Digital Revolution

„Bis ins 19. Jahrhundert waren die Veränderungen stets viel grossräumiger als die Lebensgeschichte des einzelnen Menschen. Insofern konnte einem das allgemeine Driften halbwegs egal sein. Im 20. Jahrhundert fällt der Ewigkeitsfilter, der das Weltbild so lange stabilisiert hat, allmählich weg. Und das ist zweifellos ein genuin modernes Phänomen: Die Veränderungen haben sich so sehr beschleunigt, dass sie innerhalb der eigenen Lebensgeschichte auffällig werden.

Das heisst, die Biografien der Einzelnen und die allgemeine Geschichte nähern sich einander an?

So kann man es sagen. Das Driften erfasst jetzt auch den Menschen im hintersten Winkel – es sucht ihn heim, auch wenn er sich selber nicht bewegt. Dieser Winkel gleicht im Übrigen sehr der «rechten Ecke», in die man heute so gern Leute stellt, die durch einen Mangel an stillem Einverständnis in den beschleunigten Wandel auffallen. Diese Ecke bleibt harmlos, solange ihr Bewohner gesteht, er sei zu langsam für diese Welt. Sie wird giftig, wenn die Langsamkeit sich aggressiv aufstellt. Inzwischen ist ein Teil der Ecke von Rückwärtsstürmern bevölkert. Denen muss man die Grenze zeigen“

Interview mit Peter Sloterdijk: «Die Sitten verwildern, die Gerechtigkeit ist obdachlos»
Identitäten lösen sich auf, Gesellschaften verwandeln sich in hypernervöse Gemeinschaften, die Aggressivität nimmt zu: Die Welt scheint aus den Fugen. Der Philosoph Peter Sloterdijk erklärt die grosse Drift, die sich durch die Migrationsdynamik verstärkt. Wo stehen wir? Aber vor allem: Wohin stürzen wir?
René Scheu
30.3.2018, 11:00 Uhr https://www.nzz.ch/feuilleton/wir-erleben-ein-grosses-gleiten-ld.1370201

Why?

- Do I understand what is going on?
- - the main developments?
- - the main concepts for explanations?
- - possible future developments?
- - strategies to deal with our problems

Topics

- Digital Revolution
  - Scale: Numbers Please
  - Disrupting Business
  - Disrupting Jobs
  - Disrupting Politics
  - Disruptive Internet?
  - Platforms
  - Peer-to-Peer strikes back?
  -
- Developments
  - Forces
  - Algorithms
  - Money
  - Jobs
  - Transhumanism
  - Dataism

- Scale, Complexity and Dynamics: Making Sense
  - The Big Picture
  - Explanations
  - Change Factors
  - How to think the future

- Strategies
  - Autarkism(naive, technical)
  - Autokratism (Erdogan, Putin, ..)
  - Nationalism/Populism
  - Distribution (direct democracy) add Text

Scale: Numbers Please!

He who refuses to do arithmetic is doomed to talk nonsense.
John McCarthy

(from: J.Brockman, This Ideas is Brilliant, edge.com)

- 1.35 Tbps DDOS Attacks
- 10x: computational capabilities of the human brain than previously thought;
- 21 TB data written to s3/day by BBC
- 200K msgs send per second through iMessage
- 180 TFLOPS: computation accessible via the TensorFlow programming model from a Google Cloud VM;
- >1Bio $ loss for Uber in China/year
- $7.5 billion: Uber sales; $4.5 billion: Uber loss;
- 1.5 million messages per second: Netflix cache replication;
- 400 hours: video uploaded to YouTube every minute
- 1 billion: WhatsApp users; 3.5 billion: Facebook users in 2030;
- $3.5 billion: art sold online;
- $150 billion: China's budget for making chips;
- $1.5 billion: spend on chip startups last year; (mostly PhDs)
- $8k: cost of Tesla self-driving hardware;
- 99.95%: DMCA takedowns are bot BS;
- 300 nanometers: new microscope;
- 144 terabits/second: submarine cable from Hong Kong to L.A.;
- $100 million/day: spending on apps and advertising on the App Store;
- 5 billlion: items shipped by Amazon Prime;
- 600: free online courses;
- 1.6 million: React downloads per week;
- 140 milliseconds: time Elon Musk's massive backup battery took to respond to crisis at power plant;
- 16: world spanning Riot Games clusters;
- < $100 a kilowatt-hour: Lithium-ion battery packs by 2025;
- 1: year education raises IQ 1-5 points; 110 TFLOPS: Nvidia Launches $3,000 Titan V;
- 400: lines of JavaScript injected by Comcast; (a Telco, WK)
- 20 million: requests per second processed by Netflix to personalize artwork;
- DNA encodes, at 1.83 bits/nucleotide
- Average state debt per economically active person: Germany € 47.897, USA $100.000
- Average private debt per economically active person: Germany € 5000. USA $27000
- Social expenses Germany 2016: € 915 Bio, € 956/cap.
- $23 billion: Amazon spend on R&D in 2017

Scale or Die!

From Todd Hoff, Highscalability.com et. al.

- > 5 9s: Spanner availability;
- 200MB: random access from DNA storage; 215 Pbytes/gram: DNA storage;
- 287,024: Google commits to open source; 42: hours of audio gold;
- 33: minutes to get back into programming after interruption;
- 12K: Chinese startups started per day;
- 209: mph all-electric Corvette;
- 500: Disney projects in the cloud;
- 40%: rise in CO2;
- $5 billion: Netflix spend on new content; $1 billion: Netflix spend on tech;
- 10%: bounced BBC users for every additional second page load;
- $3.5 billion: Priceline Group ad spend; (booking.com etc.)
- 12.6 million: hours streamed by Pornhub per day;
- 1 billion: hours streamed by YouTube per day;
- 1 trillion: semiconductor shipments, 9.1 % growth/yr.
- 45%: jump in Amazon cloud revenue;
- 3 billion: photos uploaded to Google on New Year's eve; 1.5 billion: montly YouTube users;
- 500 PB: data stored by Backblaze in Cloud
- $100 Billion: value lost in cryptocurrency markets in 24 hours;
- 400Gb/s: ethernet switching;
- 100,000: IoT sensors monitor canal in China;
- 28.5 billion: PornHub visitors;
- 3 billion: computer chips have Spectre security hole;
- 75.8%: people incorrectly think private browsing is actually private;
- 14x: real world 4G LTE vs. 5G bandwidth;
- 20 million: daily DuckDuckGo searches, 55% growth;
- 38.3 billion: WeChat messages sent per day;
- 500 million: database of pwned passwords to check against;
- 38%: China's consumption of world IC production;
- 92%: Fortune 500 traffic is from bots;
- $2: Blue Pill: A 72MHz 32-Bit Computer;
- 30.72 terabytes: Samsung SSD;
- 1.3 billion: loss that happens when Kylie Jenner tweets about your new UI;
- 3 Mil: Cryptocurrency Miners Purchased 3 Million Graphics Cards Worth $776 Million Last Year
- 30%: Uber and Lyft drivers lose money;

From Todd Hoff, Highscalability.com

From Exam 2016:

2. Digital Revolution: Was schliessen Sie aus solchen Zahlen? Nehmen Sie 4 und interpretieren Sie sie!

Facebook live: 2 people exploding a watermelon with rubber bands. Over 800,000 simultaneous viewers, over 300,000 comments. 100 million: daily voice calls made on WhatsApp; 2,000: cars Tesla builds each week;500 million: Instagram users;> 100M: hours watched per day on Netflix;400 PPM: Antarctica's CO2 Level;2.5 PB: New Relic SSD storage; 23%: of all corporate cash is held by Microsoft, Apple, Google;400 million: number of new servers needed by 2020; ~25,740TB: storage Backblaze adds per month; 488 million: faked comments by China per year; 90%: revenue Spotify makes from 30% of users;780 million: miles of Tesla driving data; 4 days: median time to binge watch a season on Netlix; $50 billion: amount Apple has paid out to app developers; $270 million; $1.8 billion:Series F round for Snapchat; 3x: capacity of the roadway with driverless cars;138%: growth in Alibaba's cloud;

a)

b)

Say Something!

Take a look at the average monthly living costs for a family of four. These are extremely conservative estimates gathered from multiple cost of living calculators, plus my own observations:

Housing: $1,500

Transportation (including gas): $800

Food: $1,000

Utilities: $400

Phones: $150

Entertainment: $50

Clothing: $200

Healthcare: $400

Emergency savings: $500

Total: $5,000

The median household income stands at $5,264 per month before taxes. That leaves just under $4,000 after taxes, and it doesn't include deductions for 401K and basic health insurance — or student loans.

All things considered, the average household is sinking into debt by about a thousand dollars per month.

https://aninjusticemag.com/we-cant-afford-to-live-anymore-and-the-rich-are-gaslighting-us-ac8e5bc9b455

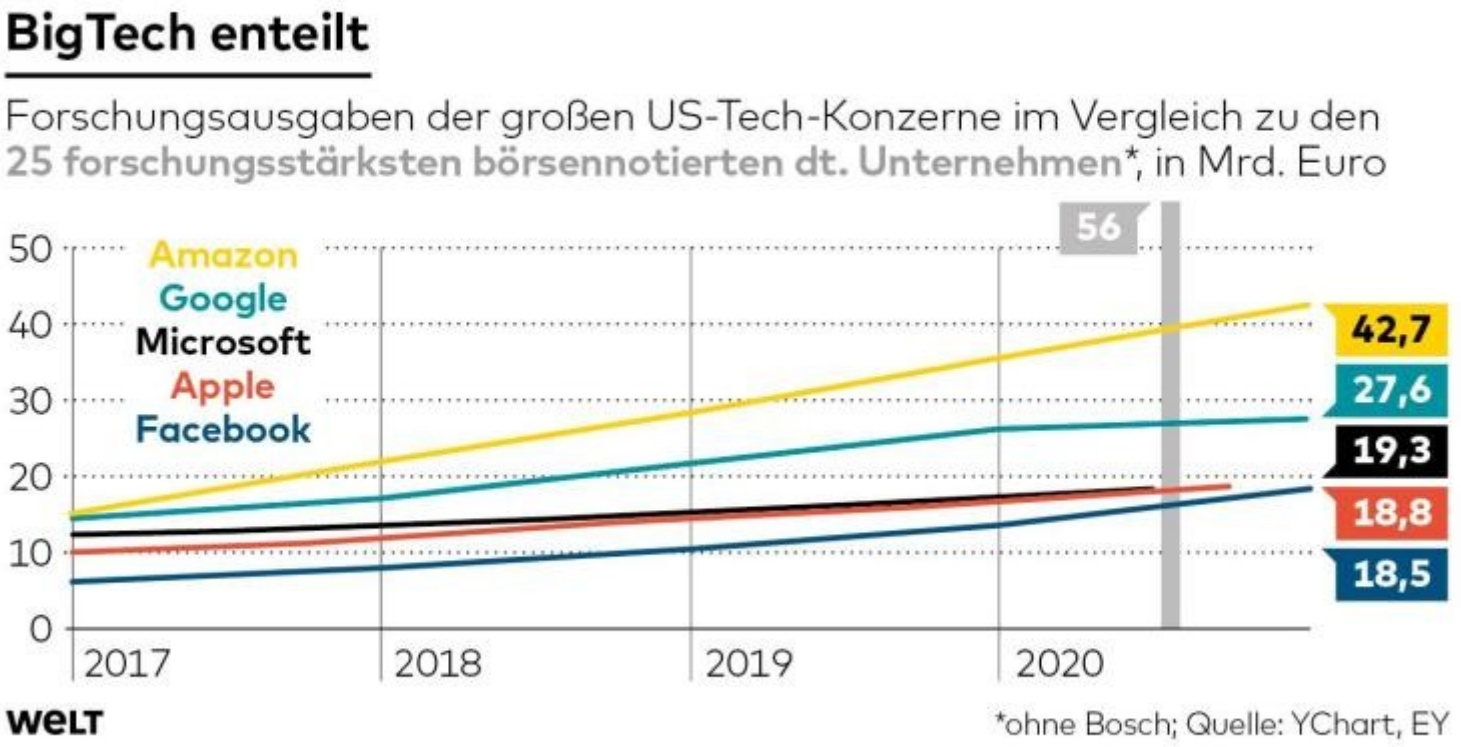
Not Just Tech!

Putting it in Perspective

- The National Science Foundation received $7.463 billion for fiscal year 2016 through the Consolidated Appropriations Act. The total United States budget outlay for 2016 was $3.54 trillion.
- Americans own almost 300 million firearms
- 1 million seconds is nearly 12 days, whereas 1 billion seconds is almost ?

Elizabeth Landau on Jan 24, 2018, http://nautil.us/blog/-how-to-understand-extreme-numbers

Research Spending 2020



https://www.welt.de/wirtschaft/article229467167/Google-Apple-Amazon-Deutschland-verpasst-die-naechste-Tech-Revolution.html

Think Scale!

- Numbers and Physics
- Add the human perspective:
  - Scale down (avoid aggregate shock)
  - Back of the envelope calculations (handle on design)
  - Embed into context (say something!)
- Statistics and Laws
- Reasoning from first principles

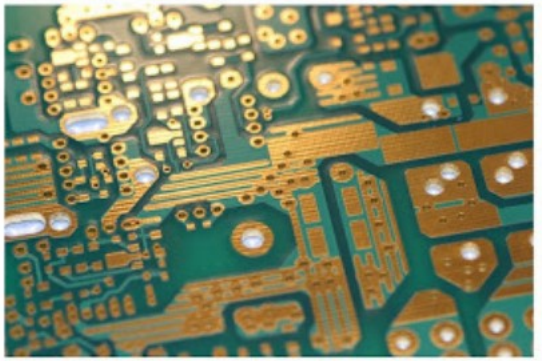
Get your numbers right!

a) single mode optical fibre

b) coaxial cable

c) CAT 5e twisted pair

d) PCB traces – standard FR4



e) ladder type aerial cable

Basic cabling test: Put these in order from slowest to fastest.

Matt Hurd, https://tabbforum.com/opinions/high-speed-trading-lines-radios-and-cables-oh-my

Realize Fundamental Change!

1 Context Switch: 2-5 ms

1 NVMEE Access: 2-5 ms

What does this say about your process and I/O model?

Back of the Envelope Calculations

L1 cache reference 0.5 ns

Branch mispredict 5 ns

L2 cache reference 7 ns

Mutex lock/unlock 100 ns

Main memory reference 100 ns

Compress 1K bytes with Zippy 10,000 ns

Send 2K bytes over 1 Gbps network 20,000 ns

Read 1 MB sequentially from memory 250,000 ns

Round trip within same datacenter 500,000 ns

Disk seek 10,000,000 ns

Read 1 MB sequentially from network 10,000,000 ns

Read 1 MB sequentially from disk 30,000,000 ns

Send packet CA->Netherlands->CA 150,000,000 ns

Example: Generate Image Results Page of 30 Thumbnails

The is the example given in the video. Two design alternatives are used as design thought experiments.

Design 1 - Serial

Read images serially. Do a disk seek. Read a 256K image and then go on to the next image.

Performance: 30 seeks * 10 ms/seek + 30 * 256K / 30 MB /s = 560ms

Design 2 - Parallel

Issue reads in parallel.

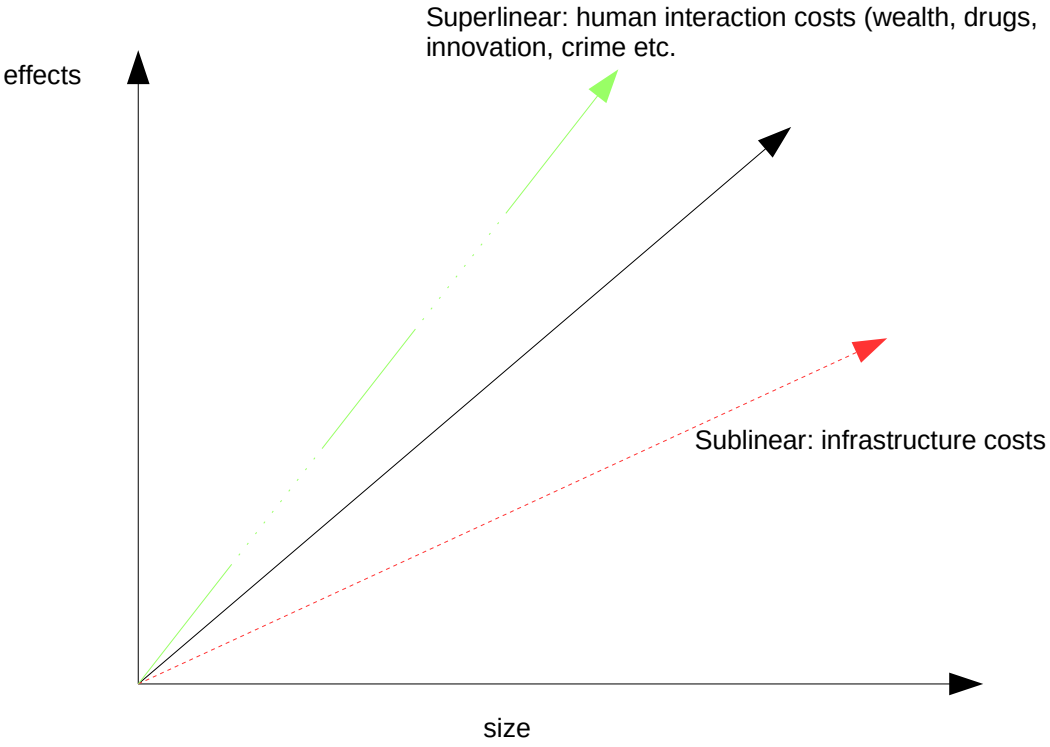
Performance: 10 ms/seek + 256K read / 30 MB/s = 18ms

There will be variance from the disk reads, so the more likely time is 30-60ms

By Jeff Dean, Building Software Systems At Google and Lessons Learned, https://www.youtube.com/watch?v=modXC5IWTJI

Power Law Scaling: Urbanization

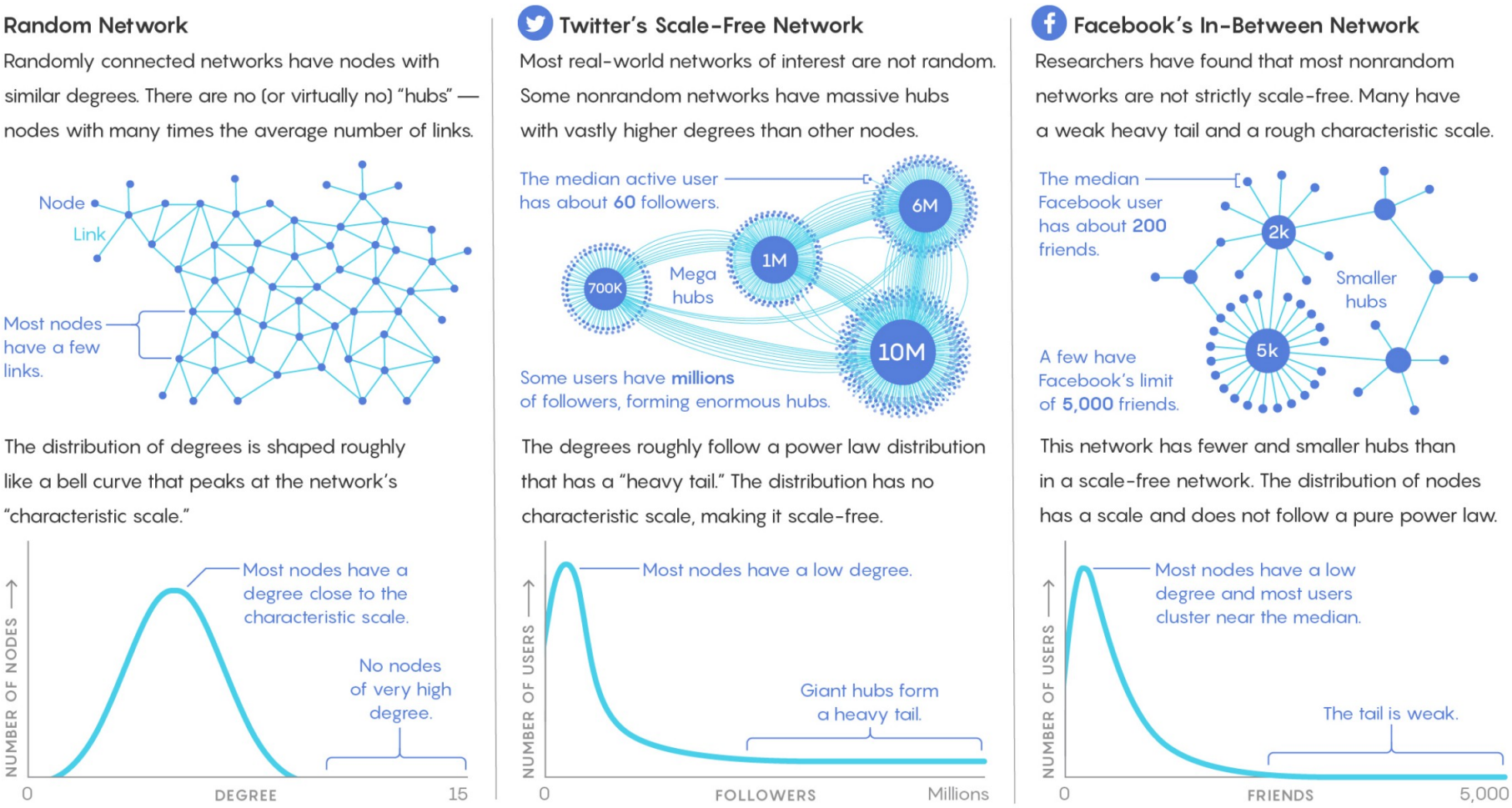
By NASA - http://earthobservatory.nasa.gov/IOTD/view.php?id=43120&src=eoa-iotd, Public Domain, https://commons.wikimedia.org/w/index.php?curid=9774579



The Real Reason Cities Are Centers of Innovation, Emily Badger, Jun 7, 2013

The big seem to get bigger everywhere and we see unprecedented growth everywhere. Growth causes density. Density causes speed and interaction. Interaction causes network effects. Network effects cause change. Change seems to accelerate. Change affects even immaterial things like innovation

Scale Free – A Law?



Erica Klarreich, Scant Evidence of Power Laws Found in Real-World Networks
https://www.quantamagazine.org/scant-evidence-of-power-laws-found-in-real-world-networ

Anna D. Broido, Aaron Clauset (UofColorado), Scale-free networks are rare,
https://arxiv.org/pdf/1801.03400.pdf

Reasoning from First Principles

By Ben Skála, Benfoto (Own work) [CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0)], via Wikimedia Commons

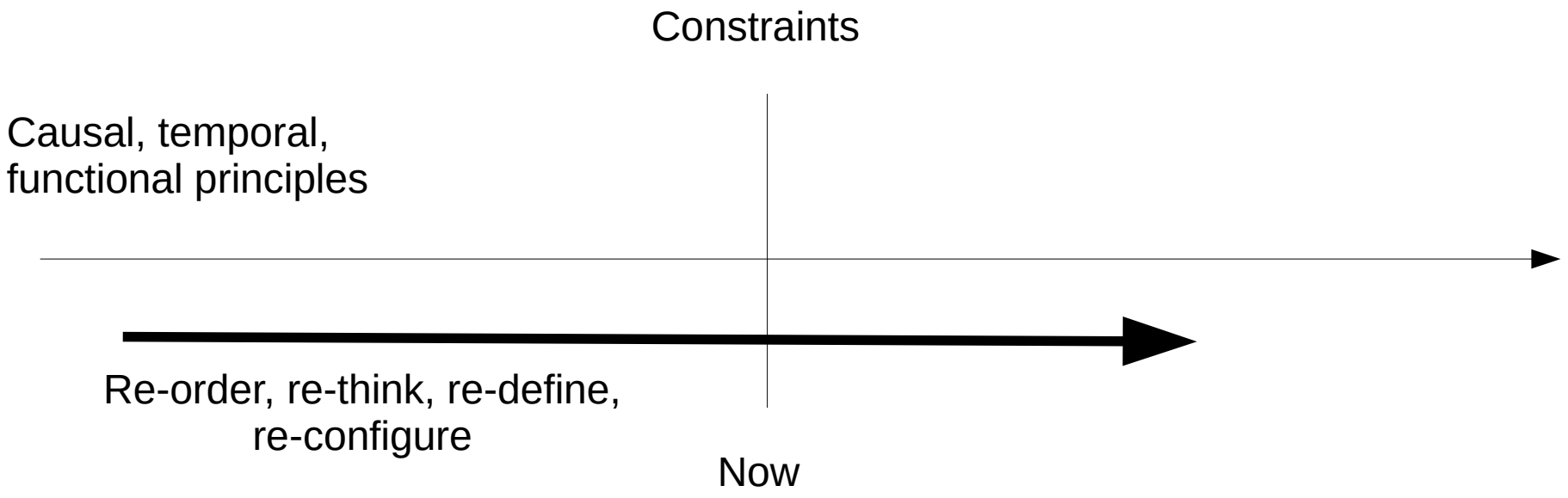
“I tend to approach things from a physics framework,” Musk said in an interview. “Physics teaches you to reason from first principles rather than by analogy. So I said, okay, let’s look at the first principles. What is a rocket made of? Aerospace-grade aluminum alloys, plus some titanium, copper, and carbon fiber. Then I asked, what is the value of those materials on the commodity market? It turned out that the materials cost of a rocket was around two percent of the typical price.”

Instead of buying a finished rocket for tens of millions, Musk decided to create his own company, purchase the raw materials for cheap, and build the rockets himself. SpaceX was born. J.Clear

The human tendency for imitation is a common roadblock to first principles thinking. When most people envision the future, they project the current form forward rather than projecting the function forward and abandoning the form. J. Clear, https://medium.com/the-mission/first-principles-elon-musk-on-the-power-of-thinking-for-yourself-8b0f275af361

Musk was shocked by the price of a rocket. Early social networks could not pay for large-scale transactional databases. And later on those could not scale to the number of users. Cutting off what you don‘t need is going back to first principles and function.

First Principles



What doesn‘t scale

By Cheatsheet (Own work) [CC BY-SA 3.0 (https://creativecommons.org/licenses/by-sa/3.0) or GFDL (http://www.gnu.org/copyleft/fdl.html)], via Wikimedia Commons

- time for media and other things
- capability for learning
- capability to deal with concurrent things
- capability for participation and communication
- memory and intelligence
- capability to overcome disturbances
- range
- number of good friends
- speed
- limited ….

The scale of the digital revolution is in stark contrast with the limited scalability of human beings. We use externders to overcome our limitiations but sometimes we confuse things like in public internet behavior which extends our reach enormously but does not provide the same intimacy as in a local conversation with friends.

Scale changes everything

- „knowing things“ is no longer a value in itself
- „finding things“ is no longer a value in itself
- Re-inventing things …
- Doing everything by yourself …
- Representation does no longer work
- Generalists have a harder time
- Bad usability kills products and services
- Full automation is needed (humans are bad monitors)

And we feel the pressure from the scale of the digital revolution: So much more knowledge every day in every field – and only a lifetime to learn. This results in a high degree of specialization.

Disrupting Business

Acceleration

- Innovation: from surprise to planned to life-saving
- Technology spread and acceptance (Use)
- Political Developments (Organization)
- The spread of memes (Distribution)
- Disruption of traditional business
- Networks and Network effects, preferential attachment (Density, Connectivity, Growth)
- VC Money

A shop where smartphones are sold. (Craig Mod)

Farmers in Myanmar using facebook as a news channel

Predictions I

Benedict Evans
@BenedictEvans

Follow

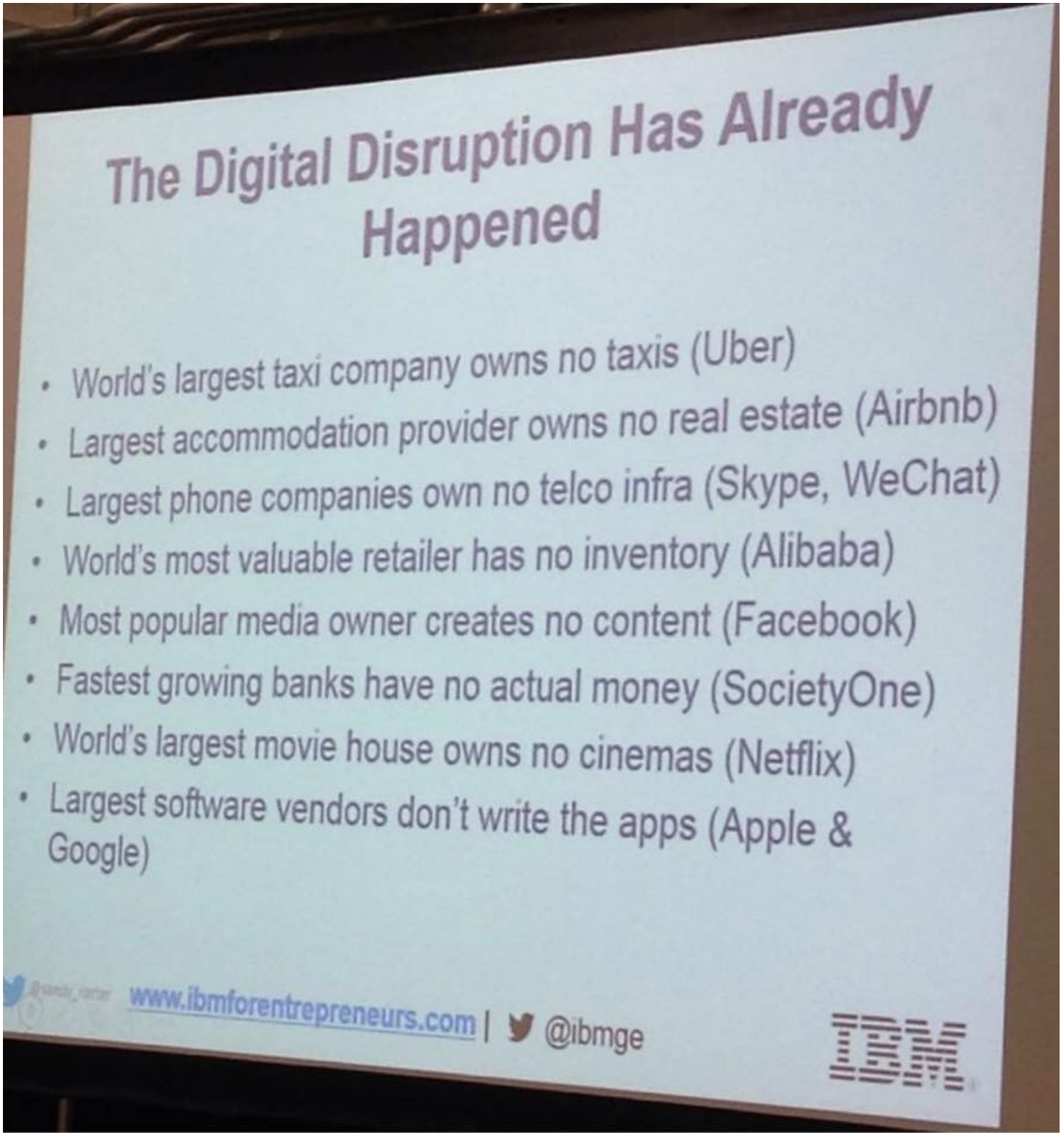
"It is somewhat ridiculous to suppose that the invention of a motor car can render horses less necessary to man" - Saddlery and Harness magazine, 1895

11:48 AM - 19 Jan 2018

190 Retweets **399** Likes

10 190 399

Can you continue this list?
- the most inventive company has no ideas?
- the biggest transportation company has no busses?
...



What do the companies in these three groups have in common?

Group A: American Motors, Brown Shoe, Studebaker, Collins Radio, Detroit Steel, Zenith Electronics, and National Sugar Refining.

Group B: Boeing, Campbell Soup, General Motors, Kellogg, Procter and Gamble, Deere, IBM and Whirlpool.

Group C: Facebook, eBay, Home Depot, Microsoft, Office Depot and Target.

All of the companies in **Group A** were in the Fortune 500 in 1955, but not in 2014.

All of the companies in **Group B** were in the Fortune 500 in both 1955 and 2014.

All of the companies in **Group C** were in the Fortune 500 in 2014, but not 1955.

Comparing the Fortune 500 companies in 1955 to the Fortune 500 in 2014, there are **only 61 companies that appear in both lists**. In other words, only 12.2% of the Fortune 500 companies in 1955 were still on the list 59 years later in 2014, and almost 88% of the companies from 1955 have either gone bankrupt, merged, or still exist but have fallen from the top Fortune 500 companies (ranked by total revenues). Most of the companies on the list in 1955 are unrecognizable, forgotten companies today (e.g. Armstrong Rubber, Cone Mills, Hines Lumber, Pacific Vegetable Oil, and Riegel Textile).

From: „IT doesn‘t matter“ (2003)

„IT is best seen as the latest in a series of broadly adopted technologies that have reshaped industry over the past two centuries—from the steam engine and the railroad to the telegraph and the telephone to the electric generator and the internal combustion engine. For a brief period, as they were being built into the infrastructure of commerce, all these technologies opened opportunities for forward-looking companies to gain real advantages. But as their availability increased and their cost decreased—as they became ubiquitous—they became commodity inputs. From a strategic standpoint, they became invisible; they no longer mattered. That is exactly what is happening to information technology today, and the implications for corporate IT management are profound.“

Nicholas G. Carr, Harvard Business Review May 2003, https://hbr.org/2003/05/it-doesnt-matter

„Strategic“ == „Scarce“

To: „Software Is Easting the World“ (2011))

„Perhaps the single most dramatic example of this phenomenon of software eating a traditional business is the suicide of Borders and corresponding rise of Amazon. In 2001, Borders agreed to hand over its online business to Amazon under the theory that online book sales were non-strategic and unimportant.

Oops.“

Marc Andreesen, Why Software Is Eating The World, August 20, 2011 The Wall Street Journal, https://www.wsj.com/articles/SB10001424053111903480904576512250915629460

„Digitalize your Business with Software“ != „Use Software to create new Business Models“.

Companies which hope to survive by optimizing their business with software do not understand that software re-writes the rules of their business. Do you use machine learning for optimization or for disruption? Same goes for universities: the „e-student“ is not „being digital“. https://www.wallstreet-online.de/nachricht/10430393-grossunternehmen-wiegen-digitaler-transformation-falscher-sicherheit-google-amazon-co

Roadblocks

- Employees defending the current structure (Why?)
- No experience with user centered approaches (transparency, participation, UX)
- Security requirements (really??)
- Lack of time, flexibility, speed.
- Too many decision levels
- No externalized digital branches (is this REALLY the only way to get around „Innovators Dilemma?“

etventure-Studie "Digitale Transformation 2018 - Hemmnisse, Fortschritte, Perspektiven", https://www.wallstreet-online.de/nachricht/10430393-grossunternehmen-wiegen-digitaler-transformation-falscher-sicherheit-google-amazon-co

Disrupting Jobs

Out: Ec onomists
In: Computer Science PhD‘s

High-Speed Firms Now Oversee Almost All Stocks at NYSE Floor

by Annie Massa
t antoniabmassa

Out: PR-Specialists
In: Data Scientists and AI

FOR ALL THE FASHION BUSINESS
Drapers

Zalando replaces 250 marketing jobs with AI

13 MARCH 2018 • BY PUI-GUAN MAN

COMMENT

Zalando has cut around 250 marketing and communications roles, replacing staff with algorithms and artificial intelligence (AI).

The Berlin-headquartered business said the cuts form part of a new strategy to "integrate marketing functions into the Zalando fashion store teams" and drive a "personalised customer approach and AI driven marketing solutions".

Outside of the cuts, some jobs will be moved to its new structure but "in a reduced scope".

As part of the changes at the etailer, it will create a dedicated personalised marketing department comprising product managers, marketing domain experts, software engineers, data and AI scientists.

It will also combine its creation and production teams under its Zalando Studios banner, and set up a new department, called Creative Lab, to focus on collaborations.

MOST POPULAR MOST COMMENTED


Zalando replaces 250 marketing jobs with AI


Oxford Street pedestrianisation gains public support


Exclusive: Missguided to launch franchise stores in the Middle East


New Look CVA 'does not go far enough', say observers

Messaging

- Slack Chat Bots; replaces some project management tasks
- Project M; replaces human customer service & support
- Drone & Connected Car Delivery; replaces human delivery services

Disrupting Politics

Against a Dark Background

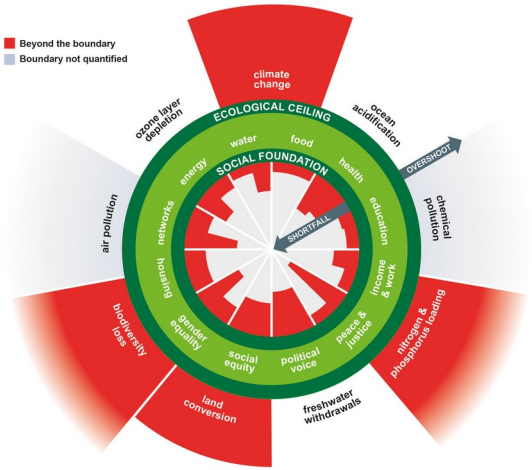


Image: Kate Raworth and Christian Guthier/The Lancet Planetary Health

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Image: Reuters

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Developments

- Mass media lose power to create global fiction
- News become fake-news (or vice versa)
- Social media create echo chambers
- Analytics allows targeted political approach
- Here comes everybody: flash crowds, actions
- New channels (youtube etc.)
- Cyber threats on critical infrastructure
- Digital vs. Old economy
- User behavior breaks laws (flames, copyright etc.) and threaten old economy
- More participation becomes technically feasible
- Politics only perceived as administration, not vision
- Populistic, Neo-facist groups take over social-democratic ideas of society

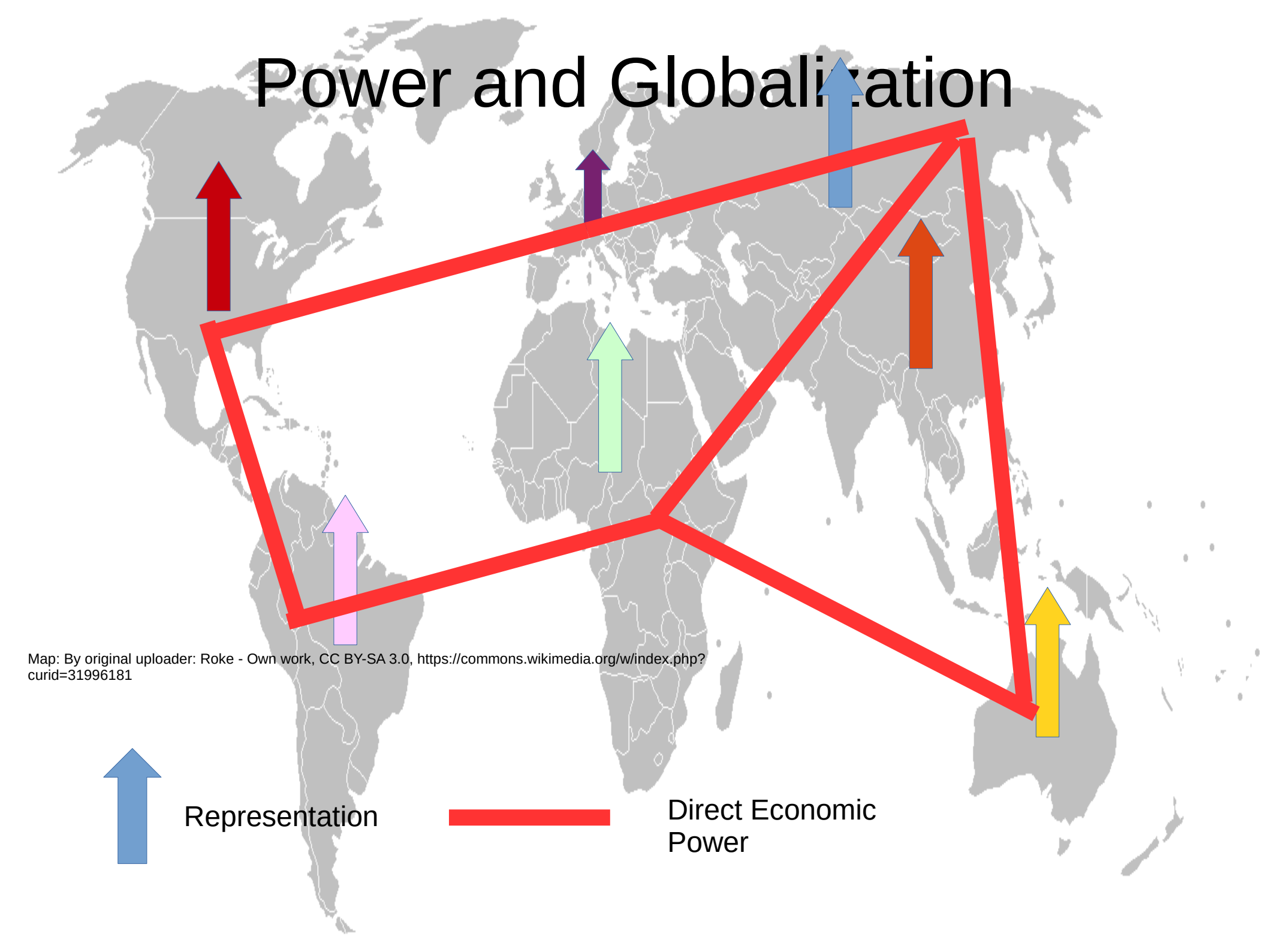
Where has all the power gone?

“Ordinary voters are beginning to sense that the democratic mechanism no longer empowers them. The world is changing all around, and they don’t understand how or why. Power is shifting away from them, but they are unsure where it has gone. In Britain voters imagine that power might have shifted to the EU, so they vote for Brexit. In the USA voters imagine that ‘the establishment’ monopolizes all the power, so they support anti-establishment candidates such as Bernie Sanders and Donald Trump. The sad truth is that nobody knows where all the power has gone.”

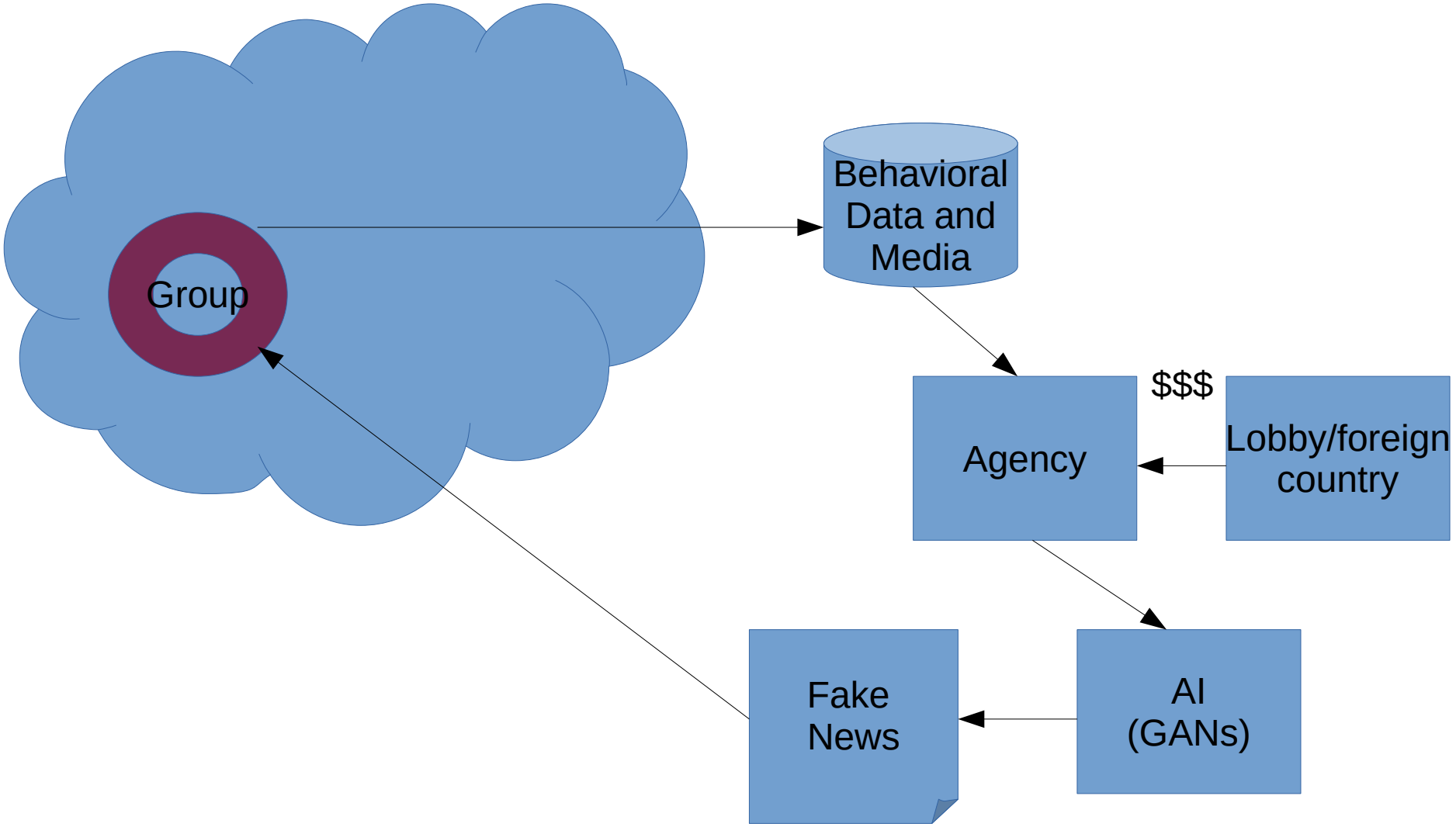
“Precisely because technology is now moving so fast, and parliaments and dictators alike are overwhelmed by data they cannot process quickly enough, present-day politicians are thinking on a far smaller scale than their predecessors a century ago. Consequently, in the early twenty-first century politics is bereft of grand visions. Government has become mere administration. It manages the country, but it no longer leads it.”

— Yuval Noah Harari, Homo Deus: A Brief History of Tomorrow, 2016!!

Power and Globalization



Social Media Platforms



Digital Manipulation

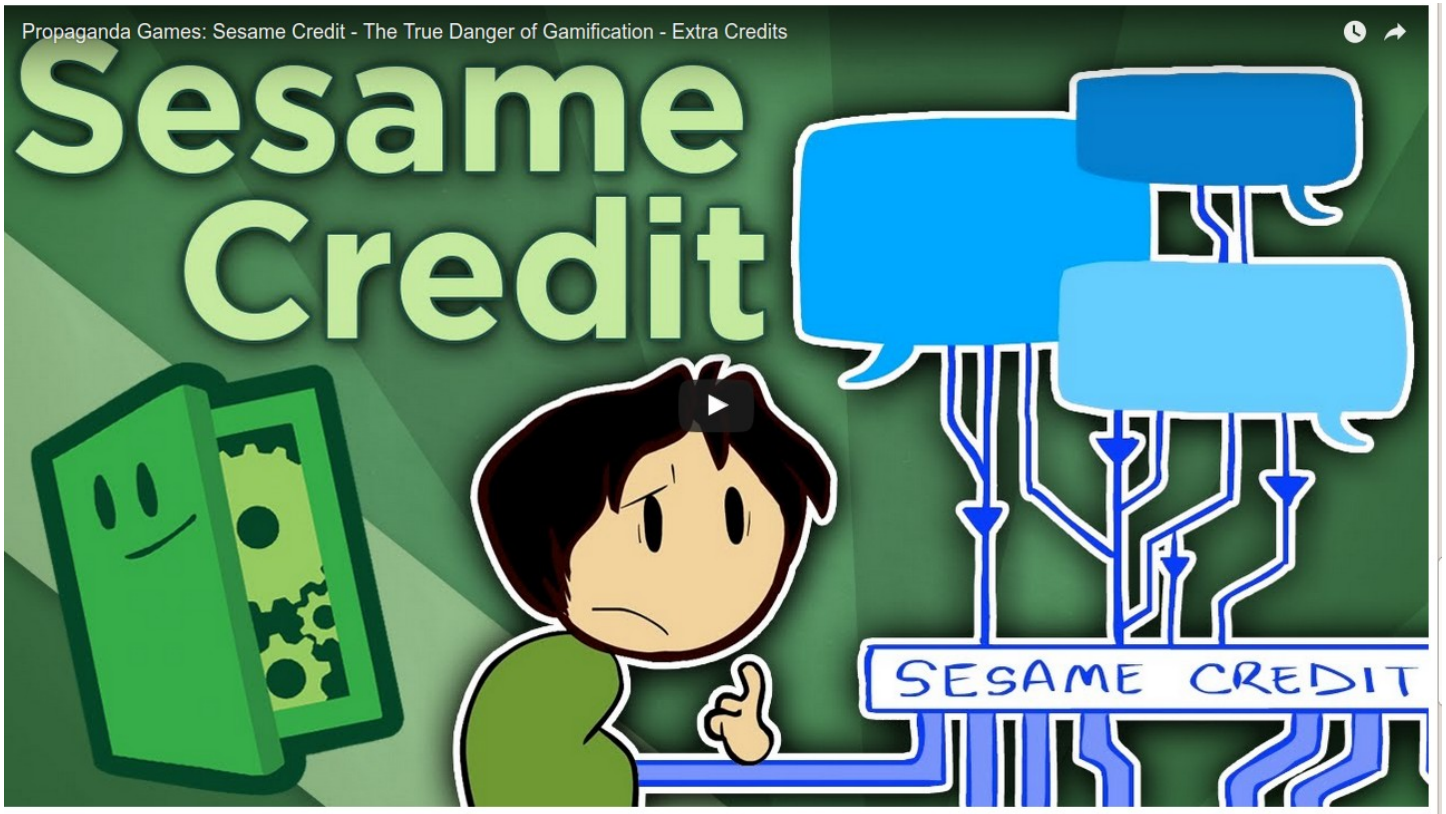
- Nvidia: convincingly generate hyperrealistic photos of objects, people, and even some landscapes by scouring tens of thousands of images.
- Adobe: Photoshop for audio, seamlessly remove objects (and people!) from video
- create pornographic videos that realistically superimpose the faces of celebrities
- combine and mix recorded video footage with real-time face tracking to manipulate video.
- turning audio clips into a realistic, lip-synced video of the person speaking those words.
- Have bots deliver targeted fake news
- „News apathy“, atomization of society

Charlie Wetzel, The Terrifying Future of Fake News, https://www.buzzfeed.com/charliewarzel/the-terrifying-future-of-fake-news?utm_term=.gi6zjZpXv#.qtaX6gOPM

The Quest for Censorship

- Data retention policies
- Filter capabilities
- Regional Internet shutdown in case of political crisis
- „fake news“ detection
- Hate speech laws and persecution
- Malware development for authorities
- New and excessive rights for secret services

China: Digital Self-Control



As Extra Credits explains on YouTube: "If you post pictures of Tiananmen Square or share a link about the recent stock market collapse, your Sesame Credit goes down.

"Share a link from the state-sponsored news agency about how good the economy is doing and your score goes up."

Similarly, Sesame Credit can analyse data from online purchases.

Would CEOs be afraid of bad social credit ratings for themselves? System borders: economy/social. Is this a stable or a fragile architecture for a Society?

A. Landwehr, China schafft digitales Punktesystem für den "besseren" Menschen, https://www.heise.de/newsticker/meldung/China-schafft-digitales-Punktesystem-fuer-den-besseren-Menschen-3983746.html?seite=all

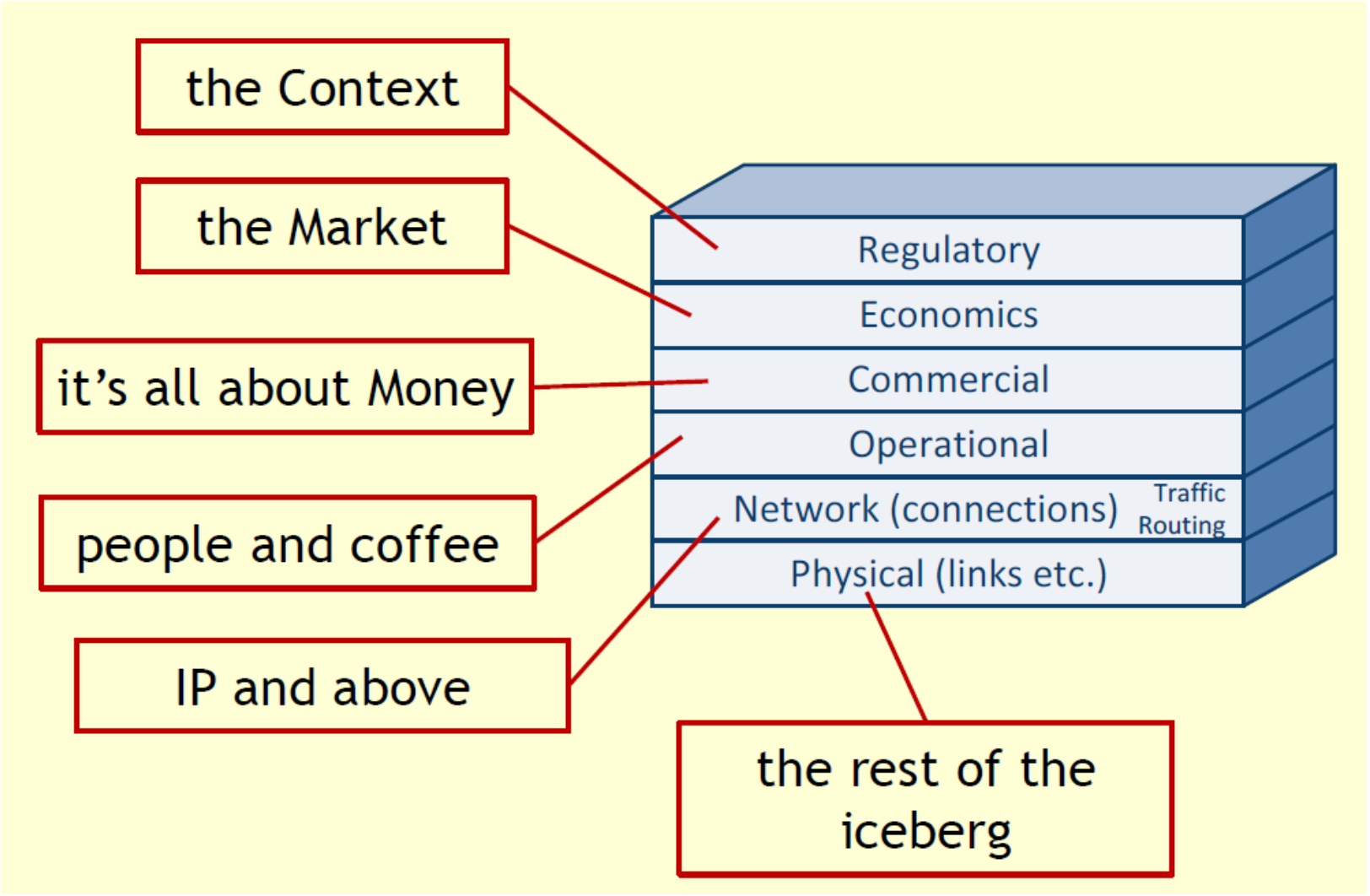
Disruptive Internet?

Winner Takes All

Who is Search?
Who is Social Network?
Who is Events?
Who is Accomodation?
Who is Transportation?
Who is Messaging?

- Be the first
- Focus on action
- Scale is key
- Innovation creates new categories
- New corporate cultures

All bits ~~are~~ were equal!



from C.Hall, Summary of Inter-X Study. Network neutrality is a guiding principle.

Internet 2017

We are witnessing an industry that is no longer using technical innovation, openness and diversification as its primary means of propulsion. The widespread use of NATs in IPv4 limit the technical substrate of the Internet to a very restricted model of simple client/server interactions using TCP and UDP. The use of NATs force the interactions into client-initiated transactions, and the model of an open network with considerable flexibility in the way in which communications take place is no longer being sustained in today's network. Incumbents are entrenching their position and innovation and entrepreneurialism are taking a back seat while we sit out this protracted IPv4/IPv6 transition.

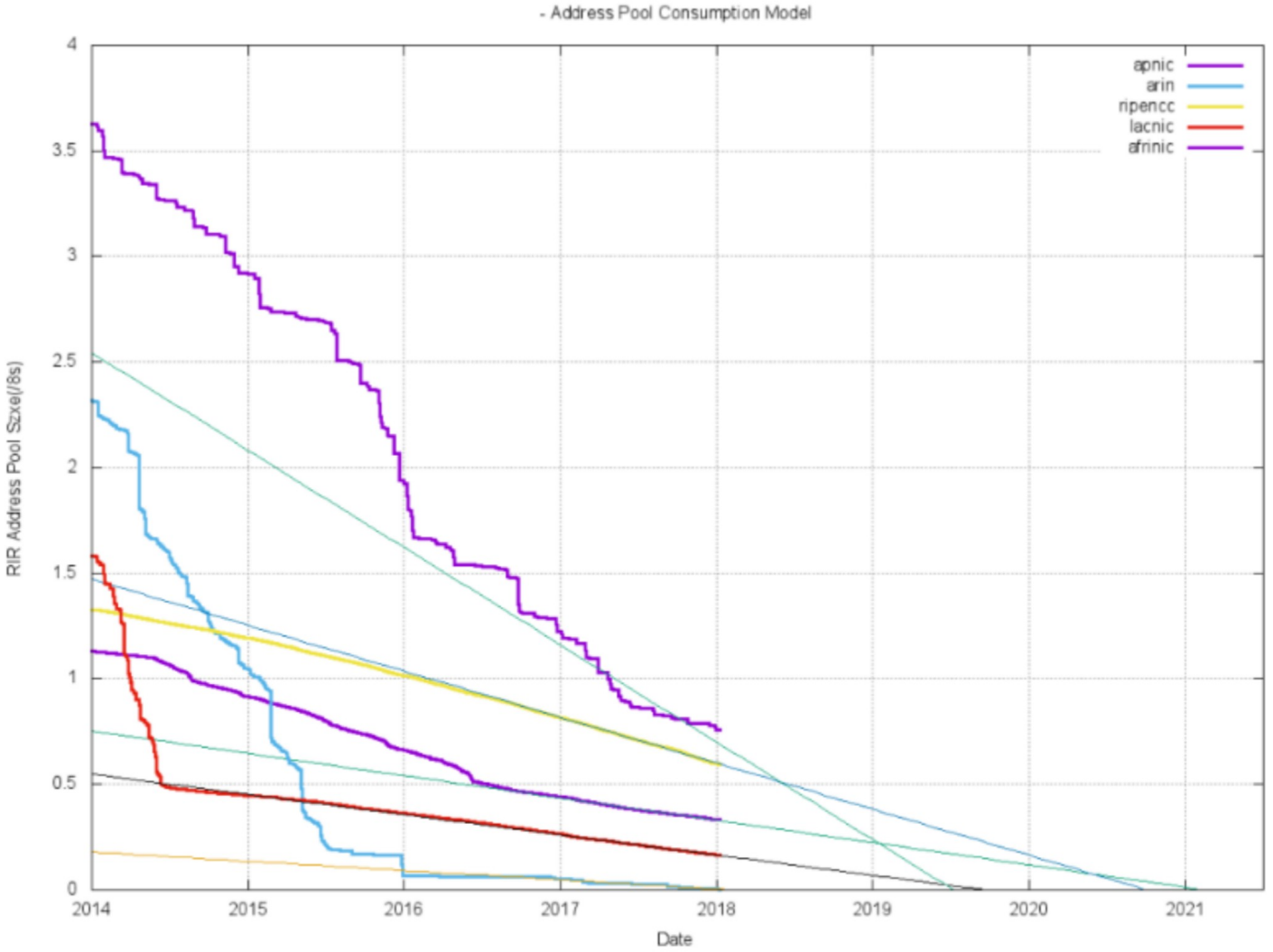
What is happening is that today's internet carriage service is provided by a smaller number of very large players, each of whom appear to be assuming a very strong position within their respective markets. The drivers for such larger players tend towards risk aversion, conservatism and increased levels of control across their scope of operation. The same trends of market aggregation are now appearing in content provision, where a small number of content providers are exerting a completely dominant position across the entire Internet.

[..]

As the Internet continues to evolve, it is no longer the technically innovative challenger pitted against venerable incumbents in the forms of the traditional industries of telephony, print newspapers, television entertainment and social interaction. The Internet is now the established norm. The days when the Internet was touted as a poster child of disruption in a deregulated space are long since over, and these days we appear to be increasingly looking further afield for a regulatory and governance framework that can continue to challenge the increasing complacency of the newly-established incumbents.

G. Houston Addressing 2017, Jan. 2018, http://www.potaroo.net/ispcol/2018-01/addr2017.html

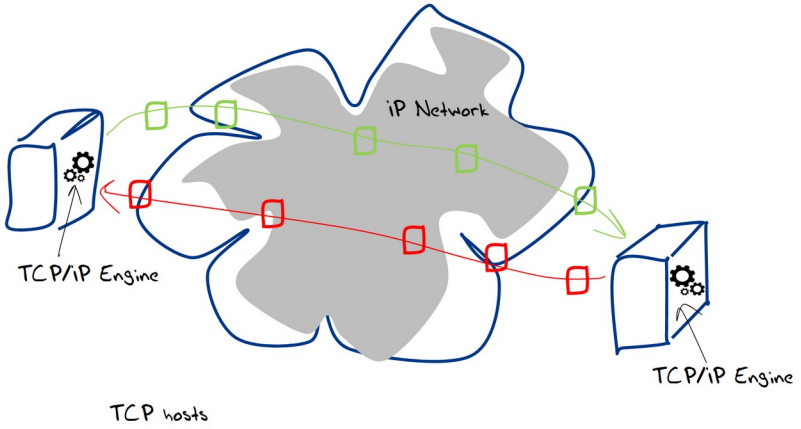
The Client/Server Internet



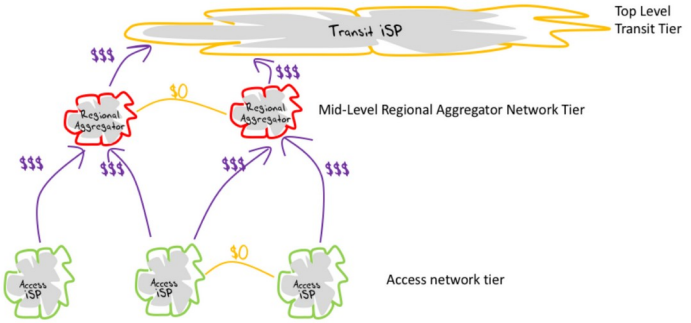
Mobile service providers with carrier grade NATs mask the decline of IPV4 addresses and support a C/S style communication model on the Internet. G. Houston Addressing 2017, Jan. 2018, http://www.potaroo.net/ispcol/2018-01/addr2017.html

From Carriage to Content

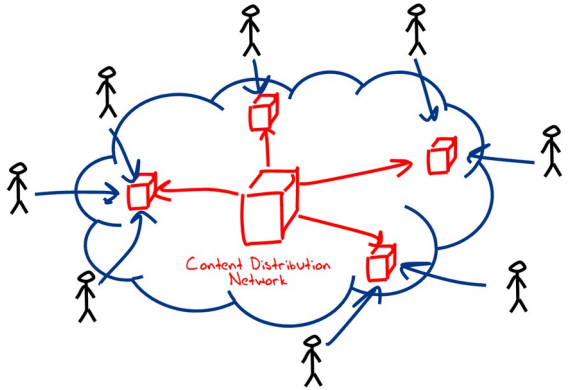
Internet Architecture (c1980's)



Network Role Segmentation



Content Distribution



Content vs Carriage

Who pays whom?

- The only reason why access networks have clients is because there are content services that clients want to access
  - Therefore carriage should pay for content
- There is no “end-to-end” financial settlement model in the Internet – both “ends” pay for access and network providers settle between themselves. To a carriage network, content is just another client
  - Content should pay for carriage, just like any other client

Geoff Houston, The Death of Transit and Beyond,
http://www.potaroo.net/presentations/2018-03-02-death-of-transit.pdf

A Repurposing of the Internet

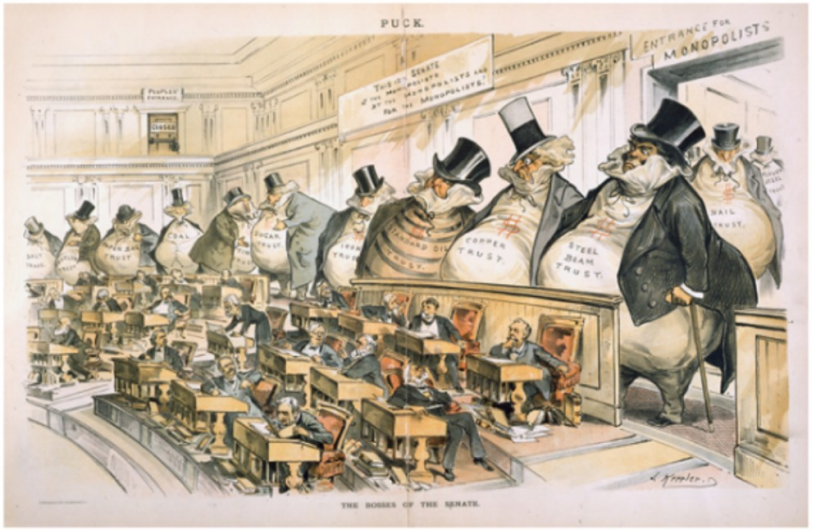
- A few content distributors left
- No reason to have a transit network, dns, domains etc.
- No need for public traffic routing
- No user to user traffic, only CDN to user[s]
- No pubic transmission lines, only marine cable from CDNs

Geoff Houston, The Death of Transit and Beyond,
http://www.potaroo.net/presentations/2018-03-02-death-of-transit.pdf

The Gilded Age

During this period in the United States the dominant position within industry and commerce was occupied by a very small number of players who were moving far faster than the regulatory measures of the day.

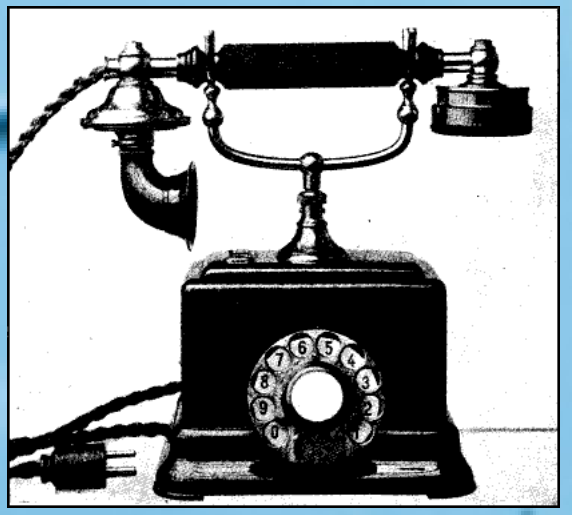
The resulting monopolies took the US decades to dismember, and even today many of these gilded age companies remain dominant in their field



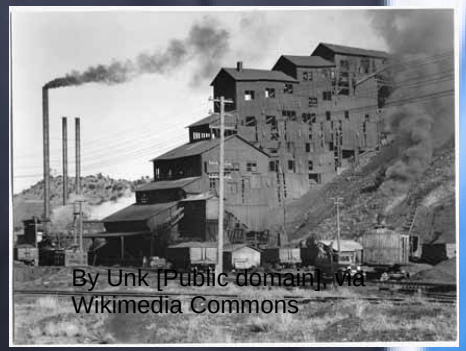
Geoff Houston, The Death of Transit and Beyond,
http://www.potaroo.net/presentations/2018-03-02-death-of-transit.pdf

Regulators

© Raimond Spekking / CC BY-SA 4.0 (via Wikimedia Commons)



Flcelloguy, CC-BY-SA-3.0 (http://creativecommons.org/licenses/by-sa/3.0/)], via Wikimedia Commons

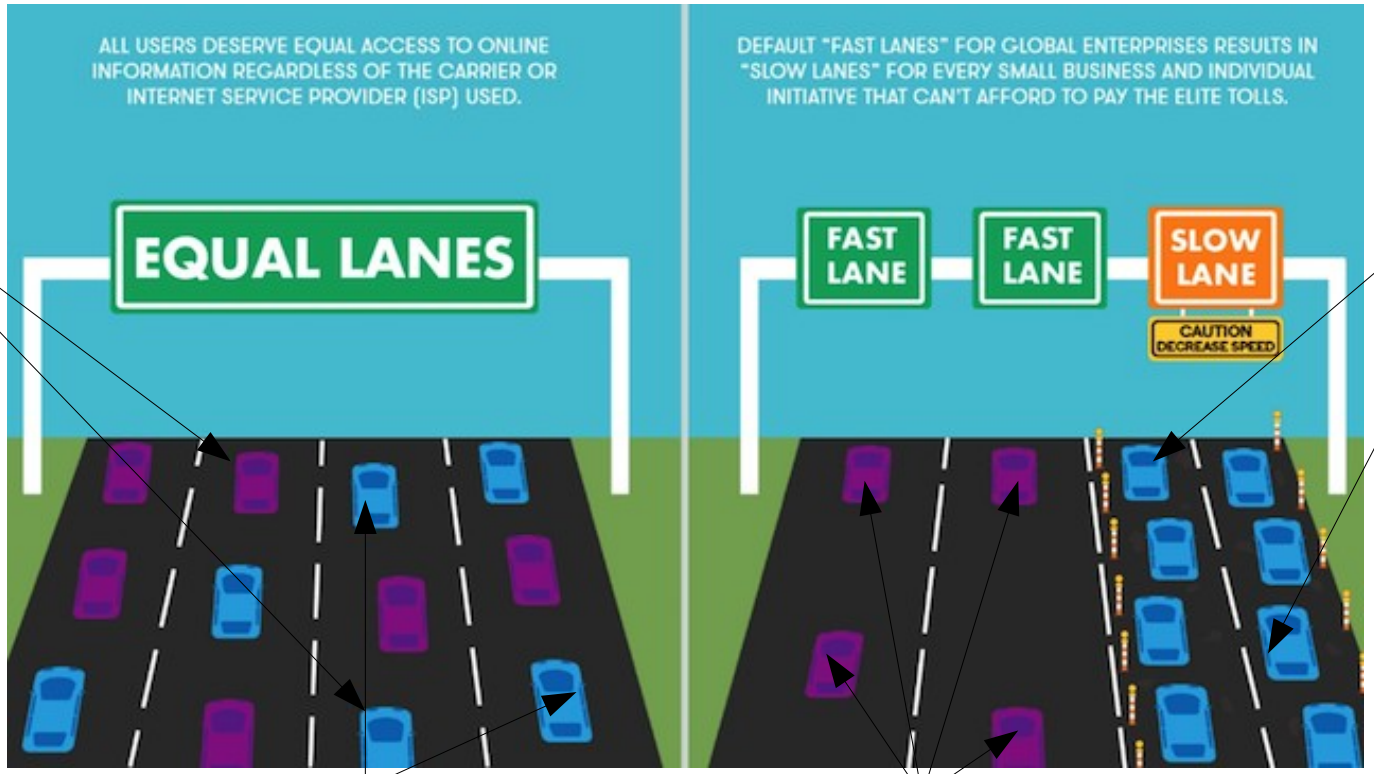


By Unk [Public domain], via Wikimedia Commons

By U.S. Army, Staff Sgt. Aaron Allmon II [Public domain], via Wikimedia Commons

Net Neutrality

Disruptive?



Disruptive?

Established

Established

Lindsey Huber, Net neutrality got kicked in the nuts, here's what's next, https://therealdaily.com/real-estate-tech/net-neutrality-got-kicked-nuts-heres-whats-next/

Sesta/Fosta: Goodbye „Safe Harbour“

Up till now, companies were not responsible for user generated content. Politics used a well known pattern (icebreaker: sex trafficking) to upturn this law. Seemingly only convering sex trafficking it is easy to see, how in the future more and more cases will be subsumed under this law and – already happening – companies will preventively censor user generated content.

https://www.techrepublic.com/article/why-passage-of-sestafosta-is-leading-some-cloud-providers-to-terminate-users/

From Self-Government to Regulation

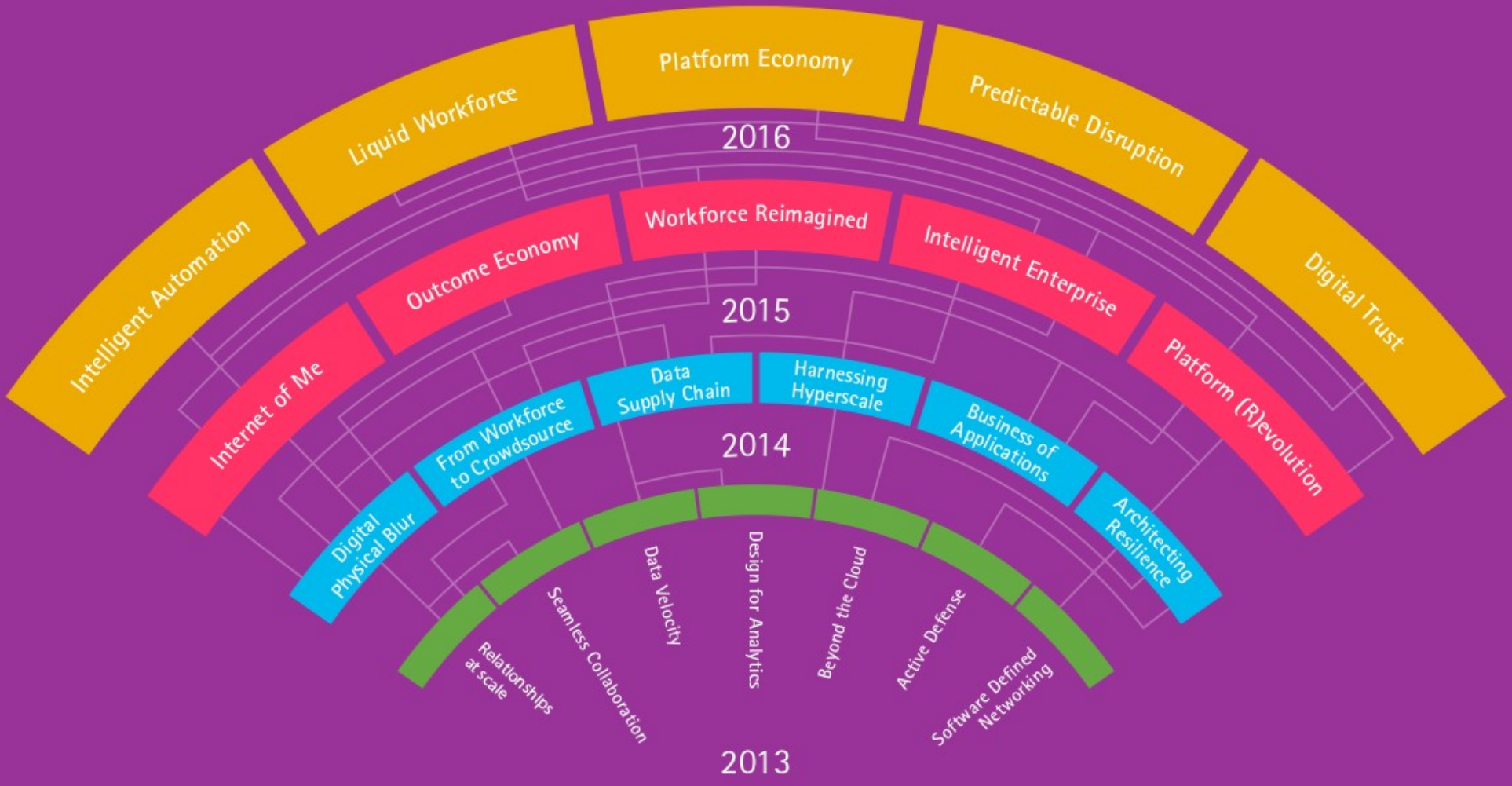
- Self regulated public service killed by concentration
- Internet regulation seems to follow other largely privatized public services like energy, telecommunication, public broadcast, water etc.
- None of these other areas have shown disruptive innovation in the interest of the public!
- Instead, intransparently operating „regulators“ decide about profit generation and distribution

Digital Platform Economies

accenture

Strategy | Consulting | Digital | Technology | Operations

Technology Vision Evolution 2013-2016



Gerard Grech
CRUNCH NETWORK CONTRIBUTOR

Take a look at the last decade's fastest-growing companies. You'll notice they have one thing in common: They're all platforms.

Stop calling Uber, Airbnb and Munchery just apps. These apps are the front end of a full-stack revolution powered by cloud, mobile, drones, robots and AI. These apps started as simple solutions to match demand and supply, but they have the potential to reinvent entire industries.

Platform How-To

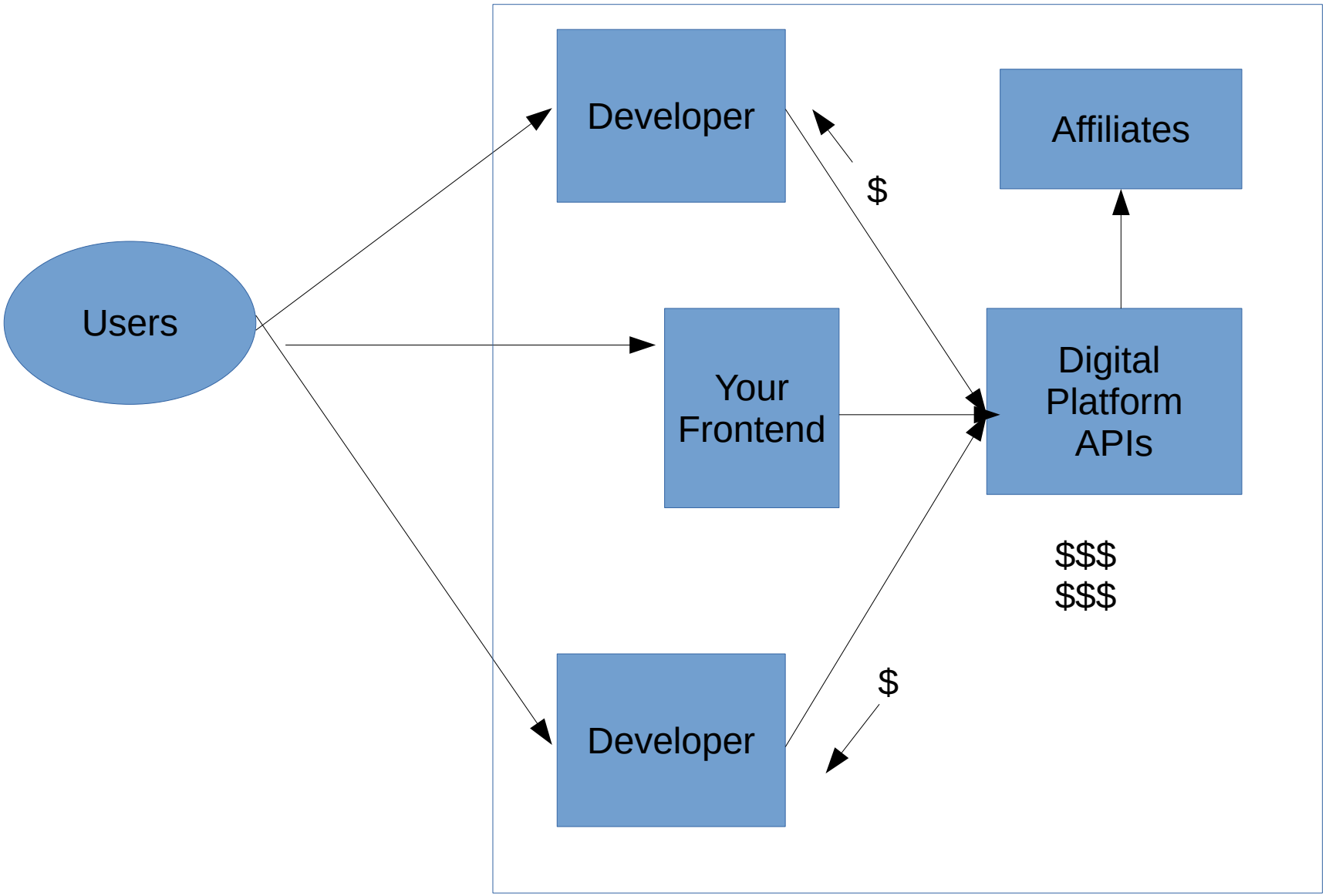
Three New Rules of the Platform Business

1. *Network Effects/Two-Sided Market:* Exists when two user groups (typically, producer and consumer) generate network value for each other, resulting in mutual benefits that drive demand-side economies of scale. The network effects of platforms, with more connected users and transactions, drive value creation and scale.
2. *Distribution Power Law:* Relates to platform business models that enable scale by allowing others to generate profits in the 'long tail' of the distribution curve—avoiding diminishing returns associated with traditional (linear) value chain models.
3. *Asymmetric Growth and Competition:* Based on driving the demand of a core market through complementary markets, which are often subsidized (or free) to users and which cross industry lines. Asymmetric competition exists when two companies go after market opportunities with very different approaches and resources.

https://www.accenture.com/fr-fr/_acnmedia/PDF-2/Accenture-Platform-Economy-Technology-Vision-2016-france.pdf

Other positive feedback loops: capital accumulation, compound interest, scale free networks

Network-Effects: API Ecosystem

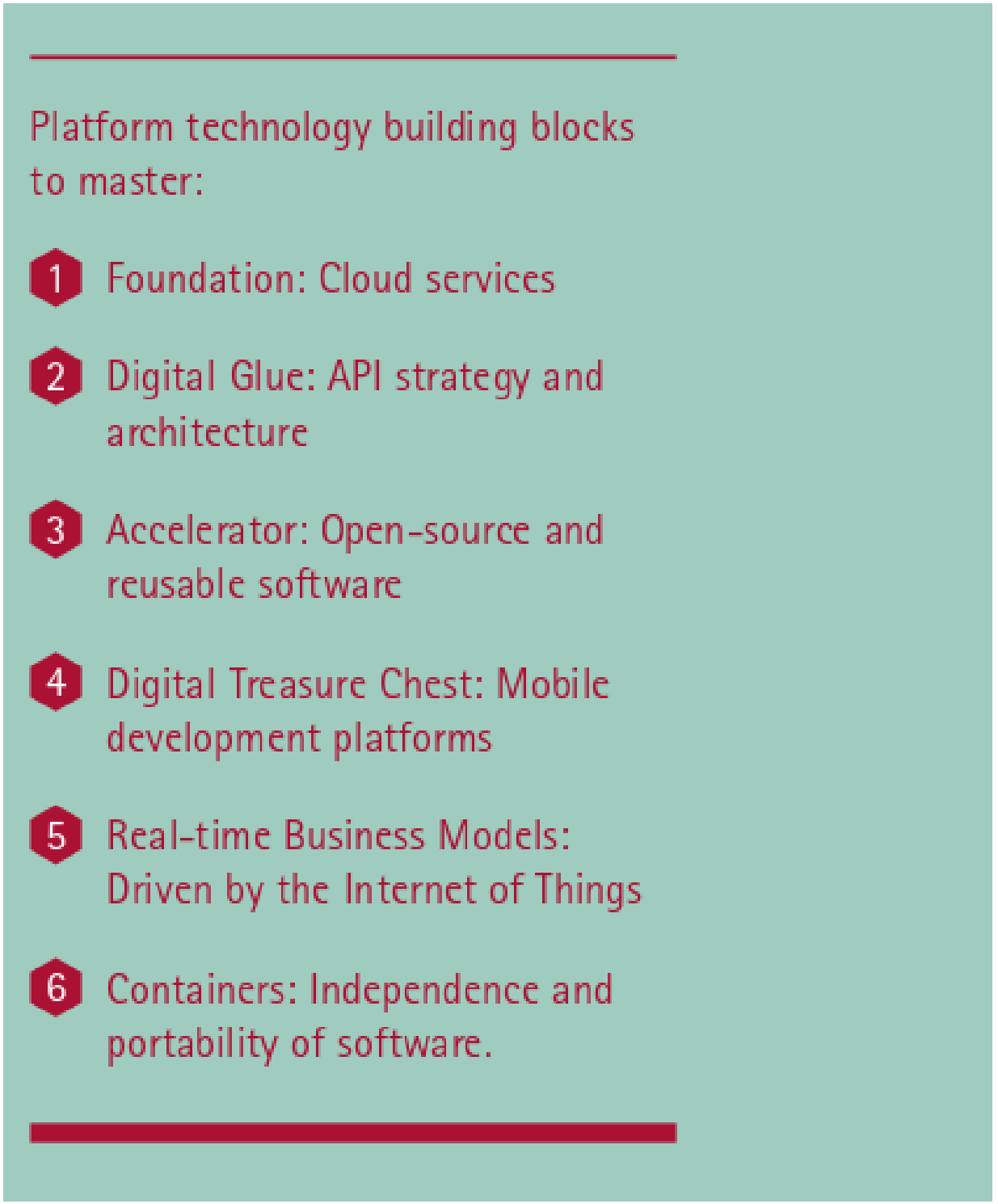


Build your Ecosystem so others can make money too! (network effect exp.). Do users Belong to your Ecosystem too?

Building Blocks

- Continuous deployment
- Experiment driven decisions
- Lean Enterprice Concepts
- Continuous delivery
- New Corporate Cultures

https://www.accenture.com/fr-fr/_acnmedia/PDF-2/Accenture-Platform-Economy-Technology-Vision-2016-france.pdf

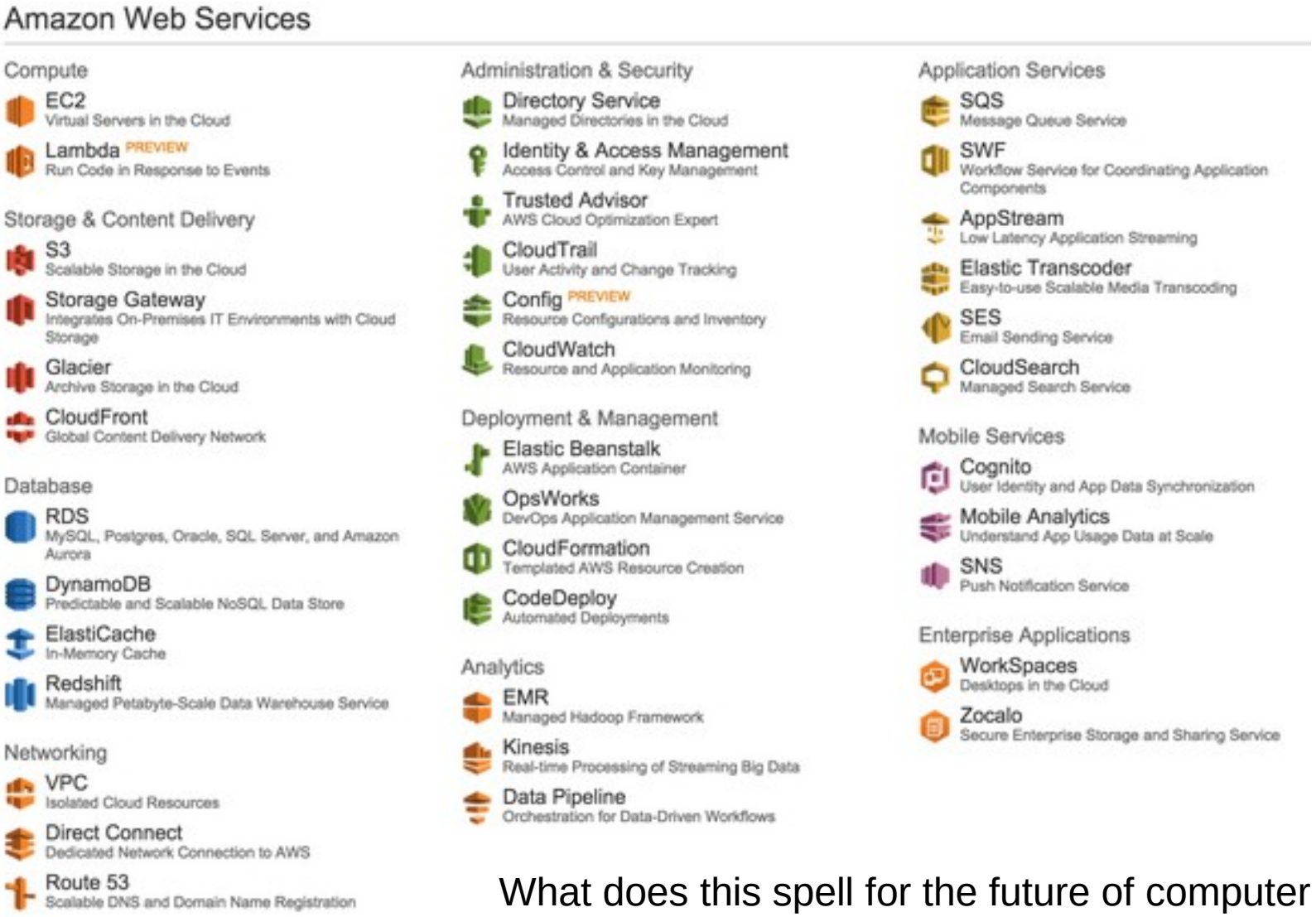


Platform Advantages

Sonos: classic supply-chain driven production of speakers. Forced to follow Amazon, Google.
Amazon: totally new fabrication geared towards dominance in the smart home market. 3 Advantages: retailer and OEM, platform ownership („Alexa inside“), Diversification (can afford to lose money)

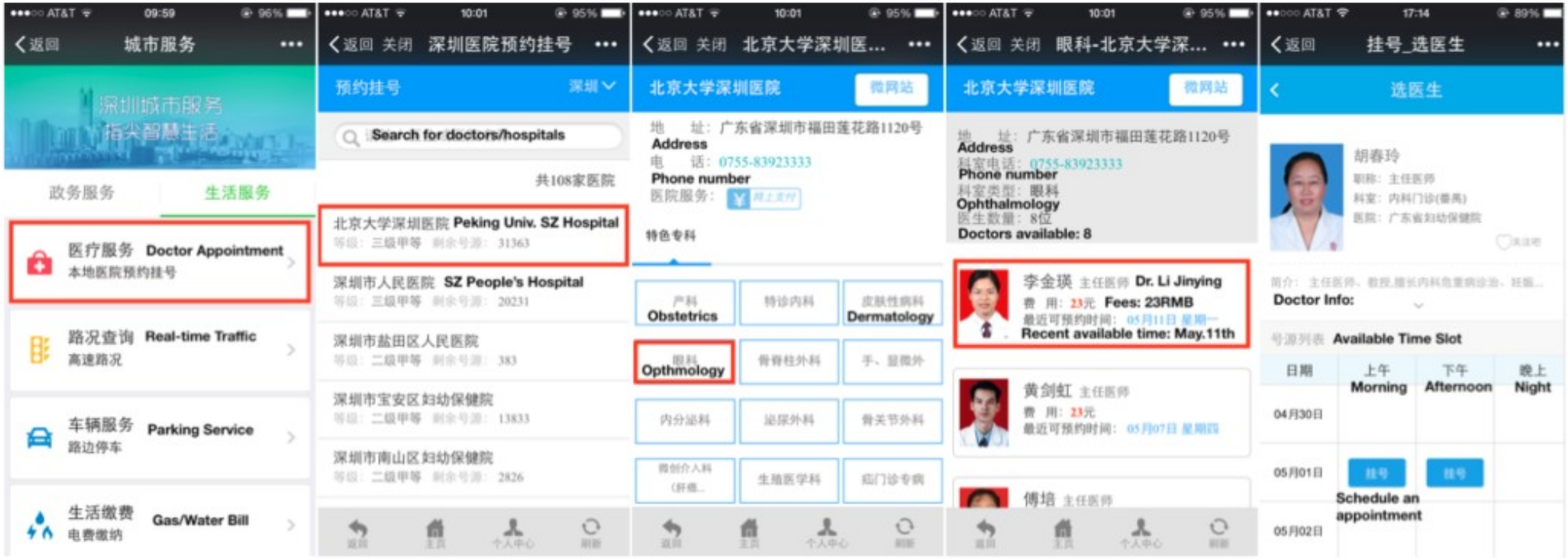
Interesting analysis at: https://blog.bolt.io/what-cracking-open-a-sonos-one-tells-us-about-the-sonos-ipo-dcab49155643

The New Feudalism



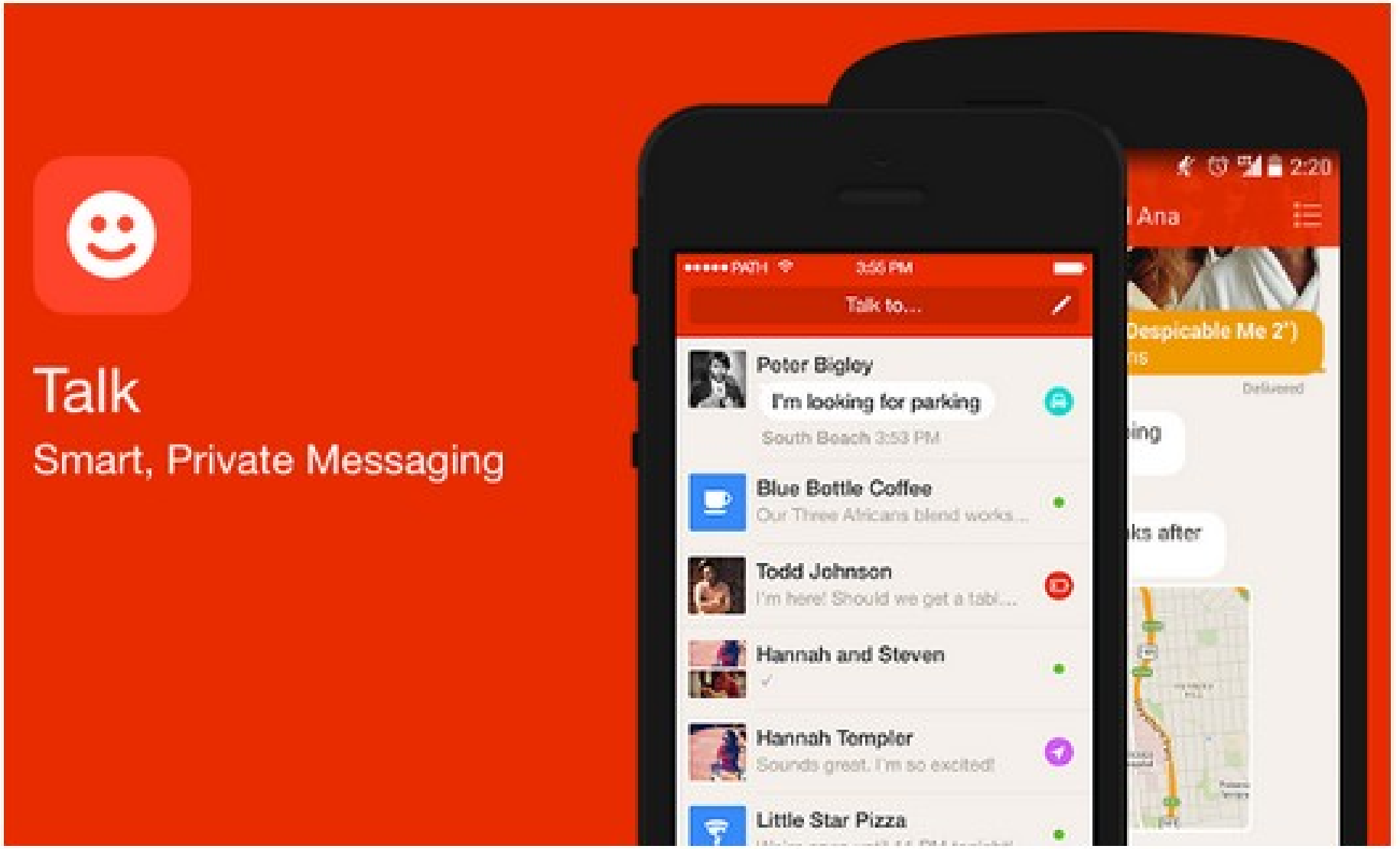
What does this spell for the future of computer science eduction?

Asia Ahead



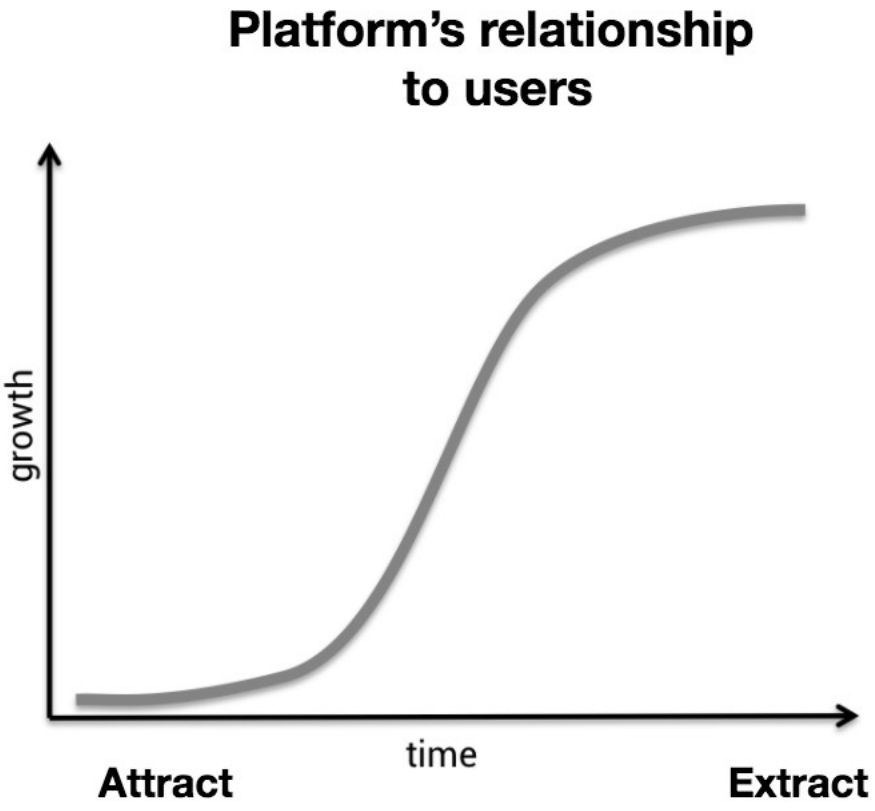
These 5 screenshots, viewed left to right, show the flow of booking a doctor appointment via WeChat Wallet

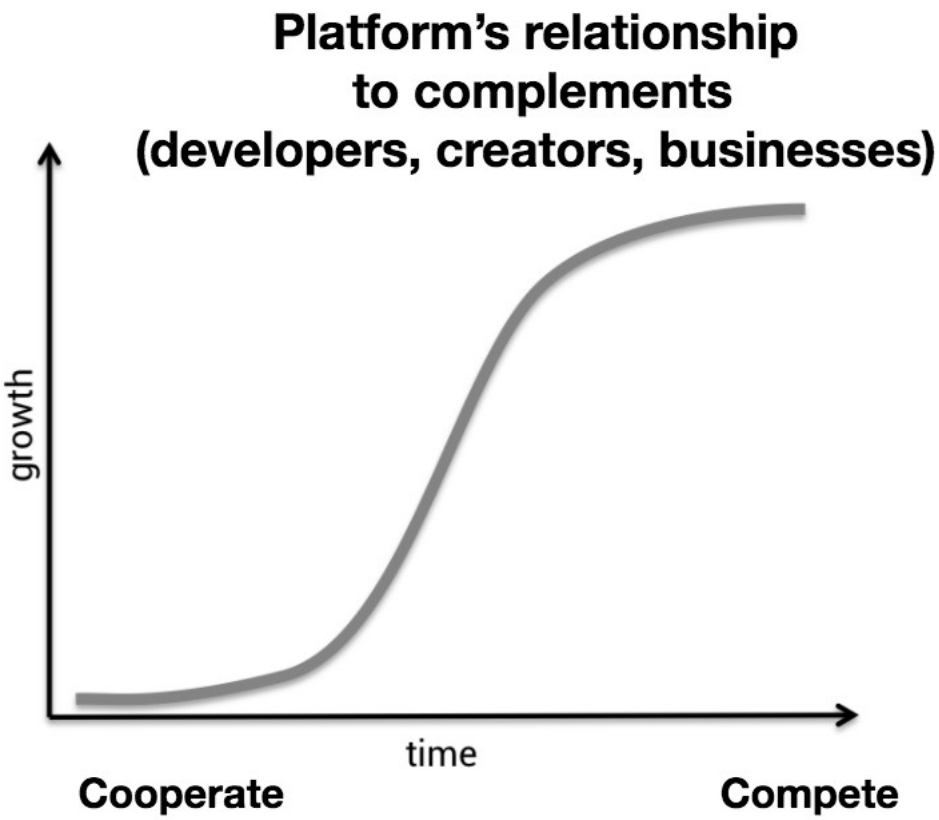
„Conversational commerce“ with messaging platforms



Path Talk allows users to communicate with businesses via text messaging

Platform Relationships





Chris Dixon, Why Decentralization Matters,
https://medium.com/@cdixon/why-decentralization-matters-5e3f79f7638e

Why Client/Server?

- Easy monetization
- Asymmetric communication parameters (upload/download)
- Asymmetric processing capabilities (smartphone/host)
- No longer SPOF and unable to scale
- Protection even against byzantine failures/attacks
- Coordination wants to be centralized
- States like big players
- Customer trap
- Easy monitoring
- Dual-market advantages
- Easy software changes/updates
- Reliable and professional state handling by admins
- The NAT-ed Internet maps 15 bil. devices to 2 bil. IP-V4 addresses
- Infrastructure cost not an issue today
- The problem of distributed reputation is unsolved (https://github.com/OrfeasLitos/TrustIsRisk)
- The problem of distributed arbitration with non-digital goods is unresolved
- Law compliance problems in p2p software (SESTA/FOSTA/GDPR)

A nice discussion of the p2p based Interplanetary Filesystem (IPFS) by Murat Demirbas, https://muratbuffalo.blogspot.de/2018/02/paper-review-ipfs-content-addressed.html Everybody‘s technical heart is for decentralization but centralization most often wins because users don‘t care.

Peer-to-Peer Strikes Back?

https://www.nzz.ch/wirtschaft/wie-blockchain-google-facebook-und-uber-gefaehrdet-ld.1380412

What we lost

- Email
- News-reader
- SMS
-

	Then	Now
Publishing	Blogger, Movable Type	WordPress, Medium, Tumblr
Search	Technorati	n/a
Comments	Haloscan, coComment	Disqus, LiveFire, Civil Comments
Responses	TrackBack, PingBack	n/a*
Likes / Favorites	n/a	n/a*
Updates	Weblogs.com, Pingomatic	n/a
Identity	TypeKey, Gravatar	Facebook, Twitter
Friend Lists	Blogrolling, MyBlogLog	n/a*
Following	n/a	n/a*
Syndication	RSS, Atom	AMP, Instant Articles, RSS, Apple News
API	Metaweblog, Atom	n/a*
Metadata	RDF	Schema.org, Open Graph, Twitter Cards
Discovery & Tagging	Blogdex, Technorati	n/a*
Analytics	Measure Map, FeedBurner	Google Analytics
Advertising	BlogAds, Google AdSense	Google AdSense
Aggregation	Google News, Bloglines	Facebook
Time Shifting & Reading	Instapaper, Readability	Facebook, Pocket, Instapaper, Apple News

More than Man-in-the-Middle?

Nick Srnicek ✓
@n_srnck

Follow

Uber is buying 24,000 cars.
Facebook is spending $1 billion on original TV shows.
Alibaba is spending $2.6 billion for physical stores.
Airbnb is opening branded apartment buildings.

> **ian bremmer** ✓ @ianbremmer
> Uber, the world's largest taxi company, owns no vehicles.
> Facebook, the most popular media owner, creates no content.
> Alibaba, the most valuable retailer, has no inventory.
> Airbnb, the largest accommodation provider, owns no real estate.…

6:15 AM - 24 Jan 2018

Keeping State (Identity, Value, Event)

Demokratie in Blöcken – die Blockchain als Politikinstrument

25.01.2016 10:49 Uhr – Stefan Mey vorlesen

(Bild: gov.uk)

Whot, no banks? No notaries? No gov?

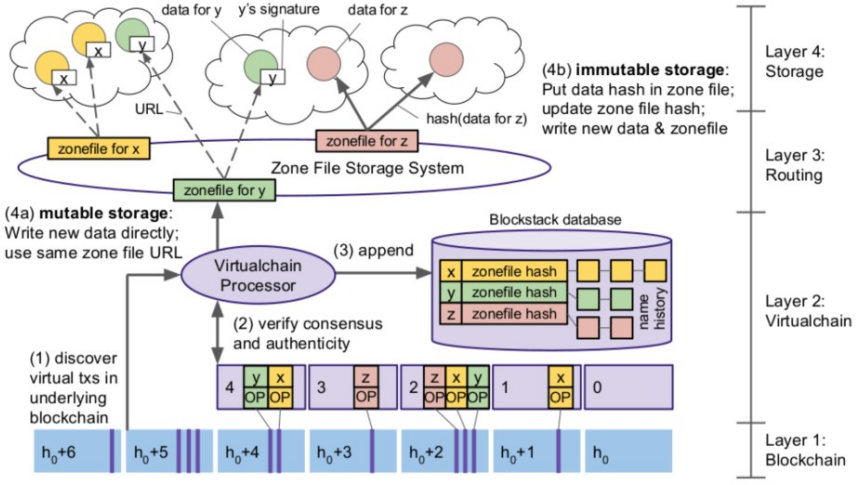
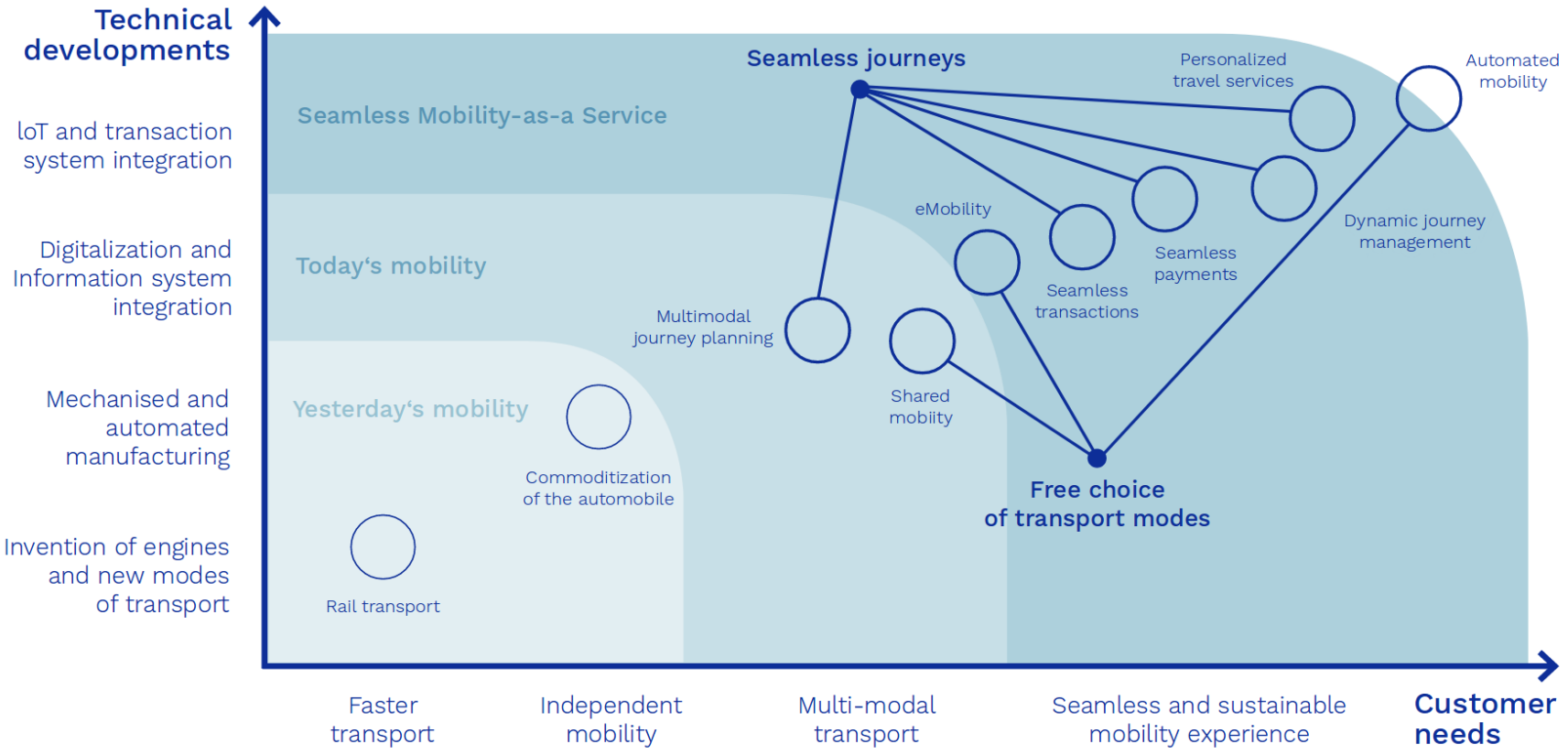


Figure 4: *Overview of Blockstack's architecture. Blockchain records give (name, hash) mappings. Hashes are looked up in routing layer to discover routes to data. Data, signed by name owner's public-key, is stored in cloud storage.*

https://blog.acolyer.org/2018/02/07/blockstack-a-global-naming-and-storage-system-secured-by-blockchain/

Ride-Sharing, E-mobility

Figure 1: The evolution of Seamless Mobility as a Service [5,6,7]



With B2C car sharing, customers gain access to corporate fleets usually offered in restricted geographical regions and with a variety of tariffs. Prominent examples include Daimler's Car2Go or the BMW/Sixt joint venture DriveNow. With P2P car sharing, consumers rent out their vehicles to others for a short time (see, for instance, Drivy and Turo).

IoT transactions require smart contracts with delegation and proxying. Platforms get disrupted like Uber in Austin/Tx. (arcade city p2p network)

https://www.omos.io/wp-content/uploads/whitepaper/OMOS_concept_paper.pdf

Blockchainable?

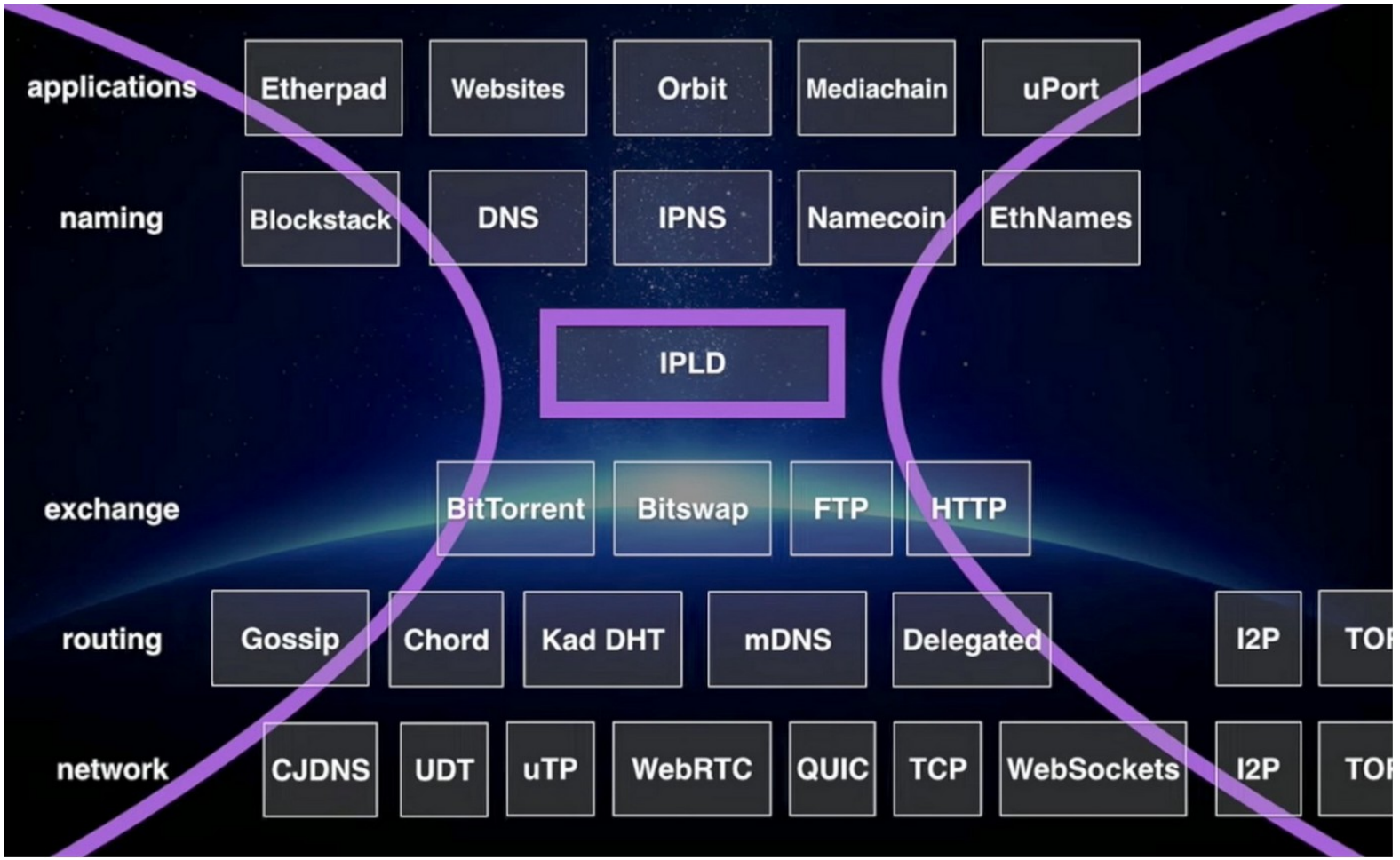
- Crowdsourcing
- Energy production and distribution
- Identity and Ownership
- Public service offerings (healthcare, voting, eGov)
- Voting (using blockchain to solve blockchain protocol dispute?)
- Renting, reservations etc.
- IoT Transactions
- Supply Chain Management
- Interbank and International Payments
- Decentralized Autonomous Organizations

Do you need a Blockchain?Karl Wüst∗, Arthur Gervais†∗karl.wuest@inf.ethz.ch,†arthur.gervais@inf.ethz.chDepartment of Computer ScienceETH Zurich, Switzerland

https://eprint.iacr.org/2017/375.pdf

Finally, IT-Security finds its true mission: Securing smart contracts, not IT-Infrastructures

IPFS/IPLD



IPLD: link layer for all hash based object systems

Mark Pors, Understanding the IPFS White Paper part 2 https://hackernoon.com/understanding-the-ipfs-white-paper-part-2-df40511addbd

A Distributed Social Network?

Matthias Beyer

Rustacean - Music freak - NixOSer - CS Enthusiast

Germany

183 Articles | 54 Tags

Blueprint of a distributed social network on IPFS - and its problems (2)

2018-02-25 · 3438 · 17 MIN DISTRIBUTED · NETWORK · OPEN-SOURCE · SOCIAL · SOFTWARE

After thinking a while about the points I layed out in my previous post I'd like to update my ideas here.

It is not necessary to read the first post to understand what I am talking about in this second one, but it also does not do any harm.

> Matrix and Mastodon are nice - but federation is only the first step - we have to go towards fully distributed applications!

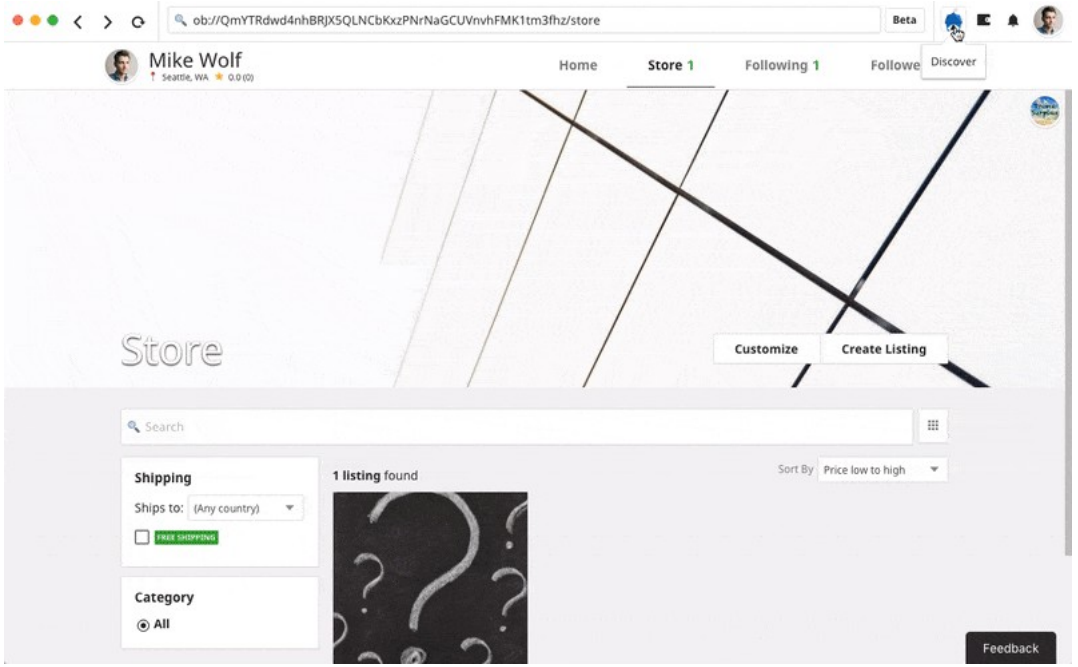
(me, at the 34. Chaos Communication Congress 2017)

The idea

With the rise of protocols like the matrix protocol, activitypub and others, decentralized social community platforms like matrix, mastodon and others gained power and were made real. I consider these platforms, especially mastodon and matrix, to be great steps into the future and am using both enthusiastically. But I think we can do better. Federation is the first step out of centralization and definitively a good one. But we have to push further - towards full distributed environments!

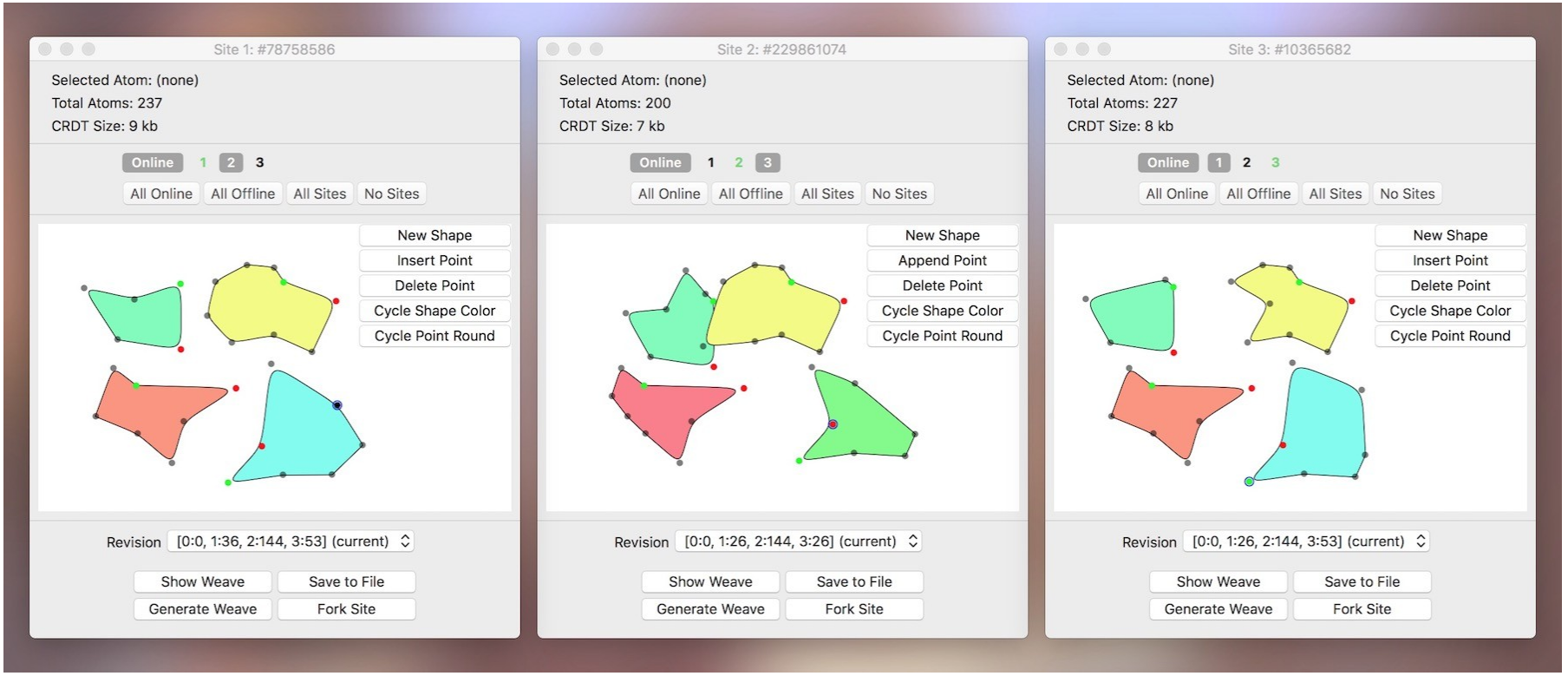
https://beyermatthias.de/blog/2018/02/25/blueprint-of-a-distributed-social-network-on-ipfs---and-its-problems-2/

The Worlds Largest Marketplace?



OpenBazaar (based on IPFS) costs nothing to download and use. Unlike sites like Ebay or Amazon there are no fees to list items, and no fees when an item is sold. Because the trade is p2p (peer to peer), it's happening directly between buyers and sellers with no middleman to take a cut from each sale. It's completely free e-commerce. https://www.openbazaar.org/features/

Totally Decentralized Editing



Alexei Baboulevitch, Data Laced with History: Causal Trees & Operational CRDTs, Mar 24, 2018, http://archagon.net/blog/2018/03/24/data-laced-with-history/

Literature

Erik Brynjolfsson, Andrew McAfee: The Second Machine Age. Plassen, Kulmbach 2014. 400 Seiten, Fr. 32.90, E-Book 25.-.

Nick Bostrom: Superintelligenz. Szenarien einer kommenden Revolution. Suhrkamp, Berlin 2014 (erscheint 8.11.). 480 Seiten, Fr. 41.90.

Kevin Kelly, The Inevitable. Understanding 12 Technological Forces That Will Shape Our Future

A Montuori, Systems Approach
California Institute of Integral Studies, San Francisco, CA, USA

A. Maurits van der Veen, The Dutch Tulip Mania: The Social Foundations of a Financial Bubble, October 2012

Scaling Agile @ Spotify
with Tribes, Squads, Chapters & Guilds
Henrik Kniberg & Anders Ivarsson

What Google Learned From Its Quest to Build the Perfect Team
New research reveals surprising truths about why some work groups thrive and others falter.
By CHARLES DUHIGG Illustrations by JAMES GRAHAM FEB. 25, 2016
https://www.nytimes.com/2016/02/28/magazine/what-google-learned-from-its-quest-to-build-the-perfect-team.html?rref=collection%2Fbyline%2Fcharles-duhigg&action=click&contentCollection=undefined&region=stream&module=stream_unit&version=search&contentPlacement=1&pgtype=collection

Peter , Demonetization of everything

The Venus Project – Resource Based Economy

Demonetizing Everything: A Post Capitalism World | Peter Diamandis | Exponential Finance,
https://www.youtube.com/watch?v=3cXPWyP0BBs

http://basicincome.org/research/research-depository/

https://www.heise.de/autos/artikel/Klartext-Elektrische-Landlust-3968651.html