



The Internet

James Young

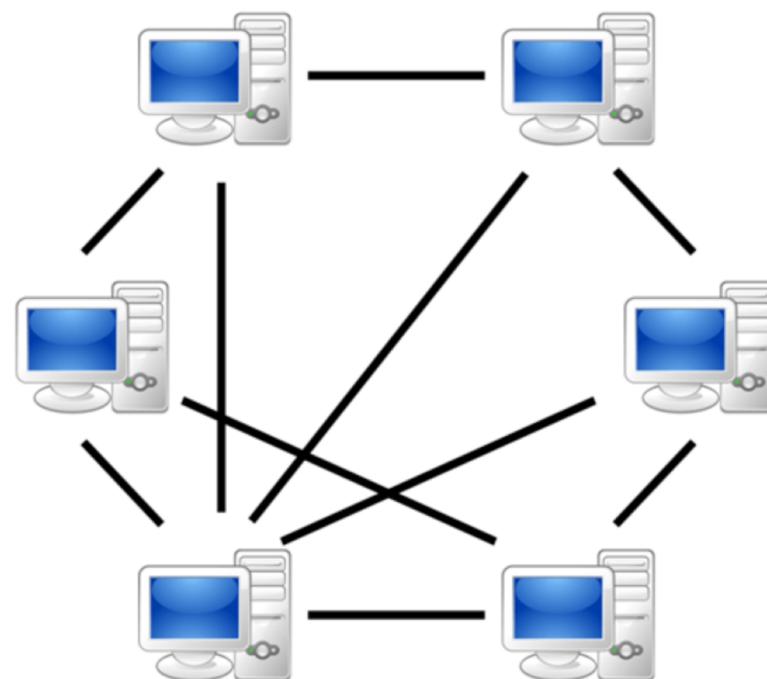
February 2020

“I think there is a world market for maybe five computers”

-Thomas J. Watson, Founder of IBM

What is the Internet?

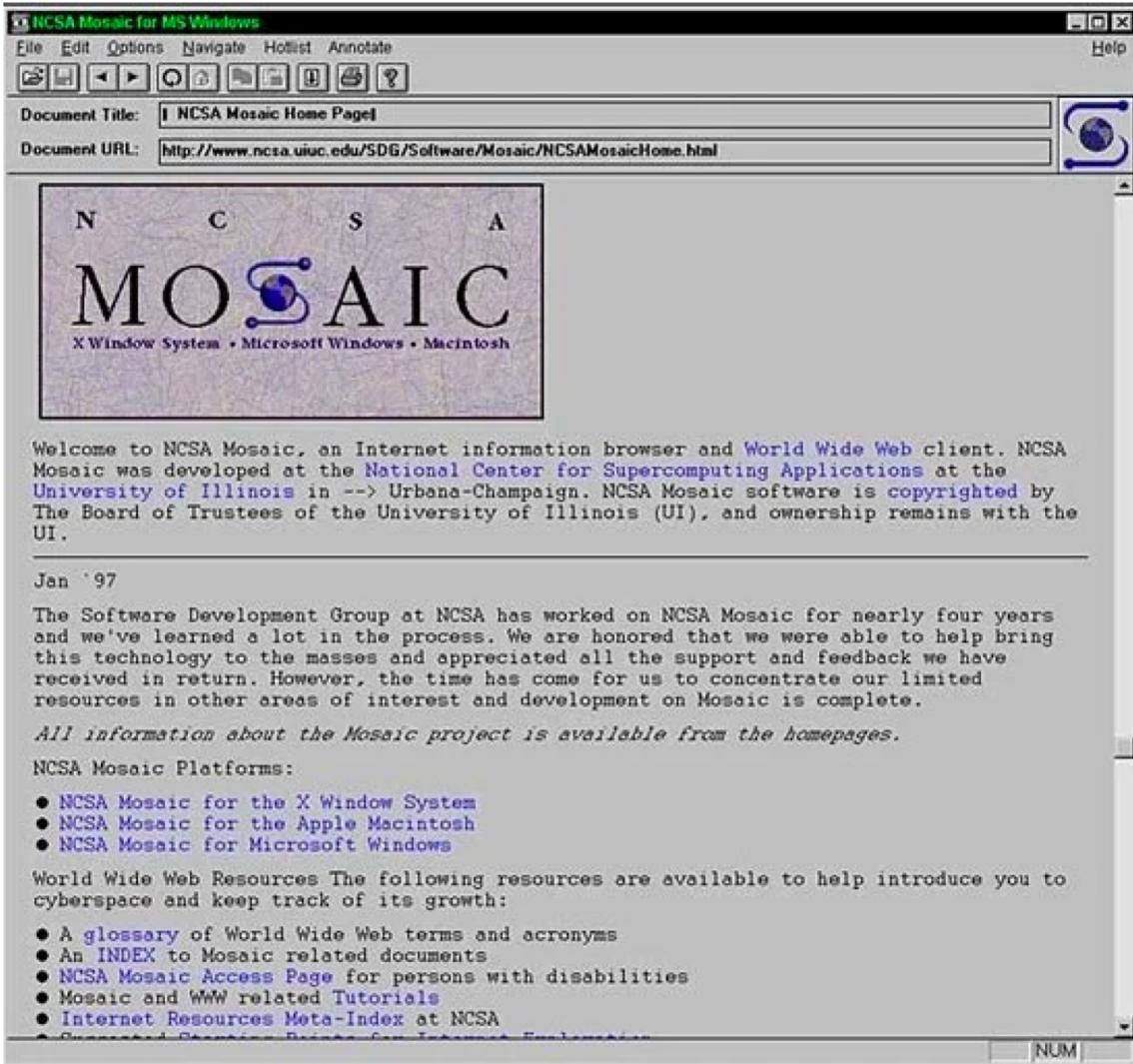
- > Wikipedia definition: The Internet is the global system of interconnected computer networks that uses the Internet protocol suite (TCP/IP) to link devices worldwide.



The Setup

- > The origins of the Internet can be traced back to ARPANET, a defense-focused, academic network founded in 1969 that connected four nodes: UCLA, UCSB, Stanford, and the University of Utah
- > The web was invented as a service for people to use on the Internet – it was conceived by Tim Berners-Lee, a swiss researcher, who created the WWW project as a academic research platform
- > The web is the **service** that is built on top of the **Internet**, the **infrastructure**

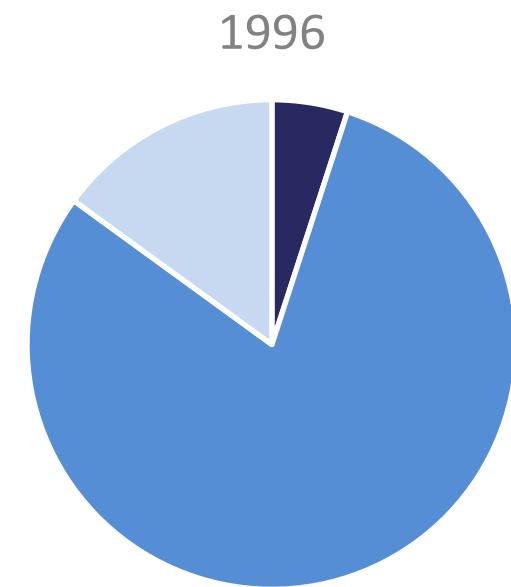
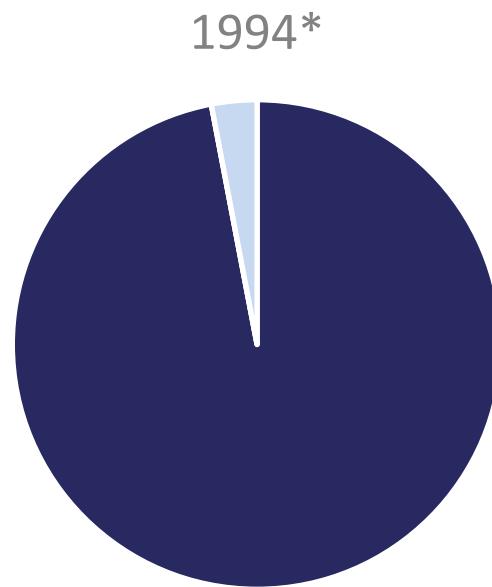
The Final Catalyst



- > In 1992-3, Marc Andreessen coded and released the X Mosaic while employed at the NCSA in UIUC for about \$6.85/hr
- > Andreessen's main innovation was adding pictures and this sparked exponential growth in Internet users

Netscape ('Windows of the Internet')

- > Jim Clark and Marc Andreessen founded Mosaic Communications (later known as Netscape), in 1994
- > Netscape provides a blueprint for dot-com era startups:
 - Have an idea, code it, and then iterate, iterate, iterate
 - Work hard, play hard culture



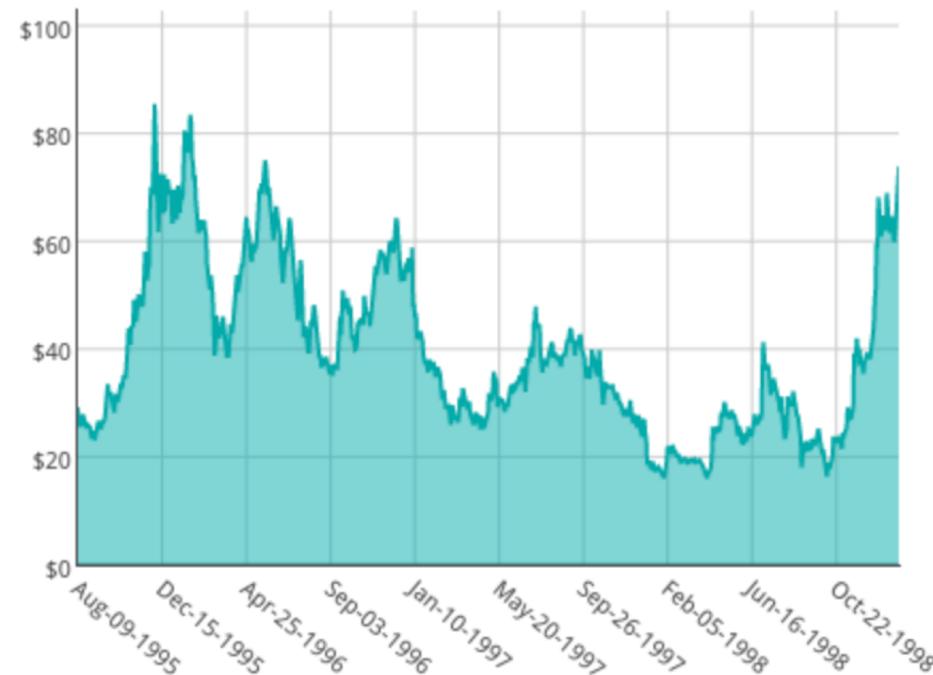
■ Mosaic ■ Netscape ■ Other

*Pre-Netscape release. Netscape took up 18% market share within 2 weeks of launch

■ Mosaic ■ Netscape ■ Other

Netscape IPO

- > Netscape went public in August 1995 and marked the start of young, Internet startups going public with little revenue track record and no profits – it also inspired the dot-com era of get-rich-quick software engineers



Source: S&P Capital IQ
Chart: Stacy Jones, Data Editor, Fortune

Picture this:
It's the early 90's and you can shop from home,
video chat, rent movies on demand, consumer
personalized news/media



What was Microsoft doing?



- > Why TVs? Existing user-base and high bandwidth
- > Microsoft tried to follow their Windows playbook to capitalize on the “information superhighway” and thus, missed the fact that the “information superhighway” already existed in the form of the Internet and World Wide Web
- > To compete, Microsoft pays Spyglass, the company that UIUC approved to commercialize Mosaic, \$2M to use Mosaic code in Windows 95
- > Microsoft offers Internet Explorer completely free with the launch of Windows 95 – this destroyed Netscape
- > <https://www.youtube.com/watch?v=IAkuJXGldrM>

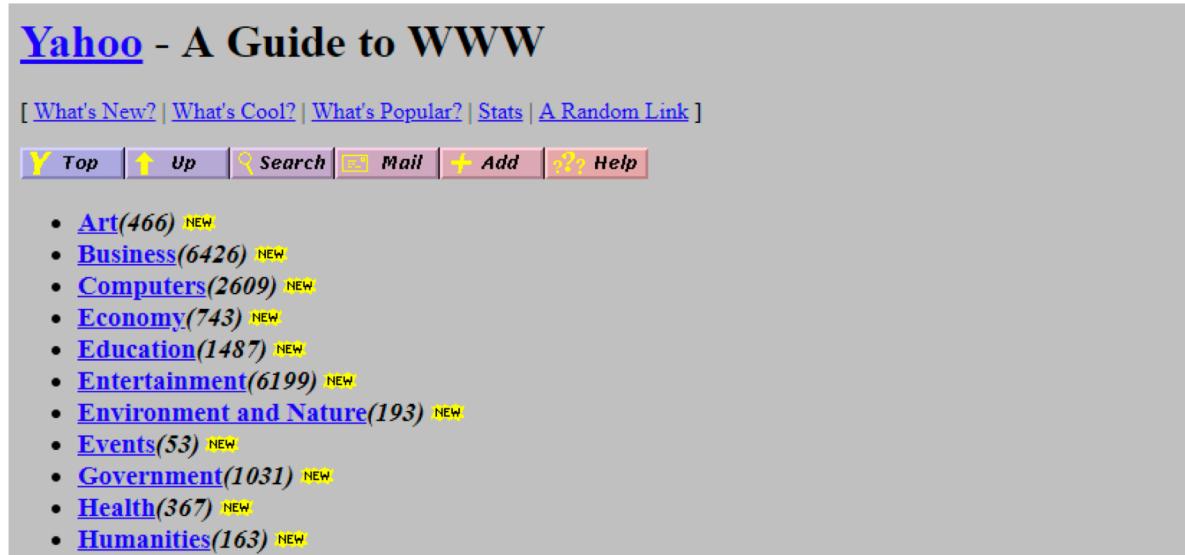
The stage was set for dot-com companies:

The World Wide Web built on the Internet was now accessible to laypeople through browsers

Yahoo!

Jerry and Dave's Guide to the World Wide Web

- > In 1994, Jerry Yang and David Filo were working on their dissertations as Ph.D. students at Stanford when they discovered the Mosaic browsers and thus, the World Wide Web
- > To procrastinate on their dissertations, they started compiling a searchable directory of website links on “Jerry and Dave’s Guide to the World Wide Web” hosted on a Stanford server



| Yet Another Hierarchical, Officious Oracle!

- > This directory was subsequently renamed Yahoo! (Yet Another Hierarchical, Officious Oracle!); the exclamation point was ‘pure marketing hype’
- > Netscape launched with a “DIRECTORY” button that led to Yahoo! which spurred astronomical traffic growth
- > Stanford asked Yang and Filo to move their operation elsewhere because of the insane amounts of traffic
- > They ended up having a 2 hour conversation with Mike Moritz convincing them that Yahoo! should not charge their customers and there must be a way to monetize their massive audience which led to a \$1M investment from Sequoia

| Yahoo!'s Competitive Advantage (?)

- > Yahoo! offered a pretty commoditized product
- > Although the process of aggregating links is time-intensive, there is nothing particularly proprietary about it
- > Yahoo! was able to succeed despite this due to their first mover advantage and their focus on branding – rather than market themselves as a tool, Yahoo! marketed themselves as a form of media
- > Yahoo! launched the "Do You Yahoo?" ad campaign and its brand nearly became a household name
- > <https://www.youtube.com/watch?v=Aa0WaSSVeIw>

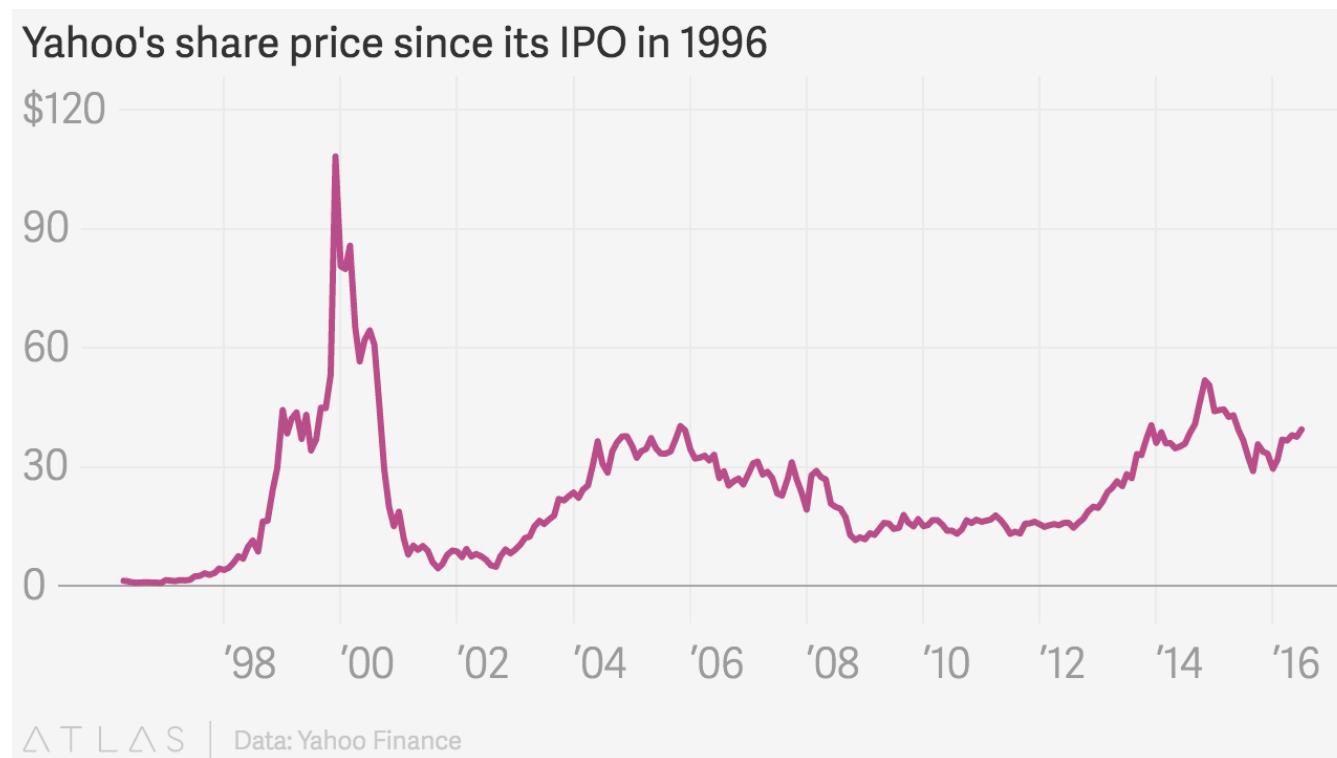
| How did Yahoo! make money?

- > Yahoo! followed the *HotWired* playbook and made money off of ad banners around their website
- > The initial response was awful but Yahoo! stuck it out and web traffic growth actually stayed on track
- > Not only did growth stay on track, they were scaling so quick that they could not even sell all their ad space quick enough



| Yahoo! IPO

- > Yahoo! was the first true web-native, web-only company to IPO



Amazon

The “Everything Store”

- > In 1993, while working at D.E. Shaw, Jeff Bezos was tasked with researching business opportunities on the Internet – one of which being the “everything store”
- > Bezos quickly decided that an “everything store” was a little too ambitious and settled on starting with books
 - Books were nearly commodities; you know exactly what you’re getting
 - There were only two major book distributors: Ingram and Baker & Taylor
 - There were over 3 million books available in print worldwide so there is a massive value-add of an online store that could carry all of them vs. a bookstore limited by physical location
- > “I knew when I was eighty that I would never, for example, think about why I walked away from my 1994 Wall Street bonus”
 - Jeff Bezos

Strategy and Innovation

- > Amazon started as essentially a dropshipping business
- > Bestsellers were used as loss-leaders and more obscure titles were the real moneymakers
- > Distributors required 10 books to be ordered at a time
 - Amazon realized that it required 10 books to be ordered but not delivered
 - They began ordering an obscure title with 9 copies of a book on lichens that was regularly out of stock
- > Amazon also pioneered the shopping cart, product reviews, and personalized storefronts using cookies

Get Big Fast

- > Amazon was, for the most part, self-funded by Bezos – they first raised outside capital from Seattle connections rather than blue-chip VC funds

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Wall Street Whiz Finds Niche Selling Books on the Internet

*By G. Bruce Knecht*Staff Reporter of The Wall Street Journal

Updated May 16, 1996 12:01 am ET

- > Amazon raised their next round from Kleiner Perkins who installed John Doerr on the Board
- > Barnes & Nobles's interest was piqued but Bezos concluded that while B&N builds its website, Amazon would be expanding into new markets
- > The endgoal was never to win “books,” it was to get a piece of everything

AOL

Online Services

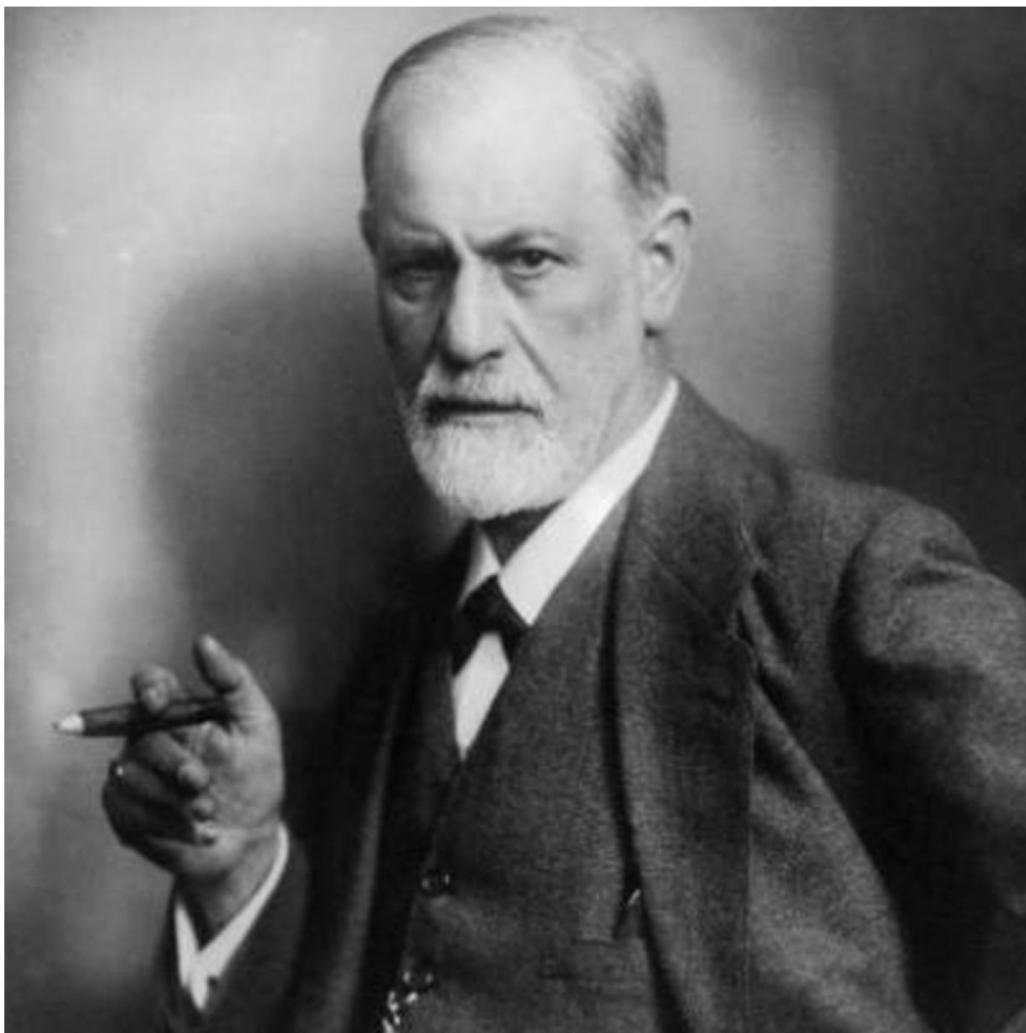
- > Online services were the use-case of the Internet that predated the World Wide Web – it came with features like games, email, chat, news, etc.
- > AOL was the first online services provider to focus on Windows users – this allowed them to ride the growth of the OS



America Online

- > AOL's installation and setup process:
 - Put a floppy disk / CD into your computer
 - Let the program install
 - Click the AOL icon
 - “Dial-in” to a local number where an AOL machine sends you content via phone lines
- > Pricing: users were charged \$9.95 a month for 5 hours of usage and \$2.95 for each additional hour
- > The “training wheels for the Internet”

AOL's Competitive Advantage



AOL's Competitive Advantage

Sigmund Freud's Psychosexual Stages

Stage	Age range	What happens at this stage?
Oral Stage	0-1 year old	Children derive pleasure from oral activities, including sucking and tasting. They like to put things in their mouth.
Anal Stage	2-3 years old	Children begin potty training.
Phallic Stage	3-6 years old	Boys are more attached to their mother, while girls are more attached to their father.
Latency Stage	6 years old to puberty	Children spend more time and interact mostly with same sex peers.
Genital Stage	Beyond puberty	Individuals are attracted to opposite sex peers.

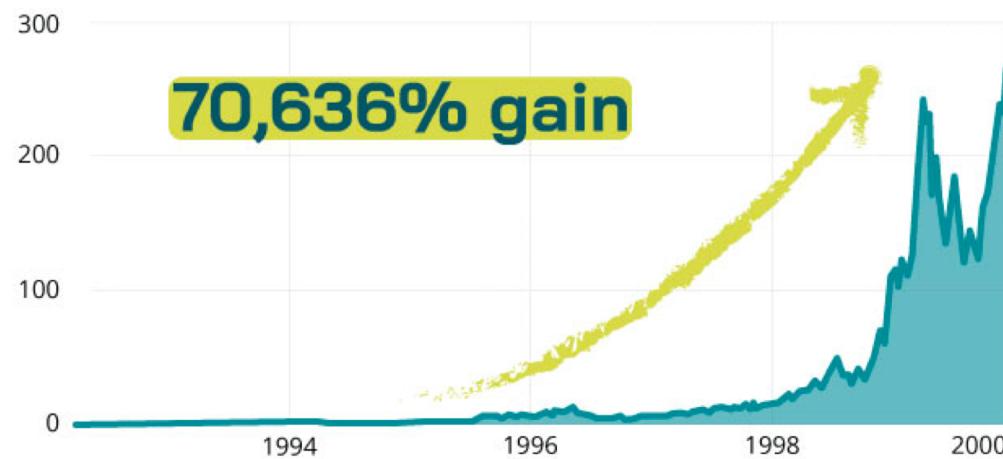
The Psychology Notes Headquarters - <https://www.PsychologyNotesHQ.com>

AOL's Marketing

- > “Someone took a computer mouse and started pointing it at the computer like a remote control. And one person put it on the floor and tried to use it like a sewing machine pedal”
 - Jan Brandt (VP of Marketing)
- > Brandt intuited that selling customers on the benefits of AOL vs. other online services was not as important as explaining to the customer what an online service is
- > What came next was one of the most successful marketing campaigns ever: AOL mass-produced trial disks and gave them away for free
 - 200K users to 22M users
 - At a point, 50% of the CDs produced worldwide were AOL installation disks

AOL's Dealmaking

- > AOL leveraged their massive platform to advertise and strike absurdly expensive deals with all the dot-com era startups
- > Through making all of these advertising deals, AOL realized that most of these companies were running out of money



- > AOL decides to use their astronomically high stock price to merge with Time Warner

AOL's Dealmaking

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AOL Posts a \$98.7 Billion Loss On New Goodwill Write-Down

Annual Loss Is Biggest in History; AOL Says Ted Turner Will Resign

By Martin Peers and Julia Angwin *Staff Reporters of The Wall Street Journal*

Updated Jan. 30, 2003 12:01 am ET

 [PRINT](#)  [TEXT](#)

NEW YORK -- In an astonishing end to a disastrous year, AOL Time Warner Inc. reported a 2002 net loss of \$98.7 billion after taking a fourth-quarter charge of \$45.5 billion, mostly to write down the value of its troubled America Online unit. The write-down, creating the biggest annual corporate loss in history, was more than twice what Wall Street had anticipated.

The Bubble Inflates

Tying it all together



- > Led the charge as the first web-native, web-only company to have a blockbuster IPO
- > Pioneered e-commerce and cultivated the 'Get Big Fast' mindset
- > Brought a social aspect to the Internet
- > Price-gouged soon-to-be-bankrupt dot-com startups

Individual Investors

- > A massive generation of 76M+ baby boomers (born between 1946 and 1964) were approaching the age where they started saving for retirement
- > They were managing their own retirement savings in record numbers and did not experience the financial and economic aftermath of the Great Depression like their parents did (although they did live through Black Monday)
- > Online trading platforms like E*TRADE, Ameritrade, etc. allowed individual investors to act instantly and not be swayed by their brokers

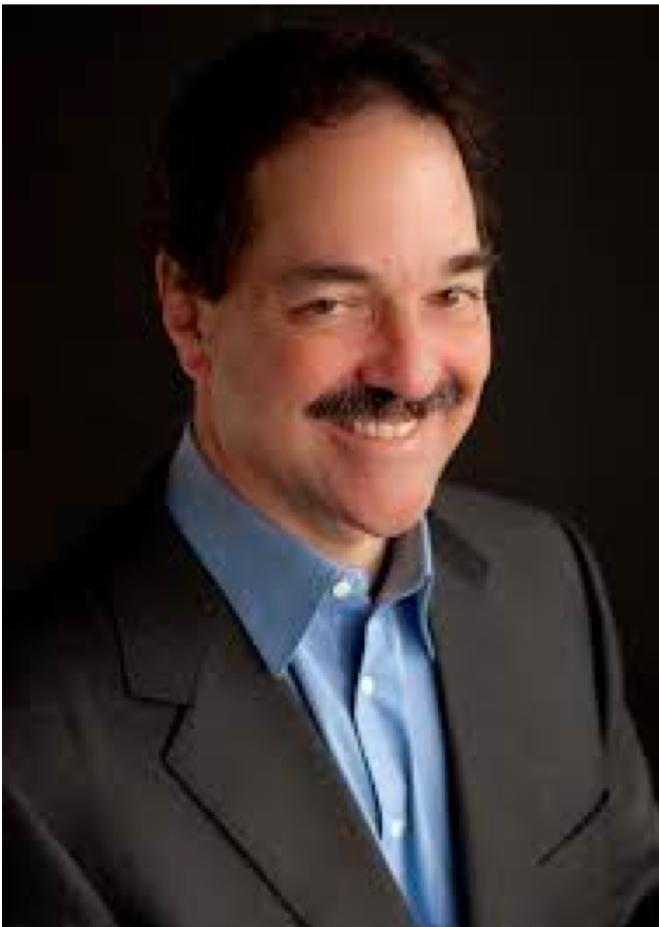
“But how do we know when irrational exuberance has unduly escalated asset values?”

-Alan Greenspan in 1996, Fed Chair (1987 – 2006)

“You wouldn’t get ‘hype’ working if there weren’t something fundamentally, potentially sound under it”

-Alan Greenspan in 1999, Fed Chair (1987 – 2006)

Investment Banks



Frank Quattrone

Credit Suisse First Boston

Qatalyst Partners



Mary Meeker

Morgan Stanley

Bond Capital

Frank Quattrone

Quattrone gets 18 months in prison

Former star tech banker also gets two years probation for obstructing justice and witness tampering.

September 8, 2004: 7:42 PM EDT

By Krysten Crawford, CNN/Money staff writer

Corporate scandals on  NBCNEWS.com

Frank Quattrone's conviction overturned

Appeals court grants ex-star technology banker a new trial

“It defies my imagination that so many people with so little sophistication are speculating on these stocks”

-Bernie Madoff, Orchestrator of the World’s Largest Ponzi Scheme

Priceline

- > Priceline sought to make the airline industry more efficient by selling vacant seats on flights using a “name your own price” model
- > It was theoretically supposed to:
 - Make flights cheaper for consumers
 - Help airlines sell excess inventory
 - Net themselves a bit of profit as a cut
- > Priceline tried to follow the Amazon and Yahoo! playbooks by spending an obscene amount on marketing to boost brand and to scale as quickly as possible
- > The problem: Priceline had to buy tickets on the open market at cost and sell to their customers at lowballs – they could either lose ~\$30 per sale or charge higher than market prices



Pets.com

- > The “Amazon for X” business model was very popular during this time period
- > Pets.com was simply an pet supplies e-commerce startup
- > Pets.com embodied the ‘Get Big Fast’ mentality all the more so given the competition within pet supplies
- > The problem: the ‘Get Big Fast’ method does not exactly work when you have no operating leverage and aren’t contribution margin positive in any category (Pets.com had about a -57% contribution margin)
- > This was further magnified by unsustainable shipping costs
 - Pets.com may have been ahead of its time – see Chewy.com now



Webvan

- > Webvan was a grocery delivery service founded by Louis Borders, who was also the founder of Borders Group, a bookstore chain that got “Amazoned”
- > Since grocery stores already had razor-thin margins, Borders posited that cutting the cost of running a physical location (~12% sales), he could make a killing
- > The problem: Webvan was ahead of its time – users tried it out as a novelty but churn was astronomical and warehouses did not have enough volume to achieve profitability
- > Further, Webvan ignored this when they started in SF and continued to expand hoping it would be different in other cities or time would fix it
 - These churn issues affect a lot of meal kit services today (e.g. Blue Apron) but grocery delivery is a viable business now (Instacart, GoPuff, etc.)

|Pop!

3/10/2000

- > The NASDAQ Composite Index reached its peak of 5048.62 on March 10, 2000 and it would proceed to lose 80% of its value in the next two years



Reignition of Internet Companies

PageRank

- > Larry Page and Sergey Brin were both Ph.D. students at Stanford when they started PageRank (named after Larry) as their dissertation in 1996
- > Their intuition by analogy was that, much like an academic papers importance was driven by citations, a webpage's importance was driven by links
- > PageRank had figured out the key to search: relevancy

$$PR(A) = PR(B) + PR(C) + PR(D).$$

$$PR(A) = \frac{PR(B)}{L(B)} + \frac{PR(C)}{L(C)} + \frac{PR(D)}{L(D)}.$$

$$PR(u) = \sum_{v \in B_u} \frac{PR(v)}{L(v)}$$

Google

- > PageRank was renamed “googol” (which is 10^{100}) but it became google.com because googol.com was taken
- > Page and Brin tried to license this algorithm out to existing players – no one was really interested
- > The incumbent search companies were mainly trying to become ‘portals’ at the time



[Yahoo! Mail](#) - free email account - use it from home, school, work

[Yellow Pages](#) - [People Search](#) - [Maps](#) - [Classifieds](#) - [Personals](#) - [Chat](#) - [Email](#)
[Shopping](#) - [My Yahoo!](#) - [News](#) - [Sports](#) - [Weather](#) - [Stock Quotes](#) - [more...](#)

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Google Ignores the Playbook

- > Google operated with a grad student's mindset:
 - Instead of the launch parties and marketing campaigns native to dot-com startups at the time, Google funneled all their money into efficiently improving the product
 - Instead of setting up servers with Microsoft's OS and IBM/Oracle's systems, Google used Linux's free OS and bought computers off the shelf
- > This minimalist style permeated the product design as well:



Google AdWords

- > Google existed for years before it even had a business model
- > 2 parts of Google' 3-pronged strategy of monetization:
 - License search tech to incumbents
 - Sell ads
- > In 2000, Google was able to license its search to Yahoo! – this was huge for improving Google's algorithm
- > In late 2000 (post-crash), Google also launched AdWords, which was inspired by Overture which added paid ad results at the top of search results
- > Google, however, fixed Overture's problem – instead of an auction system that gave spots to the highest bidder, Google considered the quality of ads – ads that got clicked on more would cost less AND rise to the top of search results

Google Search Appliance

- > The other piece of Google's 3-pronged strategy was a box:



Google IPO

- > Google had basically been printing money and in 2004, filed for an IPO - this was the first major IPO that reignited the public belief in the Internet



Web 2.0 and the Rise of Mobile

Web 2.0

- > In Web 1.0, users interacted with creator generated content while in Web 2.0 the web was interactive; websites emphasized user-created content

Wikipedia

- > Wikipedia has not changed much since inception – it is a crowdsourced encyclopedia
- > They bet that even if a random person could put blatantly false info, another could easily correct it and long-term, the articles will be mostly accurate

Facebook

- > Mark Zuckerberg quickly discovered the power of crowds and built the company off of mirroring people's real-life social networks
- > Facebook was the perfect platform for advertising – users voluntarily handed the platform their data

Smartphones – ahead of its time



- > IBM Simon (1992)
 - Email, fax, sync with computers, touchscreen, apps (address book, calendar, calculator, etc.)



- > Nokia 9000 (1996)
 - Full QWERTY keyboard, web browser, digital camera



- > Ericsson R380 (2000)
 - Touchscreen, web browser, games, email, apps

The ROKR

- > Apple just conquered the music industry with the iPod and iTunes and wanted to enter mobile – they partnered with Motorola and produced the ROKR:



- > The ROKR was a failure. After 2 years of development, Apple produced the iPhone and described it as:
 - A widescreen iPod with touch controls
 - A revolutionary mobile phone
 - An internet communications device

The iPhone

- > It was not until the iPhone 3G that Apple developed the app store enabled by high-speed data
- > The key to the iPhone and the App Store's success was the posterchild of Web 2.0, Facebook



Looking Forward and Takeaways

Looking Forward

- > Emerging markets adopt the Internet without dial-up baggage



- > Satellite broadband fuels rural connectivity



- > 5G



- > Blockchain as a protocol



Takeaways

- > The conditions for the dot-com bust was so particular that it is unlikely equity prices will be as inflated again in the near future – that is not to say that there are no overvalued tech firms today
- > Revolutionary tech does not justify a shoddy business model – an extremely high-level approach to analyzing these early-stage companies:
 - TAM, product-market fit, and path to economic moats
 - Unit economics and strength of the value chain
 - Management and execution ability

Questions?