“It’s Platforms All the Way Down”
Data and Power in the Digital Economy

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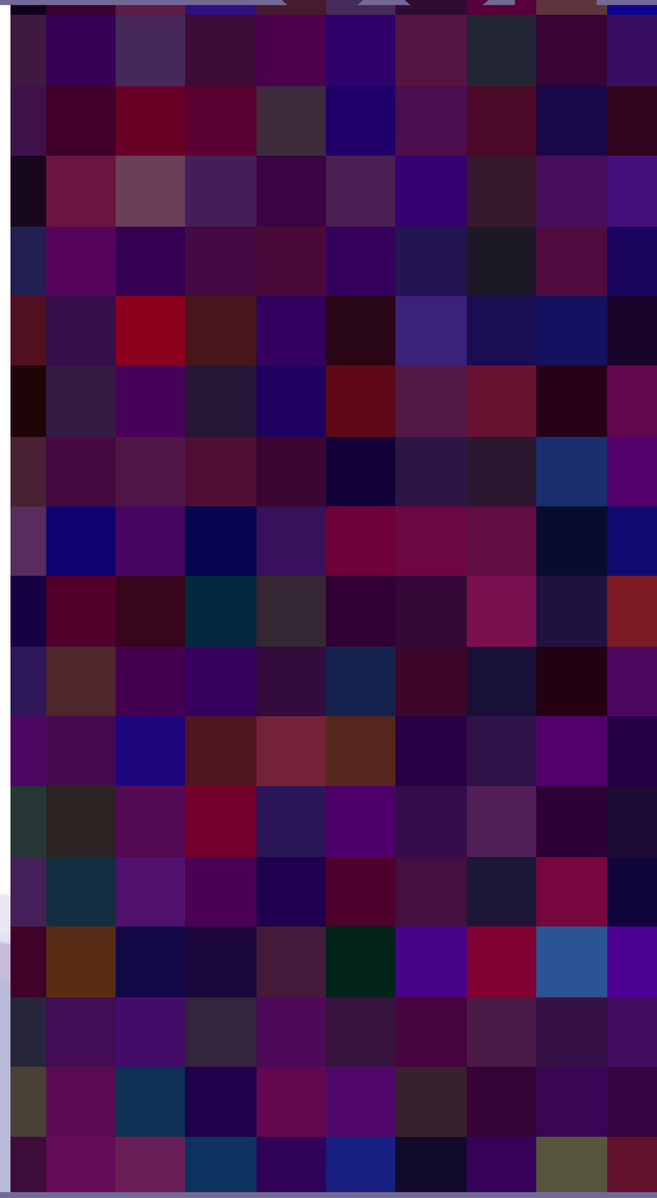
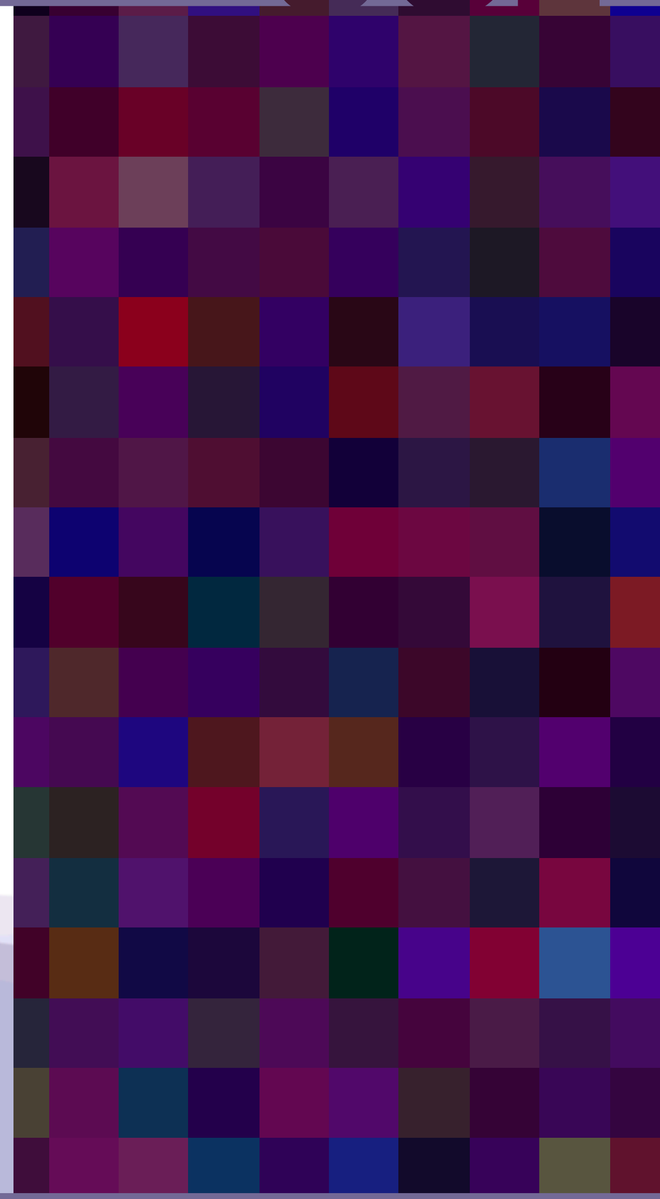
- Regulating technology requires grappling with the **business models** behind it as much as technical characteristics
- What technology–centric businesses **want** and the **mechanisms** they use are often misunderstood
- Business models are moving from taming networks using platforms, to establishing entirely new, open-ended infrastructures.
- How should society be involved in specifying and steering these infrastructures?



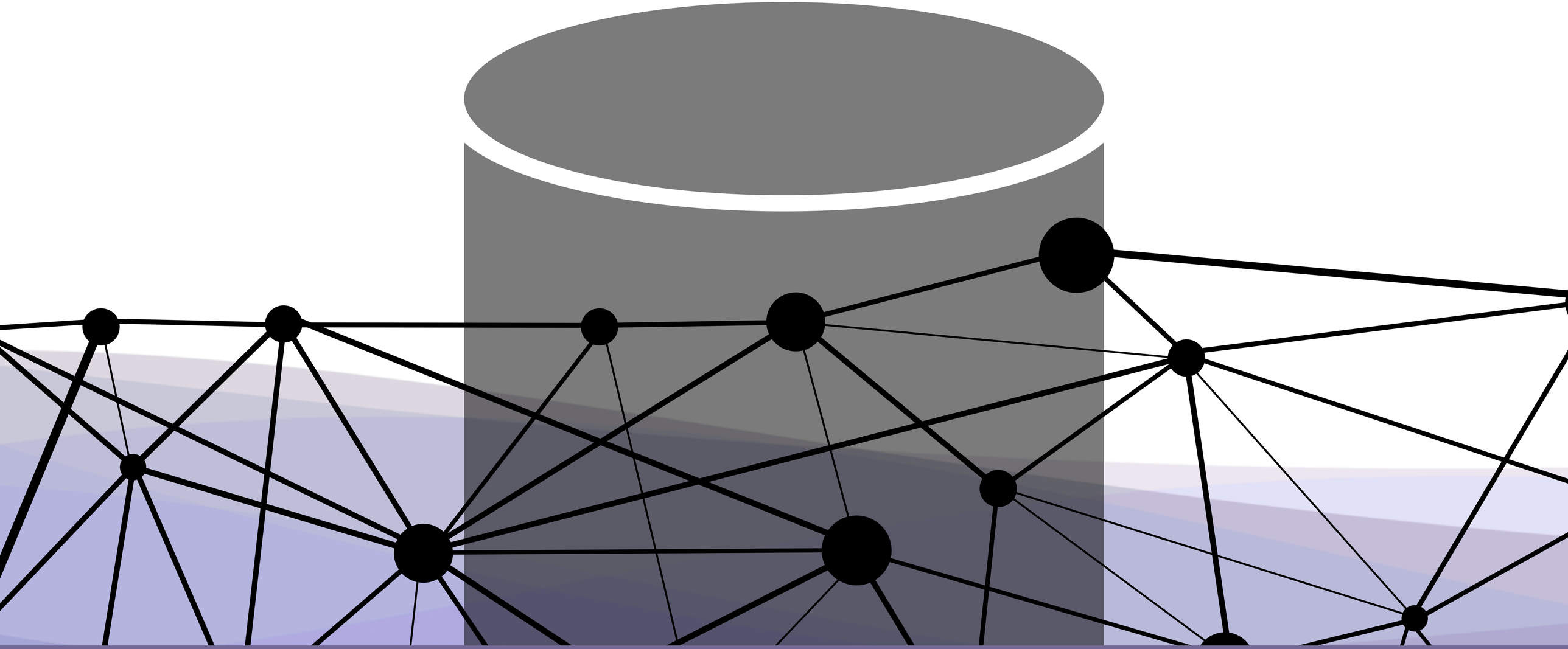
Networks and Platforms

Four Design Principles Designed to Flatten Power



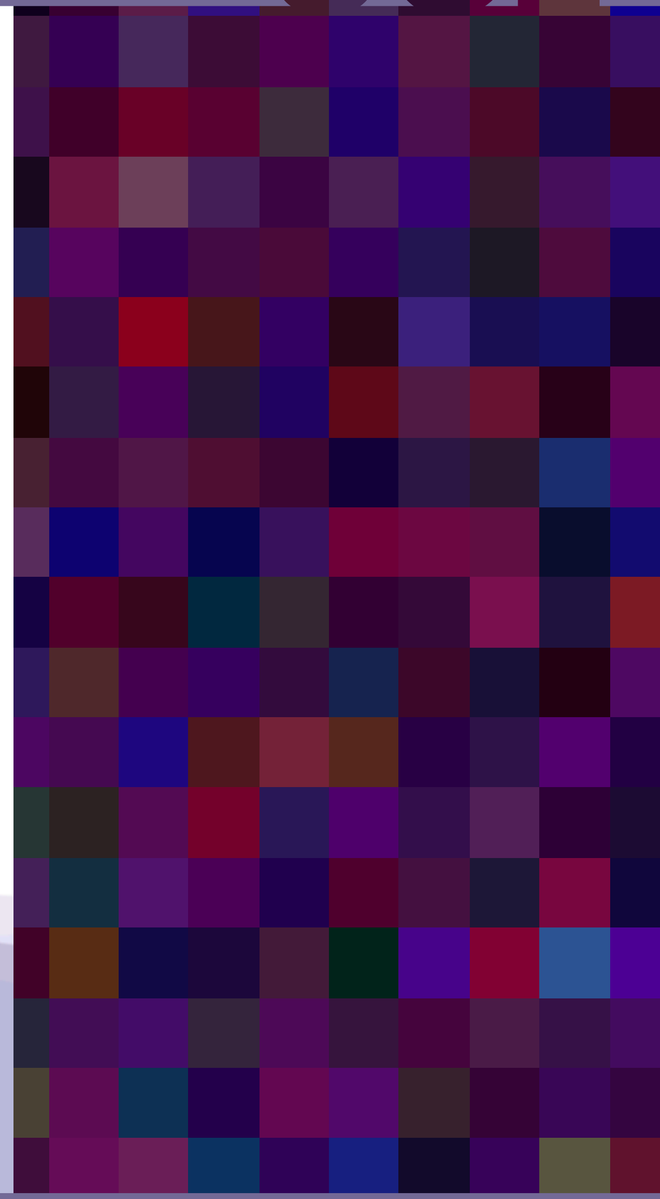
- The design principles of **openness**, **redundancy**, **interoperability**, and **end-to-end** are supposed to make it difficult to control the Internet.
  - **Openness** (e.g. open standards) assumed to make it easy for **new users to join** without permission;
  - **Redundancy** (e.g. in packet switching) assumed to **limit single points of failure** (censorship bottlenecks);
  - **Interoperability** supposed to allow a network to expand by connecting new devices without central planning, and **avoid path dependency**;
  - **End-to-end** supposed to mean that since the **intelligence of a network is on the fringes**, not in the network protocol, it is harder to centrally control.

The metaphor of a platform is a raised surface, easier to interact within than across the frontier of. They make clusters of transactions sticky. Platforms are a strategy for bounding networks and privatising and disciplining infrastructures.



Platform Strategies and Power in Practice

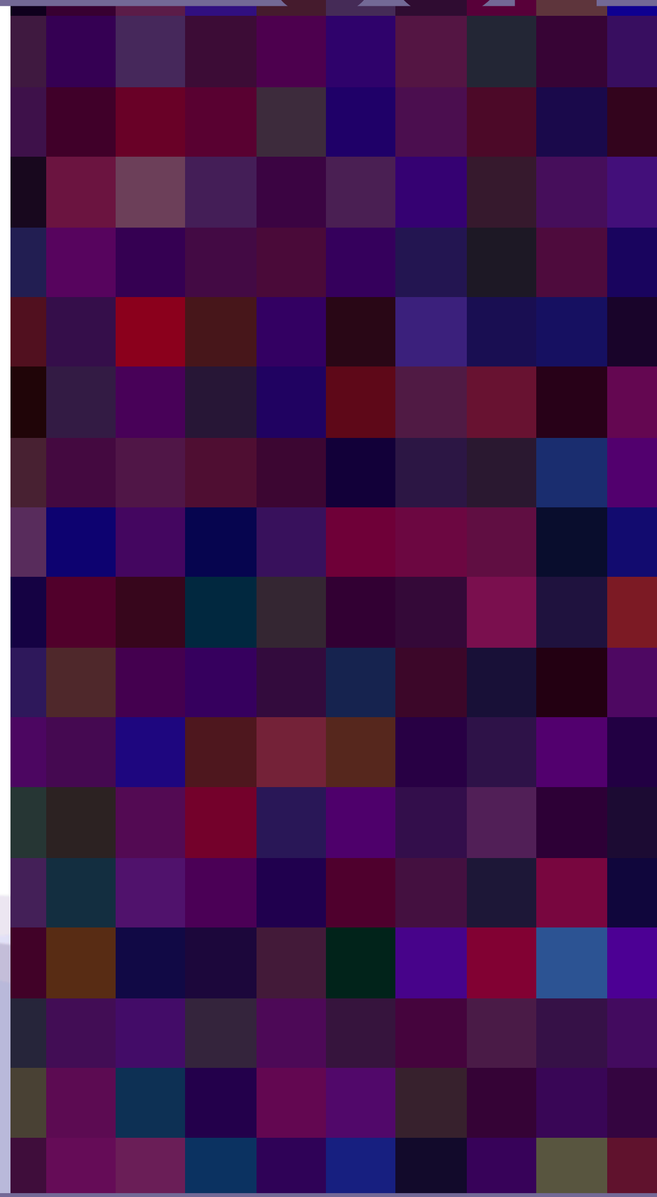
The Open Web



- For the first decade of the Web, the main barriers to setting up a website was skill and hosting resource.
- **Browser**: Google Chrome dominant around the world. Web standards *de* facto determined by Chrome, rather than W3C. Only three Web rendering engines remain.
- **Discoverability**: Google imposes standards on websites with search obscurity as a penalty (e.g. AMP, schemas).
- **Income**: For advertising revenue, sites must follow Google technical & contractual terms (i.e. *Authorized Buyers*).
- **Aesthetics**: Designers trained with templates which call Google servers for fonts & ‘minified’ JavaScript libraries.

249. The speed benefits Google marketed were also at least partly a result of Google's throttling. Google throttles the load time of non-AMP ads by giving them artificial one-second delays in order to give Google AMP a "nice comparative boost." Throttling non-AMP ads slows down header bidding, which Google then uses to denigrate header bidding for being too slow. "Header Bidding can often increase latency of web pages and create security flaws when executed incorrectly," Google falsely claimed. Internally, Google employees grappled with "how to [publicly] justify [Google] making something slower."

Smartphones and Apps

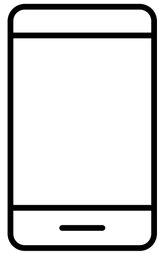


- When the first iPhone launched, all apps were Web apps — firm then backpedaled and launched the *App Store*.
- Seemingly intentional degradation of Web app functionality within the Safari browser; little support for making installation intuitive.
- Apps contain many more opportunities for control: API and library restrictions; rules on subscriptions and ‘tax’, contractual agreements with Apple, code review…

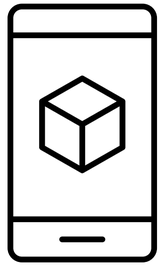
See eg Joris van Hoboken and RÓ Fathaigh, ‘Smartphone Platforms as Privacy Regulators’ (2021) 41 Computer Law & Security Review 105557.

Smartphones and Apps

- Apple’s vertical integration from hardware, to OS, to software, to cloud, allows it a huge amount of power concerning what can and cannot be computed in society.

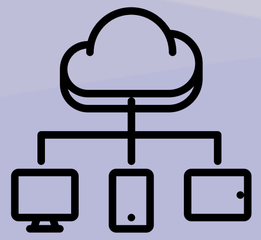


Control the phone hardware and which protocols it suppress (Bluetooth, NFC, 5G, Wi-Fi, etc)



Control the phone software and which protocols it supports (e.g. how HTML is rendered in Safari; does DNS over HTTPS work, how does e-mail function, etc.)

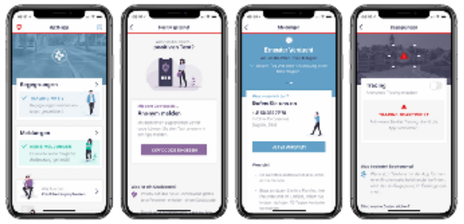
Can’t run software on iPhones/iPads without it adhering to App Store policies



Control cloud services

Exposure Notification and Decentralised Privacy Preserving Proximity Tracing

- In 2020, states wanted phones to implement pandemic policies. Privacy challenges: human rights and adoption.
- The DP-3T team, led by EPFL (ETH, UCL, TU Delft, Helmholtz, and others) produced a privacy-preserving Bluetooth contact tracing protocol. Matching occurred locally on-device.
- Some jurisdictions (France, England/Wales, Singapore) wanted a system with social graph data centralised.
- Apple and Google implemented a version of DP-3T, but did not provide an OS API which allowed a centralised version to be produced.



Near Field Communication and Apple

- Apple devices have an NFC chip (e.g. Apple Pay)
- UK wished to use it to scan passports for residency post-Brexit in the *EU Exit: ID Document Check* app.
- Apple refused to authorise use of this sensor.
- Eventually in iOS 13 it updated it Core NFC API to allow passport reading 2 years later at the end of 2019.

Attractive Regulatory Access Points

- States have a complex uneasy relationship with platforms.
- Difficult to regulate the Internet directly, but **can do *through* the platforms** that have learned to capture networked technologies.
  - Digital Services Act (EU); Online Safety Bill (UK); IT Rules (India)
- Yet simultaneously, concern that platforms have **too much power vis-a-vis states or other businesses**.
  - Digital Markets Act (EU); Digital Markets, Competition and Consumers Bill (UK); varying digital sovereignty initiatives.

Platforms and Surveillance

TOP SECRET//SI//ORCON//NOFORN

(TS//SI//NF) PRISM Collection Details

Current Providers

- Microsoft (Hotmail, etc.)
- Google
- Yahoo!
- Facebook
- PalTalk
- YouTube
- Skype
- AOL
- Apple

What Will You Receive in Collection (Surveillance and Stored Comms)? It varies by provider. In general:

- E-mail
- Chat – video, voice
- Videos
- Photos
- Stored data
- VoIP
- File transfers
- Video Conferencing
- Notifications of target activity – logins, etc.
- Online Social Networking details
- **Special Requests**

Complete list and details on PRISM web page: Go PRISMFAA

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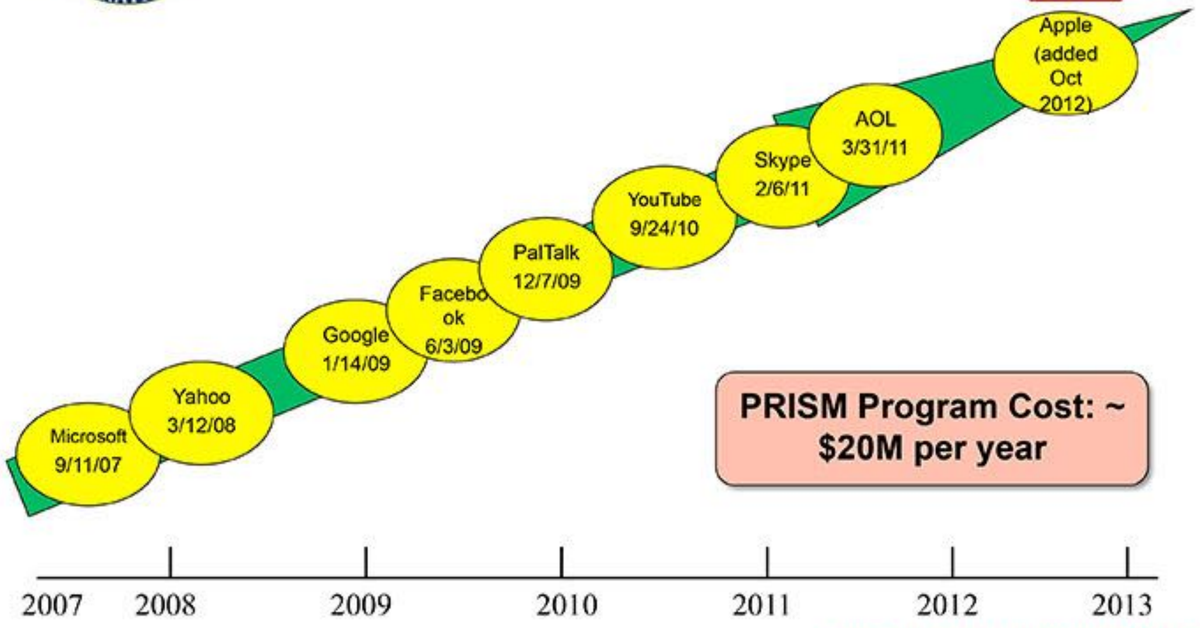
(TS//SI//NF) Dates When PRISM Collection Began For Each Provider



PRISM Program Cost: ~ $20M per year

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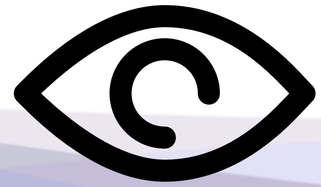
Two Questions to Ask of Platforms
Access and Legibility

- Twin functions are “the core organizational logic of contemporary informational capitalism” (Julie Cohen, Georgetown U)
- **Access**
  - giving would-be counterparts the sociotechnical ability to interface.
- **Legibility**
  - using information to both represent a mass audience and encode a way of understanding it and strategies for managing it.



- Who or what is being made legible, and how is access being provided?

From Platforms to Infrastructures

Content moderation

Cost of services

Privacy settings

Transparency to users

Above the waterline

Below the waterline

New sensors

Background processes

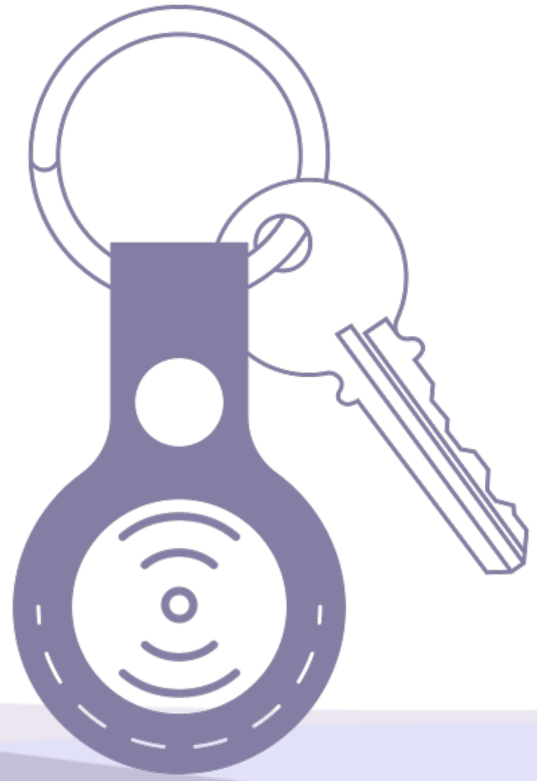
Software updates

On device hardware

APIs

New Functionalities: Turning User Devices into New Infrastructures

- 2019: Apple launched *Find My* network
  - remotely reprogrammed iPhones/iPads w/ GPS modules as infrastructure of “finder” devices for devices without connectivity/GPS.
- 2021: Amazon launched *SideWalk* network
  - remotely reprogrammed Ring/Echo to share users’ internet to Amazon-authorised devices within 100s of metres to enable e.g. *Tile* devices.
- Significant societal concerns:
  - eg in 8 mo period surveyed US police departments document 50 times women reported tracking by *AirTags* they didn’t own. Half identified men in their lives they suspected wished to stalk them.



- Infrastructures like pipes, rail, roads, have predictable functions, slow to change.
- New digital infrastructures can be orchestrated to suddenly change in functionality entirely.
- Under what conditions should societies steer, prohibit, promote, or intervene in change?

Current approaches (include)

- **Competition law lens**
  - Even critiques pushing for fairness accounts still separate economic and political ends of competition — *little said about the political legitimacy of the ends computation is put to*
- **Public utility lens**
  - Promising — yet nature of the *utility* is constantly reprogrammable; *who* owns less important than regulability and efficiency — are these really the ends of regulating computational infra?
- **Digital constitutionalism lens**
  - Assumes power imbalances and inequities are side-effects of digital transformation, not *constitutive parts* of the way technologies and business models have co-developed.
- **Digital sovereignty lens**
  - Loose and varied concepts, but by centring the issue as a geopolitical one, foreclose other discussions of power (including on a subnational level).

We can learn from...
(but it is Not Enough)

- **Telecommunications Law**
  - acknowledges public character of rights/entitlements potentially otherwise construed as private;
  - can learn from ‘common carrier’, ‘public utilities’, ‘essential facilities’ concepts/doctrines;
  - **yet** computational infrastructures are not *facilities*, but *capabilities*
  - concepts like (net) neutrality help us little with what is a constructive, generative role, not a neutral, passive one
- **Media Law**
  - recognised flexible, open-ended concepts (e.g. ‘fairness’, ‘due impartiality’);
  - can be directly concerned with power;
  - trade-off challenges with media freedom;
  - **yet** principles flounder as static infrastructures enter malleable world of arbitrary configurations

Foundations for a new approach

- Programmability as a matter of public interest
  - Large technology firms themselves are not essential. Their computational capacity is.
- A right to political participation for the Information Age
  - difficult to conceptualise due to cross-jurisdictional nature, but no need to over-institutionalise
- Remedial possibilities for positive configurations of the infrastructural stack
  - Courts rarely courageous (or skilled) enough to place specific positive design obligations, particularly ones with a broader structural perspective.
  - Yet daunting — how to require faithful design and construction without being overly prescriptive?