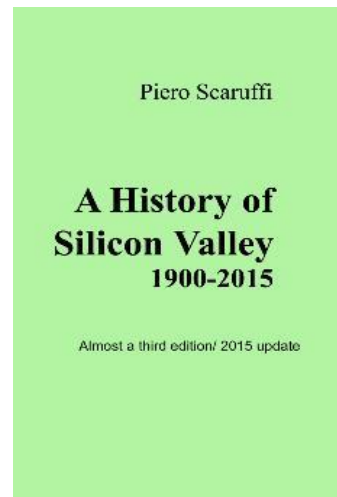


A History of Silicon Valley

The Greatest Creation of Wealth in History
(An immoral tale)

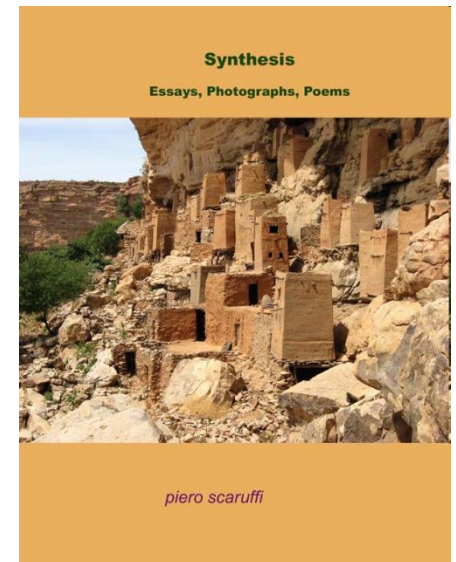
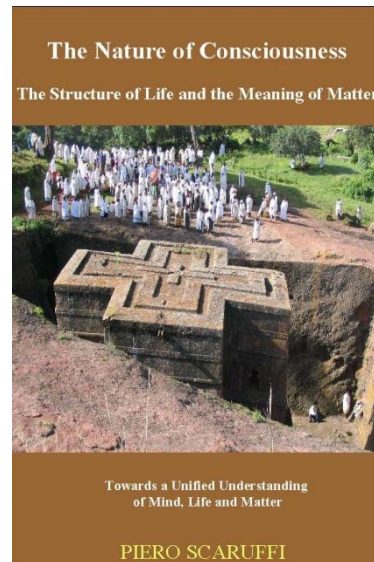
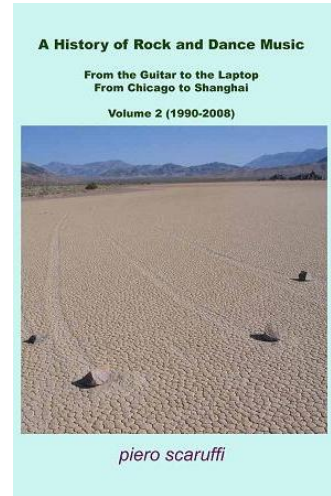
being a presentation by piero scaruffi
www.scaruffi.com

adapted from the book “A History of Silicon Valley”



Piero Scaruffi

- Cultural Historian
- Cognitive Scientist
- Blogger
- Poet
- www.scaruffi.com

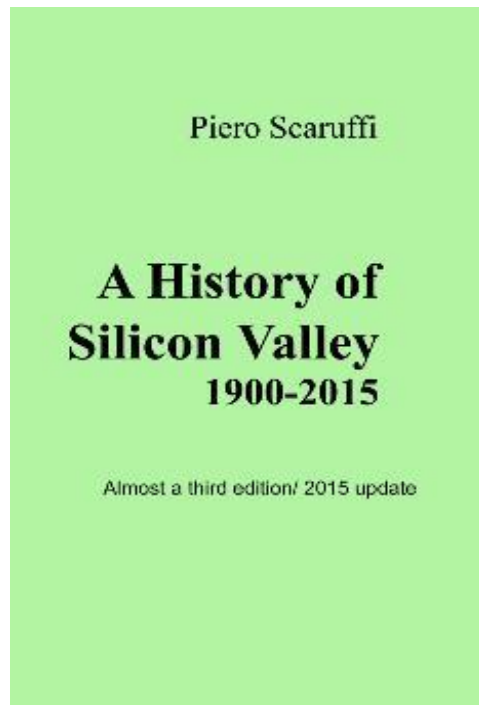


This is Part 6

- See <http://www.scaruffi.com/svhistory> for the index of this Powerpoint presentation and links to the other parts
 - 1900-1960
 - The 1960s
 - The 1970s
 - The 1980s
 - The 1990s
 - The 2000s

What the book is about...

- The book is a history of the high-tech industry in the San Francisco Bay Area (of which Silicon Valley is currently the most famous component)



Beyond the Crash

- HP acquires Compaq (1999): DEC downgraded to just up a small division within a Silicon Valley company (HP)
- Paypal (2000)
- Apple iPod (2001)
- Yahoo and Google de-facto turn the Web into an advertising tool which incidentally also contains information
- Almost all of Google's businesses are driven by acquisition of other people's ideas

You Are a Gadget

- Wikipedia (2003)
- Intel Centrino makes Wi-Fi a household name (2003)
- Facebook (2004)
- YouTube (2005)
- Twitter (2006)
- Kindle (2007)
- Zynga (2007)
- Apple iPhone (2007) and Google Android (2007)

The Age of Uploading

- Wikipedia
- Blogs
- P2P tools
- social networking sites
- YouTube
- Flickr
- Digital cameras and camcorders
- Smartphones

Success Story: Pandora

- Tim Westergren studies computer music at Stanford
- Travels with a rock band
- Composes film music for Hollywood and needs to guess what each director likes
- Invents a taxonomy of songs based on 450 parameters
- Hooks up with Will Glaser, a triple major in Computer Science, Mathematics, And Physics from Cornell University, son of a Nobel laureate
- Within two years they have 10,000 songs in an Excel spreadsheet and a macro to calculate musical proximity
- Dotcom crash
- Between 2001 and 2003 no salary paid to employees

Success Story: Pandora

- March 2004: first round of financing (\$9 million)
- Initially the music genome product is licensed to portals and retailers
- Fall 2005: launch of custom radio (note: 80% of the time that a person spends listening to music is on the radio)
- Bloggers and chat rooms spread the word
- Summer 2007: mobile app for iPhone

The Secret to Success: Free Products

facebook

You Tube



KHAN
ACADEMY



Dropbox

Google



WIKIPEDIA
The Free Encyclopedia



craigslist



twitter



The Demise of the Computer

- The smartphone (a computer that also does voice)
- Cloud computing (an invisible, omnipotent, virtual computer)
- Applications are written for social networks (Facebook apps) and smartphones (iPhone apps), not for an operating system

The Demise of the Computer

- Danger's Sidekick (2002)

Danger Hiptop



The Gift Economy

- The audience “gifts” content to the companies that make money out of it
- The companies are small but handle a huge amount of content
- The companies make money as advertising platforms
- The audience receives a free service but also provides a free service

The Great Internet Wars

- Google vs Microsoft: Microsoft owns the operating system but Google owns the search engine (Internet traffic)
- Google vs Facebook: vying to become the premier advertising platform
- Apple vs Google: proprietary or open smartphones

Biotech

- Elsewhere:
 - Celera and HGP announce the human genome has been sequenced (2000)
 - Stony Brook creates the first synthetic virus (2002)
 - Craig Venter creates an artificial being (2010)
- Silicon Valley:
 - The world's first Synthetic Biology department at the Lawrence Berkeley Lab (2006)
 - UCSF Institute for Human Genetics (2005)
 - The Bay Area boasts about 700 biomedical companies (2007)
 - Bubble of Personal Genomics startups

Greentech

- Solyndra (2005)
- The Tesla roadster (2006)

The 2000s

2005: Google acquires the Android operating system

2005: Google launches Google Maps

2006: Google acquires YouTube

2006: Jack Dorsey creates the social networking service Twitter

2007: Apple launches the iPhone

2007: Google begins freely distributing Android

2008: Airbnb is founded in San Francisco

(2009: Satoshi Nakamoto introduces the digital currency Bitcoin)

2009: Travis Kalanick and Garrett Camp launch the smartphone app Uber

2009: Facebook grows by about one million users a day

The 2010s

2011: Apple's Siri

2012: SpaceX launches the first commercial flight to the International Space Station

2012: The CRISPR-cas9 genome editing technique at UC Berkeley

2014: Google acquires DeepMind

2014: Facebook acquires Oculus (virtual reality)

2015: Elon Musk and Sam Altman establish OpenAI

2016: Niantic and Nintendo introduce the AR game Pokemon Go

2016: Google DeepMind's AlphaGo beats Go master Lee Se-dol

2017: Google introduces the "transformer" model for Artificial Intelligence

2018: Apple becomes the first company in the world to be value \$1 trillion

2018: Google and OpenAI demonstrate the first language models

2019: Google's quantum computer Sycamore

The 2010s

- 2012: Facebook goes public, the biggest high-tech IPO in history
- 2013: 92% of smartphones in the world use an operating system made in Silicon Valley (Android 75%, iOS 17%, Windows 3%, Blackberry 3%, Symbian less than 1%)
- 2014: Facebook has 1.3 billion members, Google owns 68% of the searches in the USA and more than 90% in Europe, Amazon owns more than 50% of the book market in the USA, LinkedIn has 300 million members, Alibaba controls 80% of e-commerce in China
- 2016: Alphabet (Google) passes Apple to become the most valuable company in the world (\$558 billion vs \$535 billion in January)

The 2010s

- Paypal mafia



greylockpartners.

- Linked in**

CLARIUM

facebook.

FOUNDER'S FUND

Managing Partner, Founders Fund
President, Clarium Capital
Board Director, Facebook

 Square

COO, Square
Investor, YouTube, Geni,
LinkedIn, Yelp

You Tube™

Co-founder, YouTube

Co-founder, YouTube

yammer

Co-founder and CEO, Yammer
Chairman, Geni

Geni

Advisor, Kiva
Founding Partner,
500 Startups

500

Managing Partner,
Sequoia Capital

“1995年，在《中国农村扶贫开发纲要（1996-2010）》中，首次提出‘开发式扶贫’，即通过扶持农村贫困人口发展生产，提高收入，实现脱贫致富。这一政策标志着中国扶贫工作的重大转变，从过去的救济式扶贫转向了开发式扶贫。开发式扶贫强调通过发展经济、改善基础设施、提高教育水平等方式，增强农村贫困人口的自我发展能力，从而实现长期的脱贫致富。这一政策在后续的扶贫工作中得到了进一步的完善和落实，成为推动中国农村扶贫开发的重要指导思想。”

Co-founder and CEO, Yelp



Co-founder, Yelp

President, Kiva

Founder and CEO, **SpaceX**
Co-founder and CEO, **Tesla**

TESLA



Founder, **Slide** (acquired by Google)

slide

Co-founder and Executive Chairman, **LinkedIn**
Partner, **Greylock**

Co-founder and Executive Chairman, **LinkedIn**
Partner, **Greylock**

Peter Thiel
Co-founder, CEO

Keith Rabois
Executive VP,
Business Development

Steve Chen
Engineer

Sawed Karim
Engineer

Chad Hurley
Designer

David Sacks
COO

Dave McClure
Director of Marketing

Roelof Botha
CFO

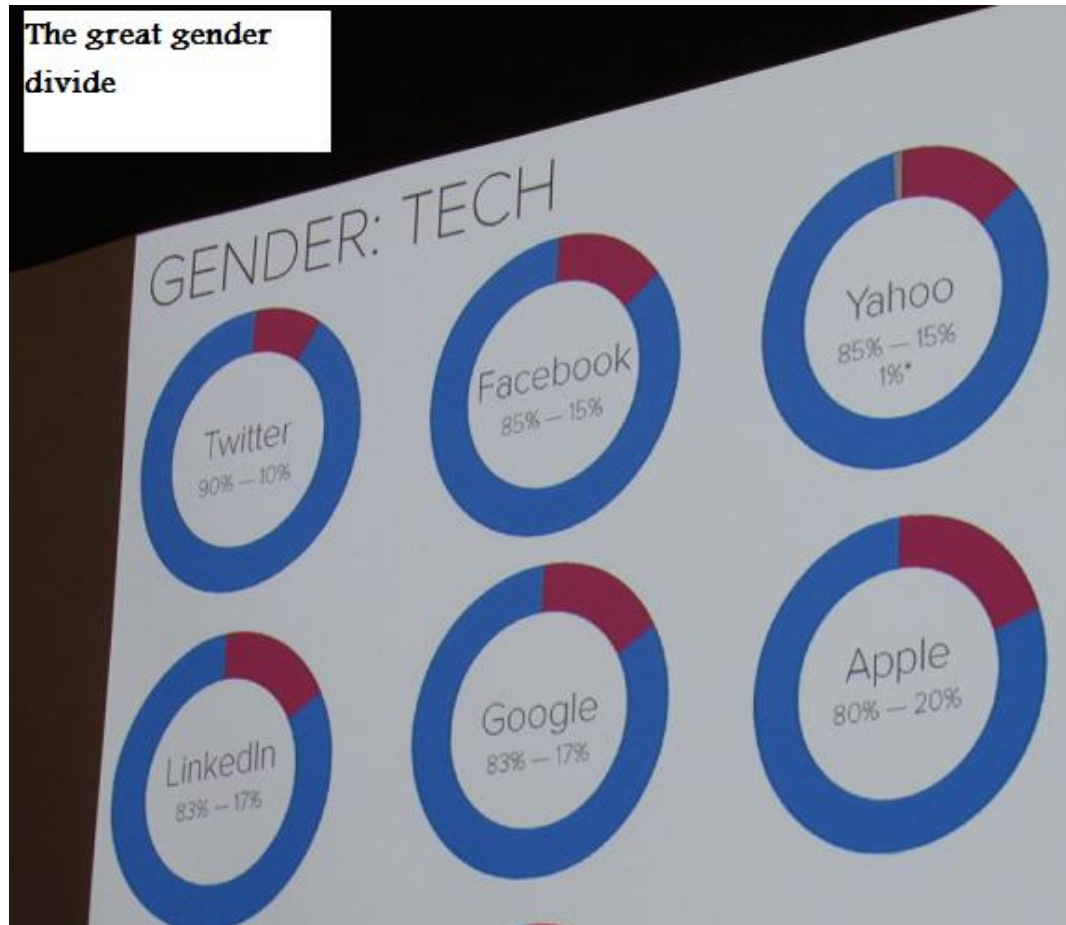


500

The 2010s

- 2015: There are 144 unicorns with a total value of \$505 billion in the USA
- 2016: For the first time more users around the world are accessing the internet from mobile devices than from desktop computers

The Great Gender Divide



The Empire

- The Bay Area is the largest high-tech center in the world (2006)
- HP passes Dell in worldwide PC shipments (2006)
- Google's revenues pass IBM's software revenues (2009)
- Oracle passes SAP (2009)
- The world's two biggest companies by market capitalization are in the Bay Area
- The Bay Area has won more Nobel prizes than any country except USA, Britain and Germany

World's most valuable companies (Dec 2016)

Apple	1	622.6
Alphabet	2	554.5
Microsoft	3	489.8
Berkshire Hathaway	4	404.0
Exxon Mobil	5	374.4
Amazon.com	6	366.9
Facebook	7	337.0
Johnson & Johnson	8	313.1
JPMorgan Chase	9	309.5
General Electric	10	280.4
Wells Fargo	11	277.8
AT&T	12	261.1
Bank of America	13	234.8
Procter & Gamble	14	225.0
Chevron	15	222.6
Royal Dutch Shell	16	218.4
Verizon	17	217.9
Alibaba Group	18	216.5
China Mobile	19	213.7
Wal-Mart Stores	20	213.0
Pfizer	21	196.3

GDP (\$million):

1	USA	16,800,000	
2	China	9,240,270	
3	Japan	4,901,530	
4	Germany		3,634,823
5	France	2,734,949	
6	Britain	2,522,261	
7	Brazil	2,245,673	
8	Russia	2,096,777	
9	Italy	2,071,307	
10	India	1,876,797	
11	Canada	1,825,096	
12	Australia		1,560,597
13	Spain	1,358,263	
14	South Korea		1,304,554
15	Mexico	1,260,915	
16	Indonesia		868,346
17	Turkey	820,207	
18	Netherlands		800,173
19	Saudi Arabia		745,273
20	Switzerland		650,782
21	Argentina		611,755
22	San Francisco Bay Area	~600,000 (8 million people)	

GDP per capita (\$):

1	Qatar	98,814
2	Luxembourg	78,670
3	San Francisco Bay Area	74,815
3	Singapore	64,584
4	Norway	54,947
5	Brunei	53,431
6	United States	53,101

(World Bank, 2013)

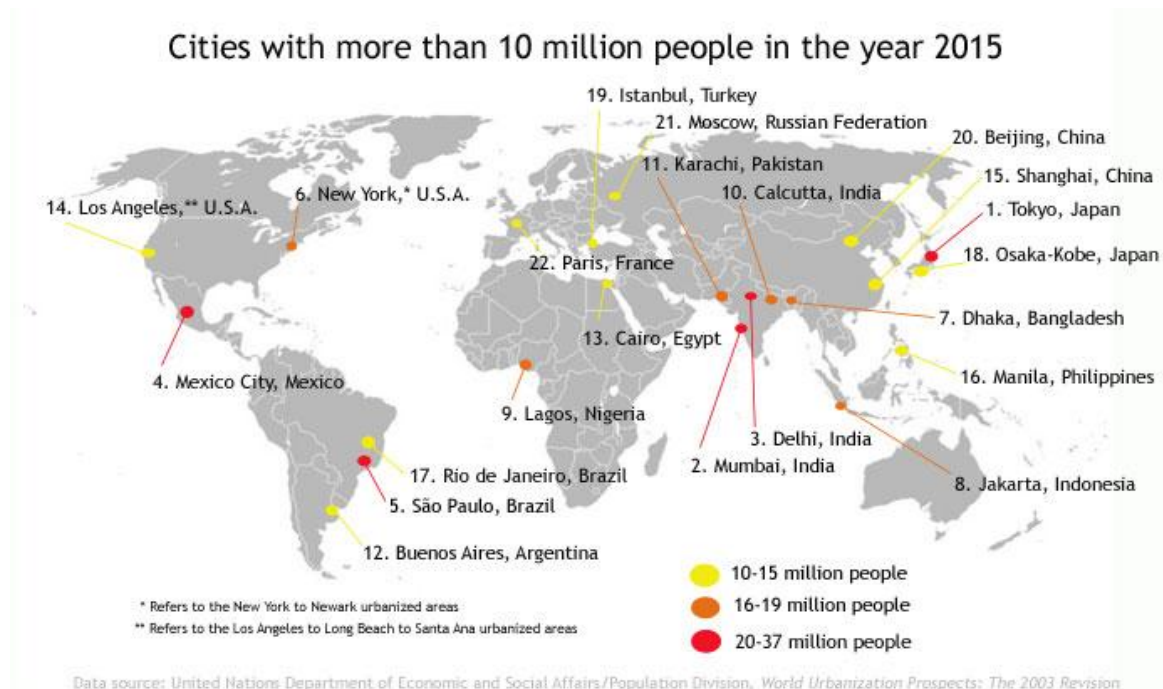
Nobel Prizes (2014):

1.	USA	349
2.	Britain	116
3.	Germany	101
4.	France	66
5.	San Francisco Bay Area	43
6.	Sweden	30
7.	Russia	27
8.	Switzerland	26
9.	Canada	23
10.	Austria	22
11.	Italy	20
12.	Japan	19

Combined Net Worth of Billionaires:

1. New York \$364.6B
2. Hong Kong \$261.3B
3. Moscow \$217.6B
4. London \$187.7B
5. Beijing \$149.9B
6. Paris \$147.9B
7. Palo Alto (only 50,000 people!) \$124.9B
8. Mumbai \$115.1B
9. Shenzhen \$78B
10. San Francisco \$74.5B
11. Seoul \$73.9B
12. Los Angeles \$70.7B
13. Shanghai \$66.1B
14. Tokyo \$62.3B
15. Hangzhou \$60.8B

(Source: Forbes)



50 Smartest Companies

5 from China in top 25: Baidu is #2,
Huawei #10, Tencent, Didi and Alibaba
Only 1 from Japan in the top 25 (Toyota)
Only 2 from Europe (Oxford Nanopore
and Collectis).
Bay Area: 9 of the top 25!

<https://www.technologyreview.com/lists/companies/2016/>

Global brand value

Interbrand Best Global Brands 2016

Wal-Mart Stores	485.65
Sinopec	433.31
Royal Dutch Shell	385.63
PetroChina	367.85
Exxon Mobil	364.76
BP	334.61
Toyota Motor	248.95
Volkswagen	244.81
Glencore	209.22
Total	194.16
Chevron	191.76

01 	02 	03 	04 
05 	06 	07 	08 TOP GROWING 
09 	10 	11 	12 
13 	14 	15 TOP GROWING 	16 

Global Brand Value

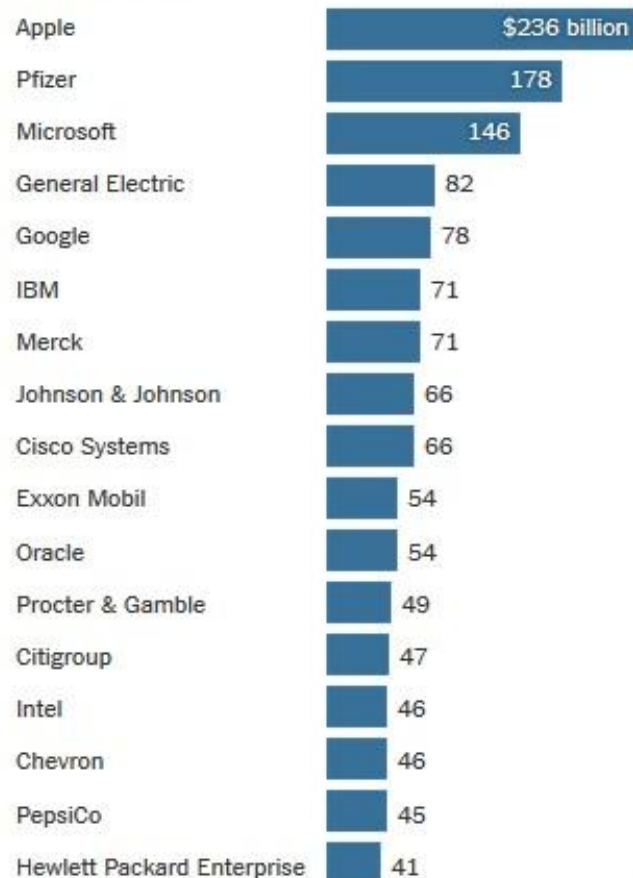
- The value of a global brand
 - Why does it matter?
 - Global brands set the agenda, frame the discussion, on new technologies
 - E.g, VR became hot in 2014... when Facebook bought Oculus
 - E.g. AI became hot in 2016... with Google's AlphaGo
 - The global brand's location automatically becomes a “strategic” location
 - Any startup located near a global brand benefits



Trouble in Paradise (2017)

U.S. Companies Hold Trillions of Dollars of Profits Offshore

The top 20 S&P 500 companies by earnings parked overseas.



International Consortium of Investigative Journalists

November 2017



ICIJ releases The Paradise Papers

Trouble in Paradise (2017)



The lawyers taking on Silicon Valley sexism: 'It's far worse than people know'

From Google to Uber, Silicon Valley's tech giants have a woman problem. Meet Lawless & Lawless, the sisters fighting back



McClure steps back at 500 Startups

TechCrunch - 738 x 490 - Search by image



Trouble in Paradise (2017)



Facebook, Google and Twitter
have been asked to testify
before Congress on Russia and
the 2016 election

27 Sept 2017

RUSSIA & 2016 ELECTION INVESTIGATIONS



The 2020s

2020: Google's AlphaFold solves the protein structure prediction problem for single protein chains

2020: Google's Waymo begins a fully driverless taxi service in Phoenix

2020: OpenAI introduces the language model GPT3

2020: Tesla becomes the #1 car manufacturer in the world by market capitalization, worth more than General Motors, Toyota, Volkswagen and Ford combined

2021: Dario Amodei and Daniela Amodei found Anthropic

2021: Facebook changes its name to Meta and focuses on the metaverse

2021: SpaceX is the most valuable US start-up and Elon Musk the richest person in the world

2022: Apple becomes the first company to reach the \$3tn valuation, higher than the GDP of Britain

2022: OpenAI introduces the chatbot ChatGPT

The 2020s

2023: Waymo's robotaxi begins service in San Francisco

2024: Nvidia value passes \$3tn, overtaking Apple and Microsoft and becoming the most valuable company in the world

Jul 2025: Elon Musk is the richest man in the world, followed by Larry Ellison, Mark Zuckerberg, Jeff Bezos of Amazon, Steve Ballmer of Microsoft, and Larry Page

Jul 2025: Nvidia becomes the most valued company in the world and the first company to hit \$4 trillion in market value

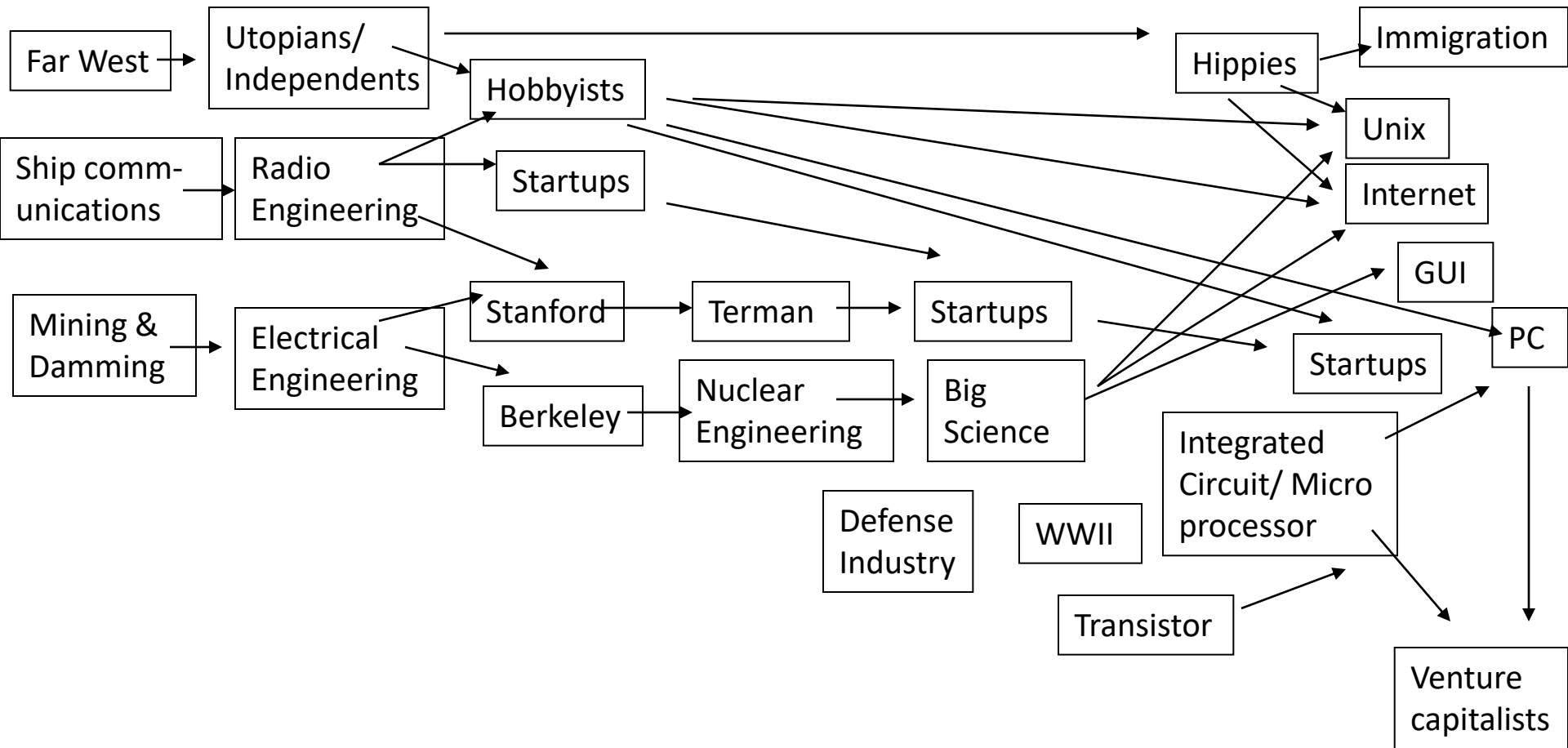
Sep 2025: Larry Ellison of Oracle passes Elon Musk to become the richest man in the world

Sep 2025: OpenAI becomes the most valued private company in history

Oct 2025: Nvidia becomes the world's first \$5 trillion company

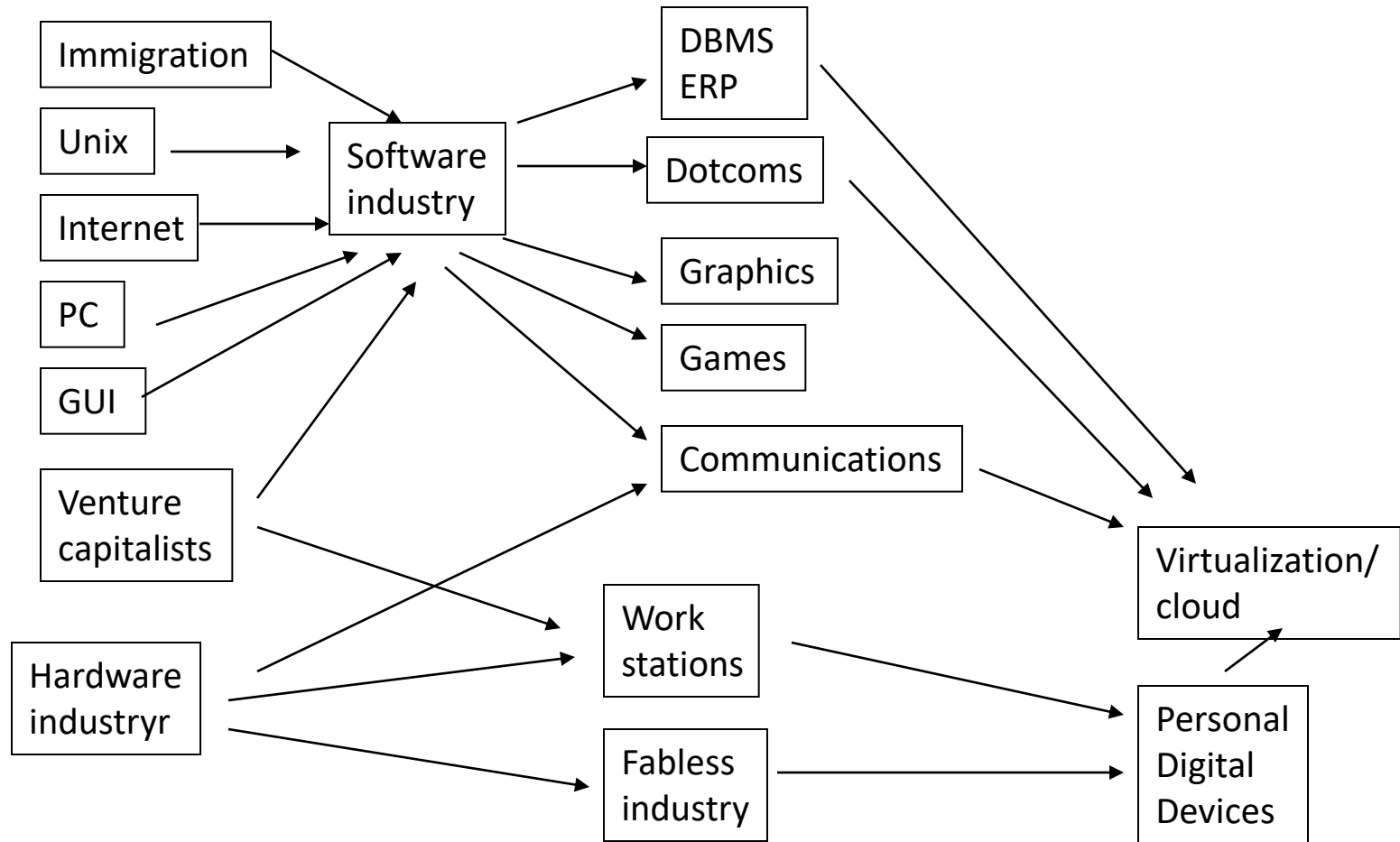
The Unlikely Symbiosis (1900s-70s)

A brief technological and sociopolitical history of Silicon Valley



The Unlikely Symbiosis (1970s-2010s)

A brief technological and sociopolitical history of Silicon Valley



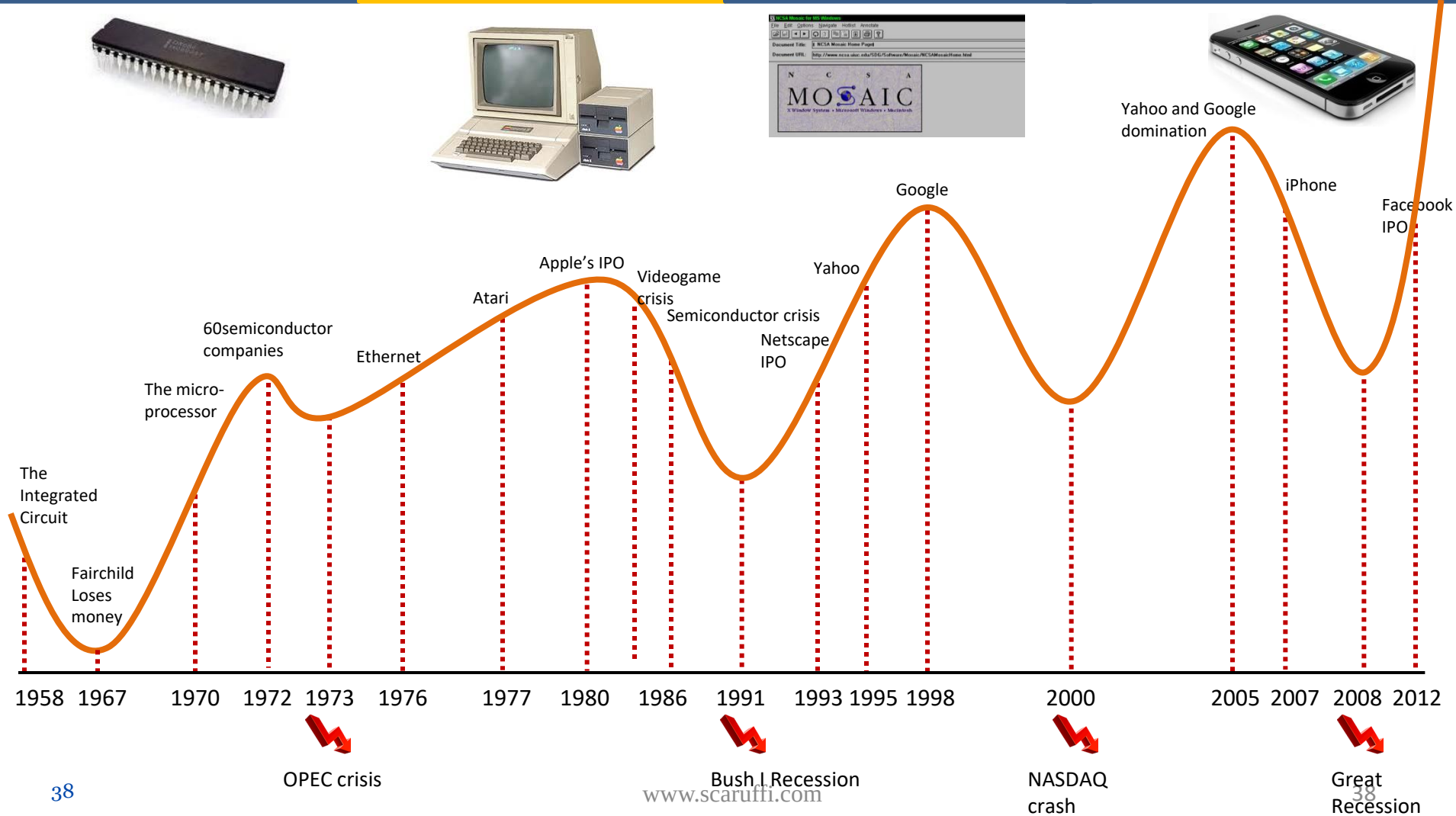
Silicon Valley's Bubbles

SILICON

PCs

INTERNET

SMARTPHONE



Conclusions

- Silicon Valley is the symbol and catalyst for the revolution that turned electronic computing from a math appliance into pervasive worldwide communication
- Almost none of the enabling technologies was invented by Silicon Valley
- SV excels at incubating businesses, not at inventing technology
- SV excels in disruptive technologies (that change the world)
- A platform for perennial innovation

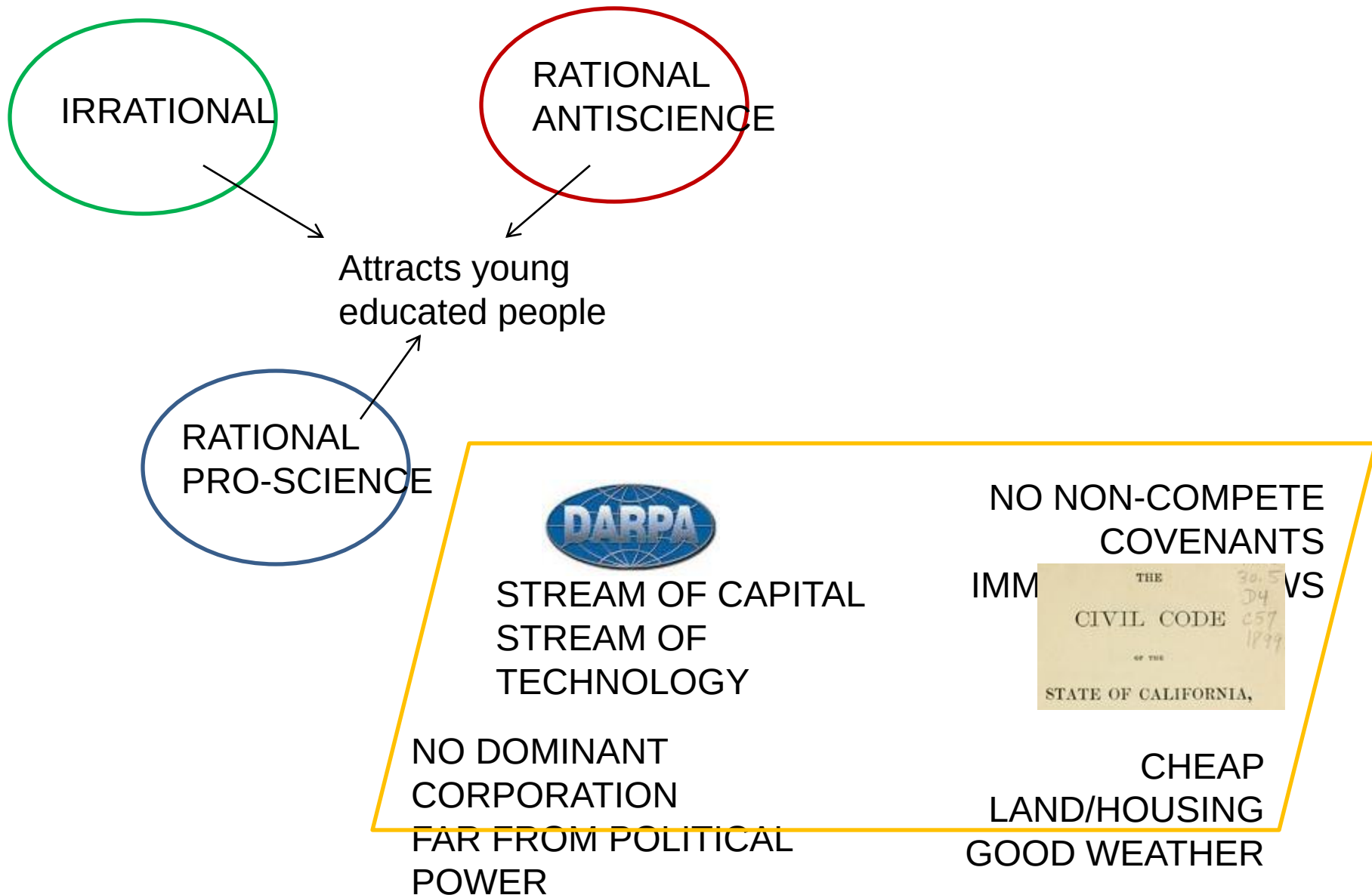
Conclusions

- Silicon Valley did not exist in a vacuum: sociopolitical and artistic/cultural background
- Alternative lifestyle, anti-establishment spirit, utopian counterculture: "question authority", "think different" and "change the world"
- SV is largely the product of a youth culture (just like rock music and videogames)
- SV hates the big government, big labor and big corporations
- SV loves the eccentric individualist and the "do it yourself" philosophy

Conclusions

- The Bay Area was uniquely equipped with the mindset to subvert rules and embrace novelty
- But it would not have happened without big government:
 - government was the largest venture capitalist of Silicon Valley
 - government was also the most influential strategist of Silicon Valley
 - government invested in high-risk long-term projects while venture capitalists tended to follow short-term trends

THE COMBUSTION



What makes it Silicon Valley

- Status symbol for the eccentric independent hobbyist (that encourages "crazy" ideas, lowers career expectations, prepares for failure)
- Utopian counterculture (that motivates young people to change the world)
- Anti-corporate attitude (that encourages young people to start their own business)
- Horizontal mobility (that spreads know-how from company to company)
- Big government (that funds high-risk long-term projects)
- English
- Immigration
- Meritocracy
- Luck

What makes it Silicon Valley

- The role of government
 - Who invests in the long-term in mission-impossible projects in a market economy?
 - DARPA
 - Why it worked: military investment during a war is less susceptible to corrupt or incompetent bureaucracy
 - Universities
 - Why it worked: scientists are rewarded by the opinion of peers, media and the public (vanity is a long-term project!)
 - NASA

What makes it Silicon Valley

- Why did you start your company?
 - hobby (Steve Wozniak)
 - i need something that doesn't exist (Google, Facebook)
 - i want to change the world (Steve Jobs)
 - business opportunity (Fairchild, Oracle, Cisco, Intel)

It's about the mindset, not the invention

- **Not** invented here: computer, transistor, integrated circuit, robots, Artificial Intelligence, programming languages, databases, videogames, Internet, personal computers, World-wide web, search engines, social media, smartphones, wearable computing, space exploration, electrical cars, driverless cars...

Trivia: Who invented What

Transistor: New Jersey (1947)
Programmable computer: England (1948)
Neural Network: Boston (1954)
Transistor radio: Japan (1954)
Integrated circuit: Texas (1958)
Artificial Intelligence: Boston (1956)
Robot: Detroit (1961)
Database: New York (1961)
Computer graphics: Boston (1963)
Internet: Boston (1969)
Virtual Reality: Utah (1969)
Pocket calculator: Japan (1970)
Email: Boston (1972)
Personal computer: New Mexico (1974)
DNA sequencing: England (1977)
Portable music player: Japan (1979)
CD: Japan (1982)
Camcorder: Japan (1982)

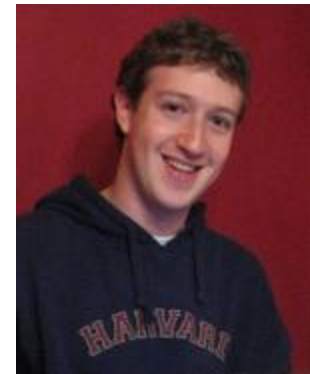
Flash memory: Japan (1984)
E-commerce: Boston (1983)
Mobile phone: Arizona (1984)
3D printing: Los Angeles (1988)
Digital camera: Japan (1988)
Search engine: Montreal (1990)
World-wide web: Switzerland (1991)
Wearable computing: Boston (1993)
Self-driving car: Germany (1994)
QR code: Japan (1994)
Gene editing: New York (1994)
Smartphone: Finland (1996)
DVD player: Japan (1996)
Hybrid car: Japan (1997)
Social media: New York (1997)
Mobile payment: Japan (2004)
Blockchain: Florida (2008)

The Mindset: Disruptive Thinking!

- What Silicon Valley does best: disrupting products
- Silicon Valley takes inventions and turns them into disruptive technologies



Google



ORACLE®

A unique place

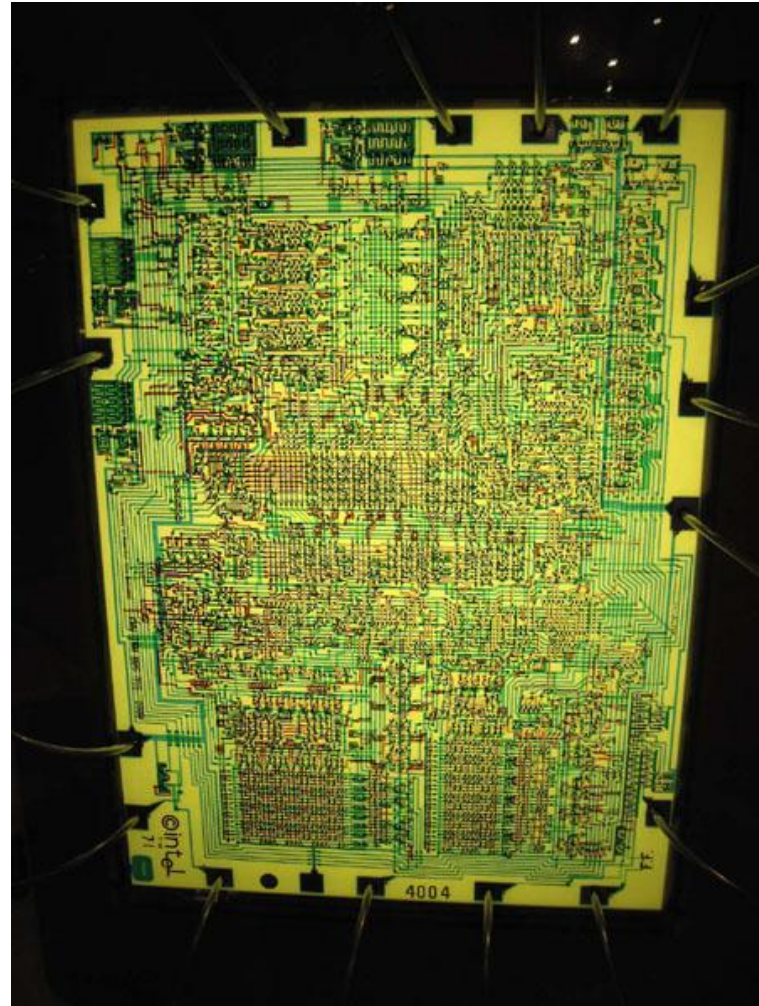
- What is special about Silicon Valley?
 - Culture of failure
 - Anti-corporate sentiment
 - Meritocracy
 - Casual work environment
 - A society that rewards the independent and the eccentric
 - A society that attracts young educated people from all over the world who want to change the world

Why Silicon Valley?

- The official history of Silicon Valley
 - Defense/DARPA
 - Fred Terman at Stanford and Stanford Industrial Park
 - William Shockley's lab
 - Fairchild/Intel/semiconductors
 - Xerox PARC, SRI Intl/computer-human interface
 - Apple, personal computing, videogames
 - Unix, Internet, Relational databases
 - The dotcoms
 - Google, Facebook, Twitter... social networking
 - Airbnb, Uber... sharing economy
 - AI, VR, Biotech...

Why is it called “Silicon” valley?

- Intel 4004 (1971)



What was special about the San Francisco Bay Area before 1971?



Why Silicon Valley?

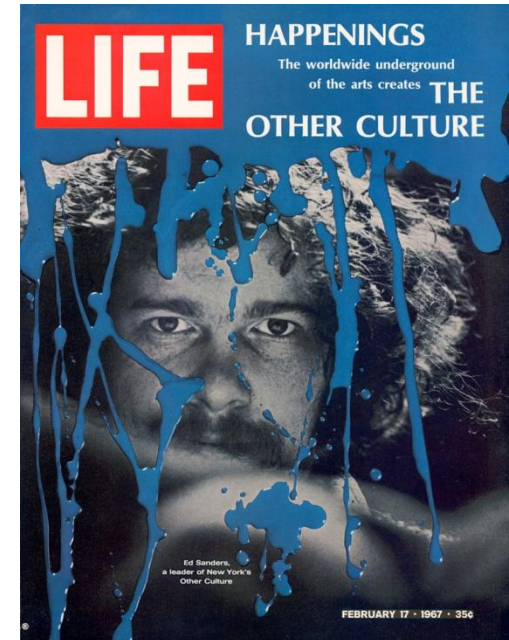
- Until the 1950s the Bay Area was mainly famous for
 - Eccentric artists/writers
- Student protests of 1964
- Hippies
- Black Panther Party (1966)
- Monterey's rock festival (1967)
- "Whole Earth Catalog" (1968)
- The first "Earth Day" (1970)
- Gay Pride Parade (1970)
- Survival Research Labs (1978)
- New-age movement (1980s)
- Burning Man (1990)



Why Silicon Valley?

The first major wave of immigration of young educated people from all over the world took place during the hippy era (“Summer of Love”)

The first major wave of technology was driven by independents, amateurs and hobbyists (From ham radio to the Homebrew Computer Club)



Why Silicon Valley?

- Anti-establishment sentiment
- The start-ups implement principles of the hippy commune
- SRI Intl and Xerox PARC: computation for the masses, augmented intelligence



The first mouse

Why Silicon Valley?

- The Bay Area recast both Unix and the Internet as idealistic grass-roots movements
- Young educated people wanted to change the world
- They did



Why Silicon Valley?

- Dysfunctional synergy between two opposite poles
 - The rational and the irrational
 - Technologists and anti-technologists
 - Hippies and engineers
 - Amateurs and corporations
 - Nerds and outlaws (the "traitors", Jobs, Ellison, Zuckerberg, hackers, cyberpunks)

Why Silicon Valley?



Why Silicon Valley?

- *The value of a global brand*
 - The largest companies by revenues: does anybody care?

Wal-Mart Stores	485.65
Sinopec	433.31
Royal Dutch Shell	385.63
PetroChina	367.85
Exxon Mobil	364.76
BP	334.61
Toyota Motor	248.95
Volkswagen	244.81
Glencore	209.22
Total	194.16
Chevron	191.76

Why Silicon Valley?

- *The value of a global brand*
 - Ranking of companies by global brand value: we care

Interbrand Best Global Brands 2016

01 	02 	03 	04 
05 	06 	07 	08  TOP GROWING 
09  Mercedes-Benz	10 	11 	12 
13 	14 	15  TOP GROWING 	16 

Why Silicon Valley?

- *The value of a global brand*
 - Largest companies by revenues... not what you think...



Why Silicon Valley?

- *The value of a global brand*
 - Why does it matter?
 - Global brands set the agenda, frame the discussion, on new technologies
 - E.g,VR became hot in 2014... when Facebook bought Oculus
 - E.g. AI became hot in 2016... with Google's AlphaGo
 - The global brand's location automatically becomes a “strategic” location
 - Any startup located near a global brand benefits



Why Silicon Valley?

- *The value of education*

- Education is important
- But the USA does not rank in the top 10 countries

Secondary maths

1. Singapore
2. South Korea
3. Taiwan
4. Hong Kong
5. Japan
6. Russia
7. Kazakhstan
8. Canada
9. Ireland
10. United States

Secondary science top 10

1. Singapore
2. Japan
3. Taiwan
4. South Korea
5. Slovenia
6. Hong Kong
7. Russia
8. England
9. Kazakhstan
10. Ireland



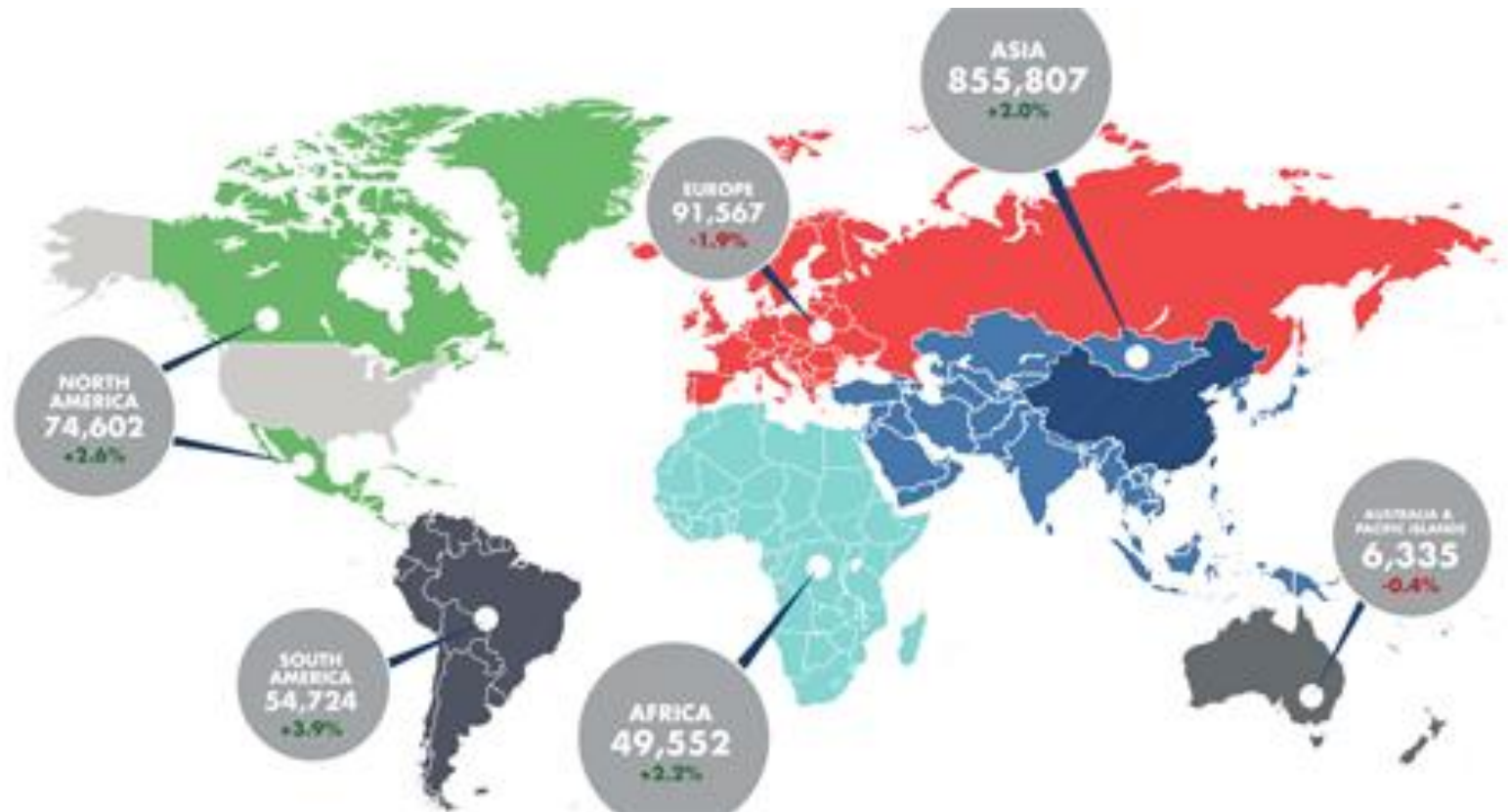
Why Silicon Valley?

- *The value of education*
 - Attracting young educated people is more important
 - Motivating young educated people to innovate is even more important



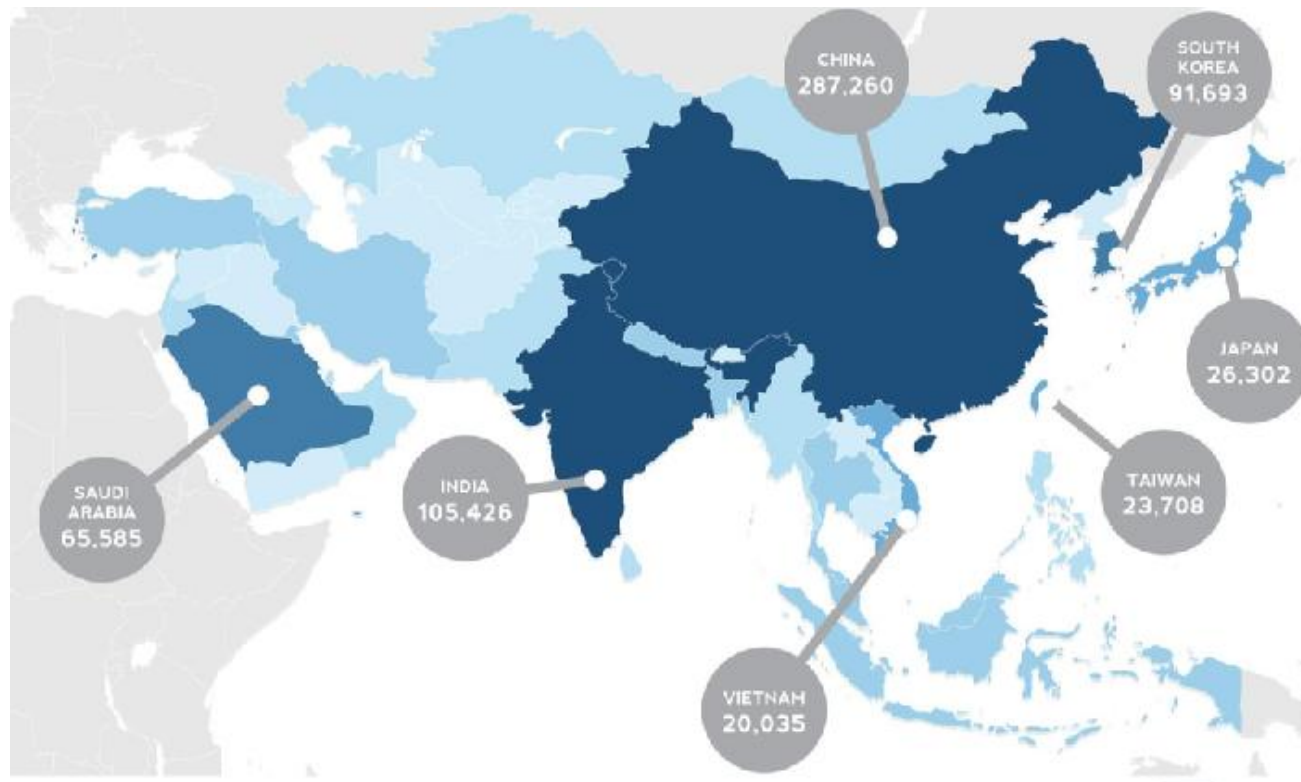
Why Silicon Valley?

- The real strength of the US education system: 1.1m international students



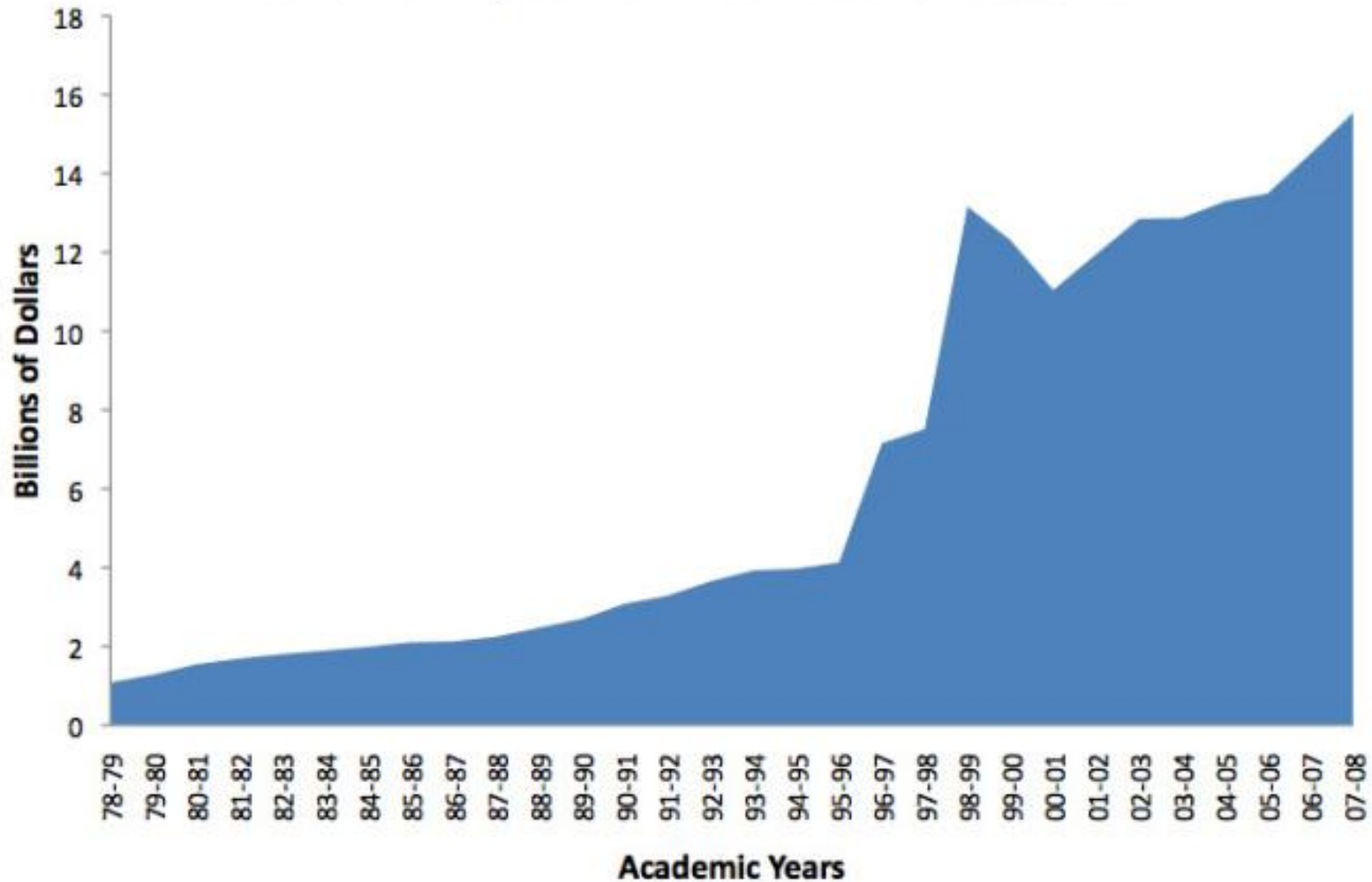
Why Silicon Valley?

- The real strength of the US education system: 1.1m international students



Why Silicon Valley?

Economic Impact from International Students



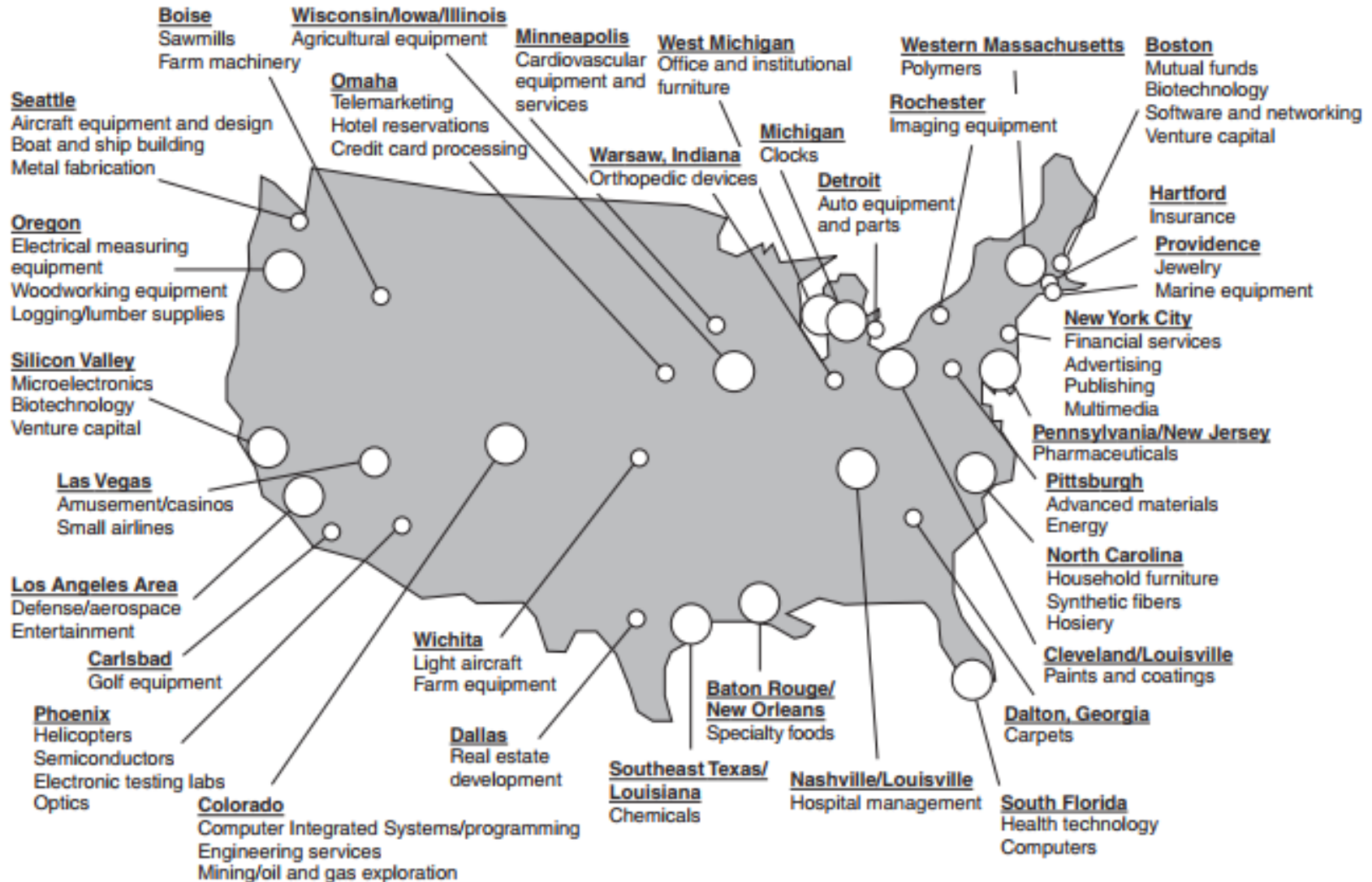
What is special is...

- The ability to excel in so many different technologies: no cluster!
- The ability to create world leaders in such a short time: small businesses thrive!

Silicon Valley is...

- Is Silicon Valley a “cluster”?
 - *“A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field”* (Michael Porter: “Clusters and Competition”, 1998)
 - Examples: Detroit automotive, French wine producers, fashion firms in northern Italy...
 - A cluster relies on network relationships within a geographical community
 - Clusters foster sharing of knowledge, collaboration (or, better, complementarity) and competition

Clusters



Silicon Valley is...

- Is the Bay Area a “cluster”?
 - Today the San Francisco Bay Area has success stories in **too many different industries** to be considered a cluster
 - The globalized economy and the knowledge society have greatly **altered the nature of collaboration and competition**
 - Venture capital, graduate education, immigration and government funding have **disrupted the natural formation of clusters**

Silicon Valley is...

- Is the Bay Area a “cluster”?
 - Clusters foster collaboration and competition, but globalization has made both ubiquitous
 - The knowledge society has made technological know-how readily available
 - universities,
 - scientific journals,
 - conferences,
 - Internet,
 - open source
 - Access to information is free and often instantaneous

Silicon Valley is...

- Is the Bay Area a “cluster”?
 - Talent mobility across borders
 - Venture capital can attract talents from anywhere
 - And talent attracts venture capital
 - The geographical location is no longer a big advantage
 - Access to capital and talent is
 - The Bay Area attracts capital and talent

Silicon Valley is...

- Is the Bay Area a “cluster”?
 - No, “Silicon Valley” should more properly referred to a location that can **simulate any kind of cluster**, that can simultaneously create multiple “virtual clusters” across the globe
 - Apple’s phones are manufactured elsewhere, Google’s engineers are spread in dozens of countries, etc
 - The Bay Area excels at simulating clusters, any kind of cluster

The Bay Area Virtual Cluster

- A virtual cluster is far more complex than the traditional industrial cluster
- A virtual cluster needs **an unlimited supply of new ideas, of capital and of talents** in order to churn out a large number of startups in all sorts of fields

The Bay Area Virtual Cluster

- The virtual cluster over the traditional cluster:
 - Experience from one field transferred to other fields
 - Talents from one field merged with talents from other fields
 - Natural achievement of “convergence”
 - Rapid adoption of new technologies and science

The Bay Area Virtual Cluster

- The virtual cluster over the traditional cluster:
 - Emphasis on horizontal platforms rather than vertical applications
 - Platforms that create whole new economies and change the world
 - Much faster adaptation and growth of successful firms

The Bay Area Virtual Cluster

- The virtual cluster over the traditional cluster:
 - Multiple types of startups
 - Multiple types of investors
 - Multiple types of exits
 - Multiple types of technologies
 - Multiple types of company organization
 - Multiple types of everything

The Bay Area Virtual Cluster

- Types of startups
 - Hobbyists (e.g. Apple, Ebay, Twitter, Paypal)
 - University spinoff (e.g. HP, SUN, Cisco, Vmware, most biotech firms)
 - Corporate spinoff (Intel and most semiconductor firms including Nvidia, Oracle)
 - Dormitory (e.g. Google, Facebook)
 - Serial entrepreneurs: Tesla, Uber
 - (Note: The startup we don't have: government funded)

Silicon Valleys in the World

- France's Sophia Antipolis
- Germany's Silicon Allee (Berlin) and Bavaria
- Malaysia's Multimedia Super Corridor
- Dubai's Internet City
- Bangalore's eCity
- China's Zhongguancun Science Park
- Russia's Skolkovo
- Singapore
- Israel
- Jordan

The Alternative (East Asian) model

- Two types of innovation

Japan:

- Transistor radio
- Pocket calculator
- Walkman (portable music player)
- CD
- Camcorder
- Flash memory
- Digital camera
- DVD player
- QR code
- NCF (mobile payment)
- Hybrid car
- Mobile phone with camera

Between 2005 and 2011 Japan was the world's most efficient innovator in the world (Xiaolan Fu, 2015)



The Alternative (East Asian) model

- Two types of innovation

USA:

- | | |
|---------------------------|---------------|
| – Telephone | Internet |
| – Television | Cell phone |
| – Transistor | Barcode |
| – Artificial Intelligence | Ethernet |
| – Robot | Laser printer |
| – Virtual Reality | Touch screen |
| – Database | Wearables |
| – Hard & Floppy disk | 3D printing |
| – Videogame | Gene |
| – Email | Sequencing |
| – Microprocessor | Gene Editing |
| – Personal Computer | Search engine |
| – Mouse & GUI | Social media |

Europe

- Radio
- Computer
- World-wide Web
- Smartphone
- Skype

South Korea

- Digital tv set
- Flat panel display

Conclusions

- In the book:

