

THE POLITICAL ECONOMY OF THE INTERNET CHALLENGES FOR RESEARCH

REACH OUT ☺

Center for Tracking and Society,
University of Copenhagen

sofie.flensburg@hum.ku.dk /
signe.lai@hum.ku.dk

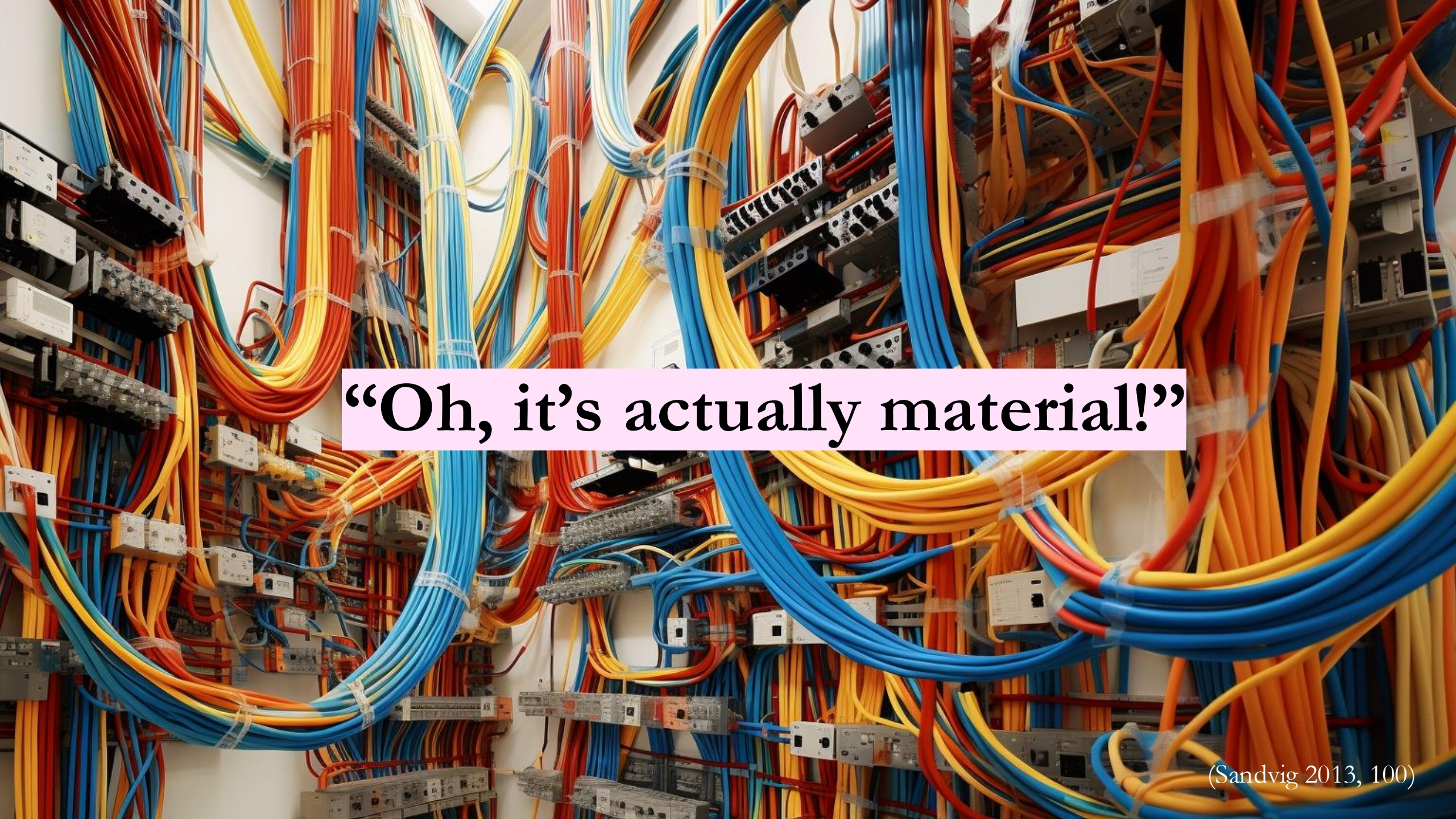
Digital Infrastructure Think Tank

lai@dig-in.dk / flensburg@dig-in.dk

UNIVERSITY OF
COPENHAGEN



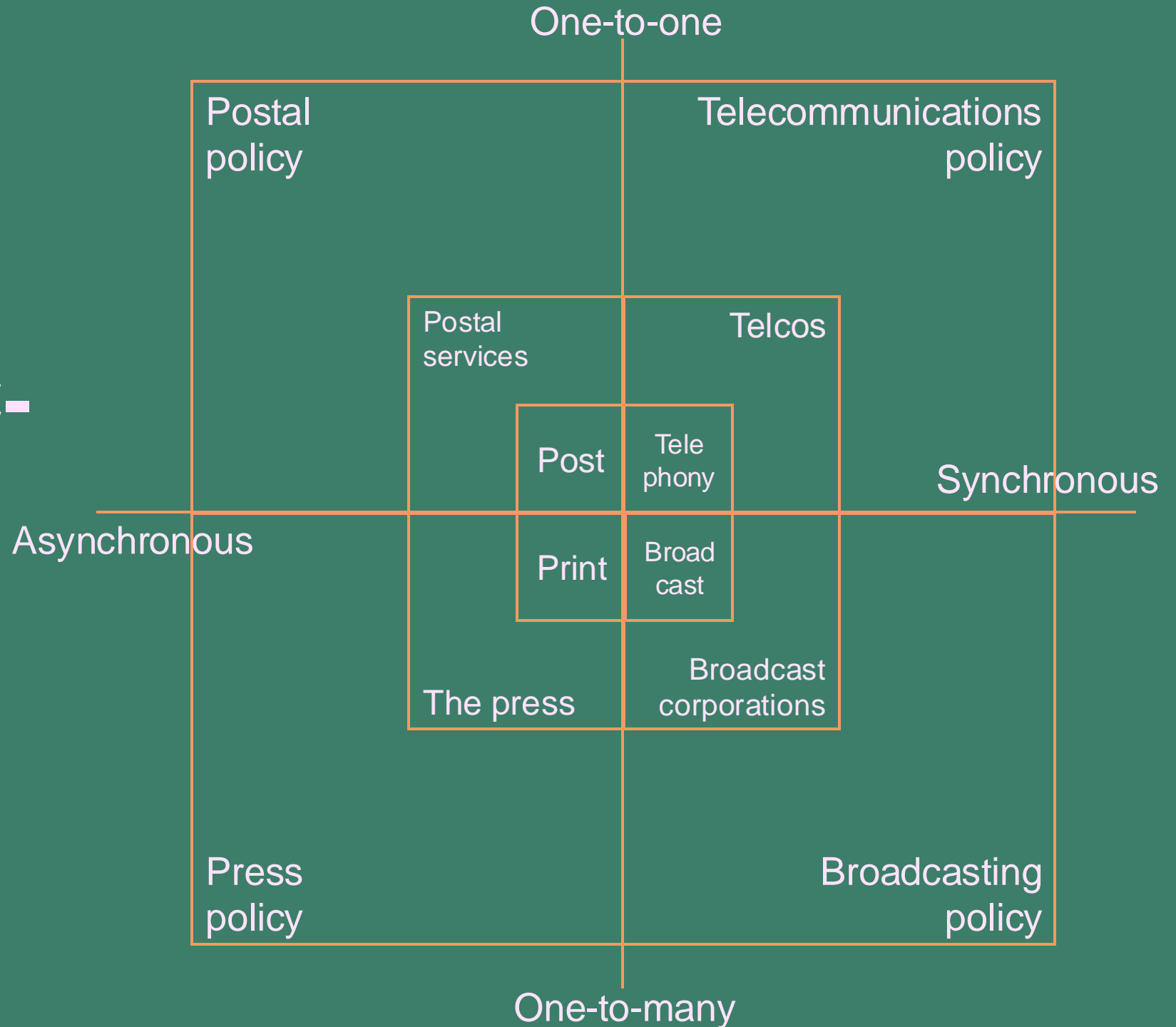
Tænketanken
Digital Infrastruktur
0|10|0|1



“Oh, it’s actually material!”

INFRASTRUCTURES HAVE ALWAYS MATTERED

(Flensburg, 2021,
inspired by Bar & Sandvig, 2008)



THE INTERNET AS GPT (Bresnehan 2010; Naughton, 2016)



FOLLOW THE DATA



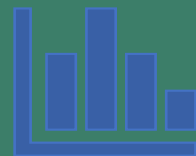
Access networks



Backbone networks

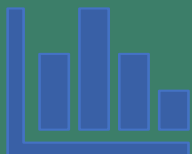
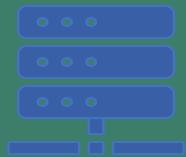


Applications



Data

MAPPING DIGITAL COMMUNICATION SYSTEMS

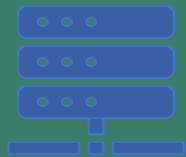


MAPPING DIGITAL COMMUNICATION SYSTEMS

Infrastructures



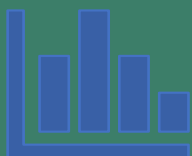
What are the existing access networks for digital communication?



What are the existing backbone networks for digital communication?



What are the existing applications for digital communication?



What are the existing tools for collecting and distributing digital communication data?

MAPPING DIGITAL COMMUNICATION SYSTEMS

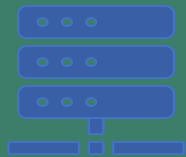
Infrastructures

Markets



What are the existing access networks for digital communication?

Who owns and controls digital access networks?



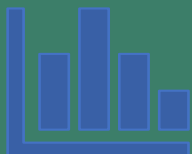
What are the existing backbone networks for digital communication?

Who owns and controls digital backbone networks?



What are the existing applications for digital communication?




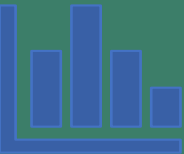
Who owns and controls digital communication applications?



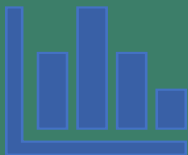
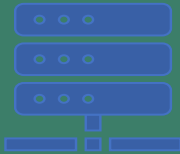
What are the existing tools for collecting and distributing digital communication data?

Who owns and controls the tools for collecting and distributing digital communication data?


MAPPING DIGITAL COMMUNICATION SYSTEMS

	Infrastructures	Markets	States
	What are the existing access networks for digital communication?	Who owns and controls digital access networks?	How does the state regulate digital access networks?
	What are the existing backbone networks for digital communication?	Who owns and controls digital backbone networks?	How does the state regulate digital backbone networks?
	What are the existing applications for digital communication?	Who owns and controls digital communication applications?	How does the state regulate digital communication applications?
	What are the existing tools for collecting and distributing digital communication data?	Who owns and controls the tools for collecting and distributing digital communication data?	How does the state regulate the collection and distribution of digital communication data? (Flensburg & Lai, 2019)

COMPARING ACCESS NETWORKS



Explore our new interactive broadband indicators



Our broadband indicators are now available on the OECD Going Digital Toolkit's Data Kitchen in a dynamic data explorer that allows you to select time periods, choose and compare countries, and instantly customise graphs in a variety of formats. You can also make comparisons with indicators from other OECD ICT databases.


> Explore the interactive broadband indicators below or on the [Going Digital Toolkit Data Kitchen](#)

Select Category

Search indicators

Databases

Category	Indicator
Fixed broadband	Fixed broadband - All subscriptions
Fixed broadband	Fixed broadband - All subscriptions per 100 inhabitants
Fixed broadband	Fixed broadband - Cable subscriptions
Fixed broadband	Fixed broadband - Cable subscriptions per 100 inhabitants
Fixed broadband	Fixed broadband - DSL subscriptions
Fixed broadband	Fixed broadband - DSL subscriptions per 100 inhabitants



Log in English

Enter search term Search

Home Data News Publications About us Contact us Help

Home > Data > Database

DATA DATABASE

▲ DATABASE

- Information
- Statistical themes
- Stats finder A-Z
- Experimental statistics
- Data visualisations
- Education corner
- Bulk download
- Web services
- GISCO: Geographical Information and maps
- Microdata
- Quality
- Metadata
- SDMX InfoSpace
- Data validation
- Evaluation

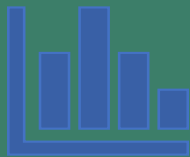
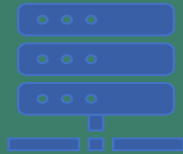
Data navigation tree

Detailed datasets

- General and regional statistics
- Economy and finance
- Population and social conditions
- Industry, trade and services
- Agriculture, forestry and fisheries
- International trade
- Transport
- Environment and energy
- Science, technology, digital society
 - Science and technology (scitech)
 - Digital economy and society (isoc) (Important notice)**
 - ICT usage in households and by individuals (isoc_i)
 - ICT usage in enterprises (isoc_e)
 - Digital skills (isoc_sk)
 - ICT sector (isoc_se)
 - Additional indicators on digitalisation (isoc_ad)
 - Digital economy and society - historical data (isoc_h)



COMPARING APPLICATIONS



android



Google Play



App Store

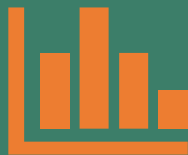
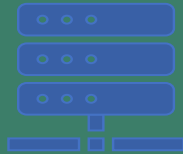
The screenshot shows the Similarweb website interface. The top navigation bar includes 'similarweb', 'Free Tools', 'Products', 'Our Customers', 'Our Data', 'Pricing', and 'Resources'. The main heading is 'Top Websites Ranking' with the subtitle 'Most Visited Websites In The World'. Below this, there are filters for 'All Categories' and 'Worldwide'. A table lists the top 8 websites:

Rank	Website	Category
1	google.com	Computers Electronics and Engines
2	youtube.com	Arts & Entertainment > Str
3	facebook.com	Computers Electronics and Media Networks
4	instagram.com	Computers Electronics and Media Networks
5	twitter.com	Computers Electronics and Media Networks
6	baidu.com	Computers Electronics and Engines
7	wikipedia.org	Reference Materials > Dicti Encyclopedias
8	yahoo.com	News & Media Publishers

The bottom section shows 'Top Apps Ranking' for 'Top Android Apps' in 'Denmark'. It includes a search bar and filters for 'Google Play Store', 'Denmark', 'All Categories', and 'Top Free'. A table lists the top 8 apps:

App	Publisher	Category	Usage Rank	Change	Store Rank
Google Chrome: Fast & Secure	Google LLC	Communication	1	=	-
Google	Google LLC	Tools	2	=	-
Facebook	Meta Platforms, Inc.	Social	3	=	13
YouTube	Google LLC	Video Players & Editors	4	=	-
Gmail	Google LLC	Communication	5	=	-
Messenger	Meta Platforms, Inc.	Communication	6	=	12
Clock	Samsung Electronics Co., Ltd.	Tools	7	=	-
Google Maps	Google LLC	Travel & Local	8	=	-

COMPARING DATA SERVICES



About

webXray is a tool for analyzing webpage traffic and content, extracting legal policies, and identifying the companies which collect user data. A command line user interface makes webXray easy for non-programmers to use, and those with advanced needs may analyze billions of requests by fully leveraging webXray's distributed architecture. webXray has been used to run hundreds of concurrent browser sessions distributed across multiple continents.

webXray performs both "haystack" scans which give insights into large volumes of network traffic, cookies, local storage, and websockets, as well as "forensic" scans which preserve all file contents for use in reverse-engineering scripts, extracting advertising content, and verifying page execution in a forensically sound way. An additional module, policyXray, finds and extracts the text of privacy policies, terms of service, and other related documents in several languages.

For extensive details on how the system works, please reference "[Preserving Needles in the Haystack: A search engine and multi-jurisdictional forensic documentation system for privacy violations on the web](#)" by Libert et al.

Using webXray

webXray is easy to use for anybody who is willing to try out a command line program and it is also possible to scale the software to ingest billions of records. By default, webXray runs a single instance of Chrome, stores data in a SQLite database, and can be used on any average laptop. For many users this is sufficient. Advanced configuration of webXray uses Postgres for storing data and leverages a distributed architecture whereby a server is able to send tasks to remote scanning nodes, each of which may be running many instances of Chrome. The distributed system has been used to control hundreds of browsers concurrently.

webXray uses a custom library of domain ownership to chart the flow of data from a given third-party domain to a corporate owner, and if applicable, to parent companies. Tracking attribution reports produced by webXray provide robust granularity. Reports of the average numbers of third-parties and cookies per-site, most commonly occurring third-party domains and elements, volumes of data transferred, use of SSL encryption, and more are provided out-of-the-box. A flexible data schema allows for the generation of custom reports as well as authoring extensions to add additional data sources.



exodus

The privacy audit platform for Android applications

Search a report

Application name



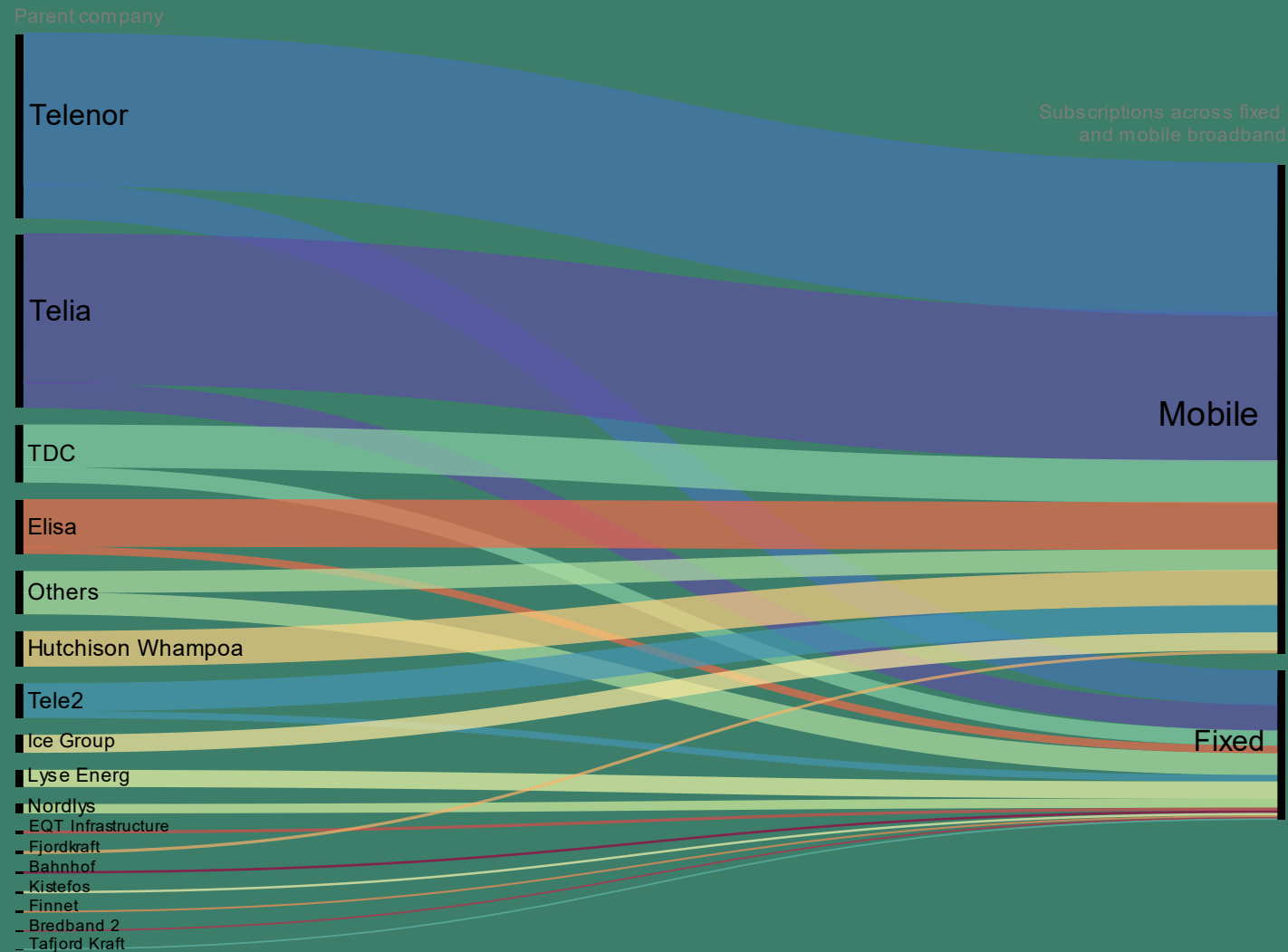
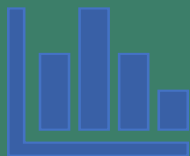
You can search for an application using its name, handle or Google Play URL

ex: *Meteo France* or *fr.meteo* or <https://play.google.com/store/apps/details?id=fr.meteo>

Cannot find the application? Search it in [Google Play](#).

Let's go!

COMPARING BROADBAND MARKETS



COMPARING BACKBONE MARKETS



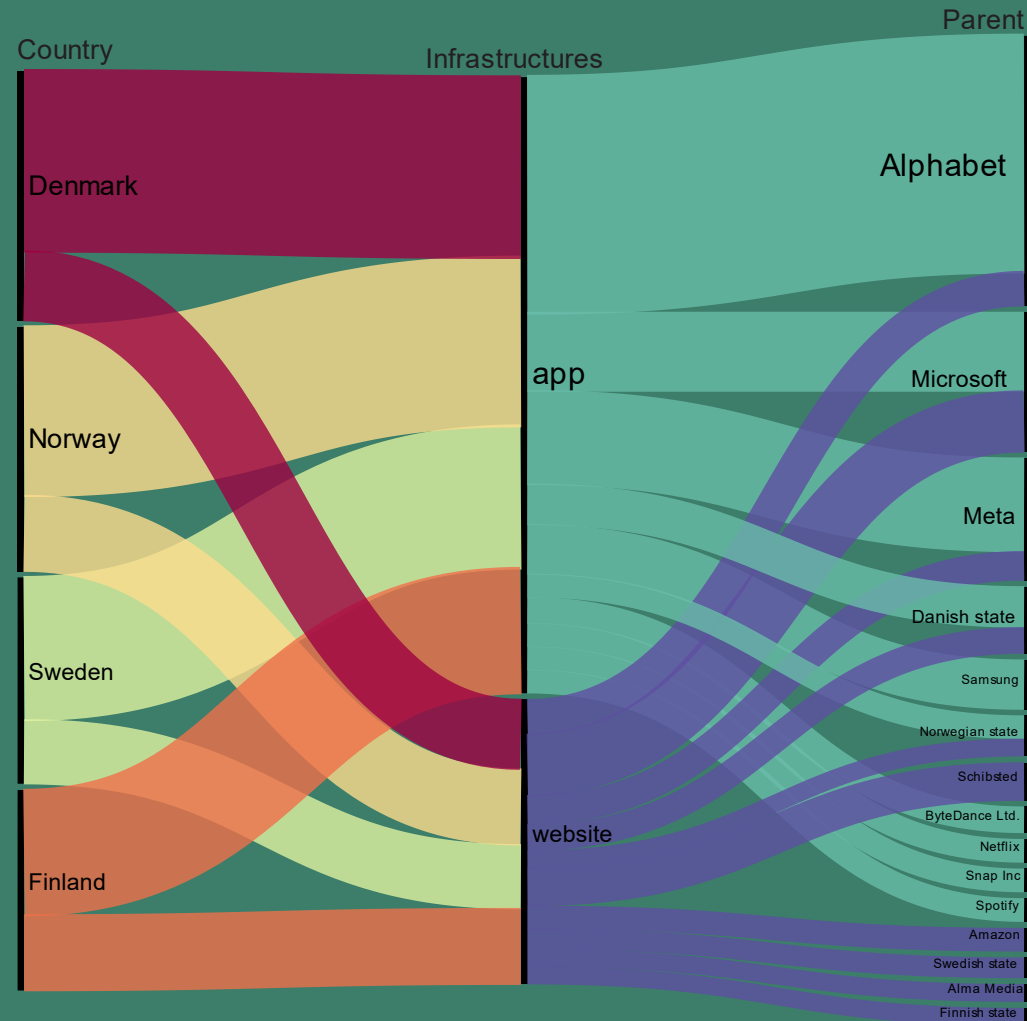
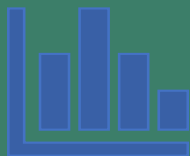
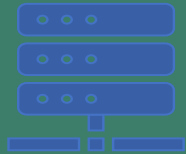
Submarine cables



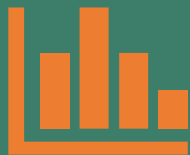
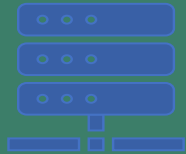
Internet Exchange Points



COMPARING APPLICATION MARKETS



COMPARING DATA MARKETS



AT THE MERCY OF THE OBJECTS, WE STUDY

Volatile data sources

Designed for purposes other than ours

Pre-defined indicators & variables

THANK YOU

sofie.Flensburg@hum.ku.dk &

signe.lai@hum.ku.dk

Center for Tracking and Society

University of Copenhagen

Digital Infrastructure Think Tank

UNIVERSITY OF
COPENHAGEN



Tænketanken
Digital Infrastruktur
01|0|0|0|0|