

From Technocracy to Data Sovereignty, Open Data and Geospatial Technologies

FRANZ-JOSEF BEHR

AGSE 2025



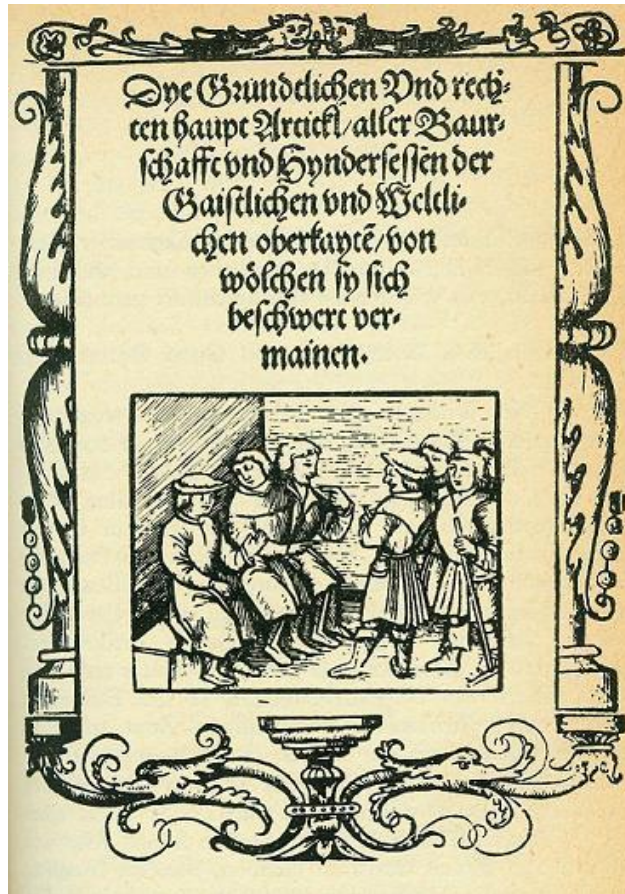
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Outline

- Introduction: Political link between 1525 and 2025
- Sovereignty
- Digital Colonialism, and its main players
- What can we do – some thoughts
 - Degrowth, Decolonialisation, Open Source
- Very short conclusions

Introduction

German Peasants' War - 500th anniversary of the „Twelve Articles“



[Schönsperger 1525]

Title page of the "Twelve Articles" "12 artículos de los campesinos"

Source: Schönsperger, Johann d.J., (1525):
12 Artikel von Memmingen

- The Twelve Articles (German: Zwölf Artikel) were part of the peasants' (farmers') demands during the German Peasants' War of 1525.
- are considered the first draft of human rights and civil liberties in continental Europe



https://de.wikipedia.org/wiki/Zw%C3%B6lf_Artikel
https://de.wikipedia.org/wiki/Deutscher_Bauernkrieg#/media/Datei:Memmingen-kramerzunft-12-artikel.JPG

My modern summary of the „Twelve Articles“

- 1- **Democracy**: Each local authority has to elect its representatives independently. Political leaders should present their ideas clearly and comprehensively.
- 2- **Prevention of corruption**: Political leaders should receive sufficient financial support to ensure their independence. Any funds available beyond this should be invested in social causes.
3. **Human dignity**: The dignity of every human being should be recognised without distinction. Every human being is free and enjoys sovereignty.
4. & 5. **Just distribution of all resources**: It is unjust and antisocial when goods are distributed inappropriately. Every human being should have sufficient means to live on.
5. & 10. **Application of Commons**: Goods should be returned to the general public as common property. The privatisation of common goods must be reversed so that they are once again available to the general public.
6. Workloads and **working conditions** should be reasonable.
8. **Just taxation and payment**: Taxation must take into account the individual's ability to pay. Necessary goods must be affordable. Work must be fairly remunerated.
9. **Justice**: Every citizen must be treated fairly (including in the administration of justice). Laws must not be changed arbitrarily.
12. These demands must be examined. This list is not exhaustive.

500 Years later



Jeff Bezos, Sundar Pichai
and Elon Musk



“an oligarchy is taking shape in America of extreme wealth, power and influence that literally threatens our entire democracy”

“the dangerous concentration of power in the hands of a few ultra-wealthy people”

Joe Biden (2025) <https://www.theguardian.com/us-news/2025/jan/15/joe-biden-farewell-address-trump-oligarchy-america>

The relevance of GAFAM

- **G**oogle/Alphabet, **A**pple, **F**acebook, **A**mazn and **M**icrosoft comprise the world's top five tech companies, with a combined market value > 3-trillion (or even 5 trillion) US dollar
- GAFAM and other Big Tech corporations control most of the essential functions of the digital world:
 - social networking (X, TicToc, Instagram, Facebook), messaging (Meta, which owns WhatsApp),
 - internet search (Google),
 - desktop and laptop operating systems (Microsoft Windows, Apple),
 - smartphone and tablet operating systems (Google, Apple),
 - office software,
 - online advertising (Google, Facebook),
 - cloud computing (Amazon, Microsoft, Google, IBM), Software depository (Github)
 - Transportation/ridesharing (Uber, Lyft, Taxify) – privacy?,
 - lodging (Airbnb),
 - streaming video (Google, YouTube, Netflix, Hulu)
- i.e. they limit the Digital Sovereignty of states and citizes (discussed later)
- Not to forget Chinese players (discussed later)

Supreme
authority in a
state.

„the ability to
act and
develop
independently and self-
determinedly
in the digital
world”

Neglecting social,
sociological and
psychological aspects

Governmental Sovereignty, Personal Sovereignty and Digital Sovereignty are threatened by technocrats and oligarchs

„[The] fullest right a person [...] can
have over herself provided that each
other person also has just such a
right.”

Decisions and exercise
of power by a small
group of people

Digital Sovereignty

Other terms: Data Sovereignty, Digital autonomy, Digital self-determination

Digital self-determination
Competence
Informedness
Values
Freedom of Choice
Voluntariness
Formation of opinion
Action

Mertz, Marcel, Jannes, Marc, Schlomann, Anna, Manderscheid, Enza, Rietz, Christian, Woopen, Christiane (2016): Digitale Selbstbestimmung. Cologne Center for Ethics, Rights, Economics, and Social Sciences of Health (ceres), Köln https://ceres.uni-koeln.de/fileadmin/user_upload/Bilder/Dokumente/ceres-Digitale_Selbstbestimmung_2.pdf

Neo-Colonialism

From colonialism to neo-colonialism

- But colonialism returned in a different form: as neo-colonialism



I propose to analyse neo-colonialism, first, by **examining the state of the [...] continent** and showing how neo-colonialism at the moment keeps it artificially poor. Next, I propose to show **how in practice [...] could immensely raise [...] living standards.** From this beginning, I propose to examine neo-colonialism generally, **first historically** and then by a consideration of **the great international monopolies** whose continued stranglehold on the neo-colonial sectors of the world ensures the continuation of the system

Kwame Nkrumah (1965) Neocolonialism. The Last Stage of Imperialism (1965) London: Thomas Nelson & Sons, Ltd. Online under <https://www.marxists.org/ebooks/nkrumah/nkrumah-neocolonialism.pdf> [2025-09-02]

(Data) Economy: firmly in the hands of corporations from the Global North

- “mechanisms of **colonial appropriation**, enclosure and **cheapening** of labour and resources” (Buch-Hansen & Nesterova 2023)
- The resource curse of the Global South:
Like in previous centuries countries, mainly in the Global South, rich in natural resources are still often suppliers of unprocessed raw materials needed for digitalization, generating little domestic value addition while having to pay for imported digital equipment and services to meet their own digitalization needs.



El Cerrejón coal mine in northern Colombia

Example:

Glencore plc, Switzerland, is one of the world's leading commodity companies. Its business activities include the production, processing, and trading of aluminum, alumina, bauxite, iron alloys, nickel, zinc, copper, lead, coal, oil, and agricultural products. Allegations of human rights violations, tax manipulation, corruption in Iran, Congo, Brazil, and other countries, and environmental pollution are worth mentioning.

Digital Colonialism „data colonialism“, „techno-colonialism“

- Digital colonialism can be observed in different aspects:
 - Software
 - Hardware
 - Network, i.e. the Internet and the underlying protocols
- Overall: The digital ecosystems implemented in our homes, institutions, companies, and public administration

[Kwet 2018, Kwet 2019]

These (eco)systems are dominated by US American institutions and companies.

“Mostly US multinational companies exercise imperial control at the architecture level of the digital ecosystem: software, hardware and network connectivity, which then gives rise to related forms of domination.” (Kwet 2018, Kwet 2019)

Example: Commercial OGC Members



FRONTEx
EUROPEAN BORDER AND COAST GUARD AGENCY

HARRIS®

AIRBUS
DEFENCE & SPACE

DigitalGlobe™

DASSAULT
SYSTEMES



ORACLE®

BAE SYSTEMS

Google™

INTERGRAPH

leidos

pitney bowes

ENVITIA
World Class Spatial Information Technologies

agi
Analysis software for land, sea, air, & space

BENTLEY®

AIRBUS

FlightSafety
international

Spacemetric

VENCORE

AUTODESK.

netcad

Trimble.

here

Raytheon

PCI
Geomatics

Bohemia
Interactive
SIMULATIONS

1Spatial

LUCIAD

Booz | Allen | Hamilton

ROLTA

Ideal solutions

Microsoft

galdos
systems inc

CubeWerx
Interoperable Services for the Geo-Spatial Web

Snowflake
software

exactEarth

Fraunhofer

Insurance Evolved FM Global

Skyline®

LOCKHEED MARTIN

Franz-Josef B. LIZARDTECH™
a celartem Company

OGC staff

 Athina Trakas Bonn, Germany Director Regional Services, Europe, Central Asia & Africa	 Bart De Lathouwer Kontich, Belgium President	 Denise McKenzie Winchester, United Kingdom Executive Director, Communications & Outreach
 George Percival Maryland, USA CTO, Chief Engineer	 Gobe Hobona United Kingdom Director, Knowledge Management	 Greg Buehler Indiana, USA Director, Communications & Logistics
 Ingo Simonis Kriftel, Germany Director, Innovation Program & Science	 Jeff Burnett Massachusetts, USA Vice President, Operations and Finance	 Josh Lieberman Newton, Massachusetts, USA Director, Innovation Program

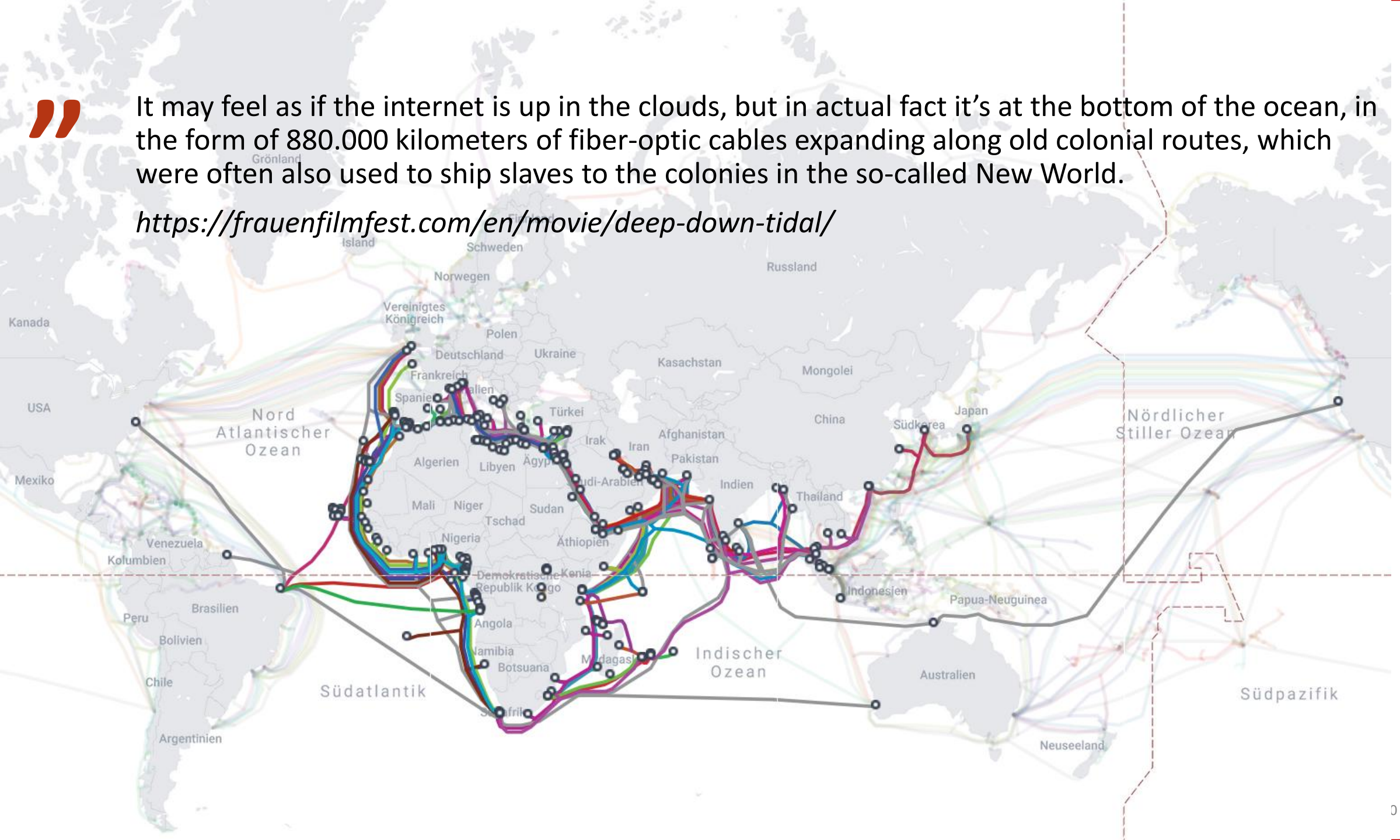
 Luis Bermudez Maryland, USA Executive Director, Innovation Program	 Marie-Francoise... Toulouse, France Director, Innovation Program	 Mark Reichardt Maryland, USA Director, Strategic Opportunities
 Nadine Alameh Washington D.C. Metro Area CEO	 Scott Serich Maryland, USA Director, Innovation Program	 Scott Simmons Colorado, USA Chief Operations Officer, and Executive Director, Standards Program
 Simon Chester London, UK Communication Coordinator	 Terry Idol Maryland, USA Director, Innovation Program	 Trevor Taylor Toronto, Ontario Canada Director, Member Services-Asia & the Americas

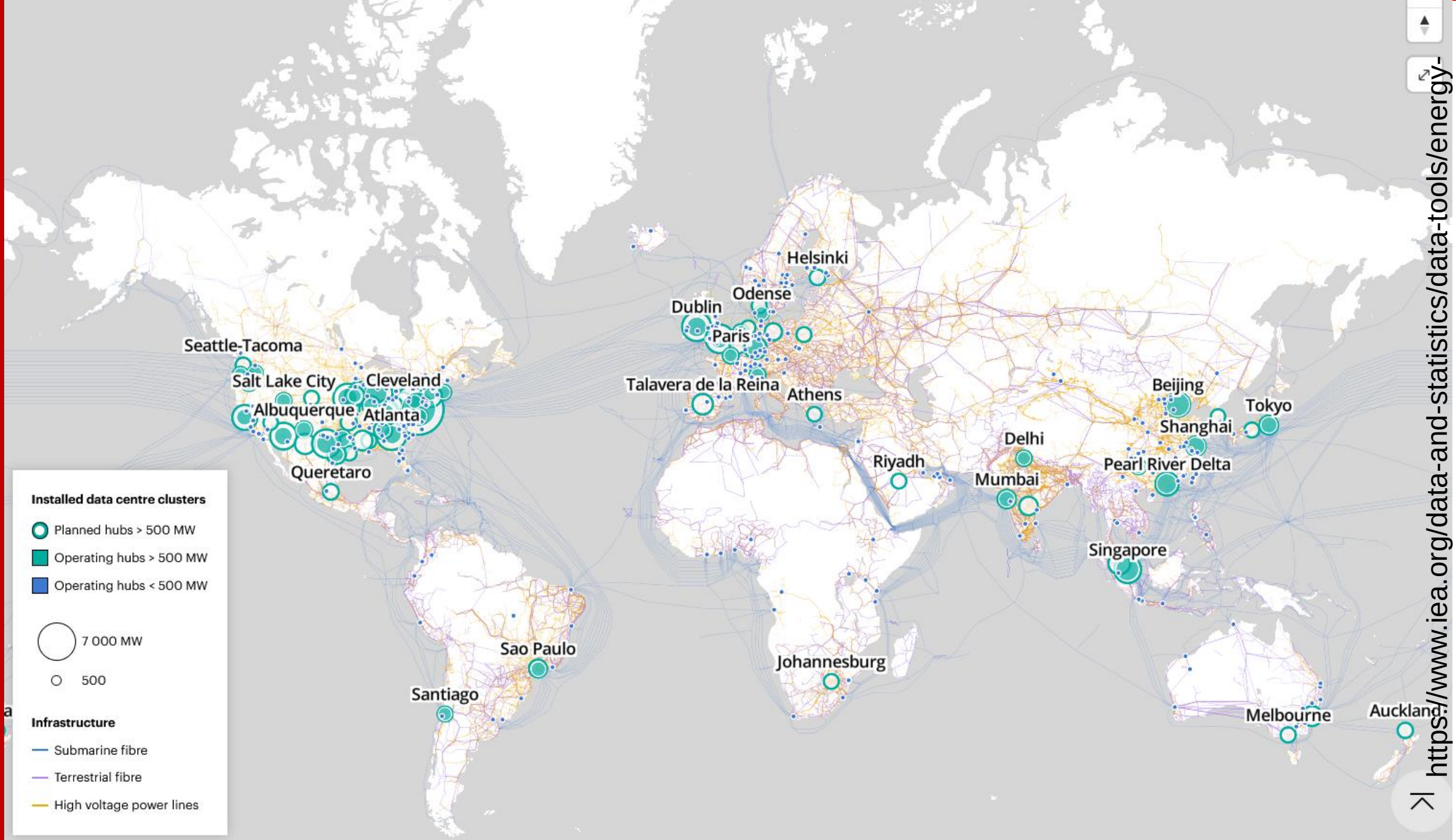
**Data colonialism:
Where do the data flow?**

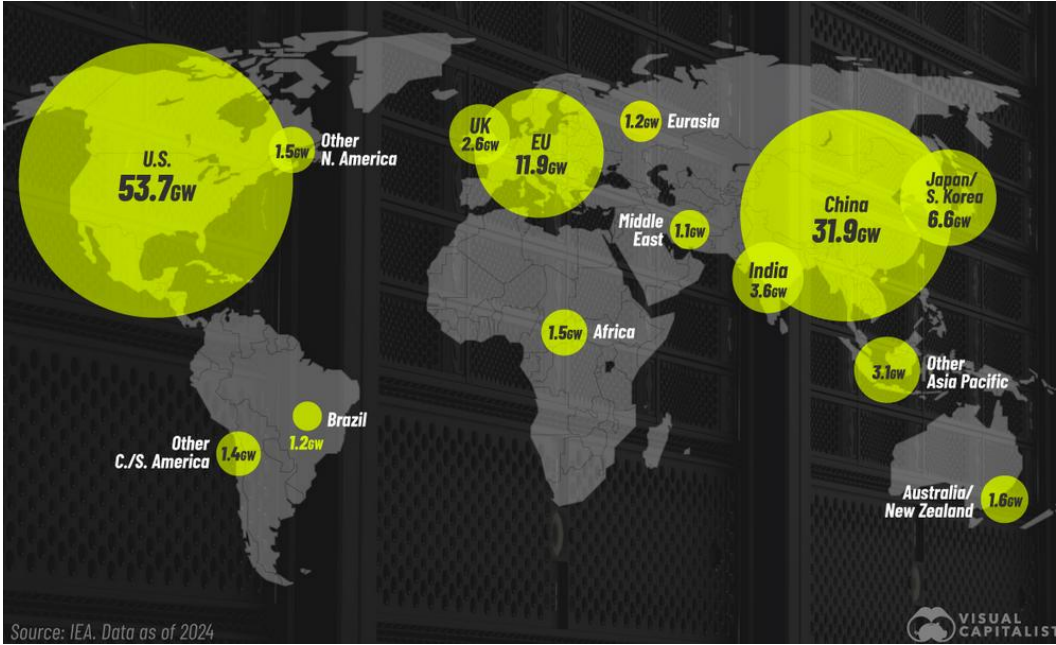
”

It may feel as if the internet is up in the clouds, but in actual fact it's at the bottom of the ocean, in the form of 880.000 kilometers of fiber-optic cables expanding along old colonial routes, which were often also used to ship slaves to the colonies in the so-called New World.

<https://frauenfilmfest.com/en/movie/deep-down-tidal/>

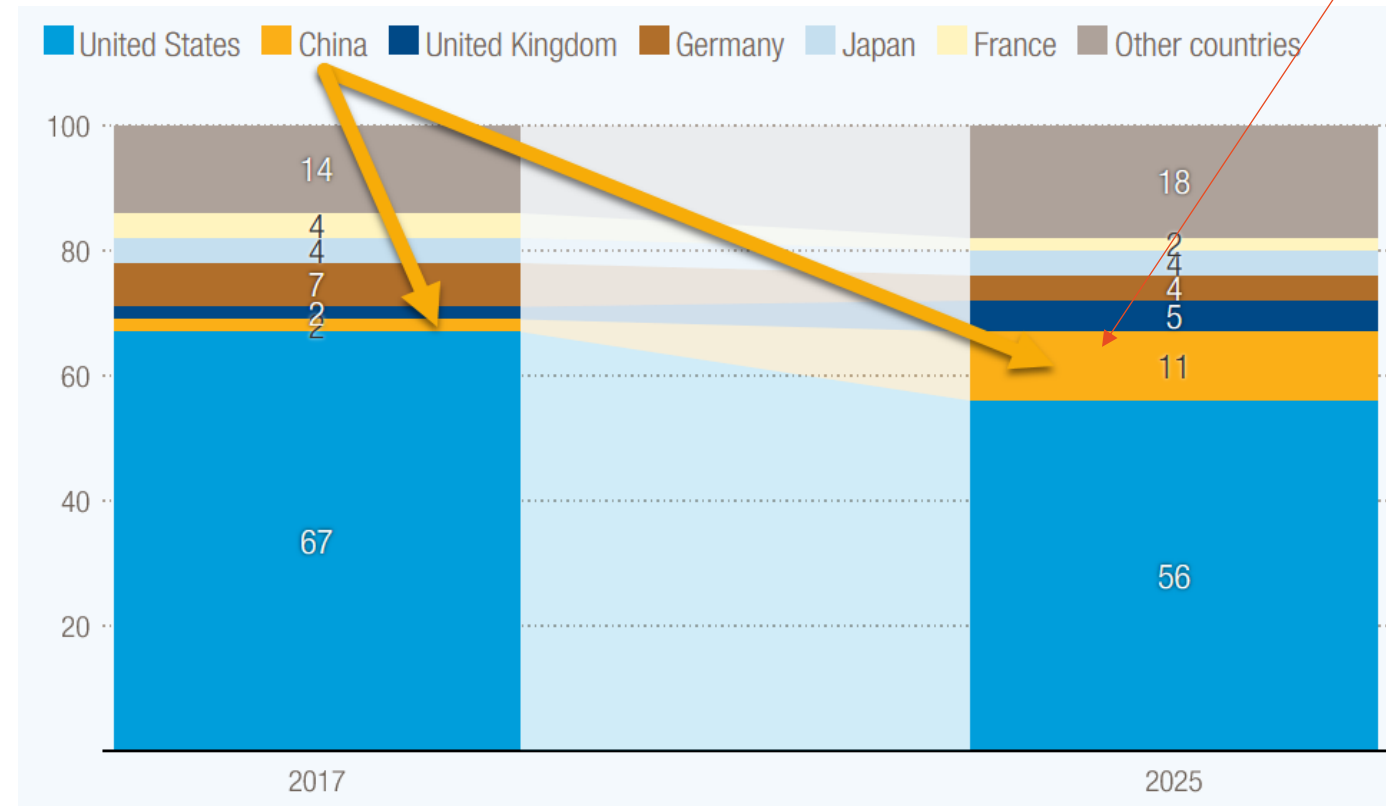






Country	Installed Data Center Capacity in Gigawatts
U.S.	53.7
China	31.9
EU	11.9
Japan and Korea	6.6
Other Asia Pacific	3.1
Other North America	1.5
UK	2.6
Africa	1.5
Australia and New Zealand	1.6
India	3.6

Who and where are the actors?



President Xi Jinping's strategy to transform China into a 'cyber superpower'

A major concern is that market dominance by a few firms – mostly headquartered in the US and China – stifles competition and crowds out local players.

Global companies dominate the entire global data value chain, including data collection, storage and analysis, and related digital intelligence. (UNCTAD 2024, p. 6).

Number of top digital firms in the digital economy, by home country, number of firms, 2017–2025

Source: UN Trade and Development (UNCTAD), based on FDI/MNEs database

A remark regarding China

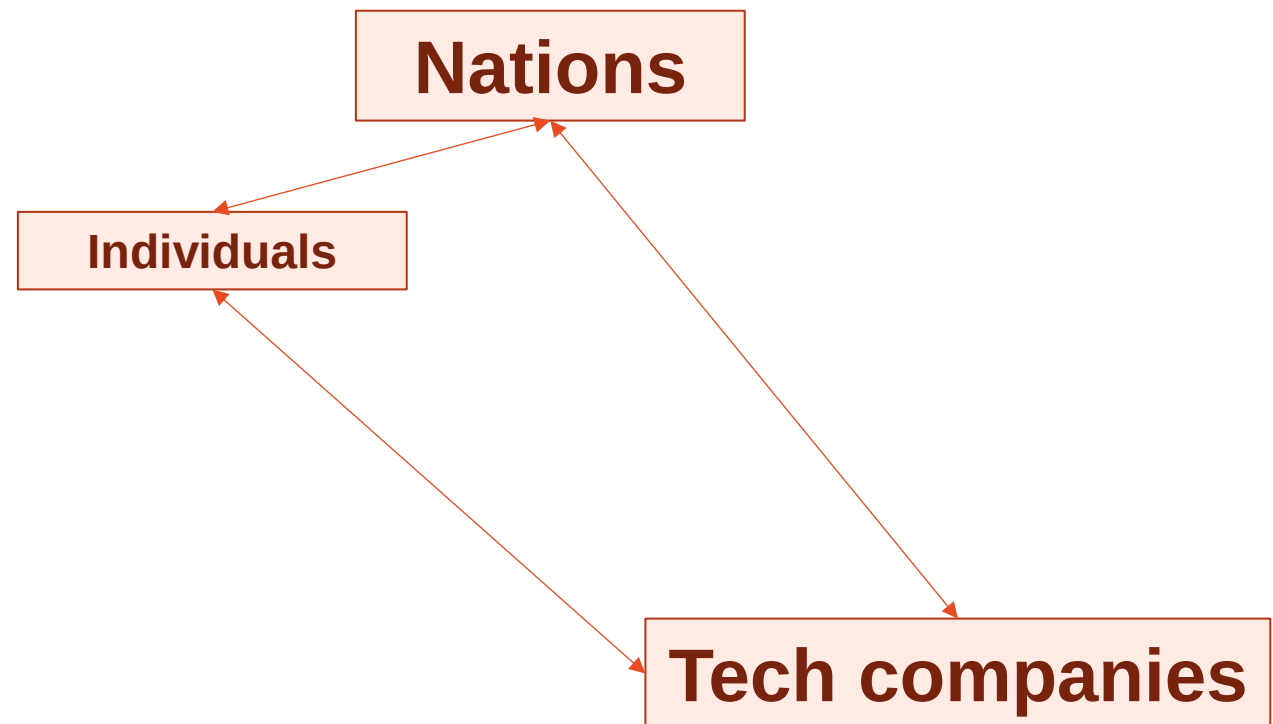
- We can observe that the Chinese government and Chinese technology companies engage in a sustained effort to export the technology at the heart of the country's information-control system to nations around the globe.
- „China has consistently promoted a vision for global internet governance that emphasizes governmental control over data flows, initially under the concept of “cyber sovereignty” and more recently as “data sovereignty.” (Yun 2025)

“From Smart Cities to Digital Communities, from smart industries to digital products, the tentacles of “digital” have increasingly extended to every corner, profoundly changing people’s lives.” (“Digital China Construction Series 5: Develop Efficient and Collaborative Digital Government Affairs,” Beijing Party Member Education Network, April 11, 2025, <https://digitalchinawinthefuture.com/?p=14698>)

Confrontation between unequal partners

We can see a triangle of tension here between individual citizens, the respective state, and tech companies:

- Tech companies vs. Nations and vice versa
- Nations vs. individuals
- Tech companies vs. individuals
- Individuals vs. nations and tech companies



From Google to Amazon: EU goes to war against power of US digital giants

In Europe there is a growing fear of becoming a 'digital colony' ruled by Silicon Valley, whose giant firms wield huge power over privacy - and like to avoid tax. Now regulators are striking back

<https://www.theguardian.com/technology/2014/jul/06/google-amazon-europe-goes-to-war-power-digital-giants>



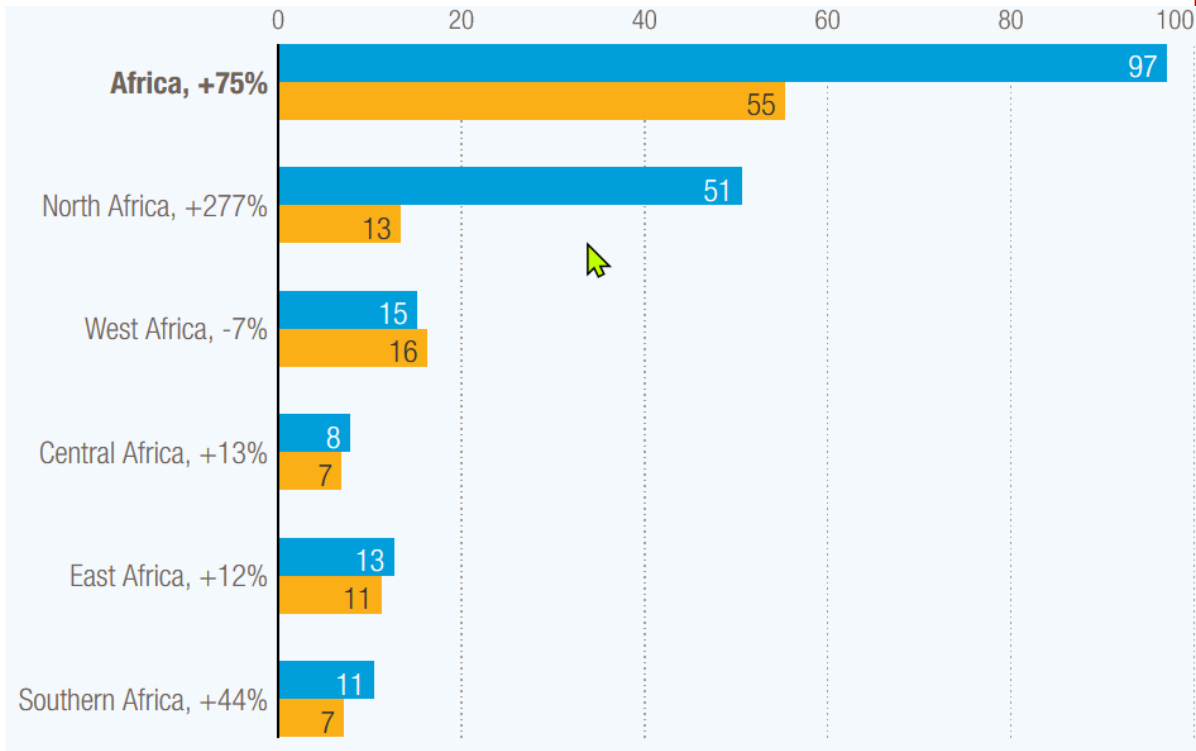
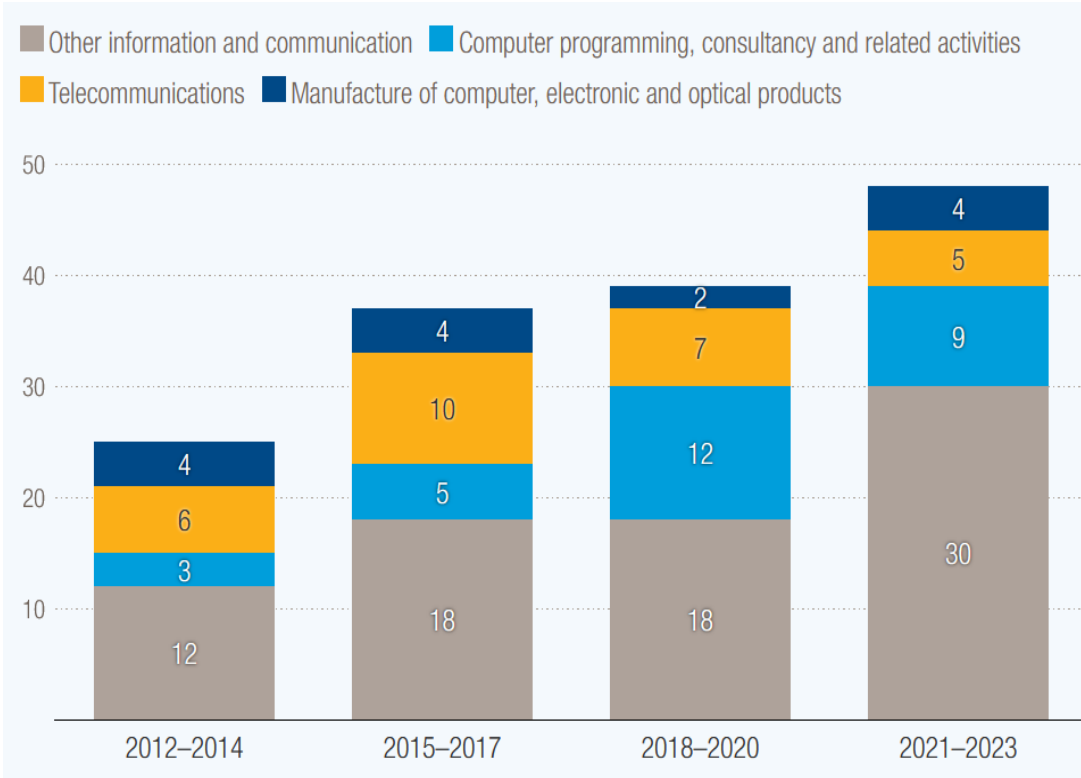
Denmark says good-bye to Microsoft

Comparison of data policies: China vs. the EU vs. the US

	China	European Union	USA
Company data	Requires local storage and processing	Protects company data, less strict than personal data	Free data flow
Personal data	Strong protection through PIPL ⁵	Strict protection through GDPR	Free data flow
Internet Censorship	Strong internet censorship and data access control	Largely free from direct state censorship, but subject to specific regulations and content moderation policies	Largely free from direct state censorship, but subject to specific regulations and modest content moderation policies
Guiding Principles	State control, Restricted data flow	Individual control, Restricted data flow	Individual control, Free data flow
Regulatory Approaches	Command-and-control	Enforced-self regulation	Self-regulation
Data sovereignty focus	National security and control over data	Protection of personal data. Ensure data flow within the EU comply with strict privacy standards	Free data flow

Source:
after Yun 2025

The monetary aspects



Inflows to developing countries in core sectors of the digital economy, billions of dollars, 2012–2023

Source: UN Trade and Development (UNCTAD)

Digital colonialism in our home

- Tech-companies permanently collect data from individuals and use it, as “a new kind of sovereign power” (Zuboff 2015, Zuboff 2019),
- to influence us in our decisions—threatening our individual sovereignty.
- Instead of being an autonomous individual who has the ability to realize the vision of her or his own future, the user is **trapped the circle of apps, in the bubbles created by streams of posts and advertisements targeted specifically to him or her.**
- Regarding data privacy: Microsoft, for example) offers **no guarantee that EU data will never be shared with the US** government, according to Anton Carniaux, chief legal officer at Microsoft France, at a hearing before the French Senate.

Rank	Name	Net Worth	Age	Country/Territory	Source	Industry
1	Elon Musk	\$342 B ▲	53	United States	Tesla, SpaceX	Automotive
2	Mark Zuckerberg	\$216 B ▲	40	United States	Facebook	Technology
3	Jeff Bezos	\$215 B ▲	61	United States	Amazon	Technology

F PROFILE

Jack Dangermond

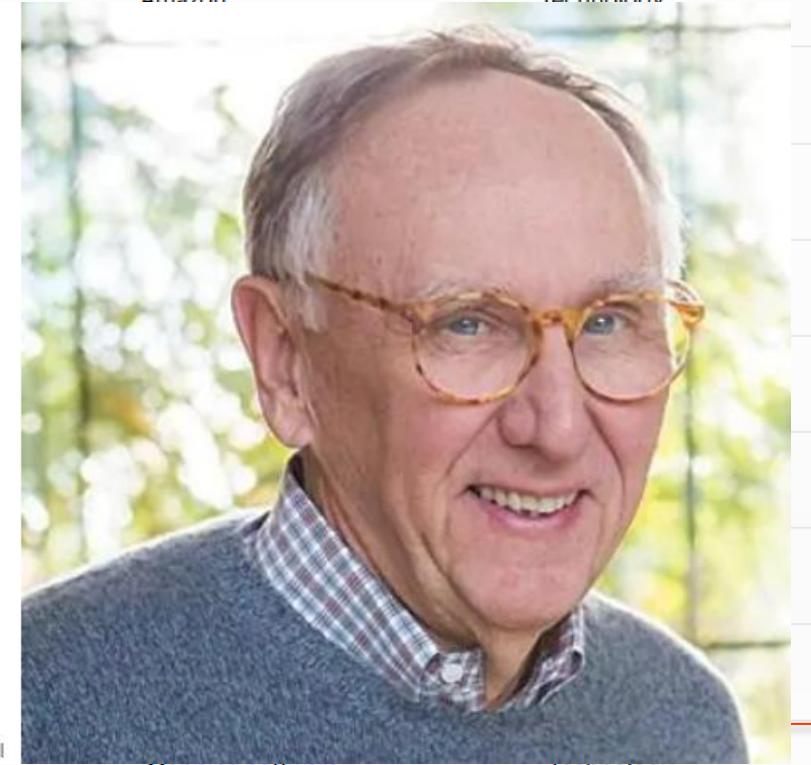
\$14.1B

Real Time Net Worth
as of 9/9/25
[#181 in the world today](#)

\$8.9B

2025 Billionaires Net Worth
as of 4/1/25

approx. 35 Trillion Pesos



337	Jack Dangermond	\$8.9 B ▼	79	United States	Mapping software	Technology
337	Jonathan Gray	\$8.9 B ▲	55	United States	Investments	Finance & Investments
337	Tobi Lutke	\$8.9 B ▲	44	Canada	E-commerce	Technology
337	Wang Lai-hun	\$8.9 B ▲	57	Hong Kong	Electronics Company	Technology

PHOTO BY COURTESY OF ESRI



While the earnings of a minority are growing exponentially, so too is the gap separating the majority from the prosperity enjoyed by those happy few. This imbalance is the result of ideologies which defend the absolute autonomy of the marketplace and financial speculation.

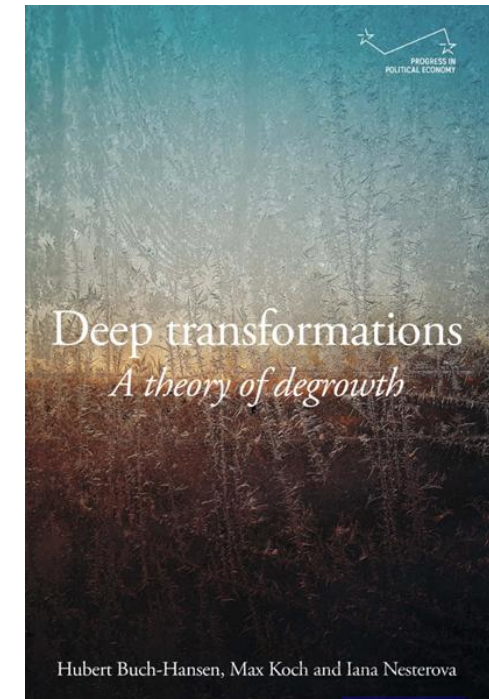
Francis, APOSTOLIC EXHORTATION
EVANGELII (24. November 2013), 202: AAS 105 (2013),
https://www.vatican.va/content/francesco/en/apost_exhortations/documents/papa-francesco_esortazione-ap_20131124_evangelii-gaudium.html

Decolonialisation - What can we do?

- Degrowth
 - #unplugtrump: Extenting digital authonomy
- Focus on Open Data, Open Source, Open Education

Degrowth

- a socio-ecological movement and economic model that **rejects the constant increase in economic output** („growthism“), having particularly the gross domestic product (GDP) as its main goal.
- Instead, the approach to degrowth strives for a society that prioritises **the well-being of all people** and the **preservation of natural resources**.
 - This includes a **reduction in consumption** and thus material production, a more **equitable distribution of resources**, a focus on quality, and a cultural shift towards greater **frugality towards consumption, regional economies, and circular economies**.
- Even though degrowth tends to be more prevalent in the Global North it is a critique of the mechanisms of colonial appropriation, and cheapening of labour and resources



Buch-Hansen, Hubert; Koch, Max & Nesterova, Iana (2024). Deep transformations: A theory of degrowth. Manchester University Press, <https://doi.org/10.7765/9781526173287>

Four aspects and habits of degrowth



- **Material transactions with nature:** Cleaner energy forms, **regard for nature**, **preservation of biodiversity** and life, place-sensitivity, **place-based activities**/localisation, nature-based economic activities
- **Social interactions:** Empathy, compassion, **peacefulness**, solidarity, sufficiency, **kindness**, generosity and **tolerance of diversity**, spontaneous right action, **fellow-feeling**, respect and concern for others, care, mutual learning, democracy
- **Social structures:** **Collaboration**, equal distribution of economic and other resources, **flat hierarchies**
- **Inner being:** Love, **creativity**, oneness, gentleness towards being and beings, awareness, **curiosity**, **transcending the narrow ego/self**, seeing oneself as part of the broader existence, self-realisation, fulfilment, harmony, joy ('to be')

As the authors point out, “it is crucial to avoid reductionism, acknowledge the interconnectedness of the planes of being and to recognise [the importance and] diversity on each plane”.

„If growthism seeks to organize the economy around the interests of capital (exchange-value) through accumulation, enclosure, and commodification, degrowth calls for the economy to be organized instead around provisioning for human needs (use-value) through de-accumulation, de-enclosure and de-commodification. Degrowth also rejects the cheapening of labour and resources.“

Buch-Hansen, Hubert & Nesterova, Iana (2023) 'Less and more: Conceptualising degrowth transformations'. *Ecological Economics*, 205, 107731

Buch-Hansen, Hubert; Koch, Max & Nesterova, Iana (2024). Deep transformations: A theory of degrowth. Manchester University Press,

<https://doi.org/10.7765/9781526173287>

#unplugtrump: Extending digital authonomy

European alternatives for popular services

- <https://european-alternatives.eu/alternatives-to>
- lists of >400 European alternatives for popular services
- that were developed and hosted in Europe
- All products that use renewable energy to provide their services are marked with a green leaf symbol.
- Assigns EU hosted labels

 Web analytics services A web analytics service tracks user behavior... 31 alternatives	 Cloud computing platforms A cloud computing platform provides on-d... 12 alternatives	 Content delivery network (CDN) services A content delivery network (CDN) is a geo... 6 alternatives
 Email providers An email provider provides its users with a... 19 alternatives	 Virtual private server (VPS) hosts A virtual private server (VPS) hoster provid... 23 alternatives	 Search engines A search engine allows their users to search... 6 alternatives
 Transactional email service A transactional mail service offers users the... 7 alternatives	 Domain name registrars Domain name registrars are companies tha... 12 alternatives	 Time tracking apps A time tracking app is an application that h... 13 alternatives
 Navigation apps Navigation apps help you get from A to B. 8 alternatives	 Uptime monitoring services An uptime monitoring service periodically ... 11 alternatives	 File hosting services With a file hosting service, users can uploa... 11 alternatives
 Machine translation services A machine translation service (translator) is... 1 alternative	 Object storage providers Object storage providers allow their users t... 1 alternative	 Microblogging services A microblogging service allows users to po... 1 alternative

Open alternatives for popular services

- Open Source alternatives
<https://openalternative.co/alternatives>
- lists of >400 apps that were developed in Europe at and therefore also comply with European data standards

AI & Machine Learning → AI Development Platforms → Machine Learning Infrastructure → AI Security & Privacy → AI Interaction & Interfaces	Data & Analytics → Web & Product Analytics → Business Intelligence & Reporting → Data Engineering & Integration → Data Warehousing & Processing → Data Extraction & Web Scraping	Miscellaneous → Design & Prototyping → Cryptocurrency & Blockchain → Finance & Fintech → Gaming → Internet of Things (IoT) → Logistics & Supply Chain → Media & Streaming
Business Software → CRM & Sales → ERP & Operations → Finance & Accounting → Human Resources (HR) → Marketing & Customer Engagement → Customer Support & Success → E-commerce Platforms → Project & Work Management → Collaboration & Communication → Scheduling & Event Management → Document Management & E-Signatures → Forms & Surveys → Compliance & Risk Management	Developer Tools → Website Builders → IDEs & Code Editors → Frameworks & Platforms → API Development & Testing → Testing & Quality Assurance → Version Control & Collaboration → Code Analysis & Transformation → Build & Deployment → Integration Platforms → AI Assisted Coding	Productivity & Utilities → Note Taking & Knowledge Management → Password & Secret Management → Screen Capture & Recording → File Management & Sync → Email & Communication → Automation → Time & Task Management → Personal Finance Management → Design & Visualization → Bookmark & Content Management → Remote Desktop & Access → Browsers & Extensions
Community & Social → Social Networking → Community Building Platforms → Collaboration & Feedback	Infrastructure & Operations → Search Engines → Cloud Infrastructure Management → Server & VM Management → Monitoring & Observability → Databases → Networking & Connectivity	Security & Privacy → Identity & Access Management (IAM) → Secrets Management

Open Source

Open Source is a catalyst for Digital Sovereignty

- „Open Source Software (OSS) is **a key element and prerequisite for strengthening Digital Sovereignty**.
- It enables societies to work independently and autonomously on solutions and to adapt them as best as possible to one's own needs. This avoids lock-in effects and expands the company's own technical know-how. In conjunction with increasing collaboration in the OSS ecosystem, efficiency and innovation gains can be achieved in the long term. These in turn contribute to the progress of the digital transformation and enable the sustainable realisation of Digital Sovereignty.”

<https://www.pwc.de/en/digitale-transformation/open-source-software-management-and-compliance/digital-sovereignty-why-it-pays-to-be-independent.html> 2025

Digital-sovereignty principles

- The **availability** of more than one **provider** ensures independence from the original manufacturer.
- The flexible operation of the software guarantees independence.
- **Open data standards** support flexible data migration and facilitates flexible and free use.
- Transparent software and code enables joint advancement and control.

After Bitkom (2023). Open Source Monitor 2023.

<https://www.bitkom.org/sites/main/files/2023-11/Bitkom-Open-Source-Monitor-2023-EN.pdf>

- See also the definitions of the *Free Software Foundation*, <https://www.gnu.org/philosophy/free-sw.html.en>

Open Source:
Visibility and
Collaboration:

The OSGeo Foundation

OSGeo's Goals



- **OSGeo Vision**
 - Empower everyone with open source geospatial
- **OSGeo Mission Statement**
 - Foster global adoption of open geospatial technology by being an inclusive software foundation **devoted to an open philosophy and participatory community** driven development.
- **OSGeo Goals**
 - The following aspirational goals support the overall mission. As a foundation we seek to:
 - provide resources for foundation projects;
 - foster the use of open source geospatial software;
 - encourage interoperability with open and community standards;
 - ensure interoperability between the foundation projects;
 - encourage a high degree of quality and innovation in foundation projects;
 - champion the use of open-source and community participation through the development of an open education curriculum
 - enable communication and cooperation amongst OSGeo communities;
 - champion community building through horizontal (local chapters) engagement and through vertical (sector specific) agreements with like-minded organizations;
 - be a welcoming and inclusive worldwide organization at all levels;
 - celebrate excellence, openness and service within the OSGeo community.

OSGeo Projects

Content Management Systems

GeoNode

Desktop Applications

Marble

gvSIG Desktop

QGIS Desktop

Geospatial Libraries

PROJ

GeoTools

Orfeo ToolBox

GDAL/OGR

GEOS

pgRouting

GRASS

Metadata Catalogs

GeoNetwork

pycsw

Other

OSGeoLive

Spatial Databases

PostGIS

Web Mapping

pygeoapi

MapServer

deegree

ZOO-Project

OpenLayers

GeoMoose

Mapbender

PyWPS

GeoServer

- Open Source is not a one-way-street.
- Open Source and OSGeo require our participation and our joint support.
- Partizipation comprises
 - Usage,
 - Education,
 - Testing, Translating,
 - Support of the community by hiring, financing further developments.

Staying together to achieve
greater output



By Alexander W. Galbraith [Public domain or Public domain], via Wikimedia Commons
https://upload.wikimedia.org/wikipedia/commons/a/ab/Barn_raising_in_Lansing.jpg

Conclusion

Follow the „Planes of Degrowth“!

Seek collaboration with others in the sense of being and supporting „Open“

„Brotherhood/Sisterhood: the foundation and path to peace“ [Franciscus 2014]

Support and multiply the spirit of AGSE and **a**pply **G**eoinformatics for the betterment of **S**ociety and **E**nvironment.

Gracias & Thank you & Vielen Dank!

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