IS1103 IS Innovations in Organisations and Society [revamped]

Lecture 12 – Digital Social Ecosystem I

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Who is this person?

• Elizabeth Holmes, founder of Theranos, a blood-testing start-up based on SV.

• Raised more than US$700 million from investors and was valued at US$9 billion at its peak.

• Claimed to have technology to run comprehensive lab tests using just a few drops of blood

• A pitch that appealed to Walgreens, which partnered with Theranos to offer the blood tests in its stores

• Justice department: "a multi-million dollar scheme to defraud investors, and a separate scheme to defraud doctors and patients."

• "the analyzer, in truth, had accuracy and reliability problems, performed a limited number of tests, was slower than some competing devices, and, in some respects, could not compete with existing, more conventional machines." "

Source: https://www.npr.org/2018/09/05/644844174/theranos-blood-testing-company-accused-of-massive-fraud-says-it-will-dissolve

“Many students find it difficult to pinpoint a specific transgression that flipped their perception of Silicon Valley, simply because there have been so many.

For **Facebook** it was not only the Russian meddling, but also last year’s Cambridge Analytica privacy scandal, which showed the company’s carelessness with user data.

At **Uber**, a 2017 blog post by Susan Fowler detailed a workplace rife with sexual harassment, which only compounded growing criticism of the way the company treated drivers and local governments.

Studies investigated how **Apple**’s iPhone was becoming addictive among children, causing increased risks of depression and suicide.

Amazon’s facial recognition software was pitched for government surveillance in 2018, and

at **Microsoft**, employees signed a petition protesting the company’s contract with ICE [US military].

At **Google**, 20,000 workers walked off the job last November because of the unsavory manner in which the company paid off an executive accused of sexual harassment.”

Source: https://www.theringer.com/tech/2019/2/6/18212421/stanford-students-tech-backlash-silicon-valley-next-generation

“It seemed super empowering that a line of code that I wrote could be used by millions of people the next day. Now we’re realizing that’s maybe not always a good thing.” — Matthew Sun, Stanford junior

In Niu’s mind, “social good” referred mainly to the positive applications of technology. But stopping bad uses of tech is just as important as promoting good ones. That’s a lesson the entire Valley has been forced to reckon with as its benevolent reputation has unraveled.

“Most of our programming had been ‘Look at these great ways you can use technology to help kids learn math,’” Niu says. “There was this real need to not only talk about that but to also be like, ‘It’s not just that technology is neutral. It can actually be really harmful.’” - Vicki Niu, a 2018 Stanford graduate who majored in computer science

Source: https://www.theringer.com/tech/2019/2/6/18212421/stanford-students-tech-backlash-silicon-valley-next-generation

How can we “solve” the primary problem we have created?

Ecology for Responsible Research and Innovation

- **Background**:
  - Idea of responsible research and innovation is coined in EU, as defined in Responsible Innovation Research programme of the Dutch Science Council (NWO-MVI)
  - Research and innovation approach aiming to take into account effects and potential impacts on environment and society
  - RRI approach has to be a key part of the research and innovation process and should be established as a collective, inclusive and system-wide approach

- **Definition**: comprehensive approach of proceeding in research and innovation in ways that allow all stakeholders to be involved in the processes of research and innovation at an early stage (A) to obtain relevant knowledge on the consequences of the outcomes of their actions and on the range of options open to them and (B) to effectively evaluate both outcomes and options in terms of societal needs and moral values and (C) to use these considerations (under A and B) as functional requirements for design and development of new research, products and services.

- **Why RRI**: Innovative development pathways should no longer focus just on the techno- economic system that delivers economic growth, but on the whole social-cultural- ecological system embracing the natural world, the socio-cultural world and interactions between the two

- **Four defining features**:

1. Anticipation - explore in advance the possible consequences of your innovation, including the undesirable and unintended ones
2. Inclusion of stakeholders in the innovation process - whether as intended users or not should have a say in its design, development, and implementation
3. Reflexivity - aim is to avoid information deficits and tunnel vision by creating an environment where assumptions are made explicit and probed from different perspectives
4. Responsiveness - technology actors and policy makers need to translate the results of the deliberations into the design, development, and implementation of technology

Source: Responsible Innovation 3 – A European Agenda?, Springer, 2017

Anticipation and Entrepreneurship

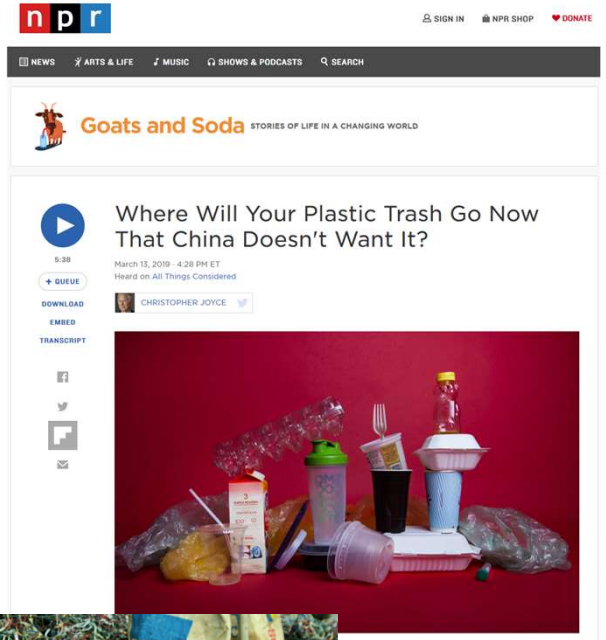
- Business ethics/Corporate citizenship – 'People, Planet, Profit'
  - 'People' - moral values of safety, health, and employment
  - 'Planet' - the moral value of sustainability
  - 'Profit' - the precondition for achieving 'People' and 'Planet'

- Anticipation was for a long time largely framed in terms of a division of tasks between private companies and public government
  - entrepreneurs anticipate what people wanted (or to make them want it) and then to make a profit by catering to these wants
  - Anonymous market forces decide what is (un)desirable are in the model. That is, citizens influence technology development not through collective deliberation, but by privately 'voting' with their wallet
  - Government protects long- term interests by installing an accountability regime that incentivizes private firms to not explode people, poison them, or devastate the natural environment

- Problem:
- Private firms tend to be averse to engage in risky, long-term, large scale projects.
- To avoid procrastination and stimulate innovation, governments step in to shoulder those costs and risks collectively.
- The burden of technological innovation is thus shifted from private entrepreneurs to ordinary tax paying citizens.
- Internet, for example, was not developed in Silicon Valley by daring visionaries, but by successive American governments.
- Similarly, the Dutch government massively invested in genomics and nanotechnology to create a space sufficiently safe for entrepreneurs.

Stakeholder Inclusion and New Social Media

- New social media have considerably enhanced the capacities of citizens to challenge expert's accounts and to concoct and advertise their own versions of reality
- New social media have made it less easy for the West to externalize, outsource and hide technology's negative consequences to far-away places
- social media yet only partially succeed in lending voice to stakeholders and disclose hidden and distant consequences; simply lack the power to make themselves heard more permanently
- new social media so far fail to provide a technological environment that is conducive to deliberation
- New social media hide things as easily as they expose them; they lend people a voice but also shut them up: post-truth, filter bubbles, fake news, Internet trolls, and a debilitating lack of civility in cyberspace



Reflexivity and Organized Skepticism

- Reflexivity needs a conducive environment: reflexivity must be facilitated
  - Most of us suffer from tunnel vision, rationalization, and all other imaginable forms of sloppy thinking
  - Are we always receptive to kindness of others to challenge us and make us aware of our placid assumptions, blind spots, flawed arguments, and cognitive mistakes like confirmation bias?

- Reflexivity is not a feature defined in opposition (skepticism) to the "common folk", but is made to depend on them

- Bringing scientists, engineers and stakeholders together in collaborative formats generates a broader and more encompassing mind-set that leads to more reliable, more robust, superior knowledge and technology. How?

- Key is to address this: "science and technology have too often failed in their promises to civil society".

- Examples:

- **Healthcare study**: through self-tracking devices, citizens produce information on their well-being, lifestyle and physiological processes, which can then be shared digitally. These enthusiastic citizens generate data for science and technology which cannot be collected without their active participation. As many diseases prove to be lifestyle related, health gains cannot simply be the result of new science and technology, but only of the subtle calibration of many heterogeneous elements and agents, ranging from medical drugs to advertisements, self discipline, patient communities, lifestyle advice and the built environment.
- **Smart city**: processes in cities can become more sustainable, efficient and safe by using Big Data and information technologies. To avoid that this becomes a top-down, technocratic, project, municipalities seek out citizens to help shape their own smart cities.

Responsiveness and Technologies

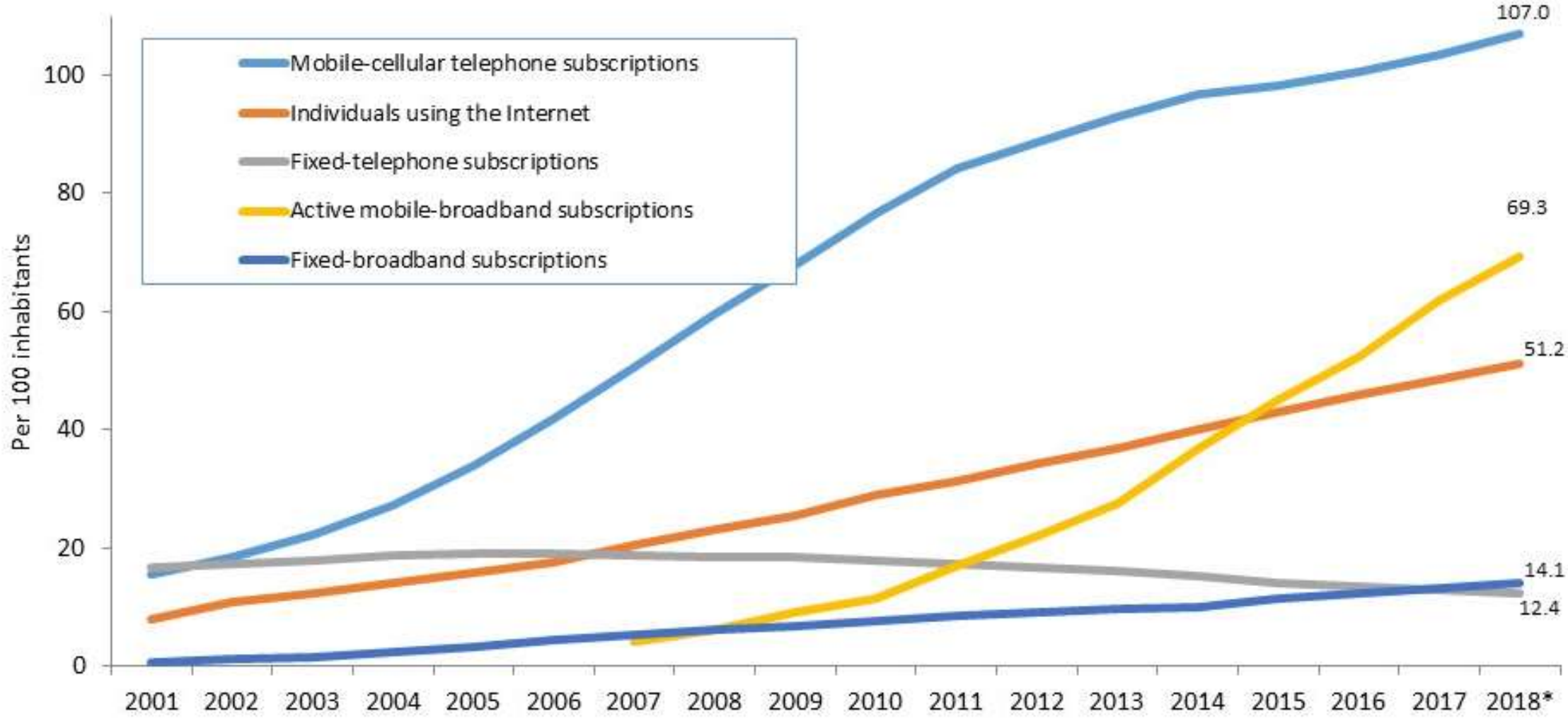
- Our belief about technology --- enhance our capability to intervene in the world, and make life easier by setting us free from undesirable tasks.
  - Technology is thus presented as an enabling device that allows the user, by giving her more free time, to conduct her life as she chooses to.
  - Instrumentalist perception of technology thus perfectly aligns with a modern, individualist, liberal view of society and the good life

- Some concerns on technology can be easily assessed, i.e. those that are non-controversial instances of harm, appealing to widely-held values like health, safety, sustainability, economic growth and employment. Example: people die from an explosion or from radiation, that is unequivocally bad – because harmful.

- Some other concerns may not be easily assessed individually but by the increasing entanglement of technologies and life world
  - Technology is now in us, for example as pacemakers, deep brain stimulation, or maybe simply in the form of medication for chronic diseases
  - Technology is between us, in the form of communication technology
  - Technology is about us - data about our most private bodily processes, mental states, and activities are stored in databases, and made available for endless comparisons and statistical mining
  - Technology starts to become like us, as in the case of robots

Digital divide

Global ICT developments, 2001-2018*



lote: * Estimate

ource: ITU World Telecommunication/ICT Indicators database

ITU 2018 global and regional ICT estimates

- ITU, the United Nations specialized agency for information and communication technologies (ICTs)
- at the end of 2018, 51.2 per cent of the global population, or 3.9 billion people, will be using the Internet.
- in developed countries, slow and steady growth increased the percentage of population using the Internet, from 51.3 per cent in 2005 to 80.9 per cent in 2018
- strongest growth was reported in Africa, where the percentage of people using the Internet increased from 2.1 per cent in 2005 to 24.4 per cent in 2018
- Growth in mobile cellular subscriptions in the last five years was driven by countries in Asia-Pacific and Africa regions. Growth was minor in the Americas and the CIS region while a decline was observed in Europe and the Arab States.

Why do we care?

Source: https://www.itu.int/en/mediacentre/Pages/2018-PR40.aspx

Digital divide

- Technological inequalities among people in one country and between countries --- technologically deprived
- How to measure: indicators concern communication technologies such as radio, television, the press, fixed and cellular telephones, fax machines, computers, and connectivity to the Internet, and participation in cyber activities for all members of a society
- enablers of the digital divide: access, relevant technology, humanware (human capacity), infrastructure, and enabling environment
- causes of the digital divide: geography, age, education, income, race, and ethnicity

Source: https://www.itu.int/en/mediacentre/Pages/2018-PR40.aspx

Enabler of digital divide - access

Access obstacles may include, but are not limited to, costs involved in:

- ❑ acquiring the technologies,
- ❑ availability of free or low-cost facilities in the neighborhood,
- ❑ the ability to travel to places where there are low-cost access points such as libraries and community centers, and
- ❑ having the capacity needed to utilize the technologies.

Access obstacles can broadly be grouped into five categories:

1. Geography
   - ➢ rich industrialized countries of the northern hemisphere VS. the poor, less industrialized countries in the southern hemisphere
   - ➢ urban and suburban areas

2. Income
   - ➢ Pew Research Center study of the US population: household income is the greatest predictor of Internet and other ICT technologies' use.
   - ➢ Households earning more than $75,000 a year significantly outpace lower-earning households, particularly those making less than $30,000 a year

Enabler of digital divide - access

Access obstacles can broadly be grouped into five categories (continues)

3. Ethnicity

- According to NTIA 2000 study, in the USA, blacks and Hispanics are twice as likely as their white counterparts not to have a computer and access to the Internet
- However, mobile technology has become an equalizer of sorts, in some aspects, as it brings computers and the ability to access Internet and the Web, at the same rate as whites, in the hands of minorities like Latinos and blacks

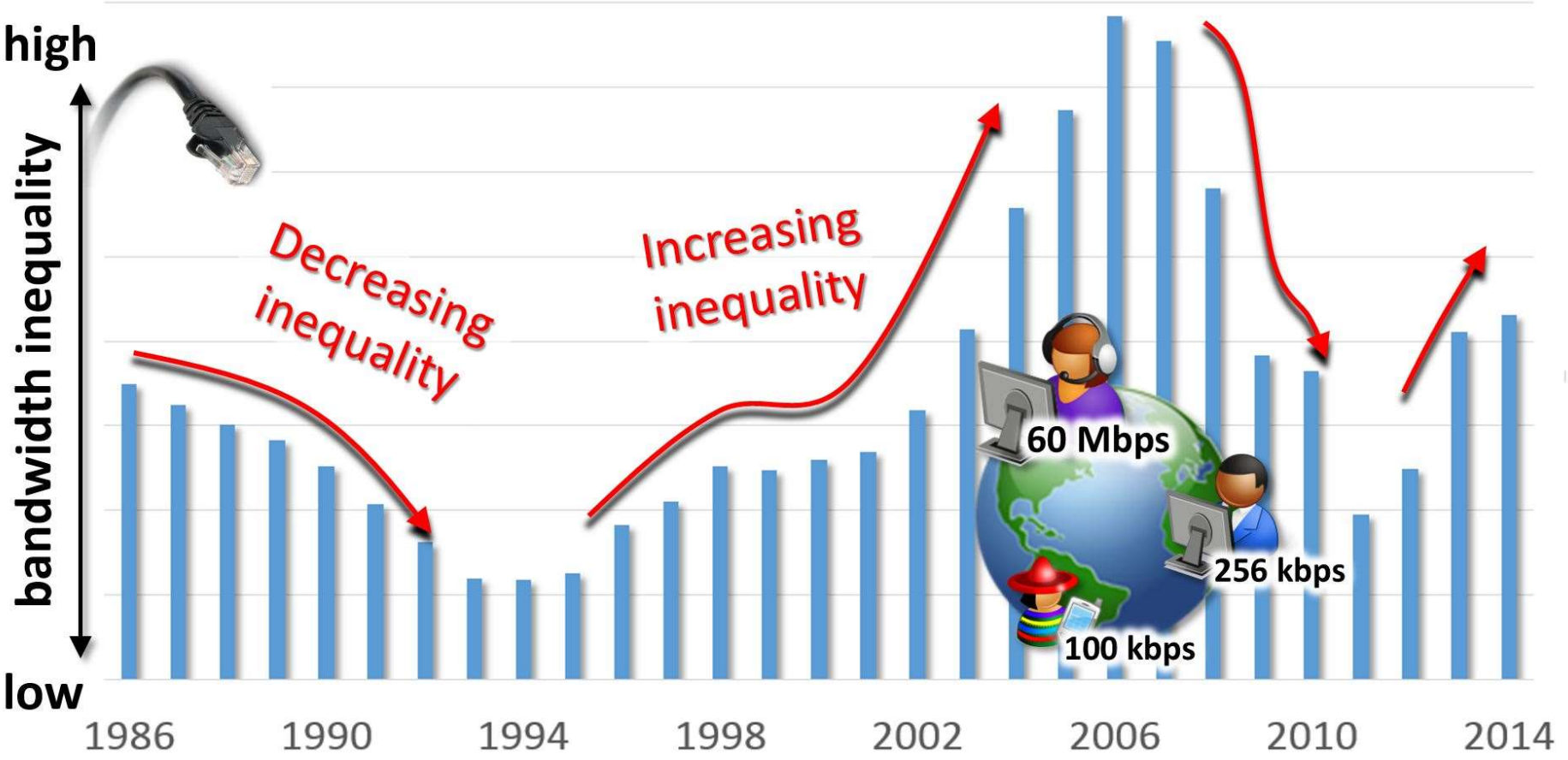
4. Age

- NTIA 2000 and the UCLA Internet report: highest usage of computers and the Internet is among people between the ages of 18 and 49
- older people and those under ten use computers and online access far less than any other age group

4. Education

- higher the education level one achieves, the more likely one is to use a computer

Gini coefficients for telecommunication capacity *(in kbps)* per individual worldwide (incl. 172 countries)



Hilbert, M. (2016). The bad news is that the digital access divide is here to stay: Domestically installed bandwidths among 172 countries for 1986–2014. *Telecommunications Policy*. www.martinhilbert.net/the-bad-news-is-that-the-digital-access-divide-is-here-to-stay/

Digital Divide and Further “Divide”

- 2012 - Microsoft under fire over a patent it was granted that's been dubbed the "avoid ghetto" feature for GPS devices.
- Meant to help pedestrians avoid unsafe neighborhoods, bad weather and difficult terrain by taking information from maps, weather reports, crime statistics and demographics, and creating directions that, according to the patent, take "the user through neighborhoods with violent crime statistics below a certain threshold.”
- Discrimination - *new application will reinforce assumptions about violent crime that just aren't true… "In much of dominant American culture, there's an assumption that criminality and being poor and not white go hand in hand," Chinn says. In reality, FBI crime statistics for 2010 show that whites were arrested more often for violent crimes that year than any other race.*
- Safety –"*I don't think anybody from any particular race is being singled out because they are using crime data to come up with these figures," Garland says. "If you don't want to end up in those places, I don't see anything wrong with somebody trying to help you out.“*

Google Maps vs. Waze – Avoid High Crime Rate Areas With GPS Navigation

ON 9/6/17 BY MIGUEL
1 COMMENT

I don't know if it's happened to you, but it's happened to me. I get in the car during rush hour and put my destination into a GPS navigation app. Then I get going, confident that the app is routing me the most efficient way possible, around the major traffic jams. 20 minutes later, I see why I'm moving so fast: there's little traffic, but it's because I'm right in the middle of a sketchy, high crime neighborhood. My glee turns into fear, as I count down the second 'till I get out of there.

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TECHNOLOGY

This App Was Made For Walking — But Is It Racist?

January 19, 2012 · 5:13 PM ET
Heard on All Things Considered

ALLISON KEYES

5:22
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Microsoft is under fire this week over a patent it was granted that's been dubbed the "avoid ghetto" feature for GPS devices. The new feature is meant to help pedestrians avoid unsafe neighborhoods, bad weather and difficult terrain by taking information from maps, weather reports, crime statistics and demographics, and creating directions that, according to the patent, take "the user through neighborhoods with violent crime statistics below a certain threshold."

The word "ghetto" doesn't actually appear anywhere in Microsoft's "Pedestrian Route Production" patent, but a slew of headlines touting the incendiary "avoid ghetto" nickname have generated outrage. Some say the feature is racist, while others say it's simply the next step in GPS technology.

Sarah Chinn, author of *Technology and the Logic of American Racism*, says she understands why people might want a GPS feature like that to help them feel safe. But, she says, the new application will reinforce assumptions about violent crime that just aren't true.

THE CONVERSATION
Academic rigour, journalistic flair

More technology doesn't mean less inequality

October 22, 2015 11.41am AEDT

Bridging the digital divide in many developing countries is not simply about access to ICT. flickr/Matt Wilson, CC BY

This article is part of the Democracy Futures series, a joint global initiative with the Sydney Democracy Network. The project aims to stimulate fresh thinking about the many challenges facing democracies in the 21st century.

The digital divide in Australia is narrowing as more people become internet users. Three billion people globally are online today, with some eight new users every second.

The United Nations emphasised bridging the digital divide as part of the Millennium Development Goals. However, although the costs of telephone and internet services have declined, digital disparities persist in many developing countries. The 2015 ICT

http://theconversation.com/more-technology-doesnt-mean-less-inequality-48180

Digital Inequality

- Digital divide focuses on the differences between the haves and have nots of the digital age --- the differences among those who have access to the Internet and other communication and information technologies and those who do not, or the differences among those who use these media and those who do not

- Digital inequality captures the complexity of inequalities relevant to understanding the differences in access and use of information technologies.

- Digital inequality considers variation on five dimensions:

1. technical apparatus people use to access the Internet (computing power; PC vs. handphone),
2. location of access [i.e. autonomy of use] (internet café, school, home),
3. extent of one's social support networks,
4. types of uses to which one puts the medium, and
5. one's level of skill [computing literacy]

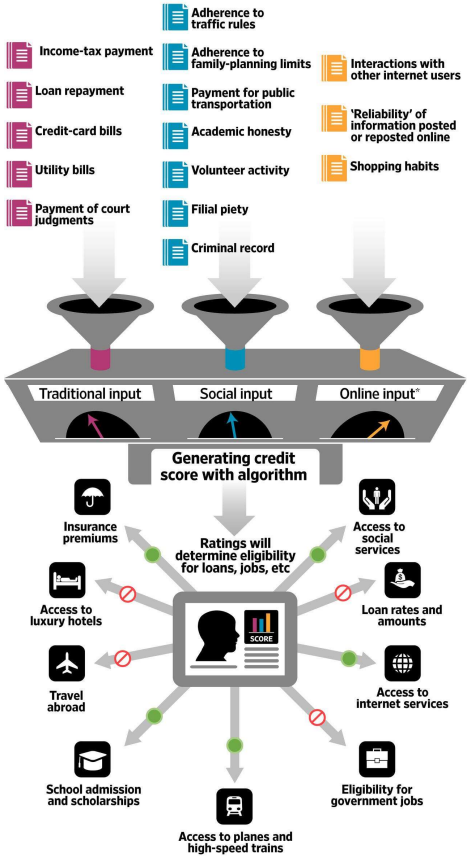
China’s social credit system

- covers all aspects of life, judging citizens' behaviour and trustworthiness.
- Caught jaywalking, don't pay a court bill, play your music too loud on the train — you could lose certain rights, such as booking a flight or train ticket
- One city, Rongcheng, gives all residents 1,000 points to start. Authorities make deductions for bad behaviour like traffic violations, and add points for good behaviour such as donating to charity. The points can be used to deduce farm land lease fee.
- List of Dishonest Persons Subject to Enforcement by the Supreme People's Court as "not qualified" to buy a plane ticket, and banned from travelling some train lines, buying property, or taking out a loan.
- no one social credit system. - local governments have their own social record systems that work differently, while unofficial private versions are operated at companies such Ant Financial's Zhima Credit, better known as Sesame Credit.
- Ant Financial is the payment firm spun out of Alibaba. The systems use shopping habits among other data to inform credit-style scores, on an opt-in basis.
- government system will be country wide, with businesses given a "unified social credit code" and citizens an identity number, all linked to permanent record.
- So far, taking part in both the private and government versions is technically voluntary

Source: https://www.wired.co.uk/article/china-social-credit-system-explained

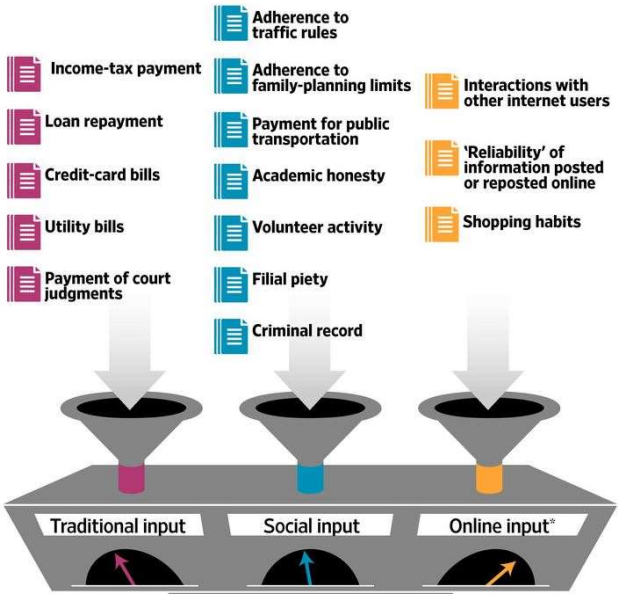
China Watching

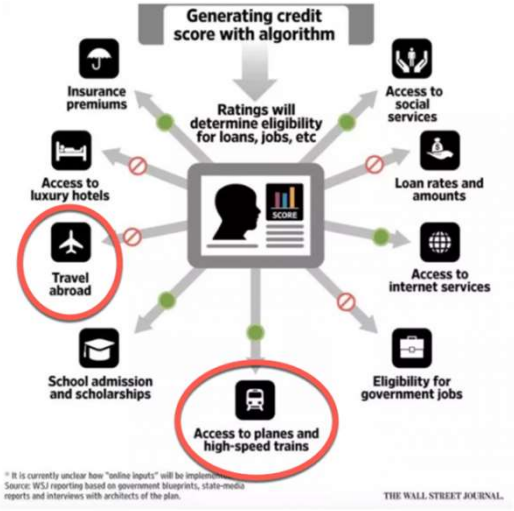
Beijing wants to create a nationwide 'social-credit' system that compiles digital records of citizens' social and financial behavior to calculate a personal rating that will determine what services they are entitled to — and what blacklists they go on. Here's a look at how the system might work.



* It is currently unclear how "online inputs" will be implemented.
Source: WSJ reporting based on government blueprints, state-media reports and interviews with architects of the plan.

THE WALL STREET JOURNAL.





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THE WALL STREET JOURNAL.

Sesame Credit scoring – social (economic) divide

- Introduced on 28 January 2015
- Ranking range from 350 (lowest trustworthiness) to 950 (highest trustworthiness).
- >= 600, one can gain privileges
- 400 million customers

- What are captured, property, salary etc to how much time one spends playing video games (that's bad) to whether he/she is a parent (that's good).

- Scoring can be shared with other companies. One example is Sesame Credit linking up with the Baihe dating site, so would be partners can judge each other on their looks as well as their social credit score; that system is opt-in.

Sesame Credit