

Silicon Valley Does It Again: From Fairchild to Uber and Beyond

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Talk Plan

- **Brief history**
- **Ecosystem/Coevolution**
- **Capital gains drive the entire system**
- **Platform economics**
 - Network effect and winner-take-all
- **Concluding thoughts**

Brief History

World War Two and Before

- **Federal Telegraph and invention of radio tube -- 1909**
- **Farnsworth and television -- 1927**
- **Litton and microwave tubes -- 1932**
- **Hewlett Packard and war industry -- 1938**
- **Early angel investors in technology**

Before Silicon



AMPEX

varian 

**Many other small firms built on military
procurement, cost-plus contracts**

Immediate Postwar

- **Cold War – radar, computers, missiles, electronics**
- **Stanford and Berkeley scientize electrical engineering with military \$s**
- **Technology-based startups in region with cost-plus contracts**

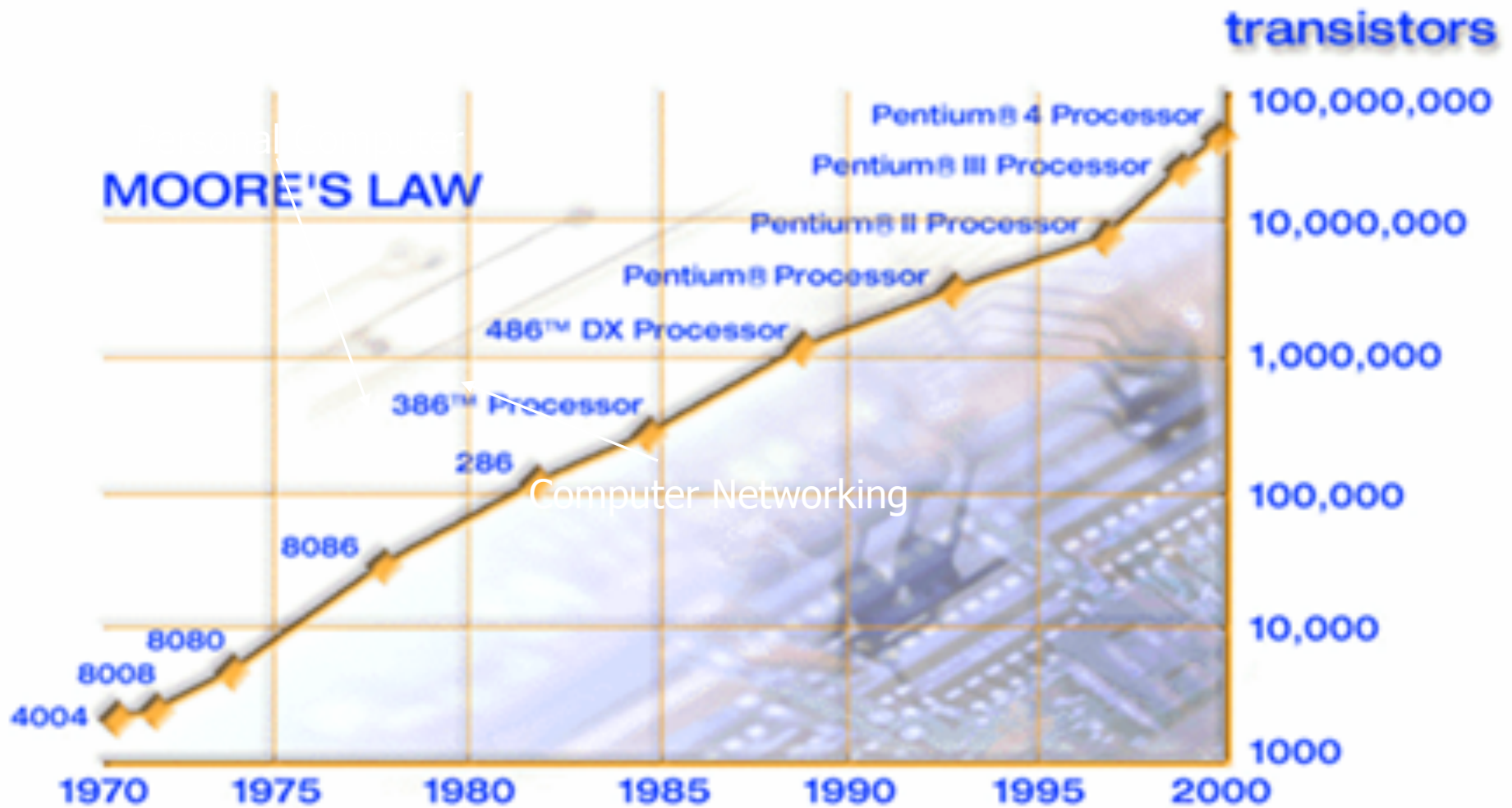
Government Role

- **Massive investment in university R&D**
 - **Research results**
 - **Great students that work in firms and become entrepreneurs**
 - **Certain standard setting such as TCP/IP**
- **Cost-plus procurement especially in early days**
- **Favorable capital gains taxation and stock option treatment – late 1970s**
- **Transparent and well regulated stock markets**
- **Little microlevel management**

The Silicon in Silicon Valley, 1958 and the Spinoff Phenomenon

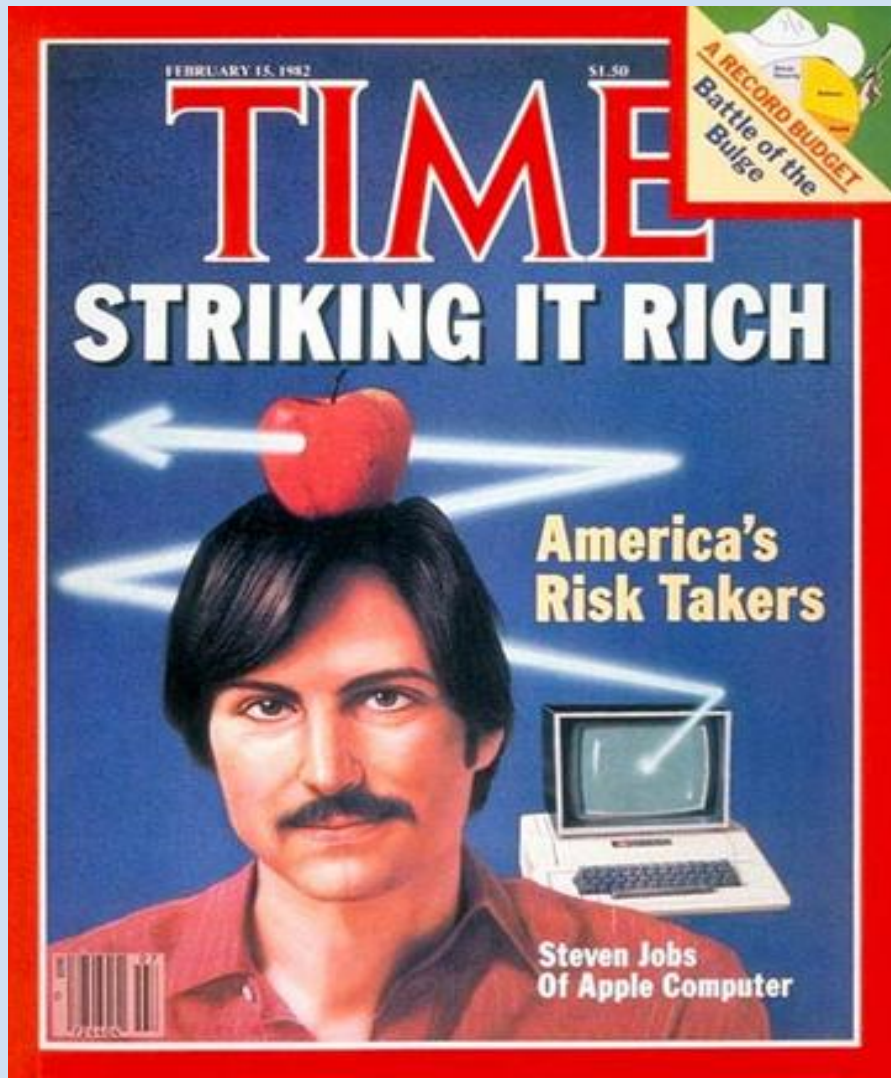


Semiconductor Improvement

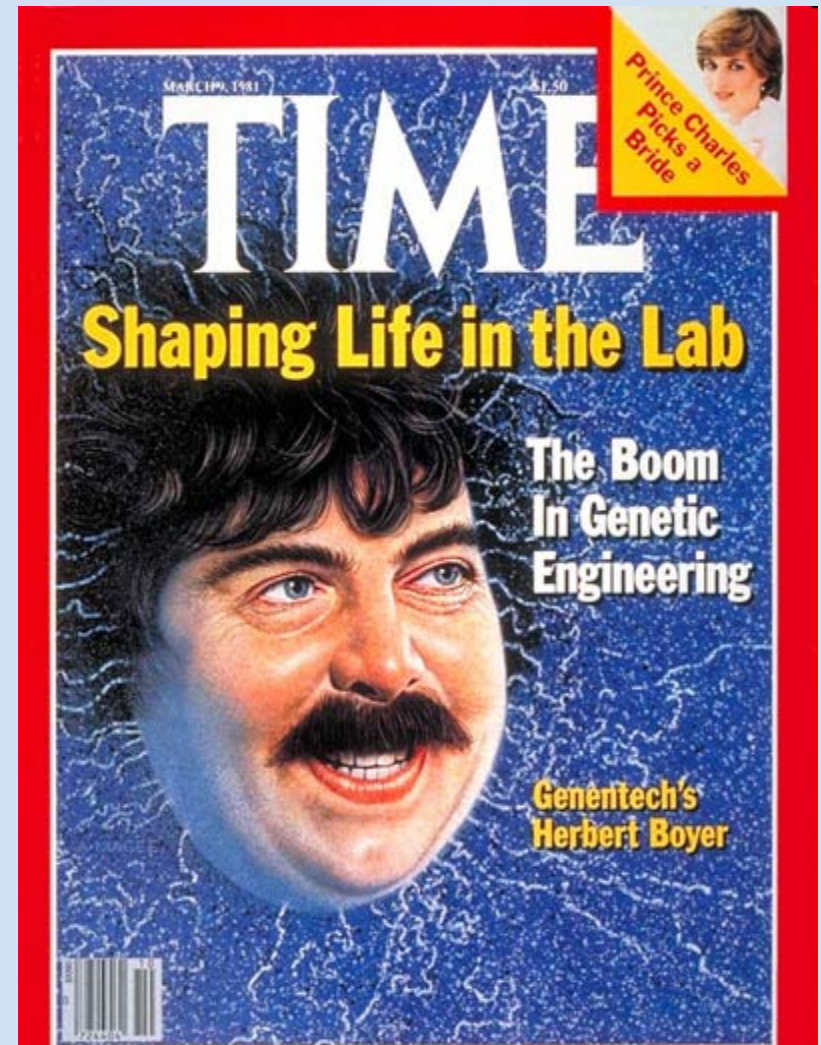


1980s – Silicon Valley is Recognized

1982



1981



Venture Capital Is Recognized, 1984



New New Thing

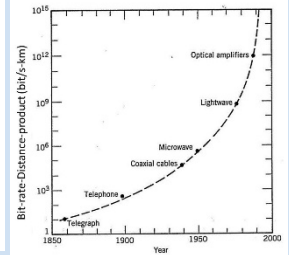
■ Chips



■ Computers etc.



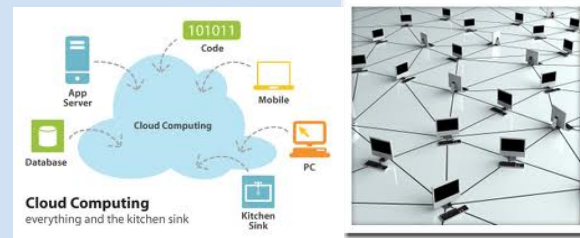
■ Networking



■ Software



■ Internet



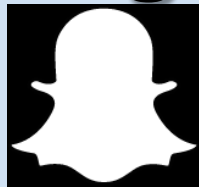
New Newer Thing

- And, of course



Google

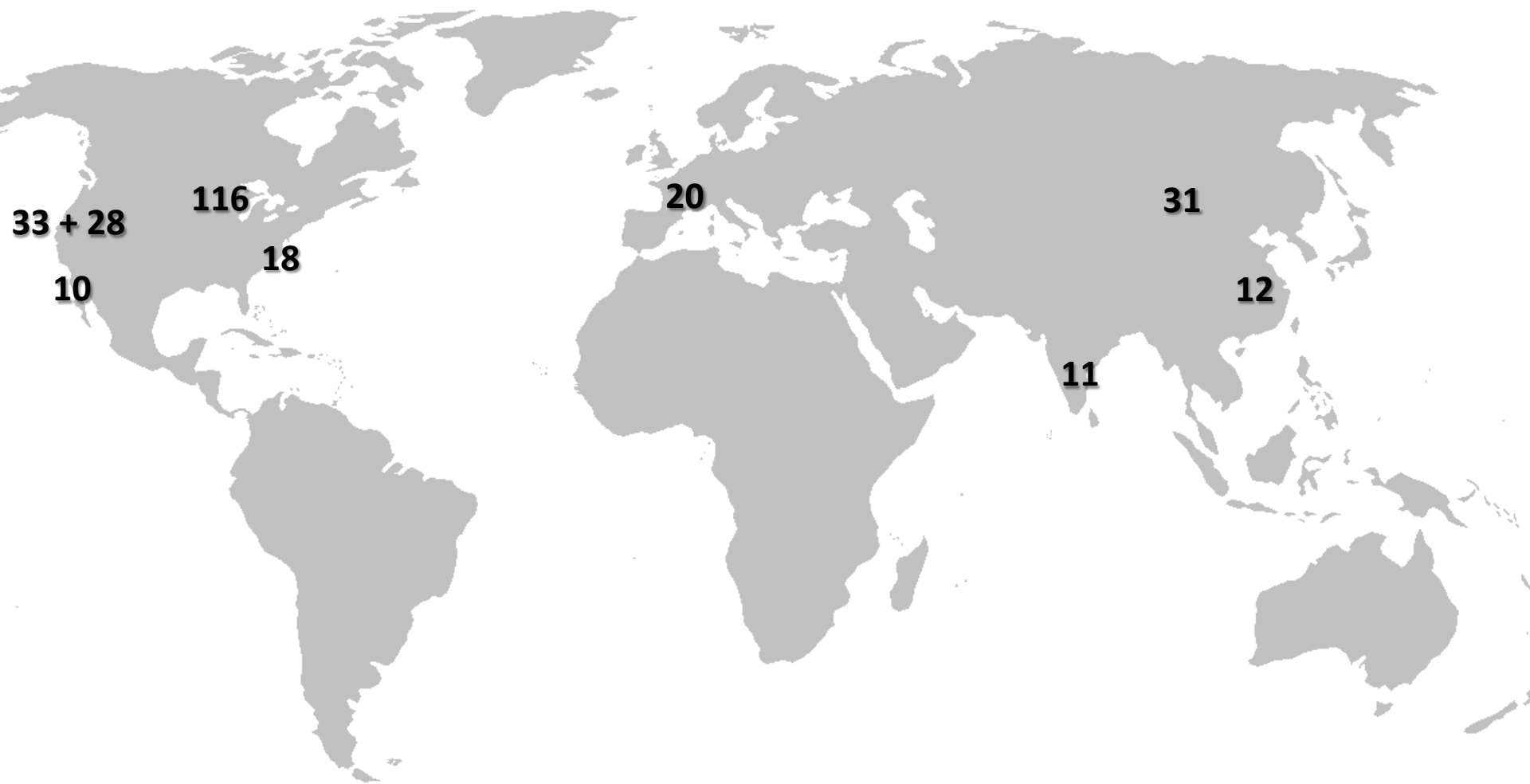
- Now getting old?



twitter
facebook
Pinterest

- Next?

Global Unicorns (not public), March 2017, N = 225



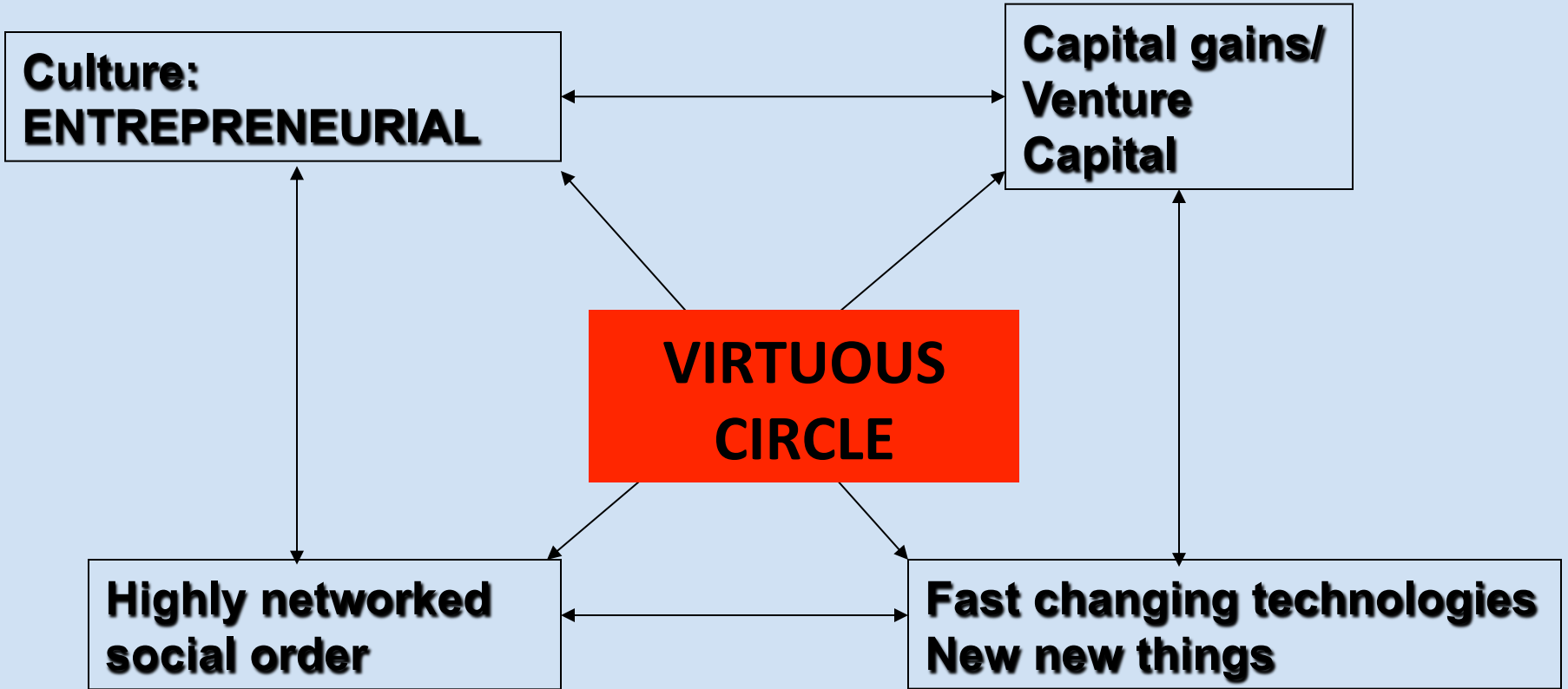
**Each of These Was Accompanied
by a Bubble**

Something Changes After Each Bubble

- **PC Revolution Bubble 1985-1990**
 - **Computers and networking**
 - Apple, Intel, Microsoft (Seattle), Cisco etc.
- **Internet Bubble 1998-2000**
 - **Worldwide web basically everywhere**
 - Amazon (Seattle firm), eBay, Yahoo!, Google,
- **Today's Bubble**
 - **Smartphone, social media, chat**
 - Facebook, Twitter, Snapchat, Uber, Airbnb
 - **Autonomous vehicles?**

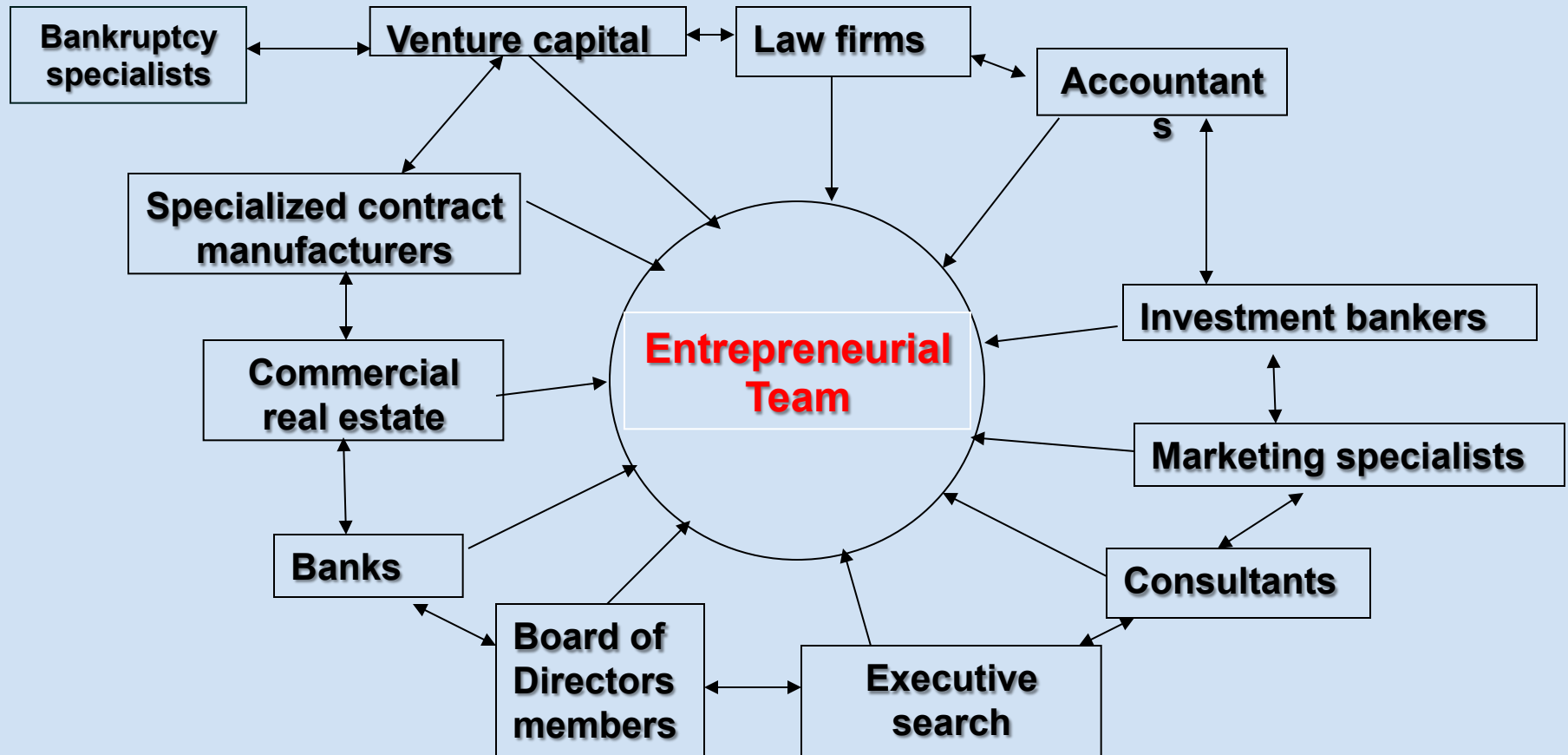
Ecosystem and Coevolution

Coevolution of Culture, Economics/Finance, Technology, and Social Networks



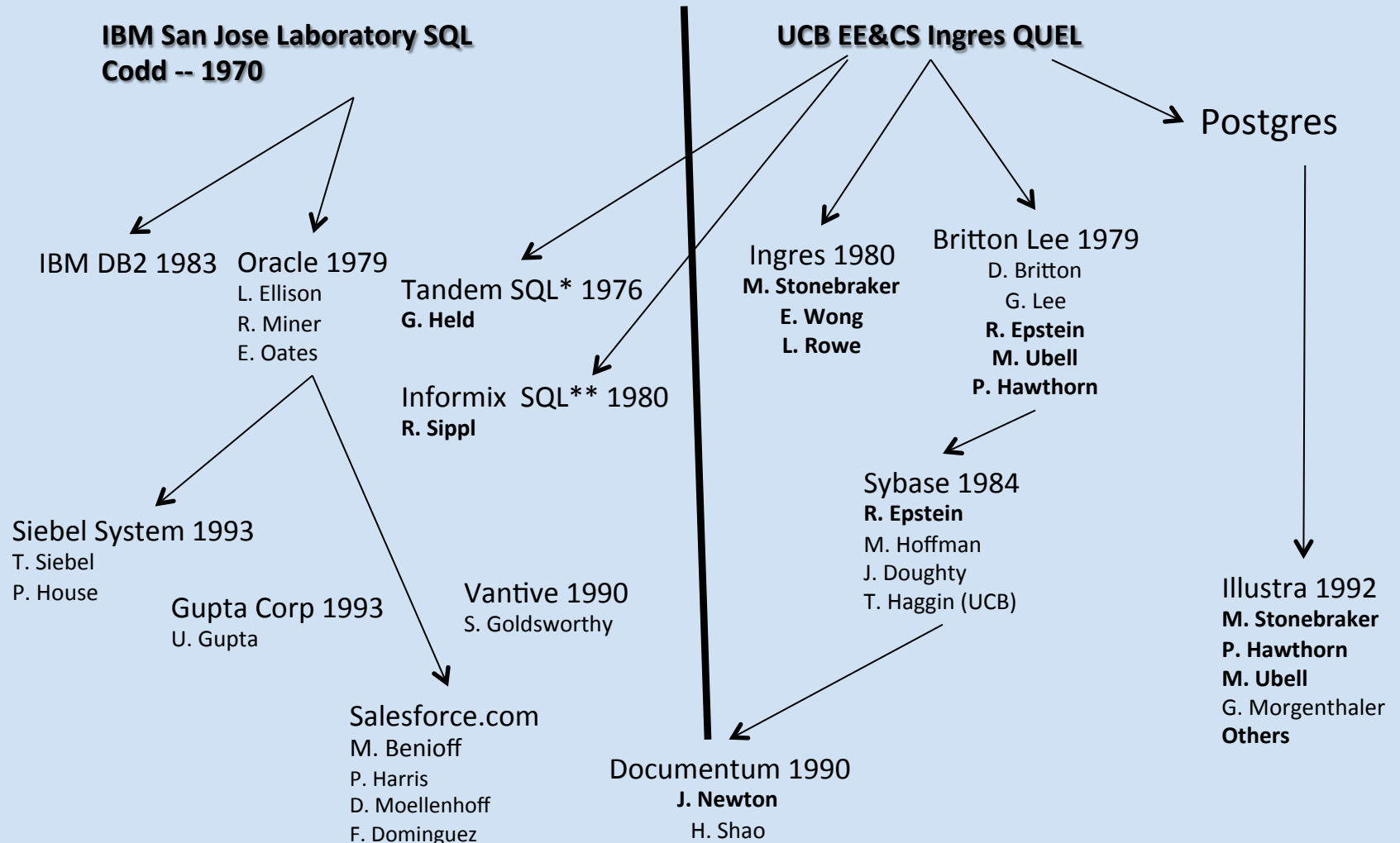
Culture, social structure, and economics are aligned

An Ecosystem Specialized in Assisting Startups



Lower entry barriers, speed the firm creation process, facilitate rapid growth, allow concentration on product development.

The Spinoff Phenomenon: An Example: Bay Area Relational Database/CRM Software Source of Knowledge and Entrepreneurs



The Culture

- **What is the “new new thing?”**
- **Go for it/change the world**
- **Gadget and engineering-oriented environment**
- **Open networks -- everyone knows someone**
- **Performance-based trust**
 - **Did and can you deliver?**
- **Fast paced, high turnover**

Opportunity Emergence

- **Not too expensive to enter**
 - Incumbents can't react because of their existing business models
- **Change the way things are done**
 - Semiconductor, PC, Internet, local area networks, "Google it," smart phone, social media
 - Create new platforms or standards
- **Next step in evolving market**
 - Myspace → Facebook → Instagram/Snapchat
- **Cannibalize old technologies**
- **Redefines market 10x improvement**

Capital Gains Drive the System

Understanding VC Returns

- 3-5 are complete losses, 2-3 don't fail but do not succeed, 2-3 get up to 5x return, hopefully one gets 10-200x return to cover mistakes
- But only a few VCs make good returns!

Keeps the entire system going, without this fuel, Silicon Valley would stagnate.

Returns to Selected VC Limited Partners, 2003

Partnership	Date	Distributions (%)	IRR (%) per annum
KPCB IV	1986	174	11.4
Mayfield VI	1987	335	26.7
Battery II	1988	419	37
Menlo IV	1988	498	42.5
KPCB VI	1992	300	42.9
Sequoia VI	1992	1231	110.8
Benchmark I	1995	4082	233.8
Accel V	1996	1724	195.8
KPCB VIII	1996	1251	350.4

Source: Adapted from Steve Lissom

Returns for Success

- Facebook -- Accel Partners invested \$12.7 million in 2005 and at 2012 IPO worth \$6.3 billion (142.70% CAGR)
- YouTube -- Sequoia Capital invested \$11.5 million in September 2nd, 2005 and return on sale to Google on October 9th, 2006 of \$480M (3,032.46%)
 - “We need to help the company quickly hire a CEO and VP BD/Sales. My preference would be to have a CEO in place within 90 days.”

Platform Economy Made in Silicon Valley

Thoughts to Keep in Mind

- **Software is eating the world (Marc Andreessen, founder Netscape and Andreessen Horowitz)**
- **Software embedded in objects, but now objects and people embedded in a skin of software processing data and making algorithmic decisions**

Digital Platforms

- **Result of big data, algorithms, and cloud computing**
- **Algorithm-enabled “cyberplaces” where constituents can act or transact**
- **Create network effects between various sides, applications and users, virtuous circles of growth**
- **Goal to lock-in ecosystem participants**

Data Is the New Raw Material

- **Internet surfing converted to value**
 - Digital exhaust
- **Uploading content to Facebook, App stores, Youtube, LinkedIn**
- **WeChat converted to value**
- **Portable devices, autos, machines, etc. all producing data**

Successful Platforms Often Are WTA

- **Platform owner/workers benefit massively, but not necessarily contractors and consigners**
 - A few may be big winners
- **Reinforce income inequality?**
- **Entry barriers dissolved and built digitally**
 - Uber/Lyft, Airbnb, and many more especially in financial sectors

Economics of Digital Platforms

- Often winner take all in the vertical
 - Single survivor – Google, YouTube, Facebook, Amazon, Github, LinkedIn, Airbnb
- Small numbers of employees, high revenues
 - Google = ~62,000 employees, \$74.54B
 - Facebook = ~12,700 employees, \$17.93B
- Successful platforms create huge but dependent ecosystems around them

Algorithms Are the Machines for Value Extraction from Data

- **They decide:**
 - **Recommendations to us on what to buy**
 - **Advertisements to serve**
 - **What machines should do**

Algorithmic Law?

- **Power is in algorithms**
 - Volkswagen “solved” pollution with algorithms that tests could not see
 - Who should be eligible for hiring
- **Uber changes payment algorithm**
- **Google changes PageRank algorithm**
 - Decides on who qualifies on right to forget
- **Facebook decides on pornography**
 - Not only government censorship, but also corporate censorship
- **“Smart” products that are always watching you**

**Hidden from users, producers, regulators,
consumers**

The New Powerhouses

- **Google (SV)**
- **Amazon (Seattle)**
- **Apple (SV)**
- **Facebook (SV)**
- **Still trying Microsoft (Seattle)**
- **Yahoo! (SV dying)**
- **New winners – Snapchat, Airbnb, Uber (SV)**

Global Competitors

- Baidu (China)
- Tencent (China)
- Alibaba (China)
- Rakuten (can I stop Rakuten)
- Europe????

Concluding Thoughts

Policy Observations

National Level:

- **Early days massive DoD purchasing**
- **Early days difficult to enforce patent laws (now changed)**
- **Standard setting e.g., TCP/IP**
- **Massive and unremitting R&D expenditures (NIH, DoD, and NSF)**
 - **Merit-based evaluation**
- **Immigration (U.S. universities attract many of the world's best)**
- **Liquid and fairly transparent equity markets**
- **Low capital gains tax & favorable stock option tax**

Silicon Valley Future

- **Enormous amounts of capital available**
 - **Venture capital and angels**
- **Great universities**
 - **Only rivaled by Boston**
- **More globally connected than ever**
- **Interesting new people keep coming**
- **Optimistic for business as digitization continues to offer new opportunities: mobile, social media, and cloud**

Concerns for SV Innovation System

- **Technologies with long lead times difficult to fund**
- **Weak link between new firms and traditional industries**
- **SV products and websites controlled by US government**
- **China excludes US Internet firms, Russia considering it, Europe?**
 - **Data privacy**
 - **National economic control**

SV System Results

- **Remarkable success over the last six decades**
 - **Entirely new industries/ecosystems created**
 - **Some new jobs created**
 - **Enormous financial wealth created**
 - **Firms have changed the world**
 - **Power shifting to platform firms and away from public and society**
 - **US firms dominate world ex-China**
 - **A world of no privacy**

Comments?

