

Data Abuse & Tech Divide:

Ethical Considerations, Social Impacts, and Policies

چالش های اخلاقی و اجتماعی فن آوری پیشرفته:
خطرات داده های کلان، هوش مصنوعی، و شکاف اطلاعاتی



About This Presentation

This presentation originated when Dr. Sirous Yasseri and I were asked to lead a discussion on the ethical and social challenges of advanced technology, with focus on the dangers of big data and digital divide. The material can be used freely in teaching and other educational settings. Unauthorized uses, including any use for financial gain, are prohibited. ©2022 Behrooz Parhami

Edition	Released	Revised	Revised	Revised	Revised
First	Dec. 2020	July 2022			

File: http://www.ece.ucsb.edu/~parhami/pres_folder/parh20-ethics-big-data-technology-divide.pdf

Summary: Data Abuse & Tech Divide

Big data is being pushed by the tech industry as the cure to all technical and social ills. Data, big or small, is indeed quite useful in many domains, including understanding genetic and other diseases based on analyzing vast amounts of data collected from patients. The same genetic information, however, can be abused if it falls into the hands of health and life insurance companies (denial of coverage, exorbitant premiums). Surveillance economy, consumer protection, engineering/technology ethics, amplification of biases by AI & ML, fake news, bogus product/service reviews, and digital slavery are among other dangers.

We are all familiar with wealth and income gaps, which are generally viewed as detrimental to the economic health of nations. Tech gap/divide, including its specific instances of information gap and digital gap, can also be problematic. In today's information-based economies, broad and fair access to information and associated technologies are key prerequisites to prosperity and justice. Setting up the needed public infrastructures and regulatory frameworks is an important function of governments. Other topics I touched upon included technological literacy (techeracy), digital natives vs. digital immigrants, and the dangers of leaving a segment of our society in digital dark ages.

Topics of Interest

Data Abuse

Hazards of big data

Surveillance economy

Consumer protection

Ethics of tech (AI, ML)

Fake news / reviews

Digital slavery

Tech Divide

Fair access to info tech

Tech haves & have-nots

Public infrastructure

Tech literacy (techeracy)

Digital natives/immigrants

Digital dark ages

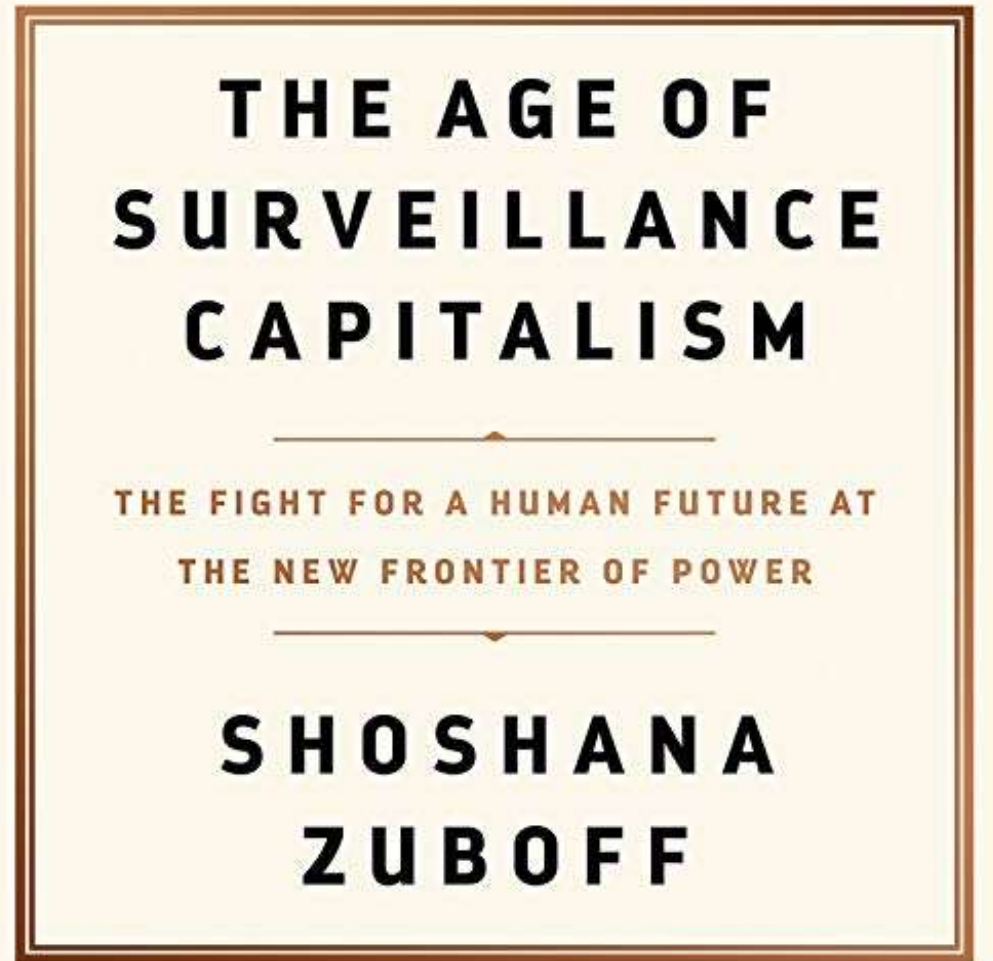
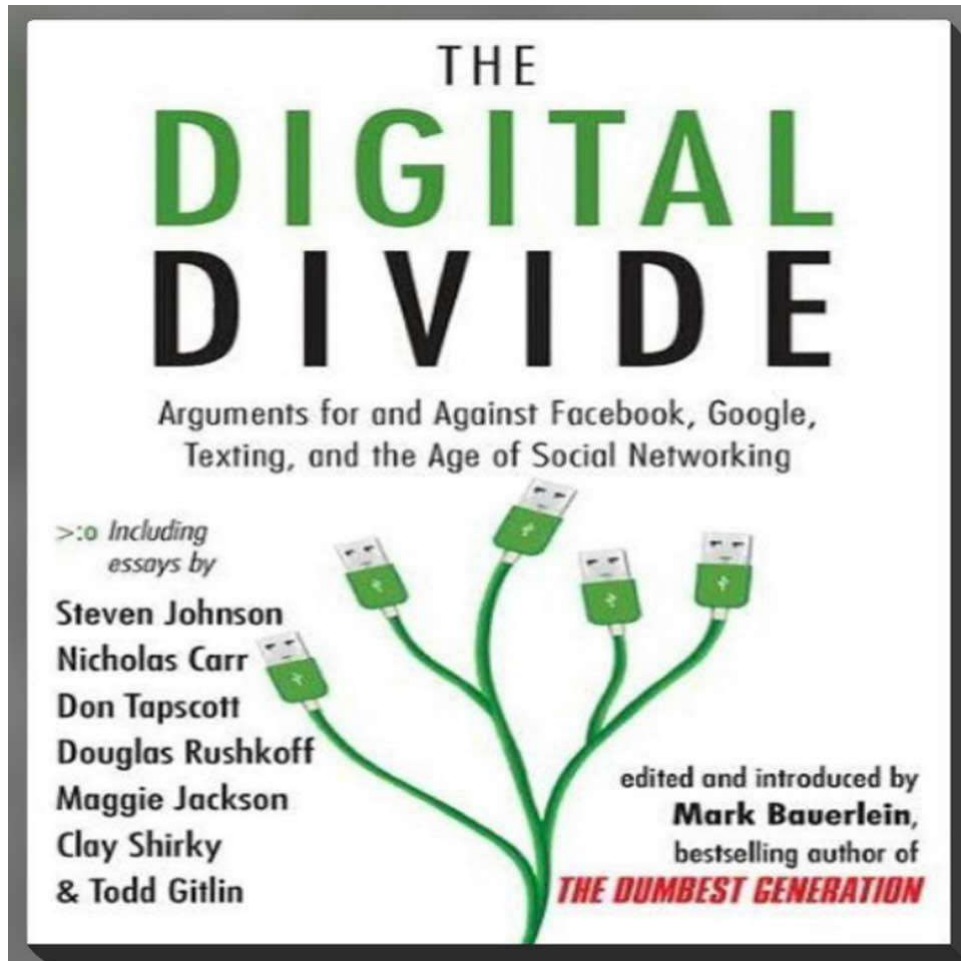
Digital Divide and Surveillance Capitalism

GoodReads review: ★★★★★

<https://www.goodreads.com/review/show/3681327863>

GoodReads review: ★★★★★

<https://www.goodreads.com/review/show/3751311770>



The Great Social Divides

Young vs. Old

Urban vs. Rural

Rich vs. Poor (Haves vs. Have-nots)

Whites vs. People of Color

Natives vs. Immigrants

Literate vs. Illiterate

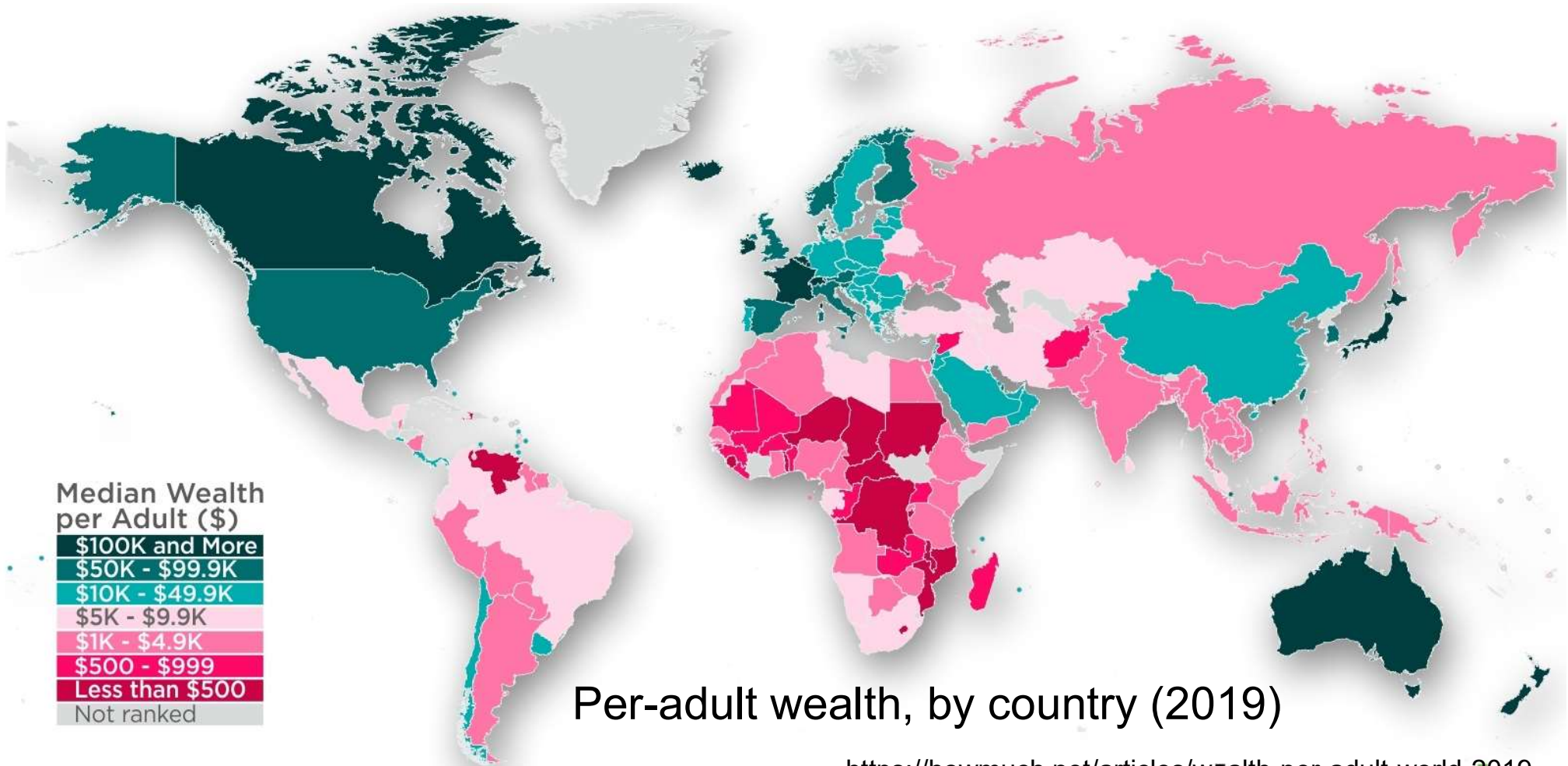
Digital Haves vs. Digital Have-nots

Digitally Literate vs. Digitally Illiterate



} **Digital Divide**

The Haves and Have Nots: Countries

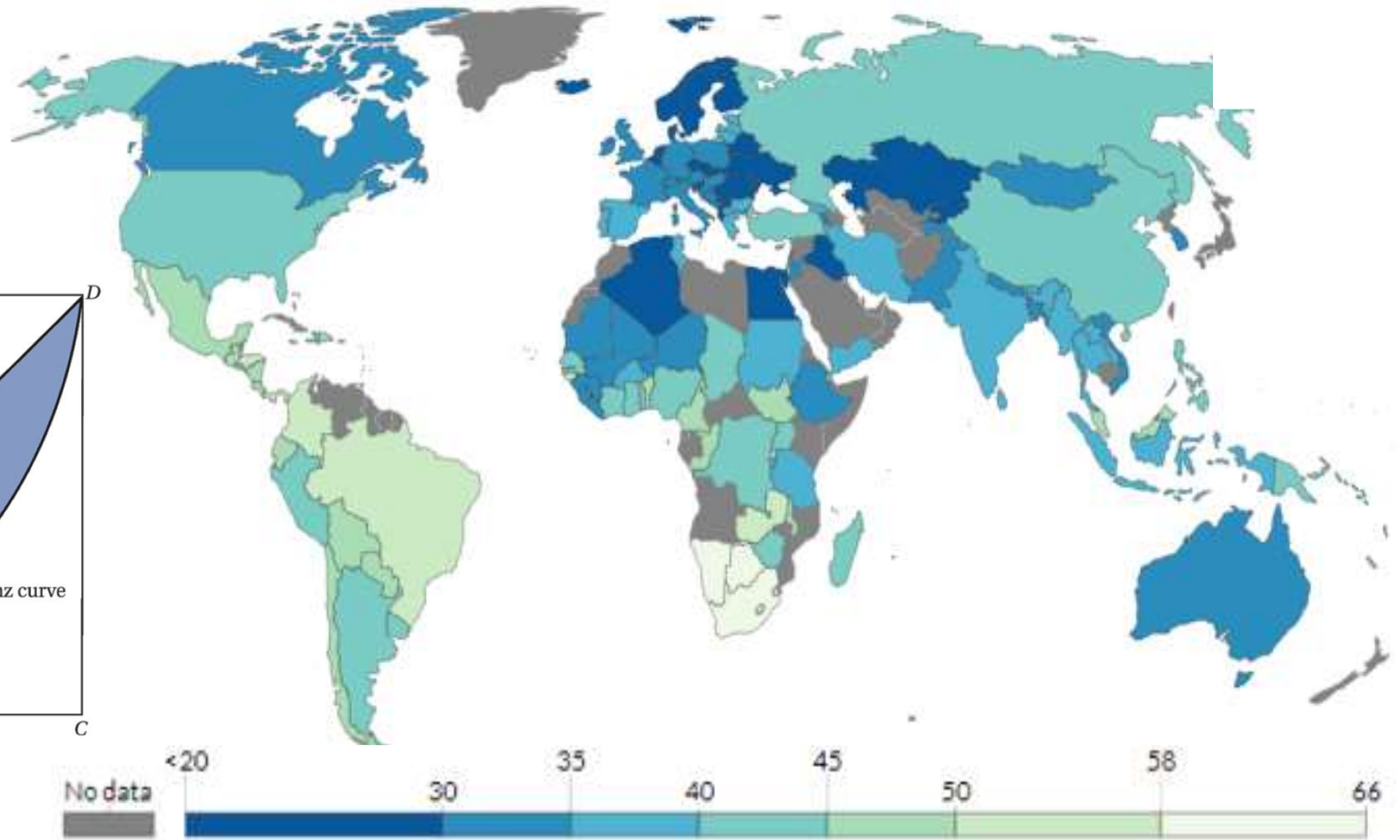
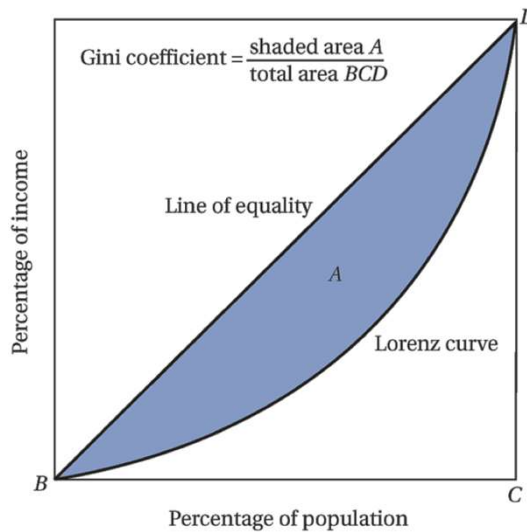


Global wealth ~ \$360T (3x GDP), ~\$70K per adult

North America ~32%; Africa ~1%; USA ~30%; China ~18%; UK ~4%

The Haves and Have Nots: Individuals

Economic Inequality (Wikipedia)



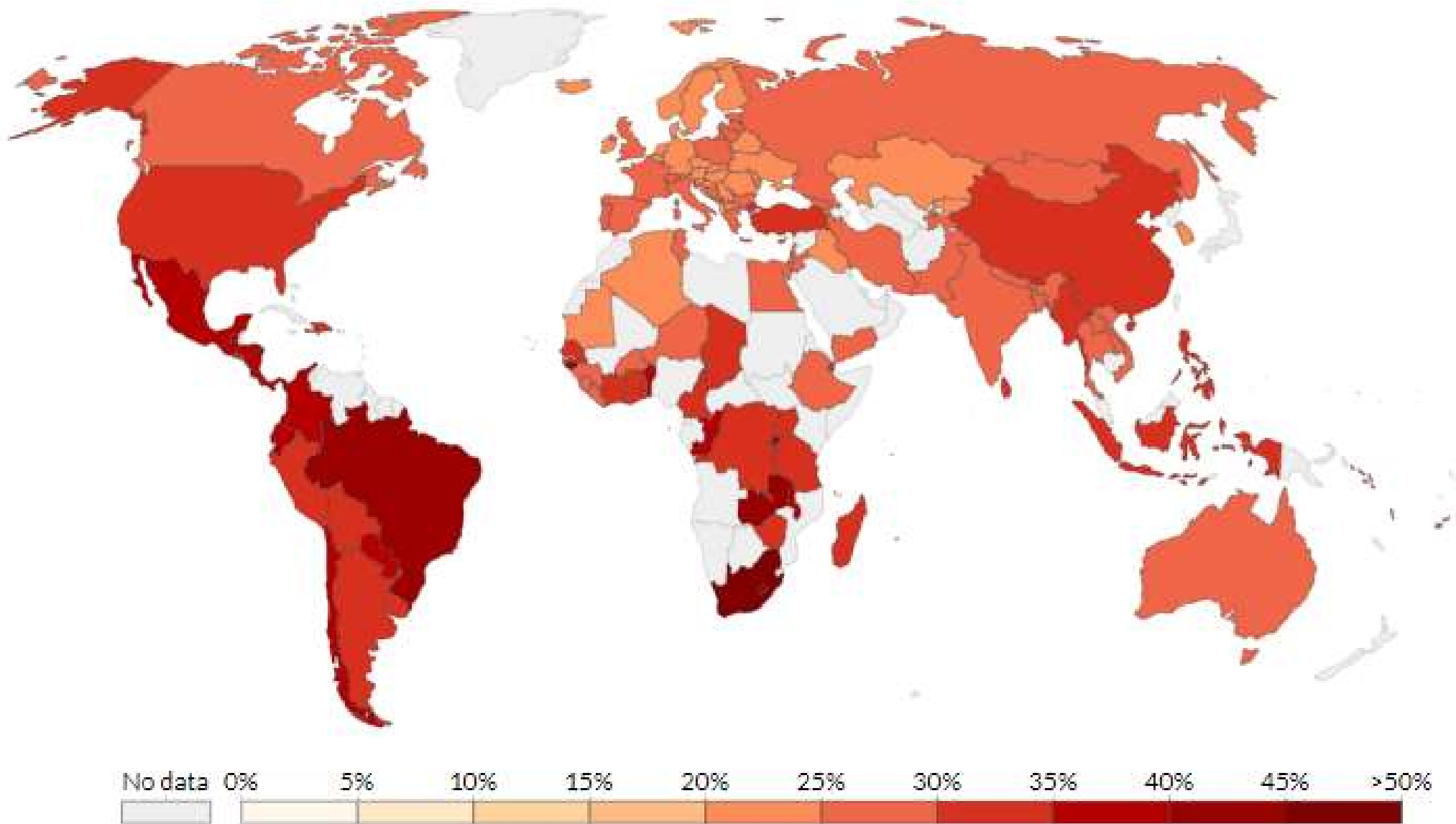
Gini coefficient, from 20 (dark blue) to 65 (light green); gray = no data

Gini coefficient or index or ratio:

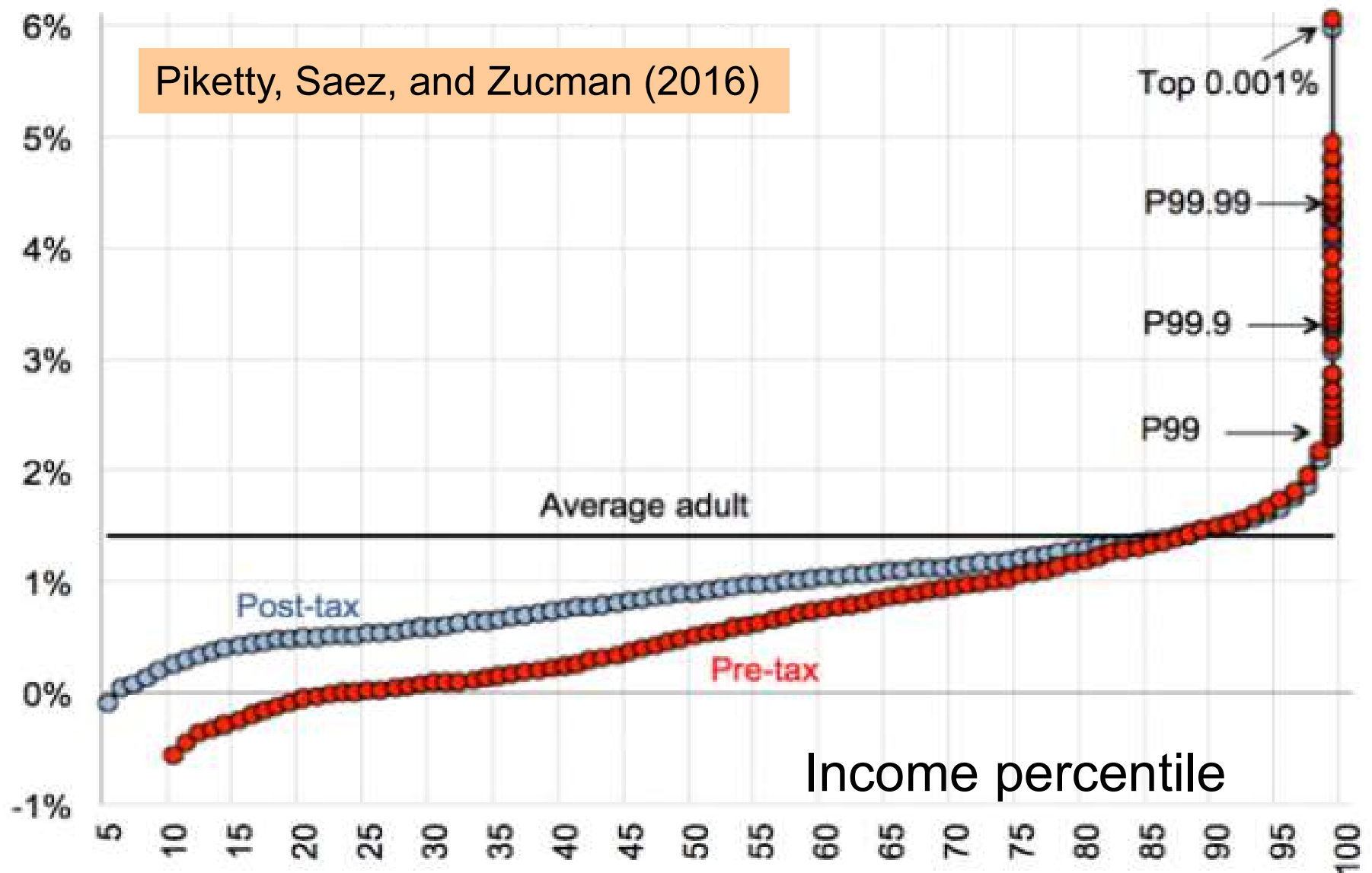
0 = Perfect equality

100 (or 1.0) = Absolute inequality

Income Share of the Richest 10%: 2015

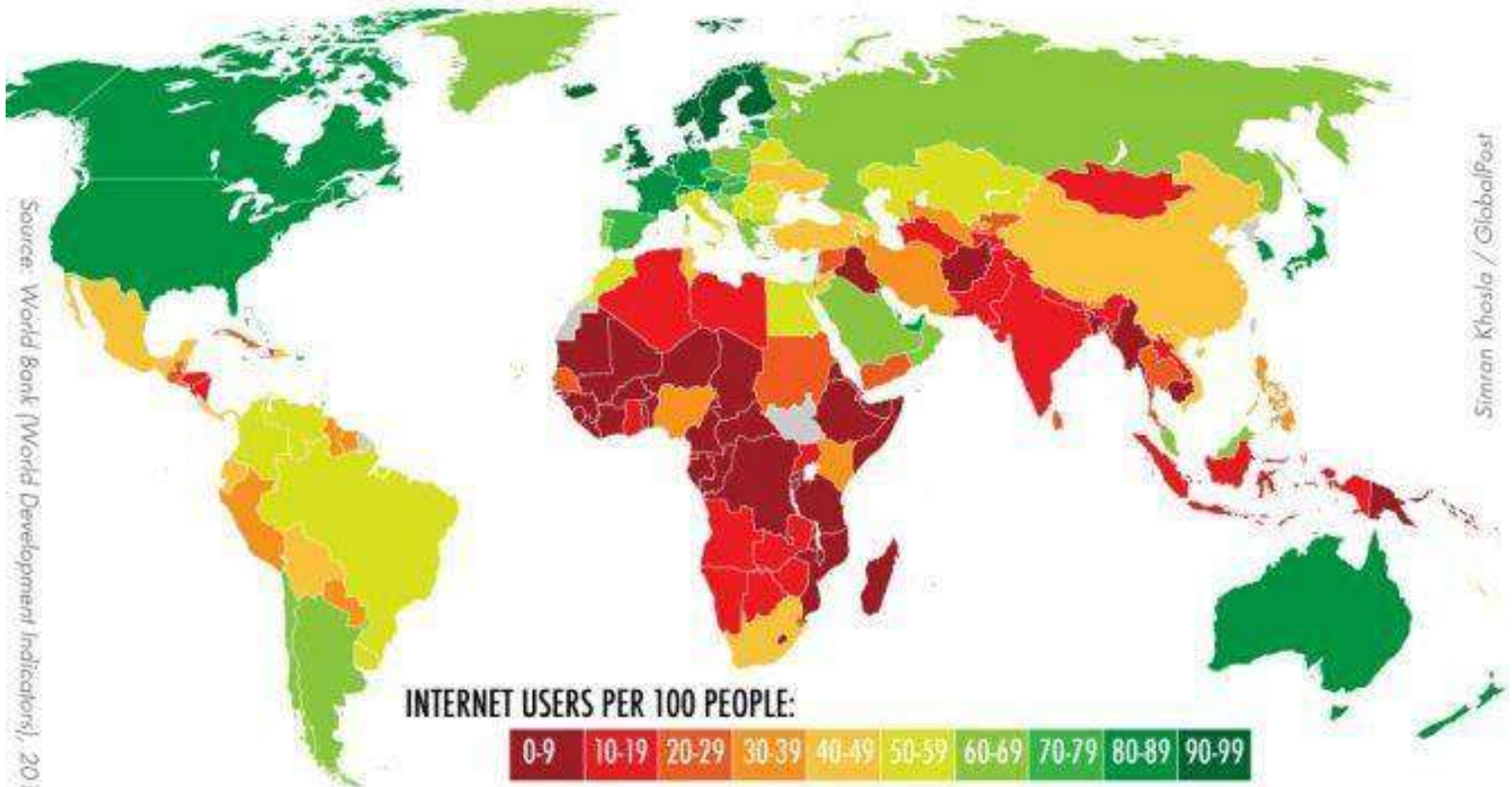


US Average Annual Income Growth: 1980-2014



Fraction of People On-Line: 2013

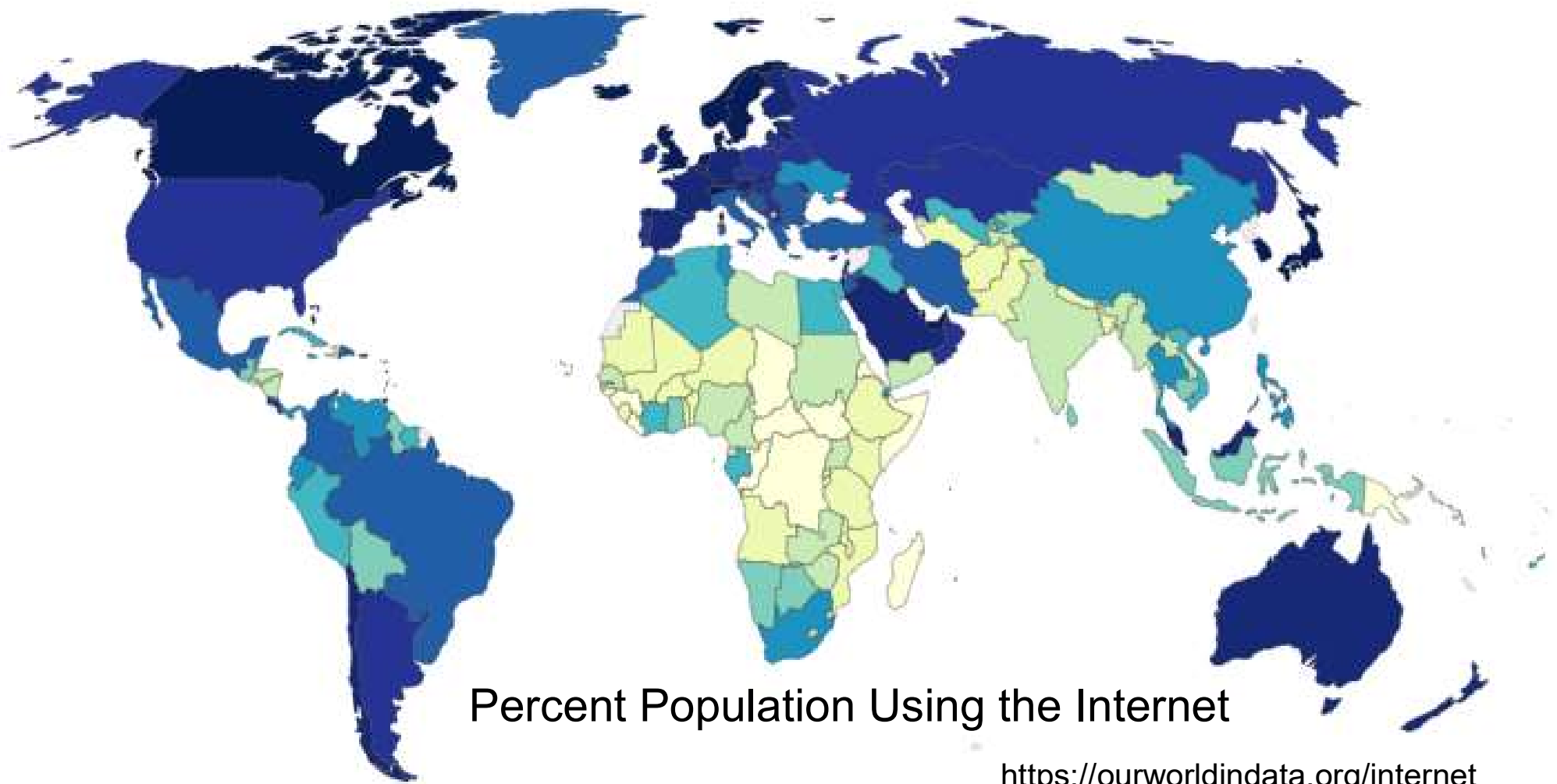
Internet Users (per 100 people):



COUNTRIES WITH THE MOST PEOPLE ONLINE

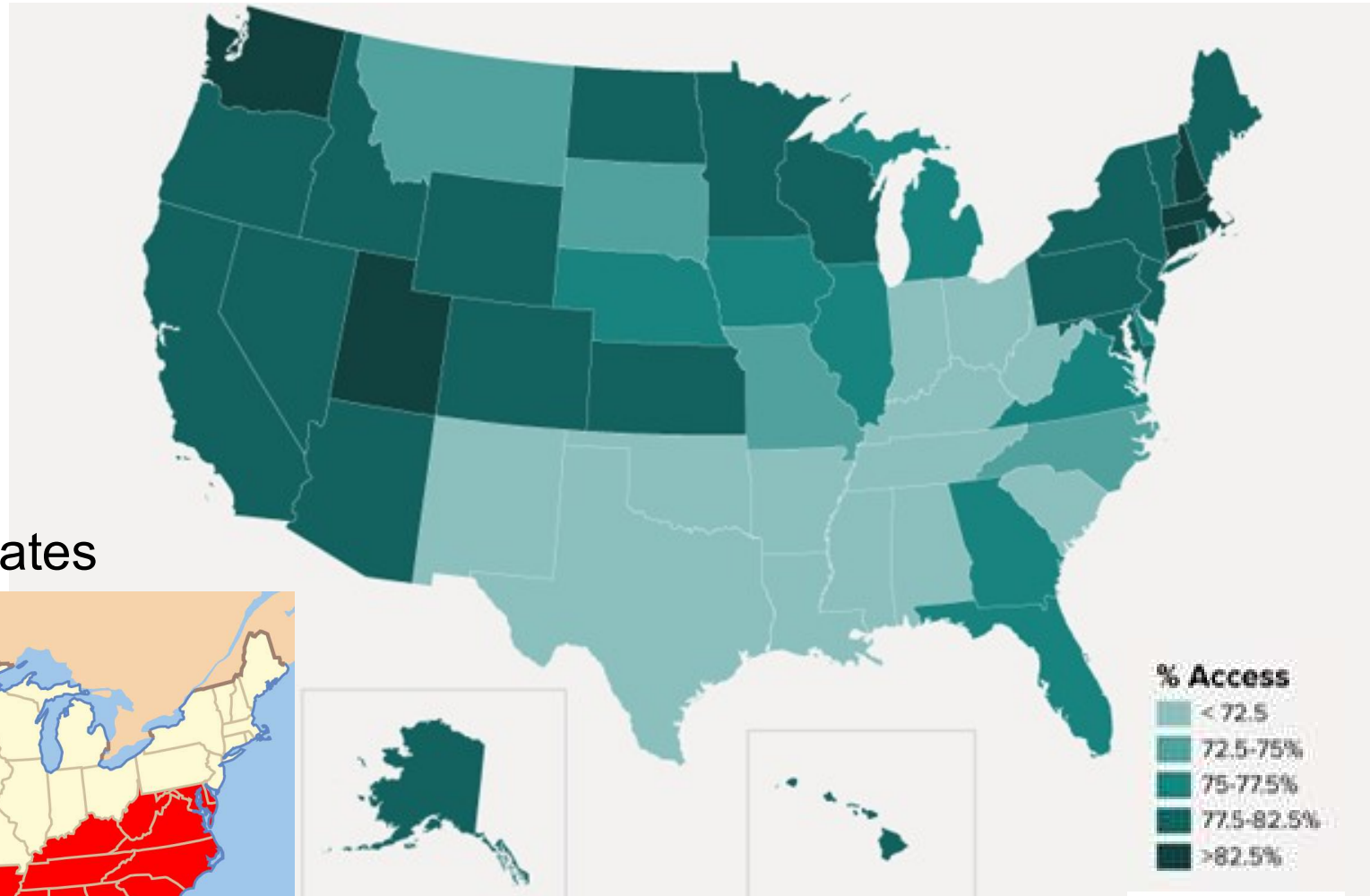
1. Iceland (97)
2. Norway (95)
3. Sweden (95)
4. Denmark (95)
5. Netherlands (94)
6. Liechtenstein (94)
7. Luxembourg (94)
8. Finland (92)
9. Bahrain (90)
10. U.K. (90)

Fraction of People On-Line: 2017

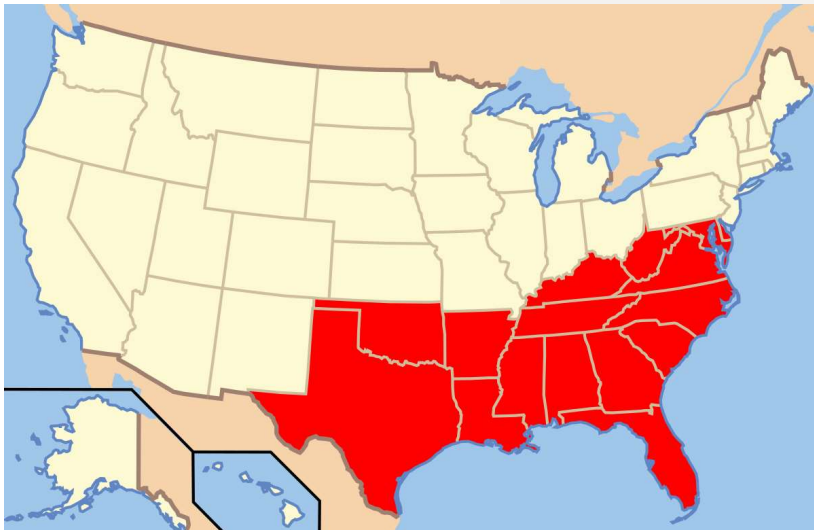


US Internet Usage by State

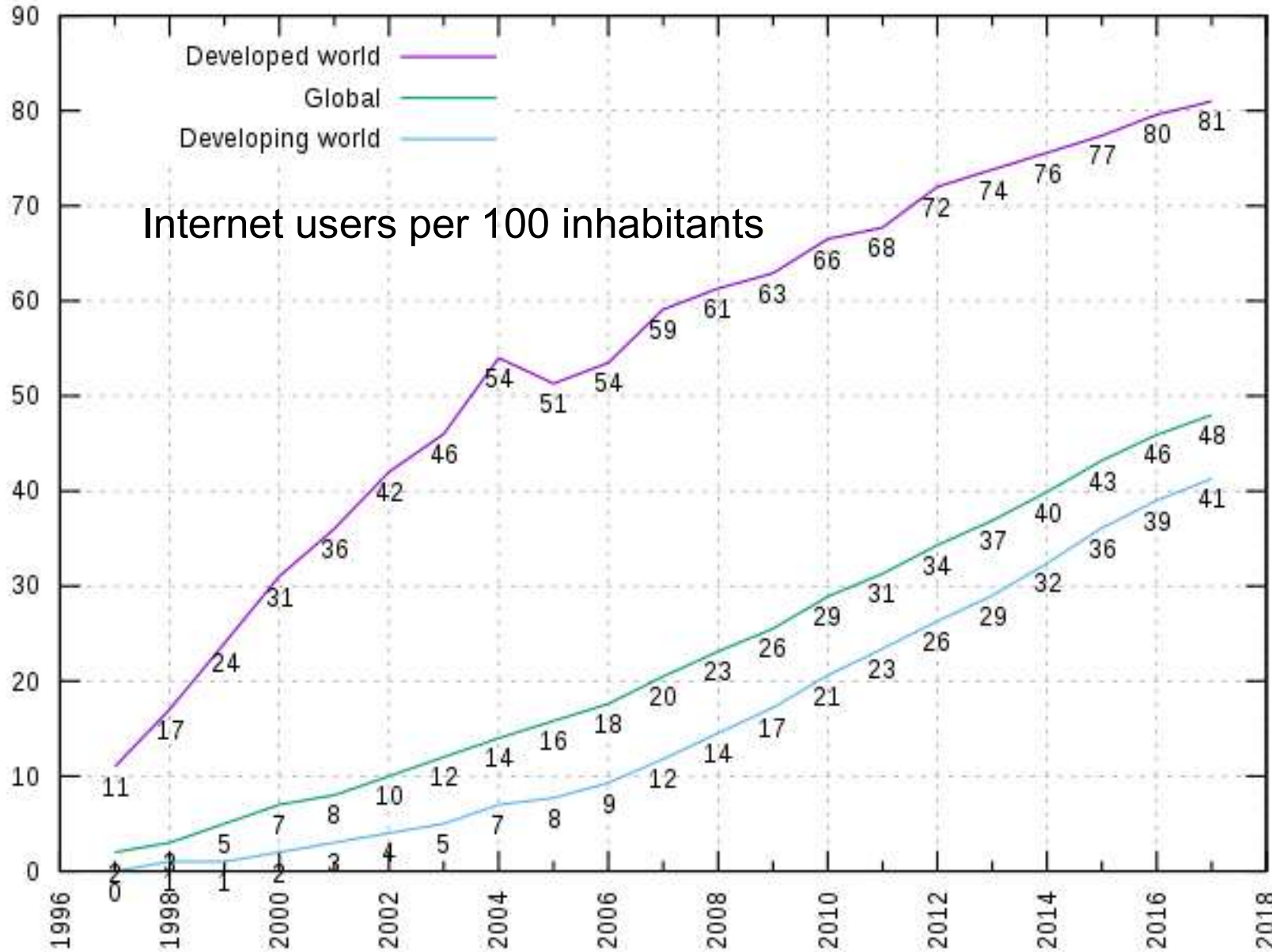
Percent of population using the Internet, by state



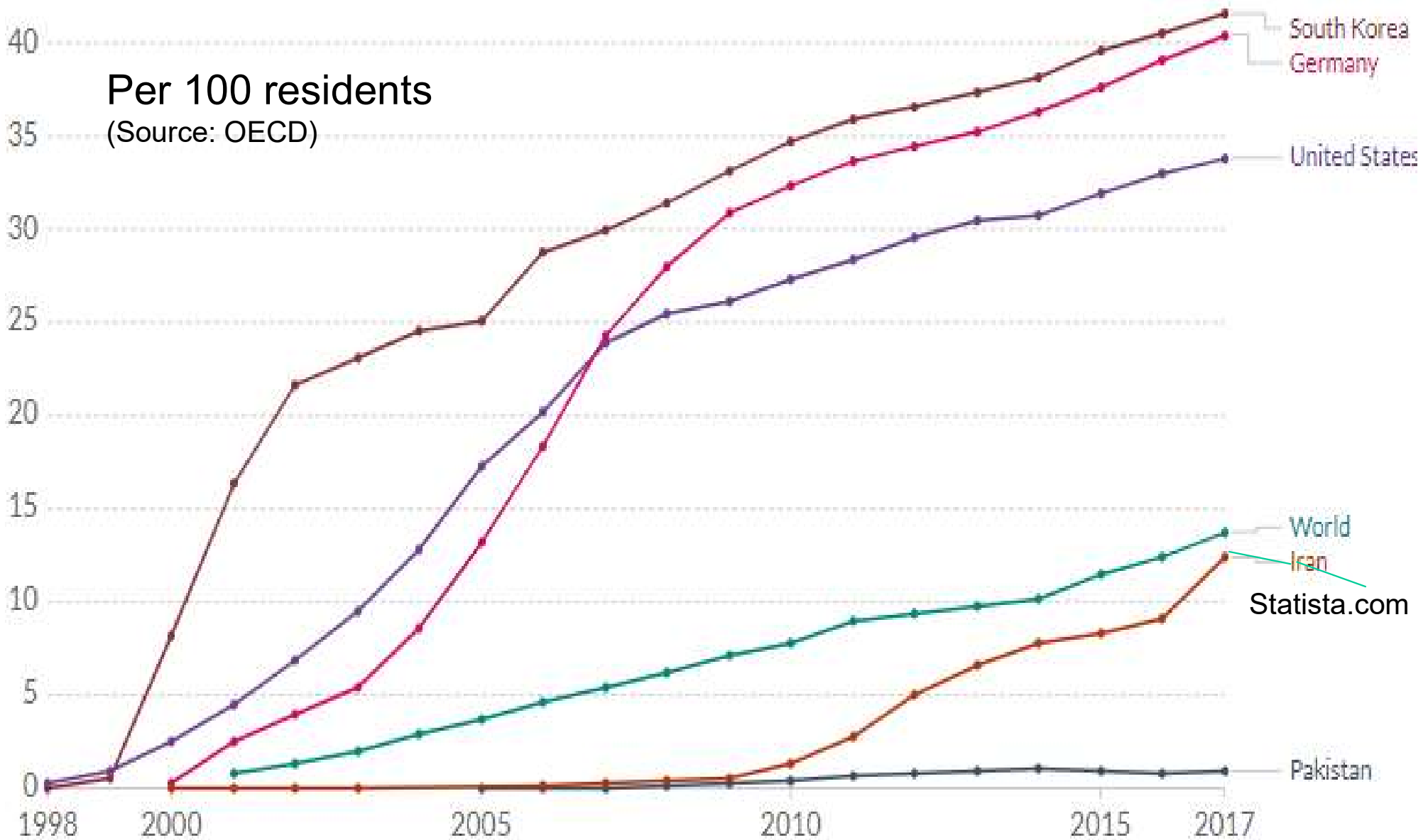
Southern United States



Internet Use: Developed vs. Developing World



Fixed Broadband Subscriptions



Statista.com

Mobile Broadband Subscriptions



Bridging the Digital Divide

Many, even in the most-advanced countries, are being excluded from digital resources

In a world driven by info, lack of access to tech leaves you in the digital dark ages

In the US, ~30M lack access to digital world (not offered to them or it's too expensive)

Access alone is insufficient; we need to provide the knowledge of use

Children learn foreign languages more easily; also adapt faster to digital world's language



TEDx talk by Jim Sevier: <https://www.youtube.com/watch?v=fzokRz1pgb0>

Digital Natives, Digital Immigrants

Today's students have grown up with computer technology: They are the digital world's natives

An average college student:
Has spent < 5000 hours reading
Played games > 10,000 hours
Watched TV ~ 20,000 hours
Isn't easily distracted
Can learn with TV on, e.g.

Digital natives have developed:
Different styles of thinking
Different ways of learning
Different goals in life



People my age had to learn about computer technology later in life: We are digital immigrants

Like other kinds of immigrants:
Some of us adapt better
Some of us keep our "accents"
Print our e-mails
Can't multi-task
Challenged by speed

We immigrants must adapt:
Try to lose our accents
Admit our way isn't best
Use graphics & hyperlinks

Marc Prensky: "Digital Natives, Digital Immigrants"

Our Physical and Digital Lives

We used to be physical beings, with our presence in the digital world a non-threatening side aspect of our existence
At UCSB, Professor Misha Sra is addressing issues in this domain as part of her research on perceptual engineering

Professor Sra: The Worldwide Web digitized information.
Social media digitized us humans and our relationships!

Our two lives are now shoulder-to-shoulder, and we need to find a way of integrating them for optimal results

In future, we will be leading hybrid physical-digital lives, in more ways than one, up to augmenting our physical bodies with digital implements for improved memory and function

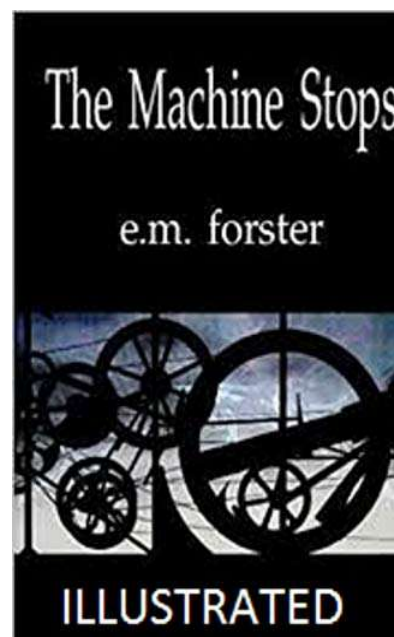
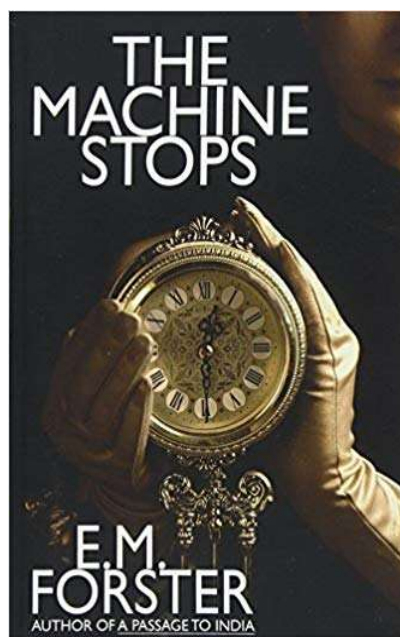


The Machine Stops

Fantasy (~12K words, 1909) by E. M. Forster [1879-1970]

Unspecified future:
People live underground
and communicate via
audio/video messages;
The “Machine” provides
all their basic needs

The New Yorker essay by
Oliver Sacks [1933-2015],
published in Feb. 2019



Young man to his mom: “We have lost the sense of space. ... We have lost a part of ourselves. ... Cannot you see ... that it is we that are dying, and that down here the only thing that really lives is the Machine?”

Info Economy Makes Digital Divide Critical

Digital divide cannot be bridged by simply providing laptops to disadvantaged children or underdeveloped countries



A Child with a Laptop Can Still Be Left Behind

No quiet/private place at home

No one to help with technical or academic problems

Sites where information can be obtained may be blocked

Bandwidth may be insufficient for visual resources

Bandwidth may be insufficient for multiple household users

Unreliable connection, frequent service disruptions

The COVID-19 experience: Weaknesses & lessons

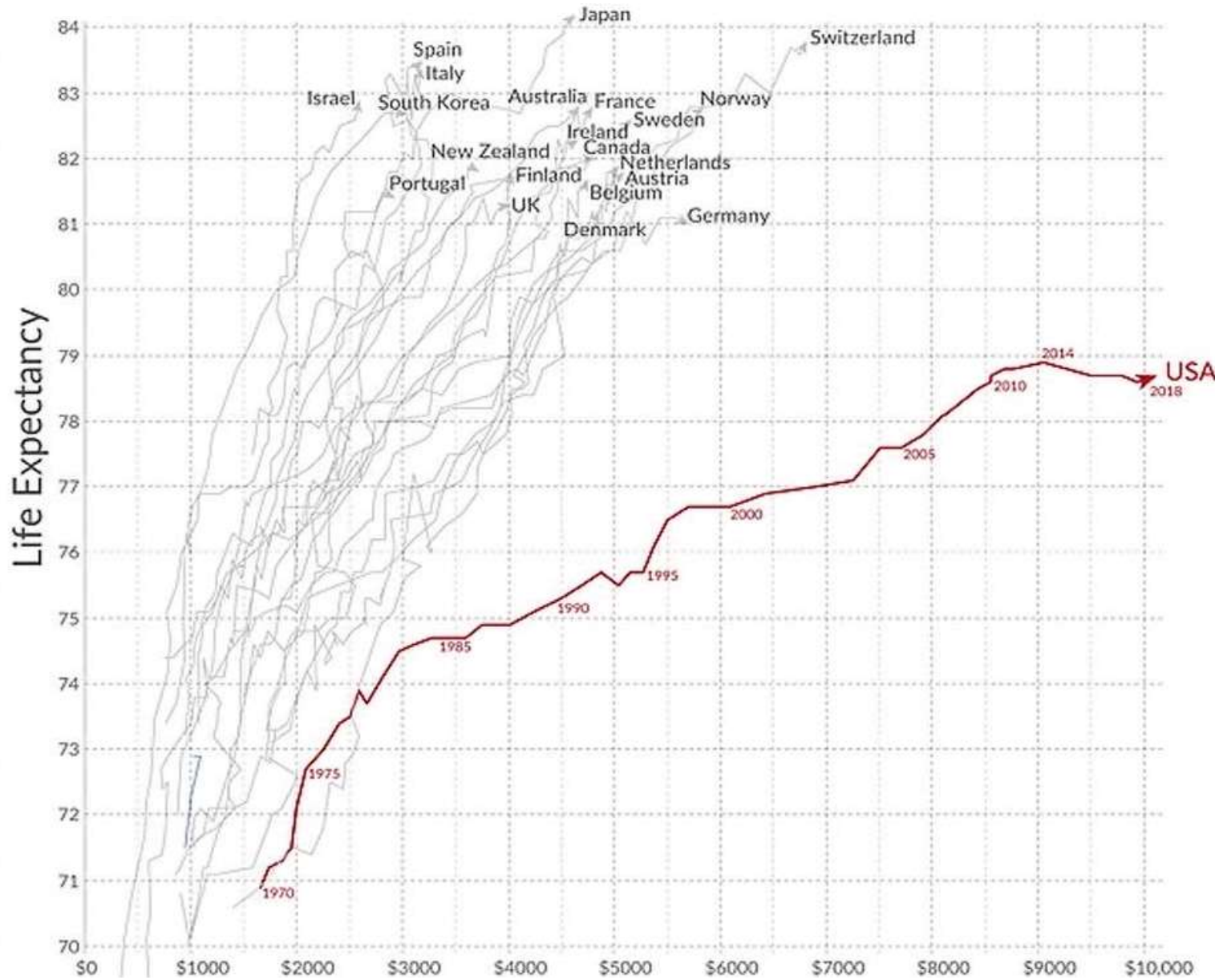
Big Data: Big Convenience or Big Headache?

Life expectancy vs. health expenditure per capita, 1970-2018

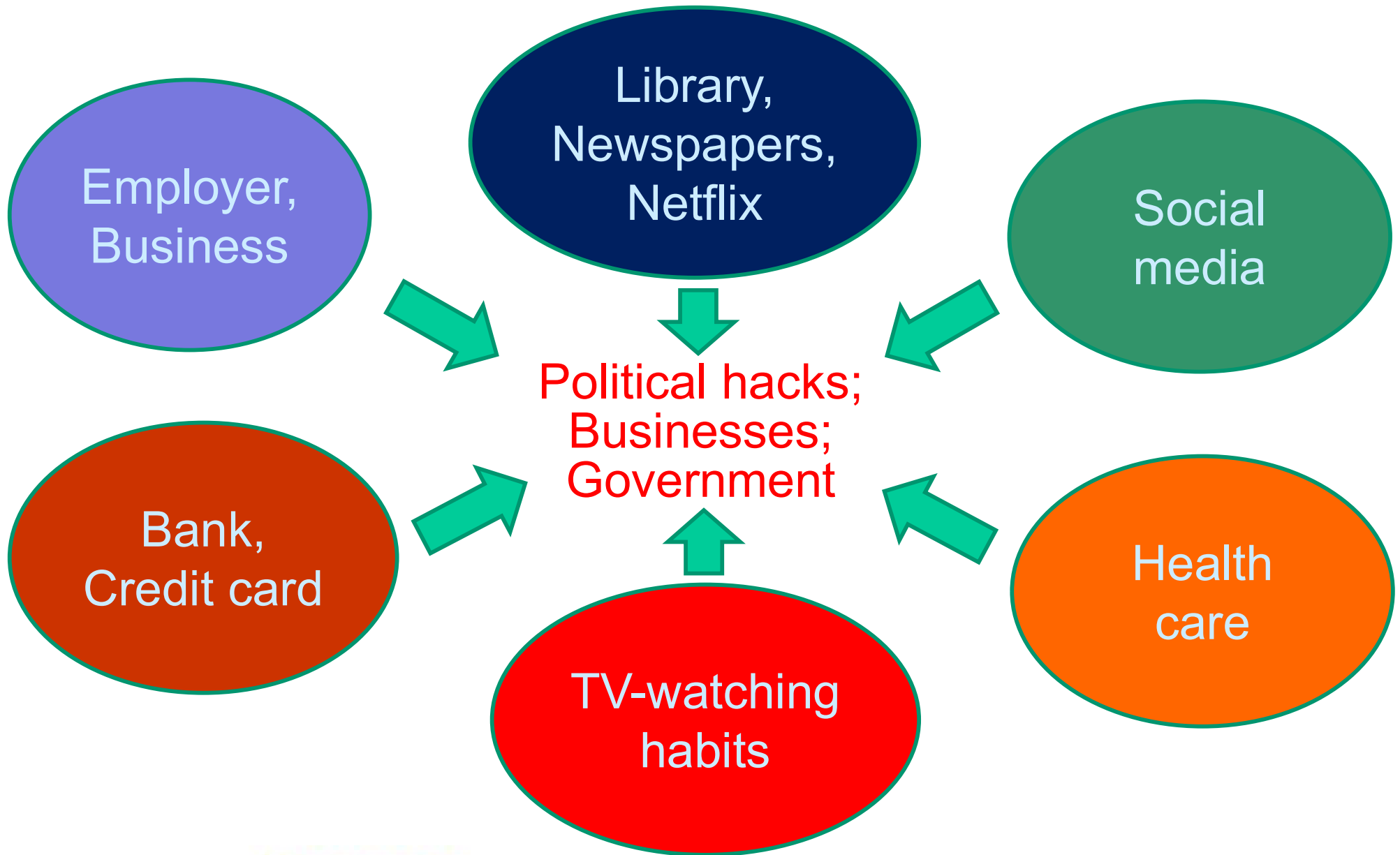
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Another example:
Data about correlation of genes with various diseases

- Predict / Cure
- Deny insurance



Why Big Data Can Be a Hazard



Your Every Move/Thought is Being Recorded



Hey Siri! Stop recording and sharing my private conversations

Roisin Kiberd

Voice assistants have a dark side, and we may be paying for their limited benefits with our privacy

Tue 30 Jul 2019 08.38 EDT



© marketoist.com



Data Privacy Laws in the US

Many states have their own laws

No comprehensive federal data-protection/privacy law

Patchwork of sector-specific, medium-specific laws

Both GDPR* (EU) & CCPA* (CA) give consumers rights to access, delete, & opt out of processing at any time

*GDPR: General Data Protection Regulation (Europe)

*CCPA: California Consumer Privacy Act



Applies only to for-profit companies

Consumer = California resident

Broad definition of personal info

Contact info; Medical; Genetic;

Geo-location; Internet activity;

Education/Employment history;

Property ownership; Purchases

Right to opt out

Right to know/access

Right to portability and deletion

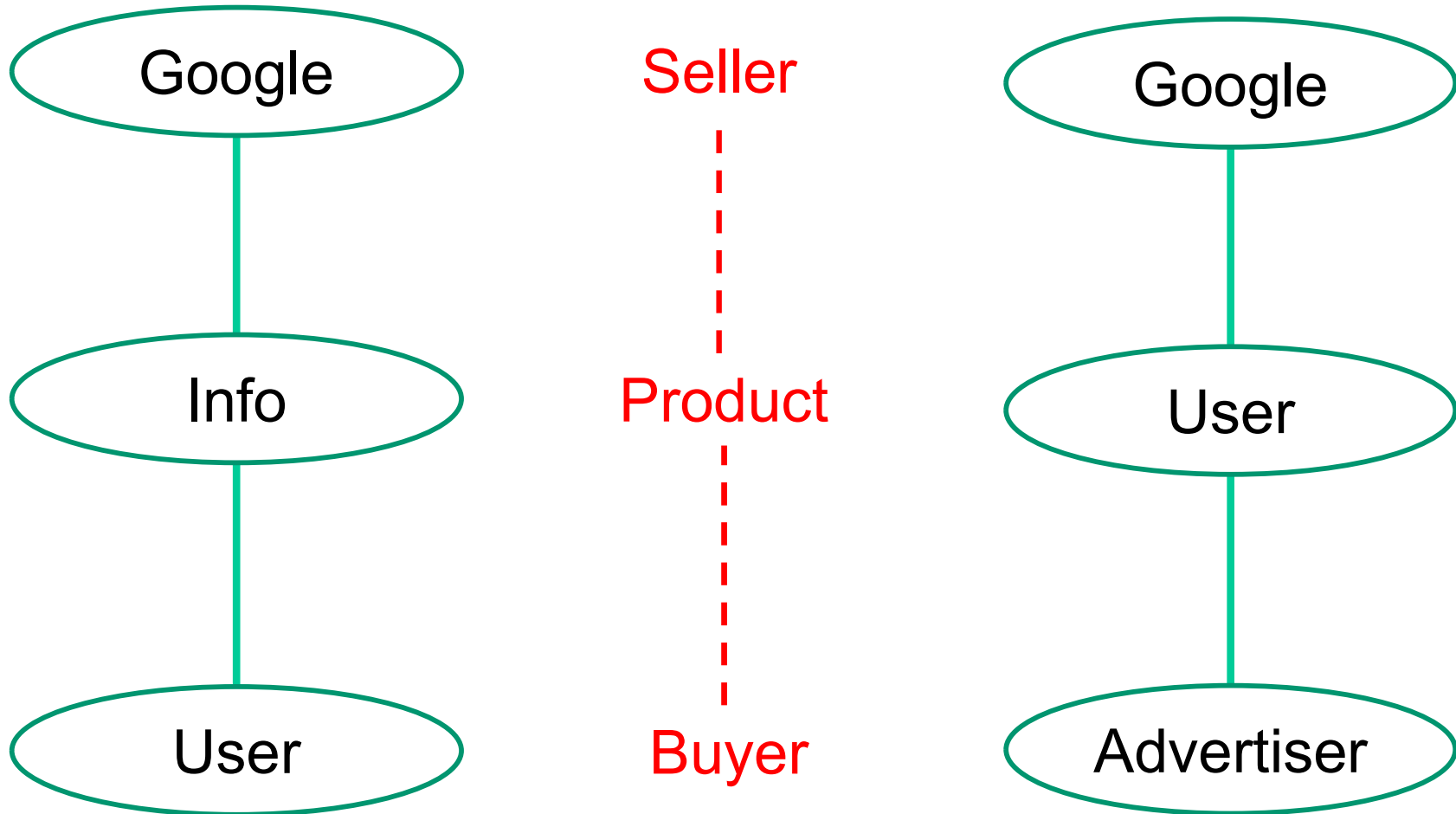
Right to equal services and price

Right of legal action for negligence

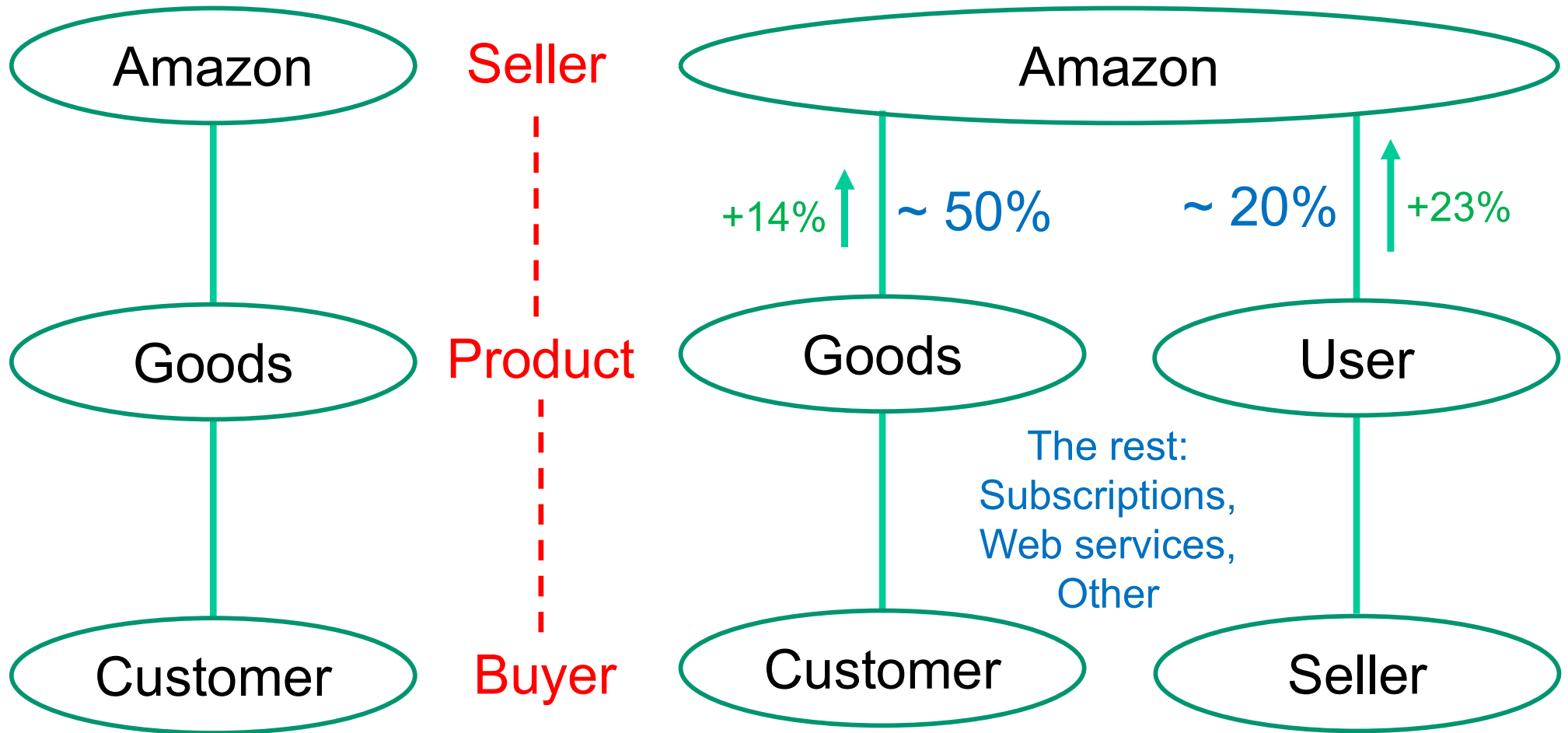
Disclosure of personal info sold

Disclosure of privacy policies

We Are the Products, Not Consumers



We Are the Products and Consumers



Big Data, Surveillance, and Politics

Responses from registered voters to the question: How have you been getting most of your news about the presidential election campaign? *

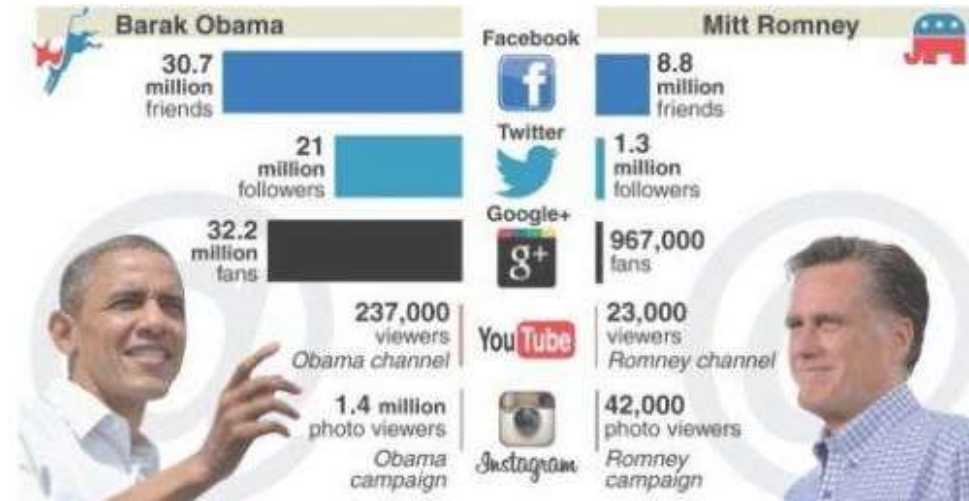
| | 1992 | 1996 | 2000 | 2004 |
|---------------|------|------|------|------|
| Television ** | 82% | 72% | 70% | 78% |
| Network | 55% | 36% | 22% | 36% |
| Local | 29% | 23% | 21% | 17% |
| Cable | 29% | 21% | 36% | 47% |
| Newspapers | 57% | 60% | 39% | 39% |
| Radio | 12% | 19% | 15% | 17% |
| Internet | NA | 3% | 11% | 18% |
| Magazines | 11% | 11% | 4% | 3% |

George W. Bush's 2004 re-election campaign

Google's Eric Schmidt with Obama, 2008



Social media enter the scene in 2012

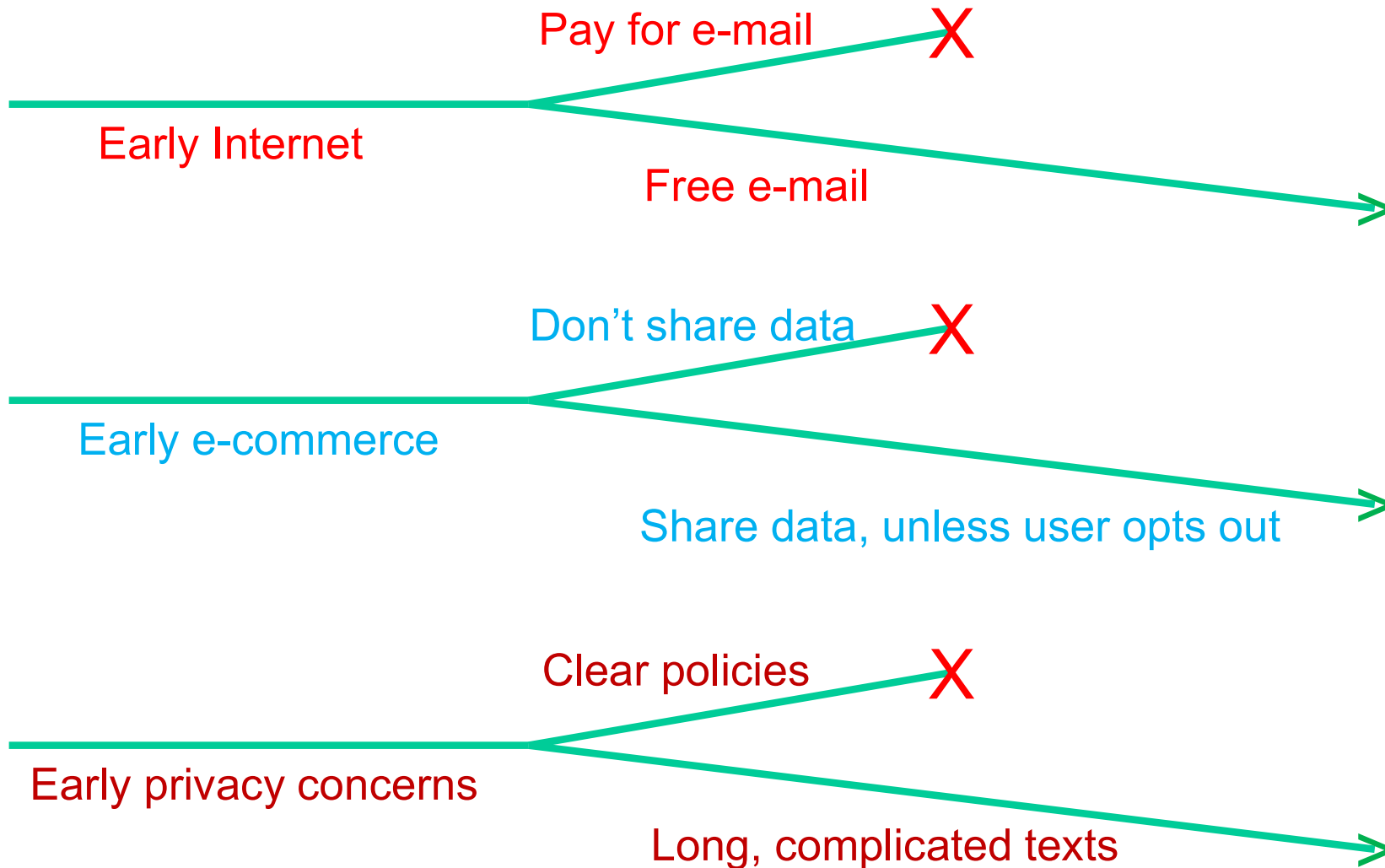


Russia's Internet Research Agency FB ads, 2016

2020?

How Did We Get Here?

The current state wasn't inevitable: We had choices along the way



Engineering / Tech Ethics

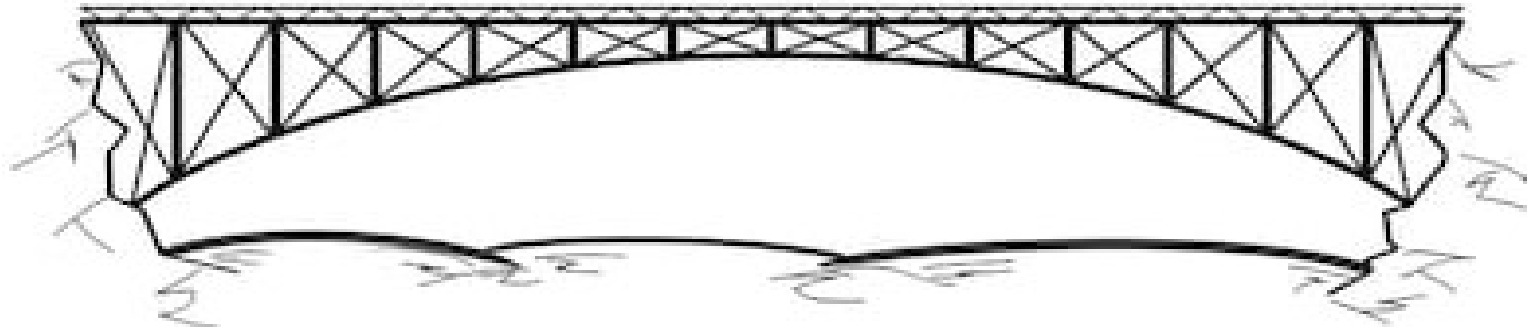
No longer acceptable: “I just invent / design / build widgets. They can be used for good or bad. That’s not my responsibility!”

Teaching about ethics in a single, separate engineering course (which is sometime optional) won’t solve our problems

Ethics must be incorporated in every course!

In the same way that reliability and safety concerns must be incorporated in every design course

We don’t teach about bridge-building in one course and about how to prevent bridges from collapsing in another



Advertisers Compete for Your Attention

You type your search query

Keywords are matched to advertisers' keywords

Each advertiser has specified a bid for the ad auction

When you win the bid, you pay the second highest bid

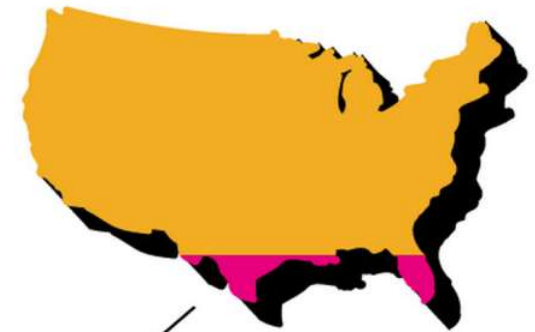
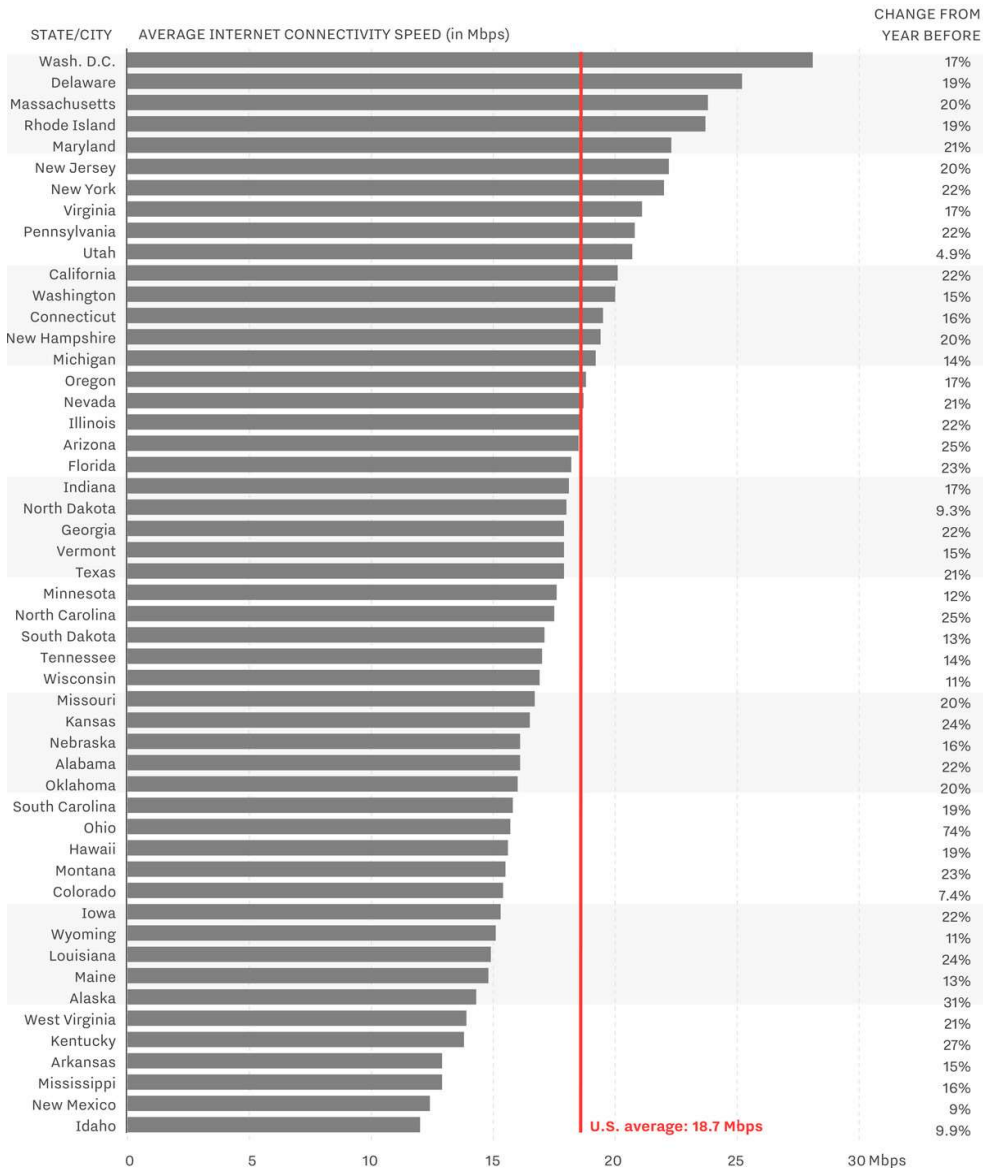
Order of advertisements isn't just based on bids

Quality of ad (contents relevant and original) also matters

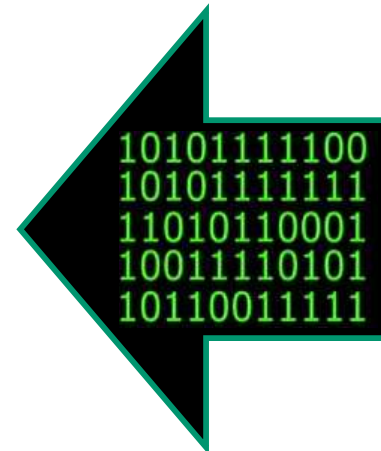
| | Bid | Quality | Format Impact | = Ad Rank |
|--|-----|---------|---------------|-----------|
| | \$4 | LOW | NO FORMATS | 5 |
| | \$3 | HIGH | LOW | 15 |
| | \$2 | HIGH | HIGH | 20 |
| | \$1 | MEDIUM | MEDIUM | 8 |

https://www.youtube.com/watch?v=SZV_J92fY_I

Digital Gap vs. Wealth/Income Gap



In 1978 the richest 1% owned 7% of the wealth.



The richest 1% now owns 23% of the wealth. Now ~40%

Source: Akamai | Data for Q1 2017, Internet Protocol version 4

recode

July 2022



Data Abuse & Tech Divide

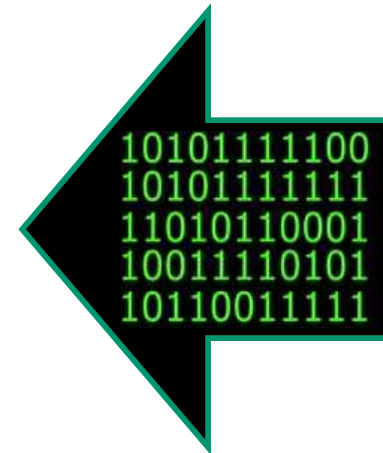
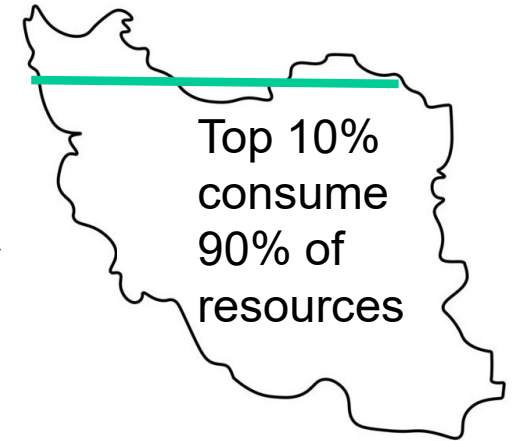


Slide 33

Internet Usage and Wealth Gap in Iran

Internet speed ~12.8 Mb/s
Ranked 104 of 130 countries
Internet-based econ <1% of GDP
In the UK, it's ~ 13%
Internet penetration ~ 53%
In Tehran, it's ~ 77%

Top 3 visited Web sites in Iran
Google, Instagram, Digikala
Wikipedia (Communications in Iran)



<https://www.iranfocus.com/en/life-in-iran/34007-iran-extreme-poverty-wealth-is-in-the-hands-of-10-percent-of-society/>

COMMUNICATIONS

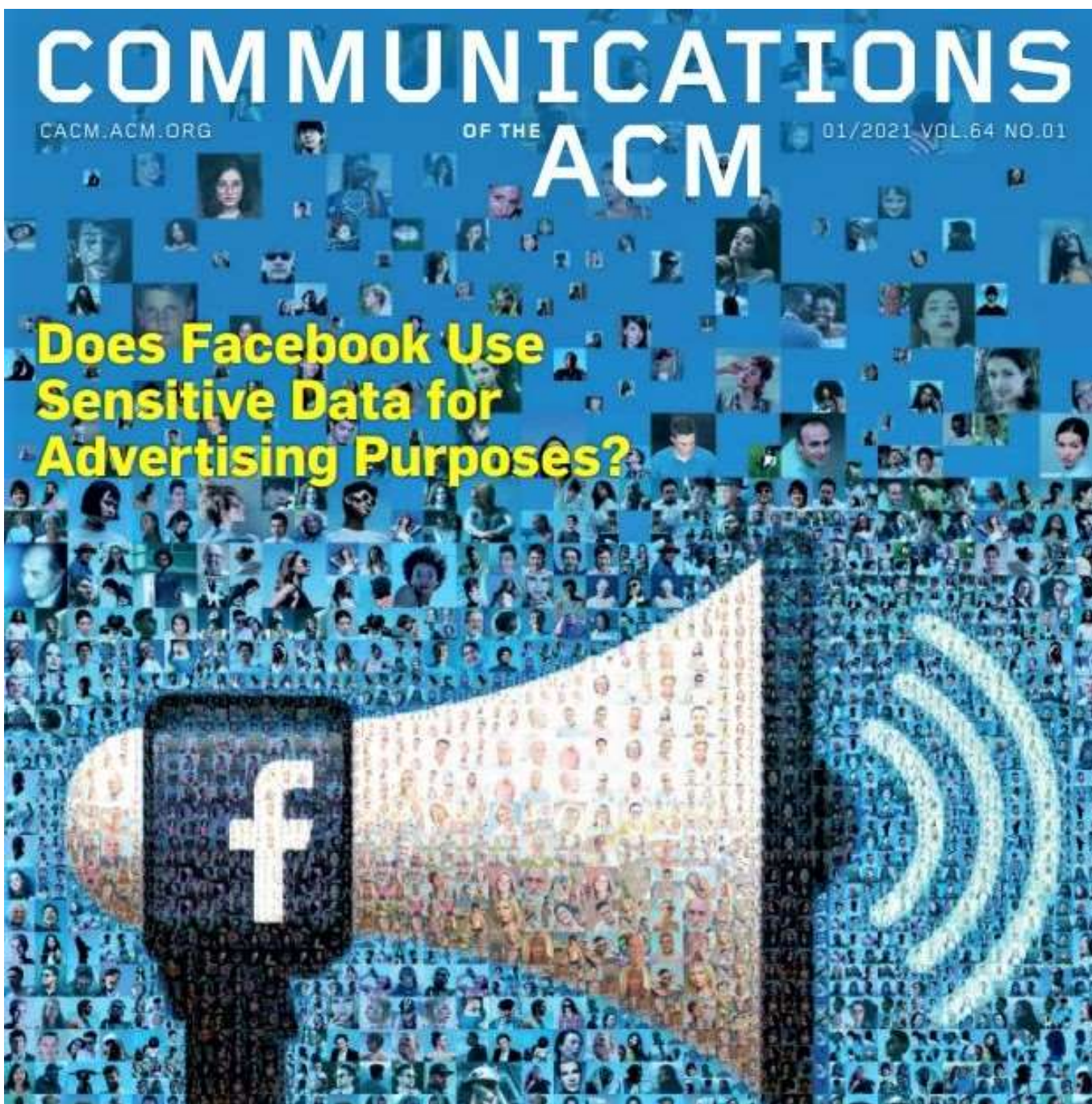
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01/2021 VOL.64 NO.01

ACM

Does Facebook Use Sensitive Data for Advertising Purposes?



Background

Advertisers configure their ad campaigns through the FB Ads Manager.^a It allows advertisers to define the audience (that is, user profile) they want to target with their advertising campaigns. It can be accessed through either a dashboard or an API. The FB Ads Manager offers advertisers a wide range of configuration parameters such as (but not limited to): location (country, region, and so on), demographic parameters (gender, age, among others), behaviors (mobile device, OS and/or Web browser used, and so on), and interests (sports, food). The interest parameter is the most relevant for our work. It includes hundreds of thousands of possibilities capturing users' interest of any type. The FB Ads Manager provides detailed information about the configured audience. The most relevant element for this article is the *Potential Reach* that reports the number of monthly active users in FB matching the defined audience.

In parallel, FB assigns to each user a set of ad preferences, that is, a set of interests, derived from the data and activity of the user on FB. These ad preferences are indeed the interests offered to advertisers in the FB Ads Manager.^b

Section 230 and It's Consequences

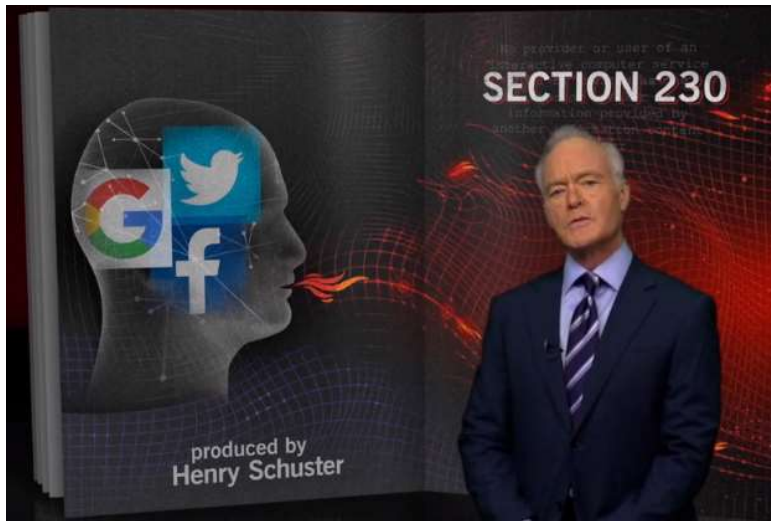
Communication Decency Act, a US law enacted in 1996, says: Internet platforms are not liable for what users post

From CBS “60 Minutes” expose, aired on Sunday, 2021/01/03:

- One woman was accused, in ~70 posted videos, as being a murderer responsible for spreading COVID-19
- A father couldn't remove the video of his daughter's murder from YouTube

CBS “60 Minutes” expose

<https://www.cbsnews.com/video/section-230-internet-60-minutes-2020-01-03/#x>



The tech industry loves it!

SECTION 230: THE “MOST IMPORTANT LAW IN TECH”

Section 230 of the Communications Decency Act is regarded as “the most important law in tech” because it promotes “the continued development of the Internet” by averting the risk of unpredictable liability for online services – which would have an “obvious chilling effect” on speech.

However, if liability protections are weakened:

Lost every decade:

- ↓ \$440B GDP
- ↓ 4.25M jobs

71% of investors would be uncomfortable investing in intermediaries

81% reduction in interest by angel investors

Section 230 enables:

100,000+ personnel in the Internet industry to engage in content moderation

Computer & Communications Industry Association

Sources: NERA Economic Consulting, Fifth Era, Booz & Co., Wired

Questions?

To dig deeper, see:

Mark Bauerlein (ed.), *The Digital Divide: Arguments for and Against Facebook, Google, Texting, and the Age of Social Networking*, Penguin, 2011

(Particularly, Marc Prensky's "Digital Natives, Digital Immigrants")

Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, Profile Books, 2019

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