w/ computer science degree
- First job at Red Hat (during Internet bubble)
  - Raised money, went public
- Got a master’s degree in economics
- Founded rPath (during 2008 recession)
  - Raised money
- Cofounded Pendo (during current... expansion)
  - Raised money
Red Hat shares triple in IPO

The initial public offering for the Linux software maker explodes...
Raleigh software startup Pendo lands $50M, plans major expansion, more hiring

PENDO  TODD OLSON
Makes me really interested in

- Why does this happen?
- How can it happen again?
- Why do these “crazy” valuations start to make sense years later?
Creating Market Value

This valuation is nuts, right?
Total Available Market (TAM)

- Toyota
  - Everyone in the world who needs a car
- Capital Ford
  - Everyone in Raleigh who needs a car
- Diamond’s Direct
  - Everyone getting married
- Bailey’s Jewelers
  - Everyone in Raleigh, who is in the top XX% of income, who is getting married

Major metric for venture capital and private equity investors.
$1B
What Limits a TAM?

- Number of people experiencing the problem
- Price point
- Geography
- Product complexity
- Product requirements
  - Computer?
  - Latest smartphone?
  - Broadband?
Companies grow by increasing TAM

- In November, 2017 GM sold 70% more cars in China than in the US
- Netflix’s TAM is largely defined by US broadband penetration
  - Which grew exponentially
- Salesforce’s TAM was limited by sales team spend
  - So they expanded into customer support and marketing
- Microsoft defined a large TAM
  - “A Computer on Every Desk”
Where Do Companies Invest to Grow?

- Infrastructure
  - Furniture
  - Computers
  - Desks
- People
  - Salaries
  - Training
- Customer Acquisition
  - Marketing
  - Sales
  - Support
Value = \frac{TAM}{Cost}
40 Year Technology Boom

• Technical achievements have driven down costs
  • Infrastructure
  • Customer Acquisition
• New products have driven up TAM a single company can reach
• Result is massive value creation
Personal Computer Market

Where it all got started (1981 - 1995)
1981

- IBM PC Launched into a crowded market
  - That only sold to enthusiasts
- Cost $2500 (or so)
- Price performance was 10x minicomputers of the time
- Smash hit
  - Selling 750,000 annually two years later
TAM Was Even Bigger

By 1992 IBM was selling 10% of PCs
How did the software market change?

TAM

Cost to Enter
And the winner is...
Microsoft Dominated the new Market

- MS-DOS made a PC a PC. Everyone had to have it
- Microsoft Word
  - Released in 1983
  - Quickly became #2 player in the market
- Windows 3.0
  - Release in 1990
  - Became more important than any other PC software program
  - Pushed Excel and Word to market leadership, later Office
- By 1996 Microsoft was worth more than IBM

Microsoft was instrumental in building a huge TAM, and captured most of it.
The Network is the Computer

Building a mass market for... everything (1995 - 2006)
Networks were everywhere already

- Local Area Networks (LAN) were dominant in commercial settings
  - Novell
  - LANtastic
  - Microsoft (a little)
  - IBM

- Building network products meant
  - Picking one (fractured market)
  - Supporting many (high cost)

- Network applications fractured

- TCP/IP was the open networking standard
  - Embraced by academia and government
  - Ignored by everyone
  - You needed a workstation to use it
Web Browsers made the Internet

- Built on open HTTP and HTML standards
- Publishers could publish once for multiple platforms
- A single application for users to install to access everything
- TCP/IP was an afterthought for Windows. It didn’t matter.
- Microsoft embraced it all with Internet Explorer
  - All of a sudden the Internet was everywhere.
Browser Made Huge TAMs Everywhere

• Market for goods and services became a single set of buyers
• Large market TAM for
  • Finance
  • Information
  • Books
  • Music
  • Pet food
  • Just... everything
Serving Internet Traffic was Expensive

- Server class hardware meant Unix workstations
- Entry place in high tens of thousands of dollars
  - Servers cost more than the IBM PC did!
  - Data centers had to be built and used
  - Huge VC expenditures to hardware and networking equipment
Linux Grows through late 1990s

- Cooperatively developed
- Runs on Intel class machines
- Price performance is 10x proprietary workstations
- Slower sure, but just buy more of them!
  - Horizontal scaling
- Red Hat was built by replacing Solaris on connected servers
Open Source Goes Everywhere
Brought together by...

- Leveraged open source
- Accessible to everyone on the internet. Simple and trusted.
- Provided a single market to everyone
- Ads connected consumers to providers in the market
- A tiny percentage of this global market is huge revenue
What just happened?

TAM

Cost to Enter
Who Needs Wires?

Mobile takes over 2007 -
Remember these?
iPhone
June 29, 2007
“Apple reinvents the phone.”

- Multitouch
- Proximity sensor
- Ambient light sensor
- Accelerometer

Thickness
11.6 mm

Weight
135 g (4.8 oz)

Display
3.5"

Storage
4, 8, 16 GB

Camera
2.0 MP

Memory
128 MB

~300,000 sold in first weekend
In many ways it was worse than the rest

- Used the older, slow 2G network
- Only on AT&T
- No 3rd party applications
- Poor email integrations

And it changed everything
Multiplier the TAM of the Internet

- Mobile Internet increased market reach of the Internet
- Within 10 years the TAM addressable by smartphone was 7x larger than that addressable by computers

How smartphones killed the PC

Smartphones outgrew PCs in 2011

- Worldwide PC units shipped (in millions)
- Worldwide smartphone units shipped (in millions)

Source: Gartner, IDC, Apple
Apple Is a Mobile Company

- Mobile transitioned Apple from irrelevant to dominant
- First company to maintain $1 Trillion market cap
- 56% of sales are iPhones
  - Not iPads
  - Not watches
- 15-20% of sales are services
  - AppStore
  - AppleCare
Facebook Won Mobile Software Market

- Founded in 2004
- Added Instagram
- 1.5 billion users. A day.
- 90% of revenue is mobile
  - Up from 30% in 2013
  - Mostly advertising for third parties
- $450B market cap
Plenty of Others Winning On Mobile

ROVIO

Domino's Pizza

The New York Times

snapchat

NETFLIX

Spotify
Reach the Planet

TAM
What’s Next?

Moving on from 2018
Cloud Computing

- Why build it if you can rent it?
  - Computers
  - Networking
  - Storage
  - Database
  - Machine Learning

- Powers Amazon
  - AWS provided 100% of Amazon's 2017 operating income

- Virtually all startups are built on cloud infrastructure
  - And so are companies like Netflix

Cost to Enter
What about this one Erik?

- rPath founded in 2003
- Tried to catch the wave of virtualization and cloud computing
- It didn’t work. Execution and timing matter
- Years later Docker is strong in the market segment rPath was trying to create
Pendo

- Began operations in January, 2014
- Cloud tech stack enabled a fast growing, capital efficient business
- Now serve 700 customers
- Collecting 2.5 billion web events a day
- We don’t have
  - A data center
  - A server
  - A database administrator
  - A network engineer
  - A build farm
  - (Red Hat had all of these, less than 20 years earlier)
- Using Google Cloud Platform lets us focus on innovating, not building commodity infrastructure
Internet of Things?

- Computers are
  - Tiny
  - Low power
  - Always connected
- Will everyone want one? Or ten?
- Cheap to get started
  - Arduino
  - Raspberry Pi
  - Particle
High Speed Mobile?

- Mobile speeds will increase by 10x in the next 5 years
- Entertainment?
- Gaming?
- Social networking?
So What?

What should I remember?
What do disruptions look like?

• Increase total market any one company can reach
  • Size of audience
  • Ability to pay
  • Value of Product

• Decrease cost to build and provide products
  • Infrastructure
  • Development
  • Sales

• The biggest disruptors do both
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Technology and Engineering Drive Both